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Design And Evaluation Of The Impact Of A Multi-Agent Control System (framework) Applied To A Social Setting

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DESIGN AND EVALUATION OF THE IMPACT OF A MULTI-AGENT
CONTROL SYSTEM (FRAMEWORK) APPLIED
TO A SOCIAL SETTING

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by

Oscar Antonio Perez

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Dedication

I dedicate this work first and foremost to my family, with love to Rocio, Fernanda, Ian and Iker
as you have always provided support and inspiration to continue working,
to my parents for their encouragement and endless love,
to all of my friends since we are a collection of life experiences,
those life experiences that I have experienced have taken me here,
and finally
to all of the students that will be able to better plan their college careers using this tool.

DESIGN AND EVALUATION OF THE IMPACT OF A MULTI-AGENT
CONTROL SYSTEM (FRAMEWORK) APPLIED
TO A SOCIAL SETTING

by

OSCAR ANTONIO PEREZ SOLIS, MSEE, BSEE

DISSERTATION

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The University of Texas at El Paso
in Partial Fulfillment
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for the Degree of
Doctor of Philosophy

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THE UNIVERSITY OF TEXAS AT EL PASO

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The completion of the project, including the nice graphics for the iAdvise program and writing of this dissertation would not have been possible without the assistance of a few very special people in my life. I would like to show my gratitude to the following:

- Rocio Castañeda for your companionship, your constant support, your organizational tips, and for your honest feedback.
- My advisor PhD. Virgilio Gonzalez for the advising, career guidance, suggestions and the sharing of great ideas during the research.
- PhD. Peter Golding for your guidance, encouragement and honest feedback during my PhD work.
- Pedro Espinoza and Herminia Hemmitt for their direct contributions by reading this dissertation document over and over again.
- Randy Anaya for the design of the graphics used on the system created and the artwork on the workflow used in this dissertation.

Abstract

The objective of this research is to design and analyze the performance of a new mechanism to improve the advising of students in a nontraditional environment. This nontraditional environment includes: a minority serving, commuter campus with a high percentage of transfer students. Specifically, these demographics are unable to keep a tightly controlled cohort of students flowing through to the completion of the curriculum. Students in these circumstances usually have varied course loads and competing priorities due to family and financial needs or other societal responsibilities. Therefore, there is a need for an individualized approach to advising.

University administrations face challenges scheduling courses and allocating diminishing resources needed to satisfy the increasing student demand. In addition, the school administrations need to assess the efficacy of the advising program in place in regards to the students' progress in completing the curriculum in a program. Collecting this type of longitudinal student data can be difficult.

A web application system (mobile compatible) using a multi-agent distributed control approach has been developed to allow the students (agents) to gain more control over their individualized advising. In this context, the student becomes an agent, and the school provides the environment with a desirable behavior for the system. This research will identify the school's administrators, as the academic control element and will be referred as the "Operator".

This study focuses on the newly designed agent system built with a dashboard tool that collects each individual student's information in a web-based program as they progress through the curriculum and generates advising recommendations specific to each student. The agent logic employs principles used in project management tools designed as a resource for schedule optimization. It provides a visualization map of course sequences that are customized for each student based on their history of courses completed. It makes advising adjustments that will optimize the length of time required to obtain the degree under a constrained set of parameters. At

the same time, the agent system provides real-time feedback to the Operators. The tool helps students optimize their resources to complete their degree sooner.

The second tool is the Operator dashboard that consolidates the collected data from the agents through several semesters (historical data) and the predicted effects of the recommended plans. This enables a better resource allocation utilizing real time data.

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Chapter 1: Introduction

This work focuses on the optimization of human and infrastructure resources needed to maximize the output and minimize time losses in an educational setting by implementing a Distributed Control System (DCS). The educational setting is the Electrical Engineering department at The University of Texas at El Paso (UTEP) where most students take longer than four (4) years to graduate. This outcome can be attributed to several factors, some of which include semester enrollment under 15 credit hours, school/work overload, flawed student schedule planning and the diminishing allocation of resources. Due to the nontraditional demographics at UTEP, students are also affected by heterogeneous cohorts, competing family demands and other non-school related commitments, in addition to the previously mentioned factors. Therefore, individual student and university resources have to be optimized to decrease the time taken to obtain a degree and maximize the number of graduates the university can prepare within the four-year period.

Our research addresses several questions regarding the implementation of such a distributed control system. Can this distributed control system help the students identify classes that do not count towards their degree? Can this distributed control system use information specific to each student to provide a quick and easy method to calculate the expected graduation date? Can this distributed control system inform the student of the relationship between classes enrolled per semester and their direct connection to the expected graduation date? Can this distributed control system help students select classes in a way that will enable them to better balance their academics with their personal life? After using this distributed control system, can students see a real benefit from personal class selection? Do students perceive this distributed control system as easier to operate when compared to the system currently in place? Do students perceive this distributed control system as faster in checking class pre-requisites and co-requisites when compared to the current system? Do students perceive this distributed control system to be a faster system than the current system as a whole? Do students prefer this distributed control

system over the current system as a whole? Even though these questions are very relevant to our educational setting, the main research question encompassing the previous questions is “Can a Multi-agent distributed control system be applied to a pre-advising system? Is it functional? And what is the performance of the system? Another two questions derived from our main research questions are: Can the Multi-agent distributed control system improve the visibility of the operators on the system? Can the agents obtain more control over their individualized pre-advising process?

A university process already established for many years that could oversee most of the challenges mentioned above is the pre-advising process. This study focuses specifically on this pre-advising process. After months of examining the problems encountered by students and the advising process in place, it is theorized that the advising process itself can be improved if it is modeled after a Distributed Control System (DCS). The constant monitoring and managing nature of the DCS allows students to more easily detect possible wasted resources such as classes that would not count towards their degree, classes taken out of sequence that would generate a less than optimal result (low grade, or class being difficult due to the lack of students’ background), and more importantly, class overload or under-load that would result in a less optimal time to graduation outcome.

On the administration side, department administrators are tasked with maximizing the department resources (human and infrastructure) to maximize the number of students that graduate in the shortest time possible. The modeling of the advising process as a DCS would allow department administrators to maximize resources by identifying student flow bottlenecks and anticipate enrollment per class. Due to the real-time nature of the DCS, department administrators would be able to visibly ascertain the overload demand or an under-utilization looking at these per class enrollment numbers. The modeling of the advising process as a DCS is based on the smart grid concept was designed, developed and analyzed in this research.

The hypothesis is that by providing the students and the department administrators with a new degree of visibility in real-time, both entities will be able to make necessary changes to the

graduation path in a way that optimizes resources. Department administrators using expected enrollment and previous class attempts have new information available to better utilize department resources to influence the flow of students within the Electrical Engineering (EE) curriculum. EE students using several pieces of information (workflow of classes, credit per semester analysis and a work/school load balancing algorithm) are able to better plan their next semester classes optimizing their available resources (time). The Electrical Engineering (EE) curriculum was selected for this pilot based on the rigidity of the program due to its highly specialized nature. This high specialization in a curriculum demands many of the required courses be sequential in order to build on the previous class content. If the system performs well in a highly rigid environment, the expectation is that configuration and applicability to less rigid curriculums (such as that of Liberal Arts) will follow.

Currently, students have to set an appointment every semester to be advised. The purpose of this routine scheduled advising is to provide guidance to the student in selecting the appropriate courses. Every semester a registration hold is placed on the student's record and is removed only after the student attends a group advising kickoff session or successfully completes an online advising questionnaire in Blackboard, the Learning Management System (LMS). All Students from the EE department are enrolled in the course Electrical Engineering Advising Resources. In this course students have access to the form "BSEE_2014_v5 - Student Name.xlsx" in Microsoft Excel and the advising quiz. The advising quiz has to be passed with a 95% or higher (85% or higher for first semester and transfer students). Students have to fill in the Excel file with the classes already taken and pay specific attention to the "Flowchart" section within the file. In the "Flowchart" section the student is shown the courses that he/she can enroll in the upcoming semester. Figure 1.1 shows an overview flowchart of the current advising process.

GENERAL Advising Process

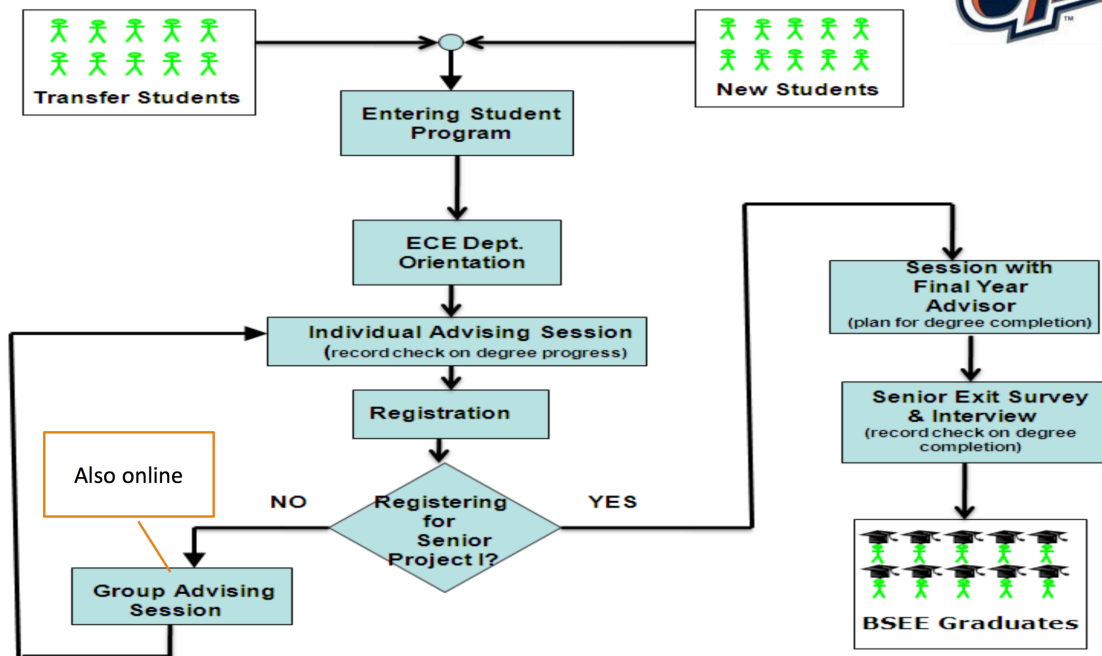


Figure 1.1. General Advising Process.

Unfortunately, the current system has many sub-processes that can negatively affect the advising process. The advising appointment can be delayed when students fail to make a list of probable classes in which to enroll. Sometimes advisors do not get the results from the BSEE_2014_v5 - Student Name.xlsx file until the appointment date, extending advising meetings. In addition, it is not uncommon for students to forget their advising appointment all together, thus resulting in a bigger delay for their advising. These are common factors that make the advising appointment take longer than expected. This process is repeated every semester until the students graduate. Figure 1.2 shows a more detailed flow diagram of the advising process, mapping out every step of the process. As it can be seen in the figure 1.1 and figure 1.2, there is room for much improvement in the current process as a whole.

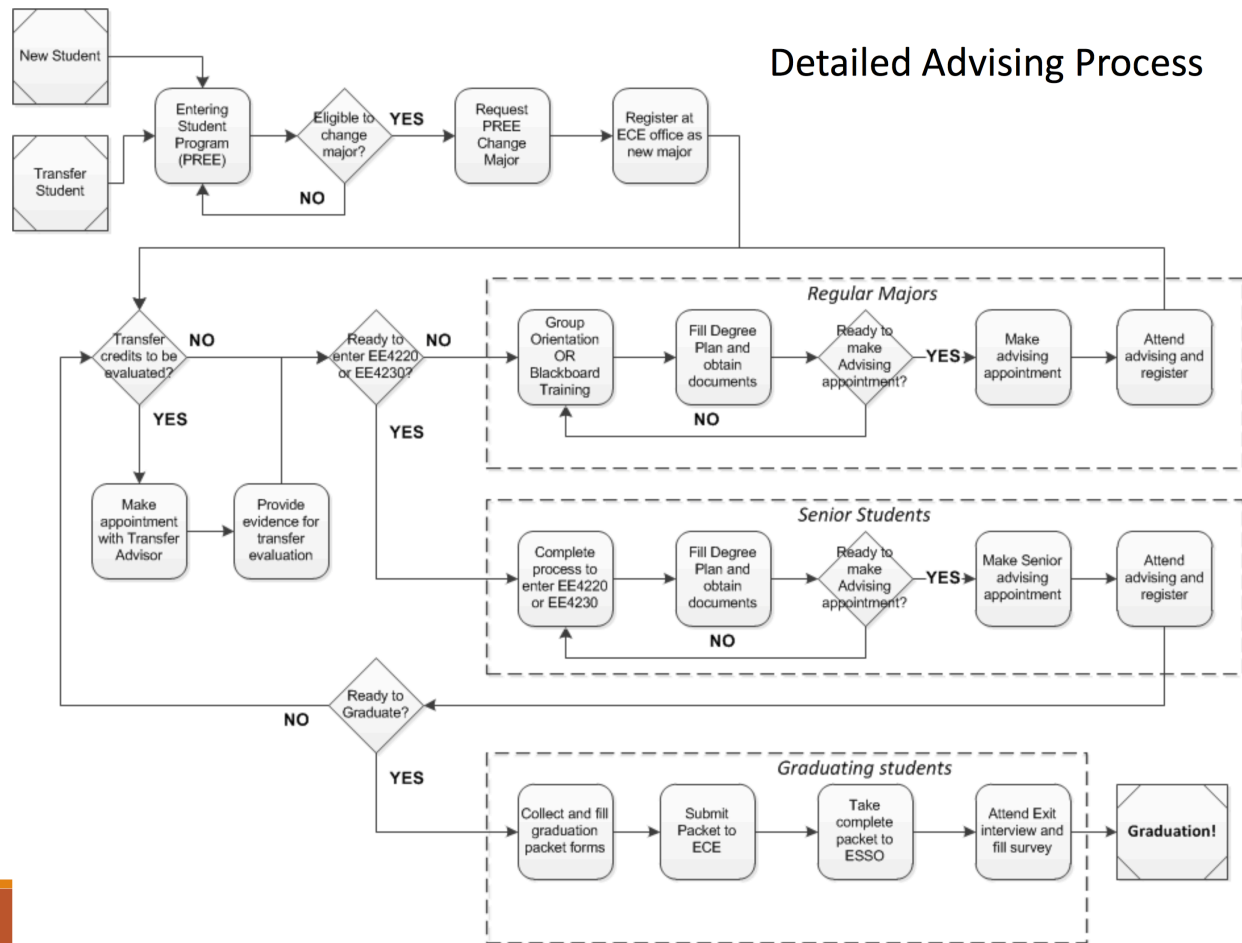


Figure 1.2. Detailed Advising Process.

The proposed methodology to improve the current advising system is to implement a distributed control system capable of streamlining the flow of information from the students to the advisors and vice versa, in real-time. This distributed control system has the ability to provide a quick automated and customized analysis of classes taken to help students plan ahead before arriving for their advising appointment. The DCS will provide readily available information enabling the student to easily substitute the Excel file with a web form that includes additional questions. The additional information input into the system will enable a deeper analysis that will help the student in his/her decision-making process regarding the selection of classes in which to enroll for the upcoming semester. The additional information requested includes the approximate

number of hours that the student devotes to other activities outside school and the number of credits that the student plans to enroll in for the upcoming semester.

In order to take advantage of the proliferation of mobile devices and cloud computing, this new methodology will also implement a DCS that can easily be accessed 24 hours a day, 7 days a week using a mobile device. The option to use a computer will remain available. Using these technological advantages enables the larger scale application of the proposed methodology. The smart-grid distributed control model is also incorporated as part of this new methodology. In this model each student will represent an agent. Each agent can operate within a given range. This range of operation is setup by the operator of the system. In this model, department administrators represent the operators of the smart grid. Department administrators, as operators, setup the curriculum, which is the operating range for the agents. Figure 1.3 shows a model of the current system and how it is similar to the old power grid. This figure shows a top down system that does not take into account the real-time demand of the agents. It makes administrative decisions utilizing only historical data. On the other hand, operators using the new system can utilize real-time data generated by the agents to change the system parameters to accommodate for a better flow of the agents through the system in real-time. The utilization of this real-time data enables the operator to optimize the system's parameters based on the current load. Figure 1.4 shows the model including a two-way communication channel that enables real-time communication to occur. Just like in the smart grid, a two-way communication channel is enabled by the smart meter. After enabling this new two-way communication channel, the operator can monitor the agents' performance. Due to all of the previously mentioned system characteristics, this newly developed control system will be referred as the MULTI-AGENT CONTROL SYSTEM (and for short, iAdvise will be used; the meaning of the "i" is innovative, intelligent and inner).

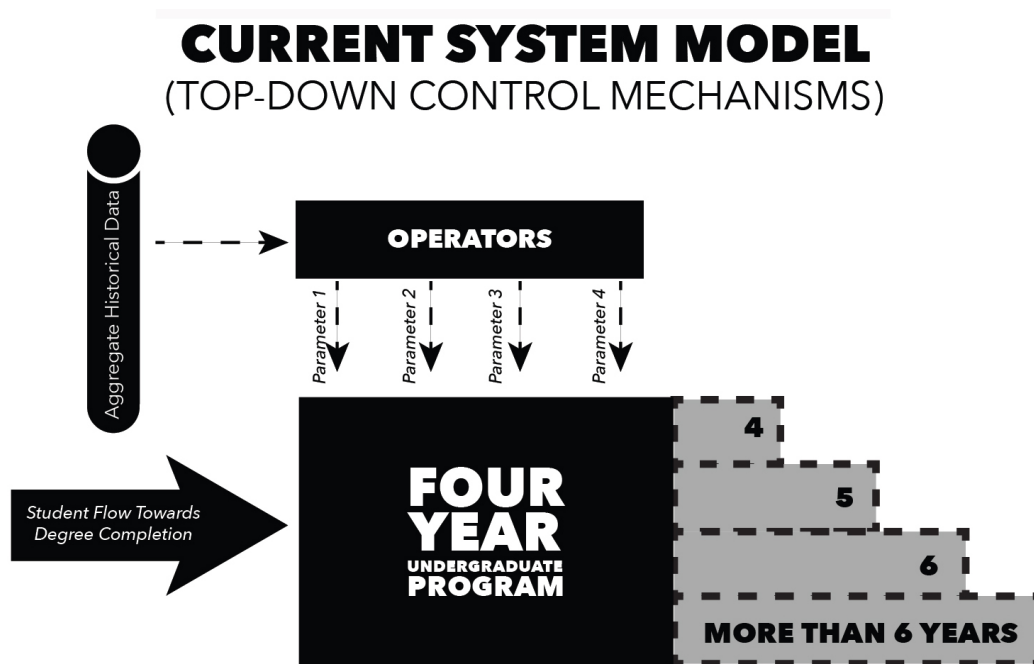


Figure 1.3. Current control system used for advising (Top-Down approach).

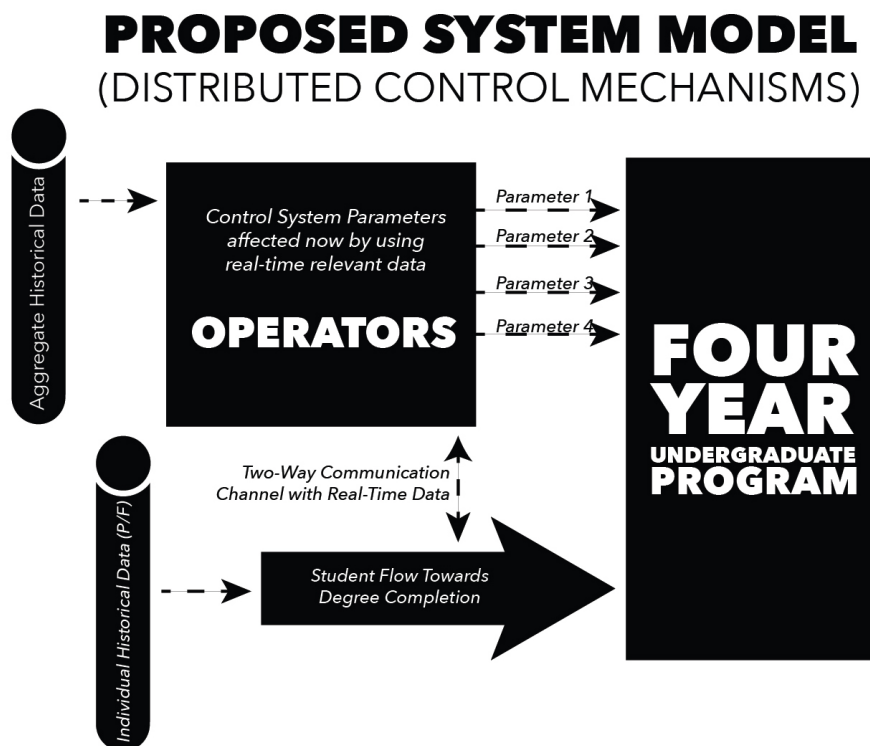


Figure 1.4. Proposed Distributed Control System.

The current system has evolved from a manual advising system (1st generation) to a more accommodating online manual form system (2nd generation). The newly proposed Multi-agent control system is capable of providing real-time feedback to both the operator and the agent. The agent can control the utilization of the local resources such as classes, time, and money in order to make an optimal decision specific to that agent. This distributed control system provides a new degree of visibility to both the agent and the operator. It provides the agent a quick and easy access to the resources and parameters of operation. It provides the operator a constant, real-time monitoring tool of the agents to optimize the flow of agents.

Currently, there is enough data to create a benchmark of the operation of both the original manual system and the second generation system. A way to measure the accuracy of the Multi-agent system is to ask students that have used the previous system to use the Multi-agent control system. After they have used both systems then students will answer a survey instrument to compare both systems. To measure the accuracy of the Multi-agent system, students who had used the system currently in place were asked to use the Multi-agent control system and then answer a survey instrument to compare both. The comparison focused on the following criteria: time to complete pre-advising, ease of use of system, error detection of the system, and agent flow prediction. Additionally, students were asked if they perceived the Multi-agent control system provided new information that the previous advising systems did not. Another benchmark of the performance of the system was generated when department administrators were queried as to the length of time it took for them to access the data of expected student enrollment in class X and finally the length of time it took for them to look for the same information using the Multi-agent control system versus the previous advising system.

The Multi-agent control system focuses on the Electrical Engineering department student body that represents the university's demographics, accordingly (Flores, 2007). This research has measured students' perceived value of using this system and the results can be seen in the Results and Conclusion sections. Given the demographics of the population, content, and subject matter involved, this type of study has not been previously done. This research provides important

information for the electrical engineering and engineering education fields due to the demographics projected by the US Census bureau (Colby and Ortman, 2014). Based on the effectiveness of this system, it could be added to the engineering institution toolbox to increase STEM success in higher education institutions and later be implemented to other colleges.

Chapter 2: Literature Review

Background information on the project management approach

Previous works in project management have presented insight into critical path methods. In utilizing the Critical Path Method (CPM) a vital chain of events was found to be needed in order to complete a project (Hillier, Lieberman. 2005). CPM has been in use since the mid-fifties (Moder and Phillips, 1964). The CPM assumes that a project can be broken down into smaller identifiable tasks or activities (Newbold, 1998)(Archibald and Villoria, 1966). Each of these tasks can be broken down into subtasks. Once this breakdown of tasks has occurred the tasks are placed in order against a timeline (AACE, 1990). Each task is assigned a start time, duration, and end time. A common way to place the tasks in a timeline is using a Gantt chart (Needleman, 1993). Each task may be dependent on the completion of a previous task, while others may be independent of previous tasks and can be done at any given time without affecting the minimal time required to complete the project (Lowe, 1966).

In this research the project is defined as the completion of the all the classes in the curriculum to achieve the Bachelor of Science degree in Electrical Engineering in a university environment. A large number of dependencies (as defined by the CPM) exist for of each class in the curriculum. To better illustrate the dependencies information, a table was created (See Appendix A). Due to the size of this table of dependencies, this project can be catalogued as a complex project (Doloi and Jaafari, 2002). In order to define the critical path of this project, the use of a project management tool commonly used in operations research (Gonzalez and Esparza 2010) was applied. The Critical Path (CP) analysis is a highly effective means to discover alternate paths or plans. CP analysis consists of three phases: planning, analysis, and scheduling and controlling. All of these phases are interdependent (Rivera and Duran, 2004) and require individual attention at every stage of the project. The critical tasks in a project are the ones that extend from the start of the project to its completion. This path of tasks is called the critical path. Using this project management technique provides the constant monitoring of the progress being made towards the completion of each task as well as the usage of each agent's resources. The

nature of project management techniques is to check resource utilization and reassign resources when the events deviate from the optimal path.

Another aspect of this project management technique is the collection of data to optimize the process by minimizing wasted resources during each cycle thereby generating a constant converging system towards the optimal solution. Figure 2.1 shows an example of classes and their dependencies. The blue boxes that do not have lines in the first column are classes that do not have a pre-requisite or a co-requisite. This characteristic makes these classes independent and not part of the critical path. Basically, since these classes do not have a prerequisite or a co-requisite, students can schedule them at any point in time without affecting the minimal time required to complete the project. On the other hand, due to the dependencies that the classes in red have, if a class from this group is delayed one semester then the minimal time required to complete the project will be extended by one semester. Classes in the red blocks are the critical path (in color red) of the electrical engineering curriculum.

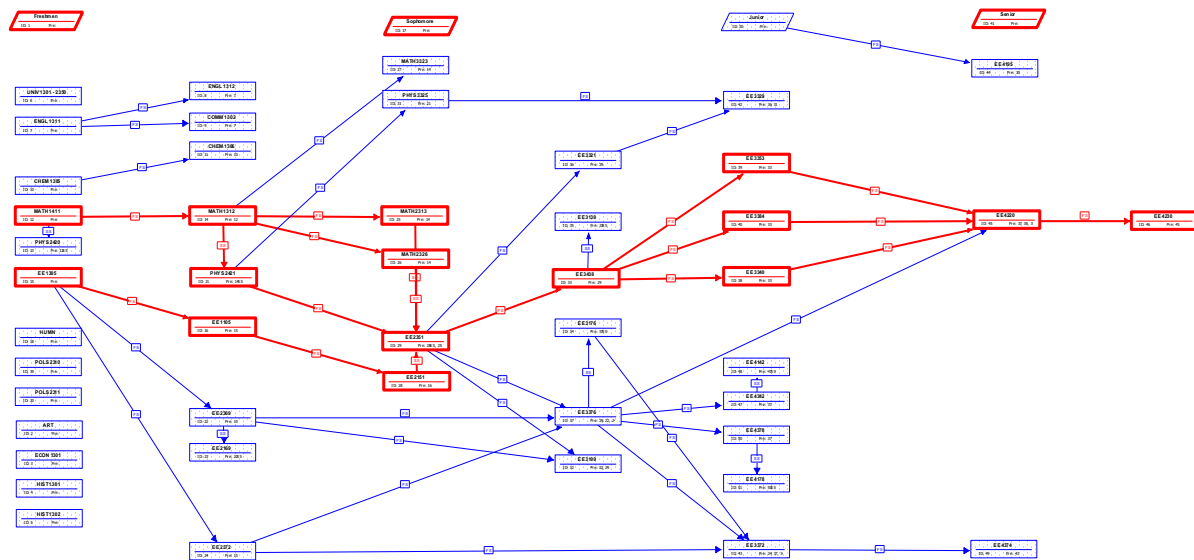


Figure 2.1. Network diagram showing the critical path (in color red) in the electrical engineering curriculum (Gonzalez and Esparza 2010).

There are two methods used to identify the Critical Path:

1. The forward pass. This method calculates the earliest time in which a project can be completed. The date each activity is scheduled to start is known as the “early start” and the date each activity is scheduled to end is called “early finish” (Winter, 2003). First, the earliest possible date for starting the project is identified, then all activities are lined up to identify the completion date.

2. The backward pass. This method uses the date the organization wants to complete the project as the path’s starting point. This method sets time requirements based on working backwards from the final date desired for the last activity to the initial first activity. The dates identified in this method are called “late start” for the starting of the first activity and “late finish” for the ending of the last activity.

The selection of method 1 or method 2 depends on the following: final desired results, available documentation, and accuracy of the data for each activity on the network diagram (Baram, 1994). Another important concept in Critical Path selection is the “Slack or float.” These are defined as the time between the earliest starting time (using the forward pass method) and the latest starting time (using the backward pass method). “Total float (float)” is the amount of time an activity can be delayed without delaying the overall project completion time (Winter, 2003).

It is rare that the Critical Path has any slack or float built into the activities. Therefore, a delay in any of the activities that are part of the Critical Path will result in the overall project taking longer to complete. The timing for starting any activity is critical when the earliest time that any activity can be started is the same as the latest time that the activity can be started. In addition to this scheduling, it is important that activities have the necessary resources available on time (Just and Murphy, 1994). The factor of resources can get even more complicated as the interdependencies of the different activities may compete for a limited amount of resources during the entire span of the project. In addition, the environment in which the project takes place may have external factors that influence one or several tasks or activities needed to complete the project (Sewell, 1975). The influence of these external factors may force the schedule of the activities in the project to be extended or completely stopped. For college students with the demographics of

UTEP, this issue is aggravated by student over commitment, including competing family, work and other non-academic time commitments. Time is a finite resource and, accordingly, a 60 hours rule was defined for college students. (Landis, 2010) The “60 Hours Rule” developed by Dr. Mulinazzi assumes that a person can be productive for 60 hours a week for the length of a semester. This parameter provides a great reference due to the nature of the demographics of this campus. Therefore, it is critical to identify the characteristics of the environment and any external factors that may affect the activities or tasks.

Finally, in order to optimize a process, the following pieces of information are required: a plan, an objective, a benchmark and performance measurement. Utilizing a project management approach to solving the time to graduation challenge helps the students and school administration identify areas where the process of graduation can be optimized. The project management approach also helps with the identification of control parameters necessary to complete the process within the time allocated and the identification of possible paths to correct the project once it has deviated from the originally planned timeline.

Background information on the Smart Grid model

Traditionally, the term grid is used to refer to the electric network in charge of electricity generation, transmission, distribution and control. In the literature there are two types of grids, the traditional grid and the Smart Grid. In order to understand the approach in relation to the Multi-Agent Control System that was developed and implemented, it is imperative to understand the traditional grid and how it evolved to become the Smart Grid. It is also of great importance to understand the main features of the Smart Grid, as the Multi-Agent Control System is based on these features that have revolutionized the industry.

The traditional grid is used to produce electricity from a few centrally located generators to a large number of customers using a high voltage distribution network (Frye, 2008). The traditional grid has one-way communication (two-way communication is only within the local environment), centralized power generation, very limited protection, and monitoring and control

systems. This last characteristic basically makes the system “blind” (Hossain et al 2010). The traditional grid has grown due to rapid urbanization, economic growth, and political and geographical factors that are unique to every single utility company (H. Farhangi, 2010). Even though there was growth, the traditional grid operated with very defined demarcations between the four major components: generation, transmission, distribution and finally the customers; the system grew without many modifications for the past century (Gharavi and Ghafurian 2011). All of these components were connected under a very hierarchical organization (Overman and Sackman, 2010). The hierarchical organization placed the generation of electric energy at the very top of the chain to ensure power generation first. The second priority was the transmission of electric power. The third priority was the distribution to sub-systems in urban areas and at the bottom of the chain was the delivery of electricity to the customers. The traditional grid is basically a one-way pipeline in which there is only top to bottom communication (Tomoiağă et al, 2013). This communication has no real-time information about the service parameters at the customer termination points. Due to this important fact the traditional grid was over-engineered to be able to supply the maximum anticipated peak demand across its aggregated electric load. After years of analyzing electricity consumption patterns in the traditional grid, it was discovered that the peak demand is a very infrequent occurrence, making the traditional grid a highly inefficient system (Ilic 2007). Figure 2.2 shows a basic diagram of the traditional grid to illustrate the way it was constructed. Four main sections can be seen, also called domains. These four domains are: Power generation, Transmission grid, Distribution grid and Customers. In this model power generation is the sole critical element and it is marked as the highest element from a hierarchical stand point. The transmission grid is in charge of the transmission of the energy for long distances. The distribution grid is responsible for the geographically limited distribution of electricity. At the end of the hierarchical chain the customers use the produced energy and pay for their consumption. It is critical to understand that the flow of electricity and communication in the traditional grid goes in one direction only, from left to right, and it does not provide feedback from domain to domain.

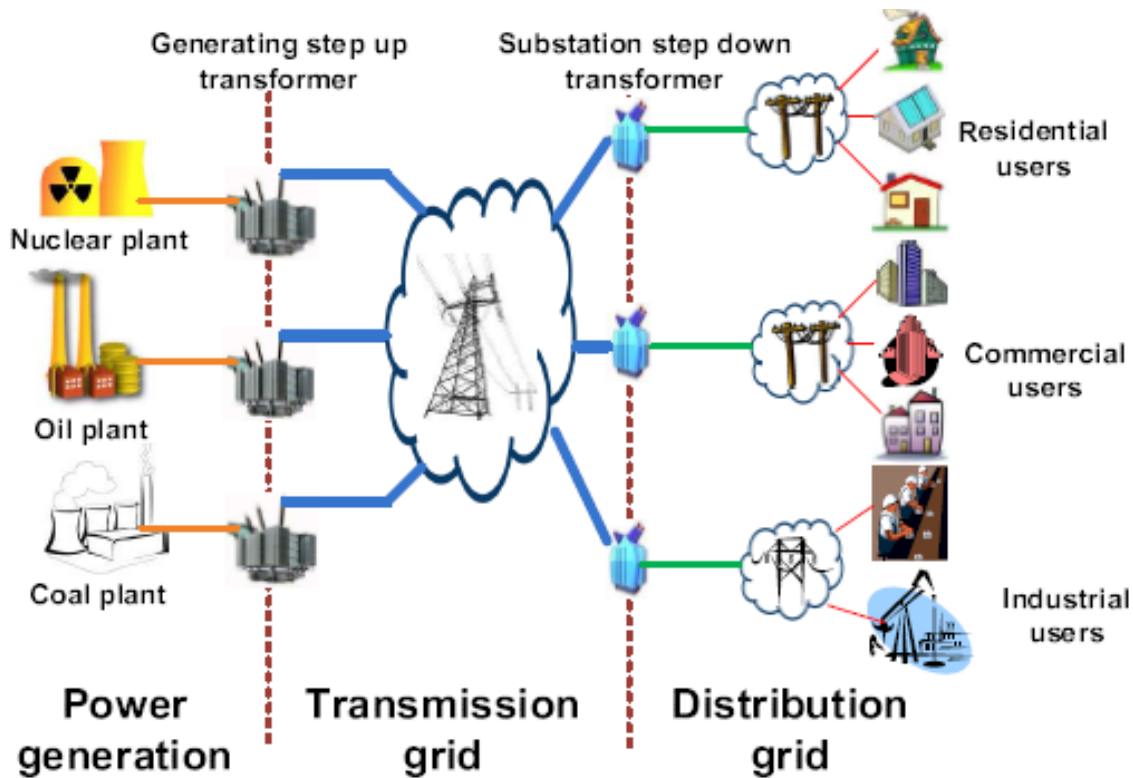


Figure 2.2. Example of the traditional power grid (Fang et al. 2012).

Figures 2.3 and 2.4 show the U.S. demand of electricity from August 2012 to July 2013 (Energy Information Administration, 2013). The traditional grid was designed to be able to supply the annual hourly maximum. Unfortunately, the demand only reaches this peak once a year. The fact that the system only works at full capacity once a year is highly inefficient. Even if the system was to steadily produce the average weekly maximum, which is 117GW, it would still be very inefficient as the system was designed to produce 155GW. The system would be running at only 75.48% of its capacity. Figure 2.5 from the U.S. Energy Information Administration (EIA) shows the average annual demand to be 89GW. This was a tremendous issue for the traditional grid. Instead of being proactive, the approach was very reactive. This exemplifies the advising problem at hand due to the similarities of the traditional grid when compared to the current advising system. Both systems share a lack of design that can adapt to real-time demand from the customer. In order for this system to be adaptable, a real-time two-way communication has to be implemented.

That communication has to be fast, (Akyol et. Al. 2010) reliable, (Wang et. Al. 2011) and secure (Baumeister and Chen, 2010) as defined by the Smart Grid model (Gungor and Lambert, 2006).

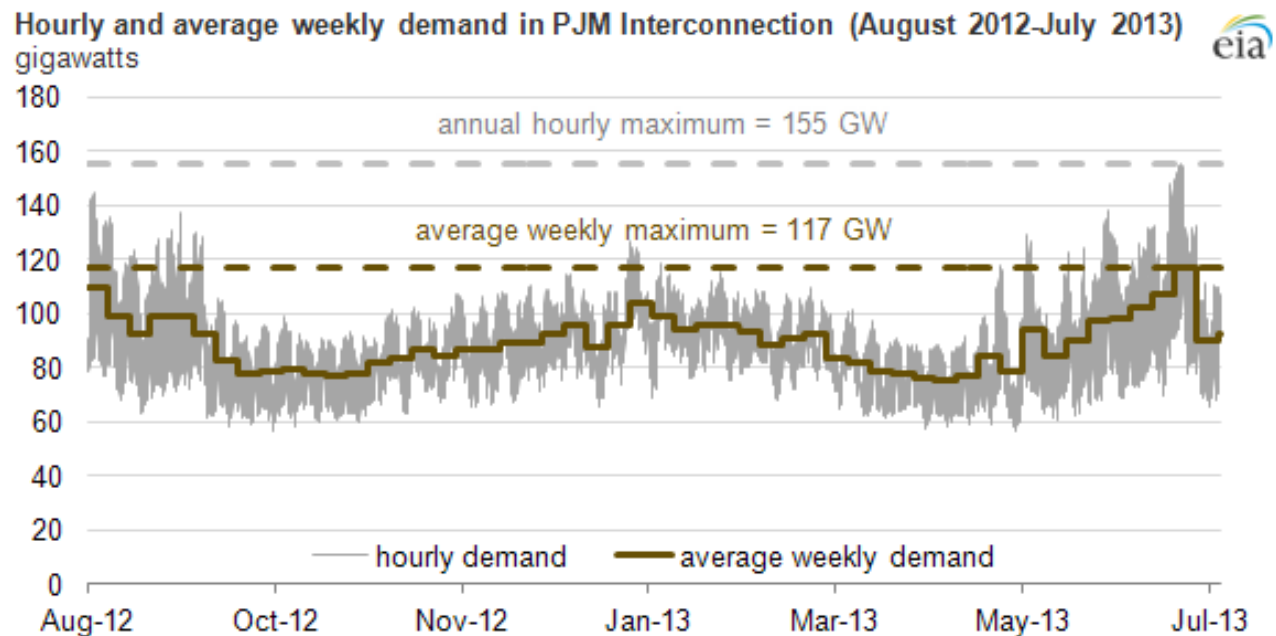


Figure 2.3. Electric demand averages: weekly and annually (EIA 2013).

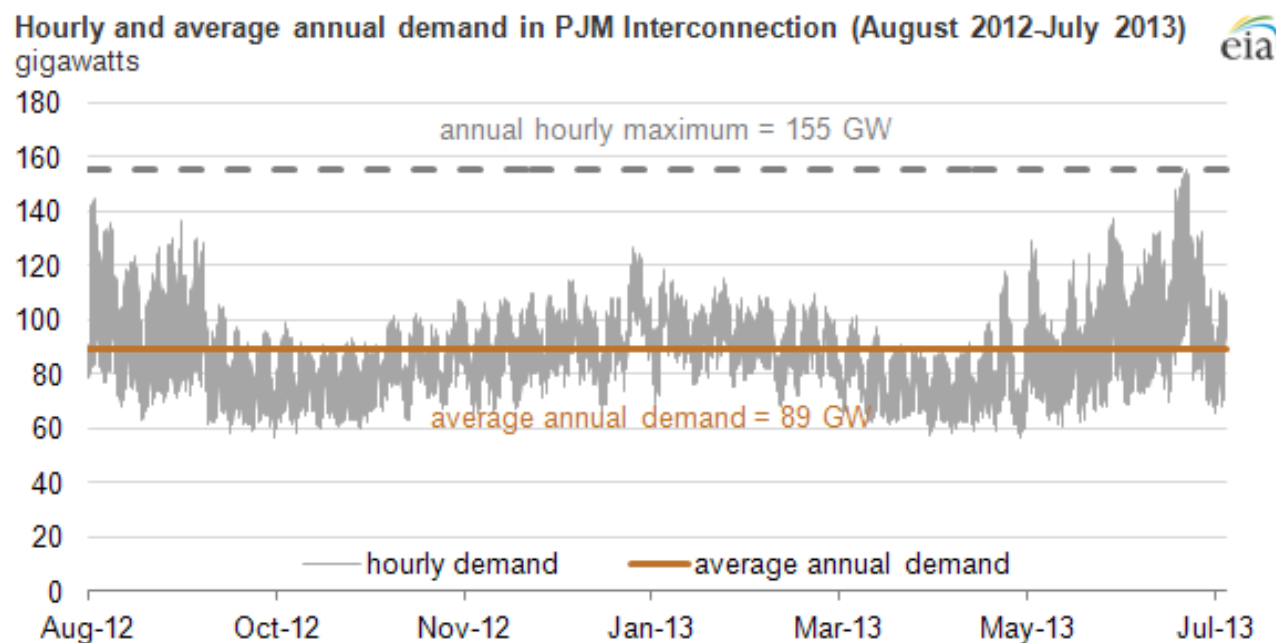


Figure 2.4. Electric average annual demand (EIA 2013).

In order to reduce the inefficiency of the system, several solutions have been presented (Ochoa and Harrison, 2011)(Taneja et al. 2010)(Ghosh et al. 2010). The solution that has had greater success in flattening the consumption curve is variable tariffs (National Action Plan for Energy Efficiency, 2009). Studies have shown a positive attitude towards variable tariffs when these tariffs have economic benefits for the customers and positive effects towards the environment (Stamminger and Anstett, 2013). Variable tariffs incentivize the usage of electric power by reducing set tariffs when the demand for power is low and de-incentivize consumption by raising tariffs during peak hours as shown in figure 2.5 (Mohsenian-Rad et al, 2010). The tariffs are scaled to the different levels of electricity consumption as shown in figure 2.5. The blue line in figure 2.5 shows how the variable tariff increases as the peak consumption (the brown line) increases. This variable tariff example would make it more expensive to consume electricity around 12:00pm on Thursday than any time on Saturday. These variable tariffs allow for a more predictive consumption curve (O'Neill et al. 2010). These variable tariffs promote the efficient production of electricity by flattening the consumption of electricity (the brown line).

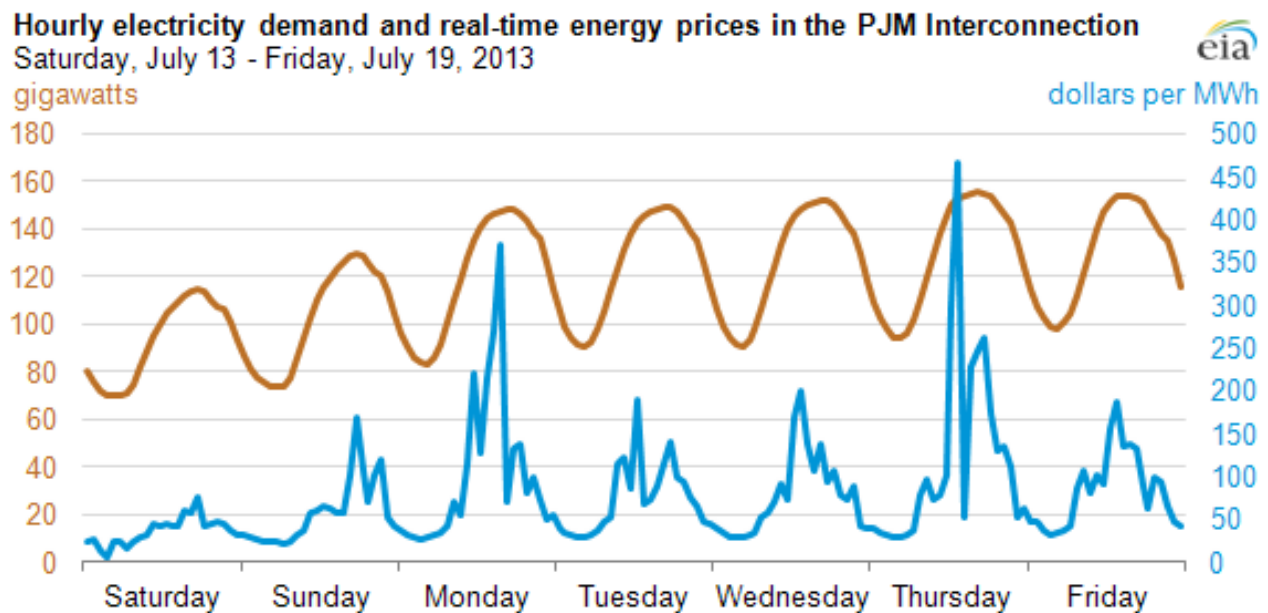


Figure 2.5. Variable tariffs to incentivize a flat consumption (EIA 2013).

According to the literature, the definition of the Smart Grid varies. Most of the definitions in the literature include the characteristics shown in table 2.1 (Uslar et. Al., 2010). Table 2.1 highlights the main areas that changed from the traditional grid to the Smart Grid. In this table by Uslar, the evolution of the communication system is shown. The traditional one-way communication across the four domains was improved by a global two-way communication system. The initial concept of the Smart Grid was first defined mostly by advanced metering with the purpose of improving on the demand-side predictability of consumption and energy efficiency. This initial definition also included the cyber security aspects along with the self-healing reliable grid protection concepts to survive a natural disaster and a malicious sabotage (Rahimi and Ipakchi, 2010). However, new requirements and demands from the electric industry, government and research sectors drove the redefinition of the Smart Grid concept to include a wider scope. The National Institute of Standards and Technology (NIST) coordinated the research and development of the Smart Grid conceptual model (National Institute of Standards and Technology, 2010). This new redefinition of the scope, contemplates a Smart Grid that contains 7 domains: markets, operations, service providers, bulk generator, transmission, distribution, and customers. The original four domains exist, but three new domains were added to the model. These new domains are: markets, operations, and service providers. All of these seven domains can be subdivided into subdomains for example figure 2.7 shows in greater detail the customer domain. Figure 2.7 shows the internal and external communication links, as well as the electricity flow within the subdomain. The communication links are based on a DCS architecture. Specifically, the customer domain has been one that has suffered the most interesting changes. One important change is the implementation of programmable sensors in most of the appliances using electricity within the customer premises (i.e. thermostats, refrigerators, washing machines, dryers, cooling and heating units, etc.). These programmable sensors allow the appliances to be programmed for a time range of operation. This new level of controllability allows the customer to program the usage of the appliance at times when electricity is at a lower cost (in variable tariff charging scheme), making these devices more intelligent. In addition, these sensors and their

interconnections across the domains enable the Smart Grid the flexibility to rapidly respond to a change within any domain. This constant real-time monitoring also allows to mitigate and contain problems detected within a domain, avoiding the propagation of such problems to other systems. All of these appliance sensors model a distributed control system (DCS). A DCS is a system that contains two or more autonomous controllers distributed at different geographical areas to gain intelligence across those geographical areas (Liu, R. et al. 2005), in other words these sensors provide information at the different remote control locations. This distribution of controllers enables the DCS ability to be flexible and re-configurable (Riyaz and Shaw, 1998). Each of the controllers are autonomous and their communication is supported by computers networks. Two main characteristics of DCS are flexibility and responsiveness (Barenji et al. 2013). Industrial Control Systems (ICS) have been using supervisory control and data acquisition (SCADA) systems for a long time. SCADA is a common process automation system used to continuously gather data from sensors located at remote sites and to transmit that information to a central site for real-time controlling and monitoring (National Communications System, 2004). The Smart Grid models is based on the previously mentioned features of SCADA systems. These are some of the features added to the last definition of the Smart Grid by the U.S. Department of Energy. The new definition as stated by the U.S. Department of Energy is the following:

“Smart grid” generally refers to a class of technology people are using to bring utility electricity delivery systems into the 21st century, using computer-based remote control and automation. These systems are made possible by two-way communication technology and computer processing that has been used for decades in other industries. These technologies are beginning to be used on electricity networks, from the generation power plants, solar farms and wind farms all the way to the consumers of electricity in homes and businesses. These new technologies offer many benefits to the utilities companies and to the consumers – mostly seen in big improvements in energy efficiency on the electricity grid and in the energy users’ homes and offices.

Table 2.1. Comparison between the Traditional Grid and the Smart Grid (Farhangi, 2010).

Traditional grid	Smart Grid
Electromechanical, solid state	Digital Microprocessor
One-way and local two-way communication	Global/integrated two-way communication
Centralized generation	Accommodates distributed generation
Limited protection, monitoring and control systems 'Blind'	Adaptive protection Self-monitoring
Manual restoration	Automated, 'self-healing'
Check equipment manually	Monitor equipment remotely
Limited control system contingencies	Pervasive control system
Estimated reliability	Predictive reliability

Conceptual Model

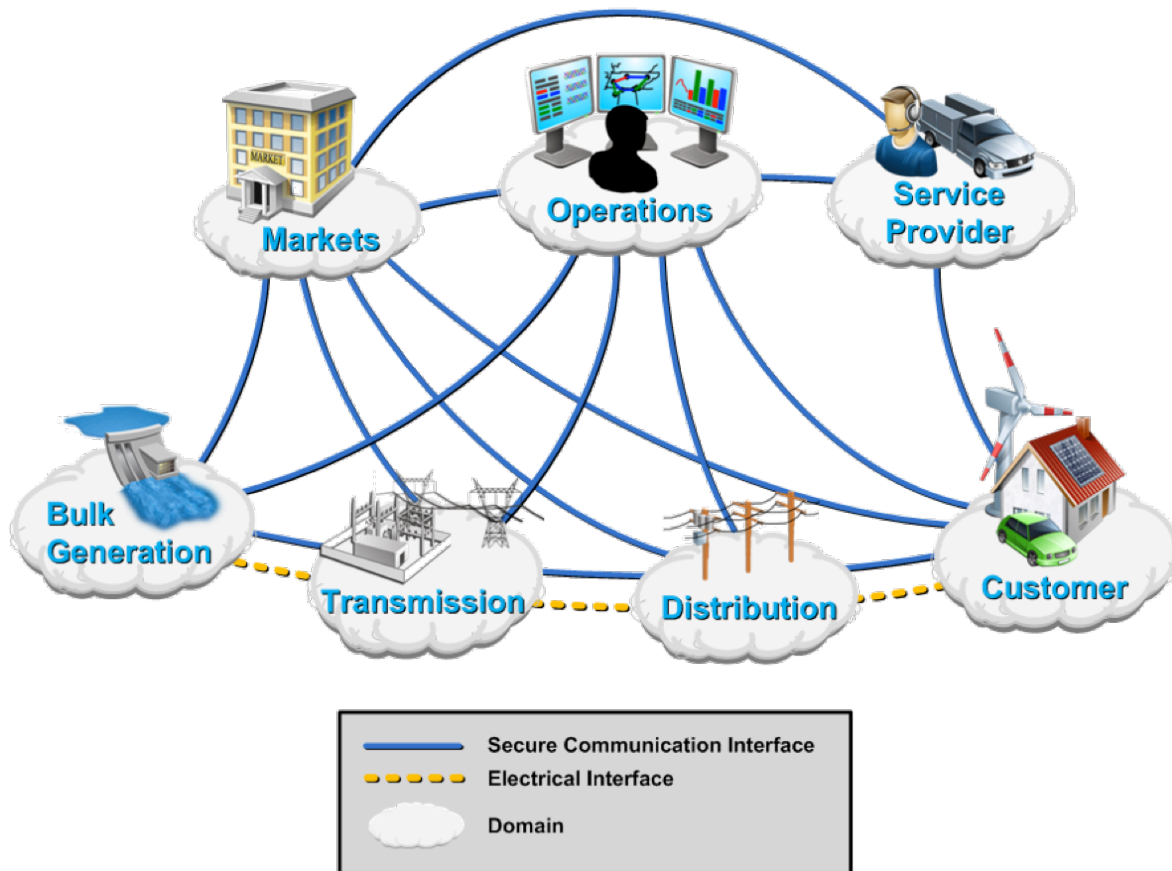


Figure 2.6: NIST conceptual domain model for the Smart Grid (NIST, 2010).

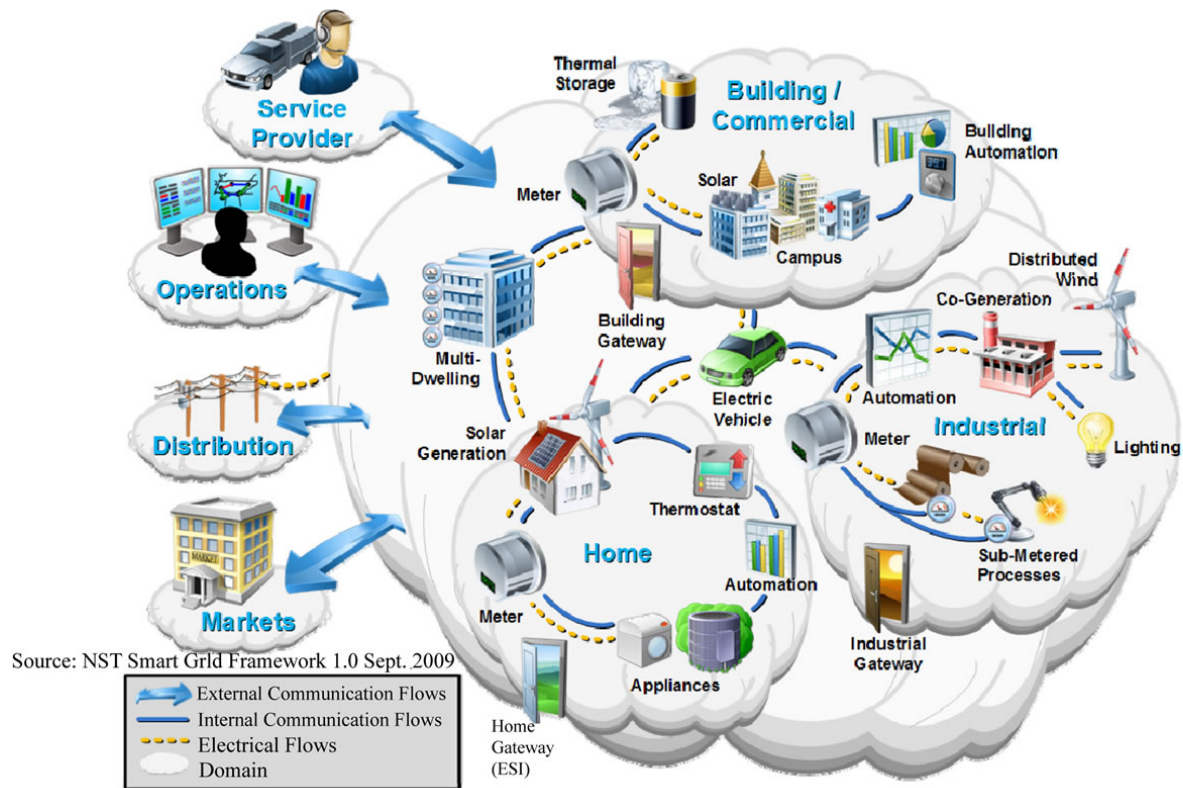


Figure 2.7: NIST conceptual customer domain model for the Smart Grid (NIST, 2010).

Background information on the educational setting

Degree completion rates and time to graduation are considered among the most important indicators for institutional quality. The validation of such importance is that research in this area consistently shows the benefits of obtaining a college degree. There are many factors that affect these degree completion rates. Some of these factors include student school/work overload, commuter campus related problems, flawed student schedule planning and diminishing resources allocated to universities and colleges. The degree completion rates become a complex problem when the combination of these common factors and administrative factors are combined. This complex problem provides an excellent opportunity to try a different approach to solve/improve on this well know issue.

Students' time to graduation in college is one of the most important metrics used to evaluate higher education institutions. This metric is used to measure institution performance at a national level as indicated by the benefits of a college degree to society and the individual (Knox, Lindsay, & Kolb, 1993). Among these benefits are: satisfaction with their work, civic engagement, higher rate of volunteering (Baum, Ma, & Payea, 2010), greater salaries, and lower unemployment rates (U.S. Department of labor 2016) as shown below in Figure 2.8. Time to graduation is affected by many factors. Most of these factors are: social, economic, and/or student planning (Creighton, 2007). Even though a college degree is perceived as being valuable, only 32% of individuals over the age of 25 actually obtain a degree (U.S. Census Bureau, 2014). Figure 2.8 shows the percentages and the distribution of education levels among individuals of 25 years of age and older. Figure 2.9 shows the evolution from 1940 to 2014 and the gap of individuals not obtaining a college degree.

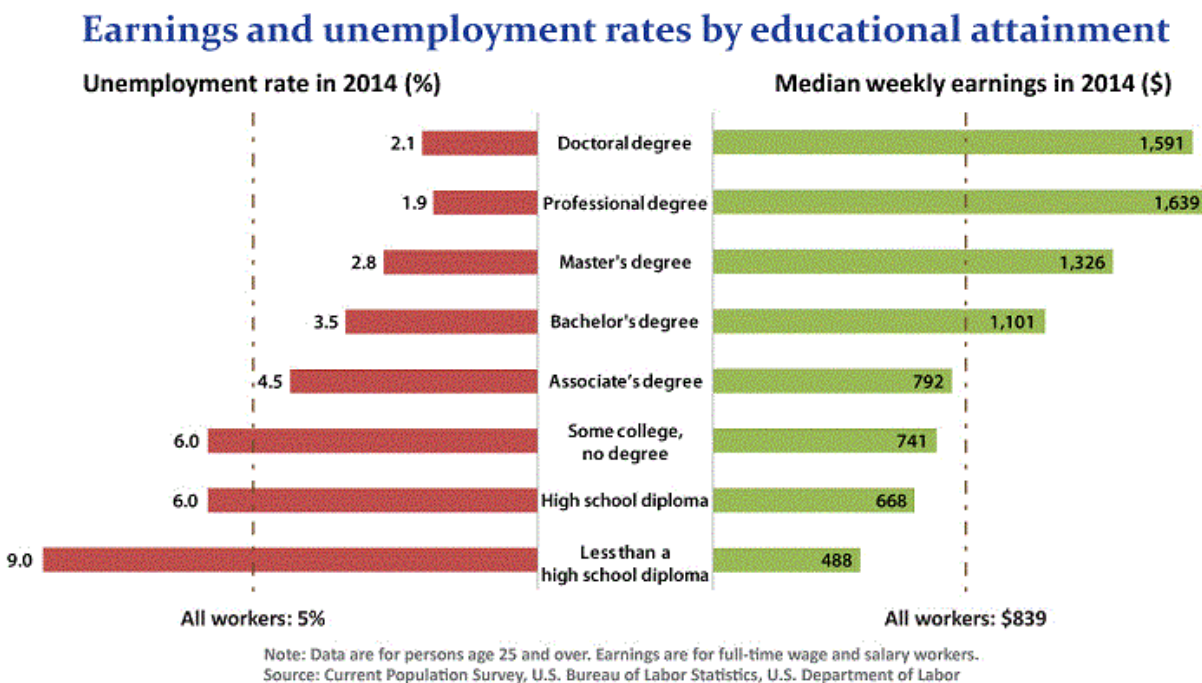


Figure 2.8. Earnings and unemployment rates by education attainment.

**Figure 2: Percent of Population Age 25 and over by Educational Attainment:
1940-2014**

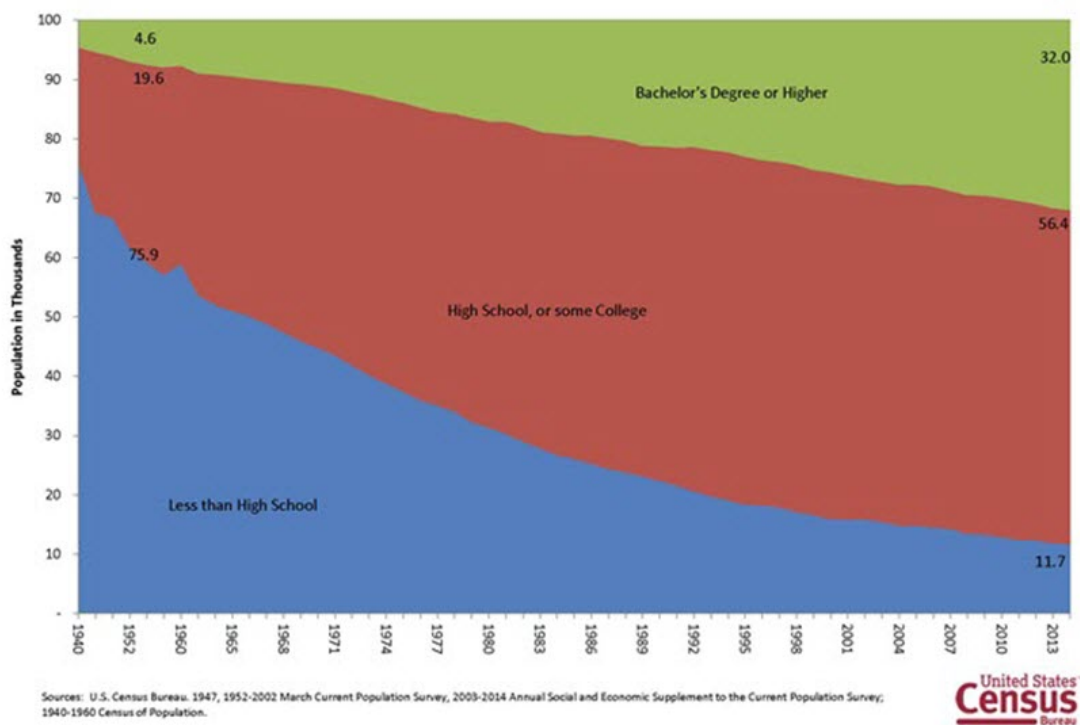


Figure 2.9. Percentage of population Age 25 and over by Education attainment 1940-2014.

Federal and state incentives have been put in place to encourage students to graduate from college as quickly as possible in order to optimize the use of available resources (Jacobsen, 1998). Unfortunately, several research projects show that top-ranked institutions control more of these resources than other institutions (e.g., Astin, 1985; Bowen & Bok, 1998). When comparing the incentives, it was also found that some were more effective than others (R. Schroeder, et al, 1997). From this data we can also deduce that many undergraduate students take longer than the expected four years to graduate with an undergraduate degree.

Recent data from the U.S. Department of Education gathered in 2015 shows that only 59% of first-time full-time undergraduates who began their bachelor's degree in 2007 completed it by

2013 (U.S Department of Education, National Center for Education Statistics, 2015). This national study also shows that graduation rates were highest at institutions that were the most selective. On the other side of the spectrum, institutions with the lowest graduation rates were institutions with open admission policies. In other words, institutions that were least selective. An example from this research shows that in a four-year institution with open admission policies, 34% of students completed a bachelor's degree within six years. In comparison, four-year institutions where the student acceptance rate was less than 25%, the graduation rate within the four-year period was 89%. Figure 2.10 shows the enrollment trends from 1990 to 2013 of student enrollment by type of institution. The data on this graph indicates that most first-time, full-time students receiving a post-secondary education are attending public institutions (U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, 2014). In 2013 there were 2.8 million students enrolled in four-year private nonprofit higher education institution. In comparison during that same year, there were 13.3 million students enrolled in 4-year public higher education institution. Finally, 1.4 million students were enrolled in private for-profit institution. This indicated that 4-year public institutions are serving 76% of the students; 4-year private nonprofit institutions are serving 16% of the students and 4-year private for-profit institutions are serving 8% of the students. The investigation detailed in this research document was done at a 4-year public institution similar to the 76% of the institutions in the U.S. This data provides useful context information to the reader of the potential impact of this research across the nation. Particularly, the longitudinal information shown in figure 2.10 indicates that the enrollment in 4-year public institutions continue provide an education service to most of the students of the country and the enrollment in this institutions is growing.

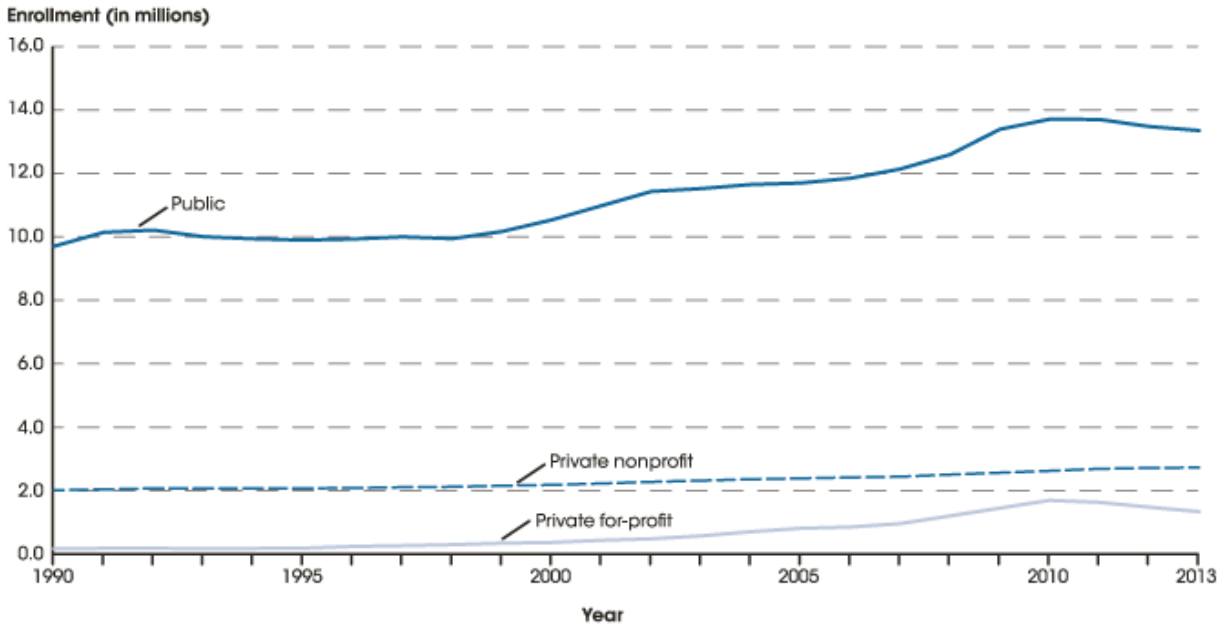


Figure 2.10. Undergraduate enrollment in degree-granting postsecondary institutions, by type of institution: Fall 1990–2013.

Students enrolled at The University of Texas at El Paso (UTEP) take longer than the national average (U.S. Department of Education, National Center for Education Statistics, 2015) to graduate (Hamilton, 2012). One of the major factors in this delay can be attributed to the fact that UTEP is a commuter campus. Commuter campuses have been extensively studied and it has been documented that different benefits exist between a commuter campus and a residential campus. However, a large number of research projects have documented the benefits of residential campuses and how these benefits overweight the benefits of commuter campuses (Astin, 1977, 1993; Chickering, 1974; Pascarella & Terenzini, 1991). Two of the major benefits found in residential campuses are increased student college life involvement and non-existent commuting times (Braxton & Hirschy, 2005; Berger & Braxton, 1998). Both of which are directly related to graduation rates (Braxton & Lien, 2000). The research shows that commuting students are distracted by too many competing demands on their finite study time. Some of these demands come from family and work commitments (George D. Kuh, Robert M. Gonyea, Megan Palmer,

2001). UTEP has been designated a commuter campus according by many sources including the National Center for Education Statistics and Excelencia in Education and Texas Monthly (Brunk-Chavez & Fredericksen, 2008).

Non-traditional students are defined in the literature as students that have to commute to campus and/or live with their families, and/or have a job, and/or have to take care of their family (University of New Hampshire 2016, Pelletier 2010). In comparison, the definition of traditional students is one that has the following characteristics: undergraduate student enrolling right after graduating from high school, pursues college studies non-stop in a full-time basis at least in the fall and spring semesters, and traditional students are typically financially dependent on others (Cox, 2009), do not have children, consider their college career to be their primary responsibility (Rosenbaum, Deil-Amen, and Pearson, 2006). According to the research, the non-traditional students that were the exception in U.S universities have become the norm (Complete College America 2011; Pelletier 2010). According to reports compiled from 33 states providing data using the Complete College America and National Governors Association Common Completion Metrics, 75% of the students enrolled in these states fall in the non-traditional category. In these 33 states only 25% of the students enrolled attended full-time at residential colleges and have no other commitments different than being a full-time student. Other factors attributed to graduation delays included social setting (commuter campus), low-income student population (Complete College America 2011), and the fact that cohorts are not as homogeneously defined as in a residential campus (George D. Kuh, Robert M. Gonyea, Megan Palmer, 2001). This growing trend of rising non-traditional student populations at U.S. universities is expected to continue rising in the future. This previously mentioned studies provide useful context information to the reader of the potential increasing impact of this research across 4-year public institutions.

The school's administration faces several challenges while scheduling courses. Among them are the diminishing allocations of resources in three fronts: financial (State Funding History Tables 2016), human resources (limited faculty that teach classes) and infrastructure (limited amount of classrooms and teaching facilities). These challenges have to be optimized in order to satisfy the increasing student demand. The federal government provides all of the states with a spending budget specifically allocated for education. Table 2.2 shows the size of that federal budget provided to the state of Texas for the last 35 years (the grand total for 2015 is not yet calculated and therefore was not included in this research). This table displays the grand total provided to Texas through the Department of education (State Funding History Tables 2016). Along with this public information the difference in each year's budget was calculated (using the difference formula ***Difference*** = $X_L - X_{L-1}$, where X is the budget allocated to Texas for year t) and presented in the "Difference" column. The percentage column shows the percentage that the budget changed from year t-1 to year t. The percentage formula used was *Percentage* = $\left(\frac{(X_T - X_{t-1})}{(X_{t-1})} \right) * 100$. UTEP's student population has been constantly increasing. Table 2.3 shows this increase in enrollment for the last fourteen years (The University of Texas at El Paso 2016). The percentage on table 2.3 was calculated using the same formula as in table 2.2. The U.S. inflation rate for a specific year is shown on the last column to indicate how inflation affected federal funding for the state of Texas (US department of labor, Bureau of Labor Statistics, 2016). Table 2.2 among other relevant information, shows the latest trend on the last four years and how the federal budget has not been able to keep up with the inflation rate. Table 2.2 shows that the federal budget allocated to the state of Texas has been decreased for the past four years, the decrease in budget in addition to the inflation rate aggravate the problem of diminishing resources for the Texas education sector.

Table 2.2. Federal Budget to the State of Texas.

Department of education budget to Texas					Department of education budget to Texas				
Year	Grand Total	Difference	Percentage	US inflation rate	Year	Grand Total	Difference	Percentage	US inflation rate
1981	620,060,187	-28,947,735	-4.46%	11.83%	1998	2,139,245,706	194,584,645	10.01%	1.57%
1982	599,811,523	-20,248,664	-3.27%	8.39%	1999	2,333,090,597	193,844,891	9.06%	1.67%
1983	626,227,857	26,416,334	4.40%	3.71%	2000	2,484,215,057	151,124,460	6.48%	2.74%
1984	661,185,101	34,957,244	5.58%	4.19%	2001	4,760,220,857	2,276,005,800	91.62%	3.73%
1985	785,709,872	124,524,771	18.83%	3.53%	2002	5,638,643,478	878,422,621	18.45%	1.14%
1986	769,642,309	-16,067,563	-2.04%	3.89%	2003	6,541,541,039	902,897,561	16.01%	2.60%
1987	912,085,000	142,442,691	18.51%	1.46%	2004	7,207,764,023	666,222,984	10.18%	1.93%
1988	1,020,695,428	108,610,428	11.91%	4.05%	2005	7,652,047,983	444,283,960	6.16%	2.97%
1989	1,085,725,850	65,030,422	6.37%	4.67%	2006	7,792,289,367	140,241,384	1.83%	3.99%
1990	1,166,461,617	80,735,767	7.44%	5.20%	2007	7,953,251,577	160,962,210	2.07%	2.08%
1991	1,315,293,108	148,831,491	12.76%	5.65%	2008	8,419,664,869	466,413,292	5.86%	4.28%
1992	1,430,124,929	114,831,821	8.73%	2.60%	2009	10,165,239,532	1,745,574,663	20.73%	0.03%
1993	1,559,646,381	129,521,452	9.06%	3.26%	2010	12,354,590,579	2,189,351,047	21.54%	2.63%
1994	1,636,271,641	76,625,260	4.91%	2.52%	2011	11,815,683,237	-538,907,342	-4.36%	1.63%
1995	1,689,447,915	53,176,274	3.25%	2.80%	2012	11,391,287,359	-424,395,878	-3.59%	2.93%
1996	1,713,273,251	23,825,336	1.41%	2.73%	2013	11,311,390,683	-79,896,676	-0.70%	1.59%
1997	1,944,661,061	231,387,810	13.51%	3.04%	2014	11,254,325,647	-57,065,036	-0.50%	1.58%

Table 2.3. UTEP enrollment since 2002.

UTEP Fall Enrollment			UTEP Fall Enrollment		
FALL SEMESTER	ENROLLMENT	Percentage	FALL SEMESTER	ENROLLMENT	Percentage
2002	17,232	6.24%	2009	21,011	2.70%
2003	18,542	7.60%	2010	22,106	5.21%
2004	18,918	2.03%	2011	22,640	2.42%
2005	19,268	1.85%	2012	22,749	0.48%
2006	19,842	2.98%	2013	23,003	1.12%
2007	20,154	1.57%	2014	23,079	0.33%
2008	20,458	1.51%	2015	23,397	1.38%

A nationwide study from the U.S. Department of Education in 2015 found that undergraduate students take an average 138.4 credits to graduate (Reference from paper Washington post, Department of Education). Most institutions' undergraduate programs require 120 credits to complete a degree. It has been documented that students take college courses that they do not need to complete an undergraduate degree. This is not a new problem and it has been documented since the beginning of the nineteen-seventies as shown in Table 2.4. A longitudinal research project lead by the Department of Education (32 years) that started in 1972 shows that

the average number of undergraduate credits earned at the time of graduation has been increasing since 1972 (Adelman, C. 2004). Table 2.4 shows the results from this study. The class sizes are as follow: class of 1972 analyzed 672,000 students, class of 1982 analyzed 758,000 students, and class of 1992 analyzed 923,000 students. From this study it can be clearly seen that as the amount of undergraduate credits earned increased, the average amount of time needed to earn a degree also increases. More importantly, taking more credits than necessary to graduate is a problem that affects most of the students studying engineering, science and math based degrees (Adelman, C. 2004).

Table 2.4. Time to bachelor's degree and average undergraduate credits earned by those in the high school classes of 1972, 1982, and 1992 who were awarded bachelor's degrees within 8.5 years.

	All students		Engineering Students	
Highschool Classes	Average time-to-degree	Average total undergraduate credits	Average time-to-degree	Average total undergraduate credits
Class of 1972	4.34 calendar years	130.1	4.51 calendar years	137.1
Class of 1982	4.45 calendar years	134.3	4.74 calendar years	147.1
Class of 1992	4.56 calendar years	138.4	4.68 calendar years	150.6

Another and more recent study by the department of education (U.S. Department of Education. 1999) shows how taking more credits than required to graduate more dramatically affects transfer students. UTEP, specifically, accepts many students that transfer from the El Paso Community College (EPCC). This study shows that the national student cohort starting and completing at the same public institution in 1982 would complete an average of 133.7 credit hours before completing the bachelor's degree. On the other hand, students that start at an institution but finish at another four-year institution (transfer students) accumulated an average of 140.0 credit hours before completing their bachelor's degree.

Nationally, engineering degrees are ranked as high credit hour requirement programs. The national credit hour requirement average to graduate with an engineering Bachelor of Science

degree is 128 credit hours (Nate, Reidy, Droll, and LeMon. 2012). The research has also shown that students attempting an engineering degree are affected the most. The national student cohort starting and completing at the same public institution in 1982 in an engineering discipline would complete an average of 145.1 credit hours before completing the Bachelor of Science degree and transfer students accumulated an average of 161.2 credit hours before completing their Bachelor of Science degree (US Department of Education). The trend in this study shows that the number of credit hours required in engineering programs has gone down since 1995 when it was 132 credits. State governments, such as that of Texas, have tried to incentivize graduation by lowering credit requirements in engineering programs (Texas Comptroller of Public Accounts 2011). Using the national average of credits hours required for an engineering Bachelor of Science degree (128) and the national average of credit hours earned by engineering students at graduation, it can be deduced that students staying with in the same institution (this being a public institution) earned 17.1 more credit hours than what was needed to graduate. For transfer students this number was even higher at 33.2 credit hours. The standard measure for graduating in the desired four-year timeframe while enrolled only during the spring and fall semesters of an academic year is 15 credit hours per semester. It is clear that enrolling in the additional 17.1 extra credit hours would delay a full-time engineering student from graduating by at least two semesters. Transfer students with 33.2 credit hours over the required 128 for an engineering Bachelor of Science degree would have to delay their graduation by at least 3 semesters.

A research study conducted in October of 2013 by the nonprofit organization “Complete College America” covering 30 states (including Texas) and in 171 public 4-year institutions, discovered that 69% of college students were enrolled in classes that were not needed to complete their degree and would extend their expected graduation date beyond four years. This research

also assumed that the students would not fail any classes and would not change majors. Even with these ideal assumptions, the students' selection of classes would delay their graduation (Complete College America. 2013). This research also found that among the full-time students in these institutions 50% of them were taking less than 15 credit hours per semester.

The data presented in this chapter comes from several sources such as: government, non-profit organizations and academic sources. The data found in the literature review is consistent and aligns with the well-known problem of extended times to graduation. From this literature review the following factors were identified as contributing to augmented graduation times: enrollment is under 15 credit hours per semester, school/work overload, flawed student schedule planning and diminishing resources to universities and colleges. The extension of graduation times can also be seen as a problem in the optimization of resources. This complex problem provides an excellent opportunity to try a different approach to solve or improve on this well know issue.

Chapter 3: Methodology

Current pre-advising and advising processes

In this section an overview of the current pre-advising and advising processes is covered to illustrate the previous system and to provide background information on the system being upgraded. The current methodology of the advising system is based on the analysis and mapping of the current degree plan and advising process in place. Mapping the required flow of agents in the current degree plan provided a critical path specific to the Electrical Engineering degree plan as previously discussed in the literature review (Gonzalez and Esparza 2010). For this previous analysis the critical path was mapped for the classes required to graduate with a BSEE degree. Using project management tools, the path to graduation was optimized using time as the main criteria. Figure 3.1 shows a brief overview of the evolution of the advising system and the various advising approaches in the past. A more detailed diagram is presented in the next chapter.

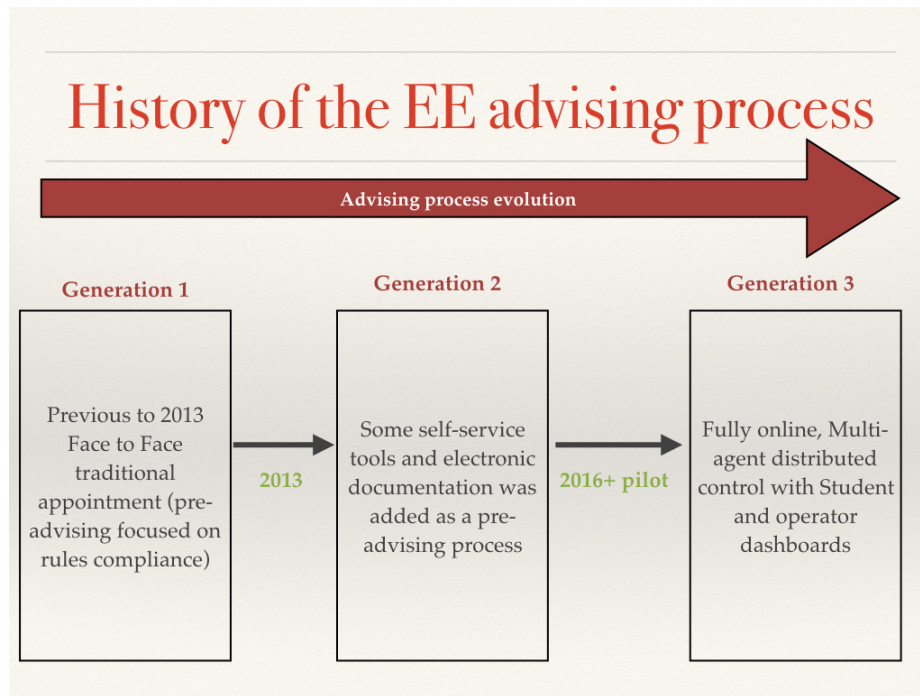


Figure 3.1. Evolution of advising systems at the EE department at UTEP.

Currently, prior to registering for a new semester, a student faces a registration hold that can only be removed after being advised. To be advised the student has to access the university LMS shown in Figure 3.3, download the “BSEE_2014_v5 - Student Name.xlsx” file and completely fill in all of the classes that the student has previously enrolled in and passed as shown in Figure 3.5. After filling in this form, the Excel file automatically refers to an internal database. Using the student’s input, the Excel application uses macros to generate a class workflow map. The Excel file calculates the classes that the student can enroll in as shown in Figure 3.7. After completing the form, the student has to save it with his/her name and upload it onto the university LMS to be analyzed by an advisor before they can meet for advising. It is only after the file is uploaded that the student is able to schedule an appointment with the advisor. The student is responsible for printing the form and taking it to the EE department in order to schedule the appointment. Before the meeting with his advisor, the student has to complete the white/yellow “Academic Advising Form” shown in Figure 3.4. The Academic Advising Form has to be filled out with possible classes for approval by the advisor. After approving the listing of probable classes to be taken, the yellow form is signed and the registration hold is removed, allowing the student to go into the university registration system and register. This generation 2 advising and pre-advising methods consume a high number of hours from the students. The overall experience from the first generation advising was improved tremendously by the second generation. Even though the process was improved by the second generation system it is still long and it requires specialized software and hardware for the student to be able to complete the forms. Figure 3.2 shows a flow diagram of the current second generation advising systems. In addition, figure 3.2 shows the different process and tasks that need to be completed by the student in order to get the registration hold removed.

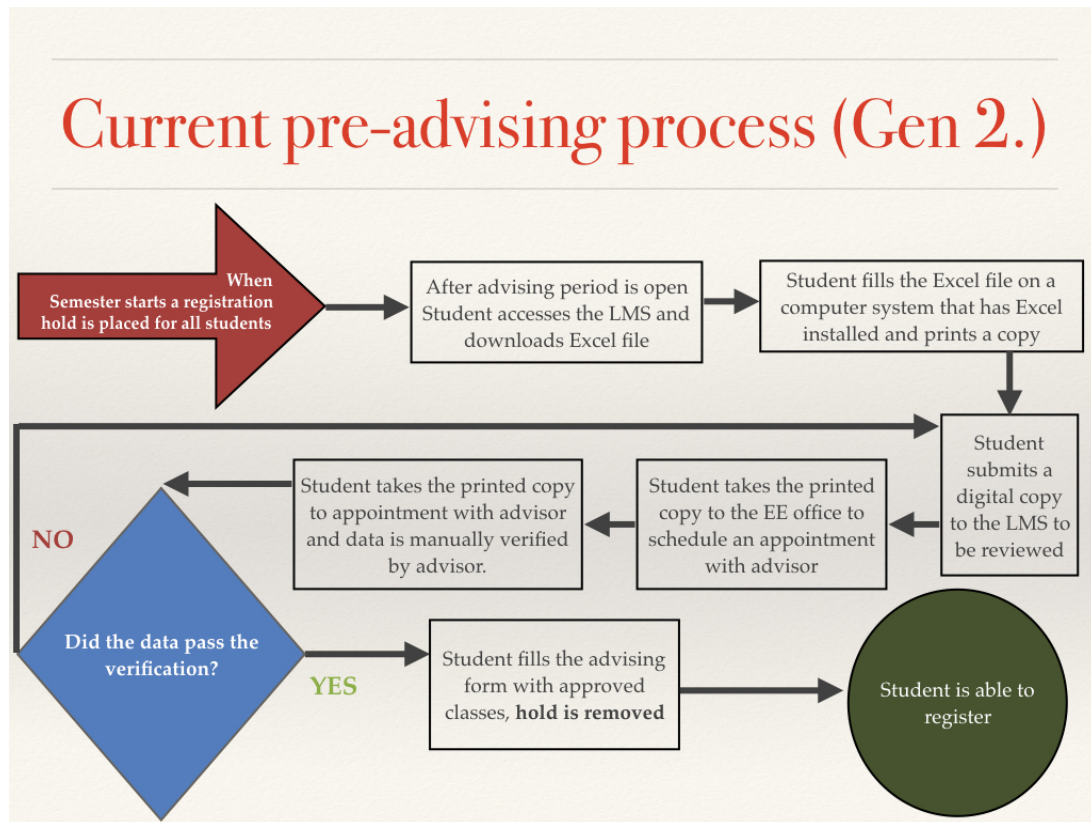


Figure 3.2. Flow chart of second generation advising system at the EE department at UTEP.

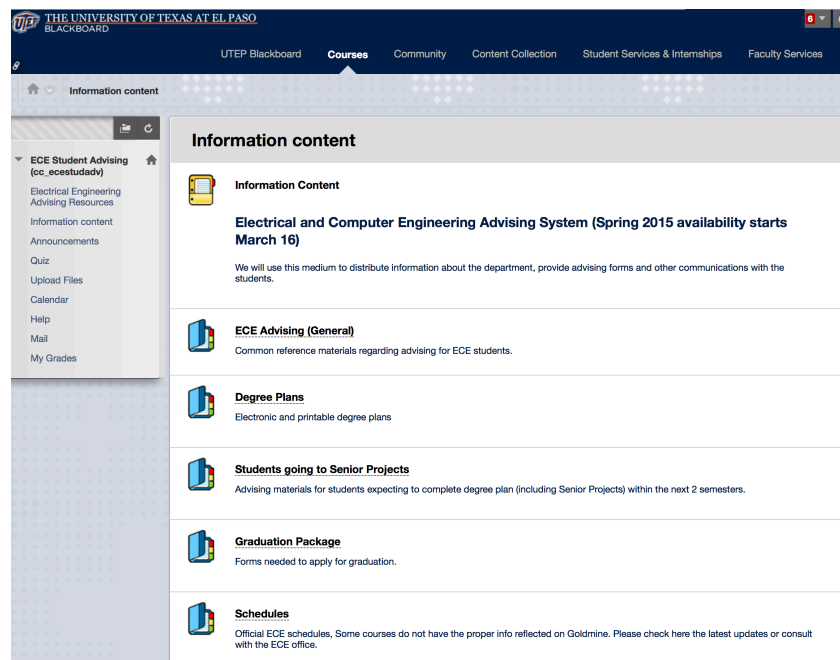


Figure 3.3: Blackboard LMS showing the ECE Student Advising course.

THE UNIVERSITY OF TEXAS AT EL PASO
Electrical and Computer Engineering
Academic Advising Form

Last Name _____ First _____ Middle _____

 UTEP ID

--	--	--	--	--	--	--	--

Major: _____ Degree: _____

 Fall ☐ Spring ☐ Summer ☐ 20____

Course	CRN	Course Title	Notes

Advisor's Signature _____ Advising Date _____

1st Copy: Department 2nd Copy: Student

Figure 3.4: Official Academic Advising Form.

Figure 3.2 shows the long process that the agents had to follow. This block diagram shows the seven tasks that need to be completed in order to remove the student registration hold. The diagram shows where the student or the system itself may face many potential single points of failure that will impact the successful completion of the advising process in time and ultimately, the registration process. The new methodology addresses these concerns and provides a streamlined process in a system that does not requires specialized software and hardware. The current pre-advising process requires a full desktop capable of running the full MS Excel with macros enabled. The new methodology used in iAdvise will be covered with great detail in the next section. Concluding this section, it can be seen all of the different tasks that are required to complete the current advising process. This section also showed the different advising systems used in the past and the timeline of when were these advising processes changed.

BSEE_2014_v5 - John_Doe.xlsx - Excel

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H27

B

Bachelor of Science – Electrical and Computer Engineering 2014

Degree Plan (checklist)

Catalogs: 2014-15

Last Name: Doe First Name: John M.I. Expires: 09/09/2021

UTEP ID: 12-34-5678 NOTE: Overall GPA ≥ 2.0 AND In-Major GPA ≥ 2.0 REQUIRED for Bachelor of Science degree

Placement English: YES Pre-Cal pass: YES

A Core Curriculum (45 SCH)
(minimum of "C" grade required)

Complete	Final Grade	SCH	Sub #
1. Communication (6 credit hours required)			
RWIS1301* Rhetoric and Composition I	TB	3	
RWIS1302* Rhetoric and Composition II	TA	3	
2. Mathematics (3)			
MATH1411* Calculus I	B	4	
3. Life and Physical Sciences (6)			
PHYS2420* Introductory Mechanics	C	4	
PHYS2421* Fields and Waves	TA	4	
4. Language, Philosophy, & Culture (3)			
Select one (or type valid option):			
HIST2301* World History to 1500	TA	3	
5. Visual and Performing Arts (3)			
Select one (or type valid option):			
Choose ART* <-- Select		3	
6. U.S. History (6)			
HIST1301* History of the U.S. to 1865	TA	3	
HIST1302* History of the U.S. since 1865	B		
7. Political Science (6) -- all 6 SCH must be completed at the same institution			
POLS2310* Introduction to Politics		3	
POLS2311* American Govt. & Politics		3	
8. Social and Behavioral Sciences (3)			
CE2326* Econ. For Engrs & Scientists		3	
9. Institutionally Designated Option (6)			
UNIV1301* Seminar/Critical Inquiry	A	3	
CS1320* Computer Programming Sci/Engr	B	3	
B Foundational Math & Science (15 SCH) (minimum of "C" grade required)			
MATH1312* Calculus II	A	3	
MATH2313* Calculus III	P	3	
MATH2326* Differential Equations	B	3	
MATH3323* Matrix Algebra		3	
Choose Sci <-- Select Science or Math		3	
SUBSTITUTIONS** Large cases need special forms			

C Major: Required Lower Division Courses (21 SCH)
(minimum of "C" grade required)

Semester Completed	Final Grade	SCH	Sub #
EE1105* Lab for EE 1305	B	1	
EE1305* Intro to Electrical Engineering	B	3	
EE2151* Lab for EE 2351	P	1	
EE2169* Lab for EE 2369	B	1	
EE2350* Electric Circuits I	A	3	
EE2351* Electric Circuits II	P	3	
EE2353* Continuous Time Signals & System		3	
EE2369* Digital Systems Design I	A	3	
EE2372* Software Design I	P	3	

D Major: Required Upper Division Courses (32 SCH)
(minimum of "C" grade required)

Semester Completed	Final Grade	SCH	Sub #
EE3138* Lab for EE 3338		1	
EE3176* Lab for EE 3376		1	
EE3195* Junior Professional Orientation		1	
EE3321* Electromagnetic Field Theory		3	
EE3325* Applied Quantum Mech for EE		3	
EE3329* Electronic Devices		3	
EE3338* Electronics I		3	
EE3340* Electronics II		3	
EE3353* Discrete Time Signals & System		3	
EE3376* Microprocessor Systems I		3	
EE3384* Probabilistic Methods-Engr/Sci		3	
EE41xx <-- Choose Experiential Learning		1	
EE4220* Senior Project Lab I		2	
EE4230* Senior Project Lab II		2	

E. Major: EE Concentration (12 SCH)
see advisor for list of approved courses

Semester Completed	Final Grade	SCH	Sub #
EExxxx <-- Choose EE Option courses		3	
EExxxx <-- Choose EE Option courses		3	
EExxxx <-- Choose EE Option courses		3	
EExxxx <-- Choose EE Option courses		3	

Concentration: General

F Professional Option (3 SCH) or extra cred
see advisor for approved courses

Semester Completed	Final Grade	SCH
PROF Type Professional Option		3

Checklist Flowchart & Concentration Info.

Figure 3.5: Blackboard LMS showing the ECE Student Advising course.

New methodology for the pre-advising process

This study started in 2013. The first step was submitting a form to the UTEP Human Subjects Research (IRB) to receive approval to conduct the study. The study was approved and due to the minimal risk of the research, an exception was granted under category 1 of the IRB form

“IRB-008 UTEP_IRB_Exemption Application_2013.doc”. After the IRB exception was granted, an initial survey was designed and used to measure student interest on the possible development of the Multi-Agent distributed control system. This initial survey was conducted to a group of 38 students, the student interest on three characteristics of the Multi-agent control system was measured. These characteristics were: support of mobile devices, access to class pre-requisites and co-requisites, and recommended load balancing of classes. A second survey was conducted to a group of 113 students to directly gather information on the following areas: the type of advising students enrolled in the college of engineering prefer, student non-academic commitments, and desired information at the time of registering for classes. After the results from this second survey were analyzed, the development of the iAdvise system started. After the iAdvise system was developed and tested the pilot phase started. Finally, a survey was completed to measure the performance of the iAdvise system based on student use and feedback.

As mentioned in the Introduction, the BSEE degree plan is being used as the component of the pilot to measure the effectiveness of a Multi-agent control system in the university advising process and was selected based on it being very rigid with minimal flexibility. The Multi-agent control system itself was designed modeling the smart grid and the distributed control characteristics it possess. Agents in the model of the smart grid have an independent non-deterministic behavior, in the same way students have independent non-deterministic behaviors. In the Smart Grid, the electric consumption from each agent is monitored in real-time to adjust the production of electricity to better fit consumption needs without wasting great amounts of electricity. Using this same methodology student’s intended enrollment is monitored using the iAdvise system in real-time. Similarly, department administrators are able to see the students’ intended enrollment in real-time and adjust department resources to fit student demands and

prevent non-optimal department resource usage. The whole system has an iterative and systematic nature just as the Smart Grid. This iterative nature allows the systematic gathering of data to discover trends semester after semester. The systematic gathering of data facilitates the longitudinal analysis of the agent flow across the BSEE curriculum. The two-way communication channel provides real-time feedback to correct the process in a way that the end result converges to the best (time-based) possible path to graduation for each individual agent. The mathematical model created simulates the iterative nature of the system and is based on a discrete Finite Impulse Response filter (FIR), as shown in Figure 3.6. The designed system is discrete in nature since the values come in semester after semester and not in a continuous way. Where the $x(n)$ is the number of students enrolled in class A, $y(n)$ is the number of students that passed class A, and the transfer function $h(n)$ is calculated by dividing the output $y(n)$ by the input $x(n)$. In figure 3.6, n is the latest semester in which we have the values for $x(n)$ and $y(n)$, in other words, the latest completed semester. The transfer function is only defined for the semester after the pilot started. The transfer function $h(n)$ is defined as 0 for all of the semesters before the program started and $h(n)$ is also defined as 0 for the future semesters for which there is no data available yet. After several iterations the FIR filter acts as a moving average window of size m . This window (m) can be modified to provide information per semester (when $n=1$) or group various semesters at once (when $n>1$). The iAdvise system was designed to gather data for multiple semesters. The longitudinal analysis of this system will yield enough information to discover an optimal size for the windows m , as well as the effects of other factors in the transfer function $h(n)$ for each class (i.e. change of room, room size, instructor, etc.). The usage of the model will provide the data needed to generate the analysis of the combinations of different classes and their effect on agent flow across the system.

AGENT VISUAL MODEL per class

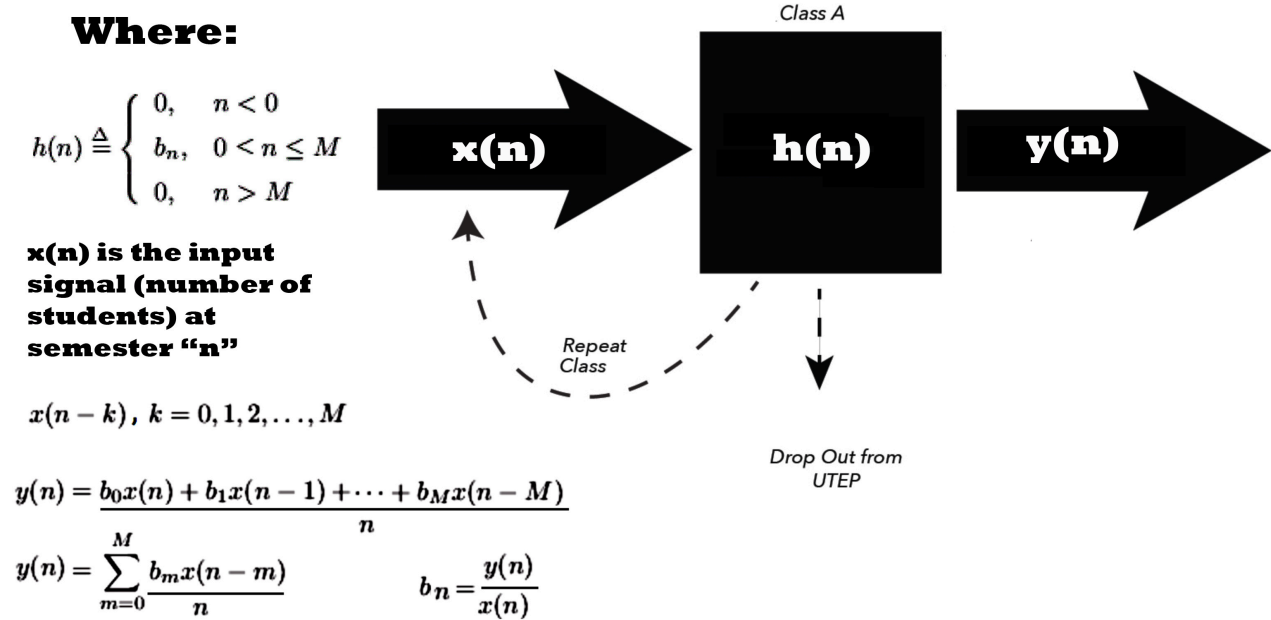
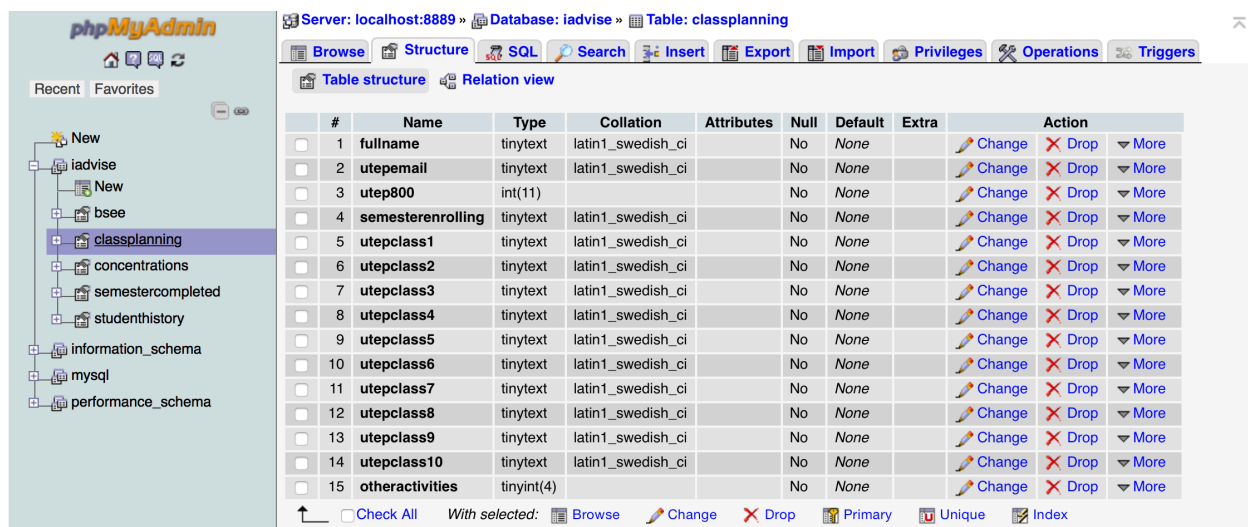


Figure 3.6: FIR model of each class.

Figure 3.8 shows the model of the semester as a whole. The online platform was designed to substitute the whole LMS process with the iAdvise system, creating an interactive, user friendly one-stop-shop for the students. In this design several tools were used for the creation of the system. First a webserver (HTTP) was selected, configured and tested. The configuration of the webserver followed the best practices by Microsoft, Symantec and MAMP. The risk of intrusion to the test system was minimized, by renaming the root user, changing the default password to a complex password, and setting up a firewall with only one port open (port 80). Cybersecurity is a very important area of today's systems developers. Several penetration test were executed and the server setup passed the tests. The MAMP package was selected as it is the leading free package that contains a webserver (APACHE), database back end server (Mysql) and a dashboard for easy administration of the MySQL server (phpMyAdmin). Using a Mysql database server an iAdvise

database was created along with a user that only have read and write access to certain tables within the database. This was done as an intrusion prevention mechanism. Several concepts of database design had to be implemented to ensure that data storage is sufficient, available, protected, redundant data has been minimized and overall database performance is adequate. Another database design concept used in the creation of the database and the tables was a naming convention, the avoidance of reserved words, and data type convention for numerical plus alpha numerical fields. Within this database there are five tables as shown in figure 3.7 (bsee, concentrations, semestercompleted, and studenthistory). Figure 3.7 shows the basic structure of the classplanning table and the attributes of each fields of information contained in the table. In addition, figure 3.7 displays other tables contained within the iadvise database. Included in Appendix A is the BSEE table with all the classes and their interdependencies. This information is critical if the system is to be replicated as the database and all fields have to be created with exactly the same name, types, and collation.



#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
1	fullname	tinytext	latin1_swedish_ci		No	None		Change X Drop More
2	utepemail	tinytext	latin1_swedish_ci		No	None		Change X Drop More
3	utep800	int(11)			No	None		Change X Drop More
4	semesterenrolling	tinytext	latin1_swedish_ci		No	None		Change X Drop More
5	utepclass1	tinytext	latin1_swedish_ci		No	None		Change X Drop More
6	utepclass2	tinytext	latin1_swedish_ci		No	None		Change X Drop More
7	utepclass3	tinytext	latin1_swedish_ci		No	None		Change X Drop More
8	utepclass4	tinytext	latin1_swedish_ci		No	None		Change X Drop More
9	utepclass5	tinytext	latin1_swedish_ci		No	None		Change X Drop More
10	utepclass6	tinytext	latin1_swedish_ci		No	None		Change X Drop More
11	utepclass7	tinytext	latin1_swedish_ci		No	None		Change X Drop More
12	utepclass8	tinytext	latin1_swedish_ci		No	None		Change X Drop More
13	utepclass9	tinytext	latin1_swedish_ci		No	None		Change X Drop More
14	utepclass10	tinytext	latin1_swedish_ci		No	None		Change X Drop More
15	otheractivities	tinyint(4)			No	None		Change X Drop More

Figure 3.7: iAdvise database design.

The critical path of the BSEE curriculum has only one semester of “slack” which provides the worst case scenario for a time-critical process. It is the perfect test for the Multi-agent control

system since the curriculum only has one semester of flexibility. A two semester delay in a class that is part of the critical path will result in the delay of the graduation date by one semester. This rigid curriculum can only accommodate for one semester without a class from the critical path. The BSEE degree plan is shown below in Figure 3.9. The degree plan shows the classes already arranged to meet the critical path, pre-requisite and co-requisite conditions. This study began with the evaluation of the advising system in place. During the summer and fall of 2014 the new iAdvise system was designed after the first two surveys were completed. The development of the system took place after the two student surveys were compiled and analyzed. The development of the beta system was completed at the end of the fall 2015 semester. In the spring of 2016, the infrastructure required for its support was finalized and implemented as a pilot. After implementation of the infrastructure was completed and tested, the pilot with student participation began. The first class to use the Multi-agent control system (iAdvise) was a EE2350 (Electronic Circuits 1) course with an enrollment of 120 students from the EE and CS departments. This class was selected to meet two objectives. Objective one was that EE students in this class have already used the second generation advising system and they can compare the features of both systems. Reason two was that CS students could be treated as transfer students to the EE program and could provide feedback as first time users. The new methodology for conducting the pilot program launched in phases. In the pilot phase, students were instructed during an in-class presentation to start using the system before meeting with their advisors. The instructions were to use the system as if it was in the production phase to provide a true student load environment for the Multi-agent distributed control system.

AGENT VISUAL MODEL

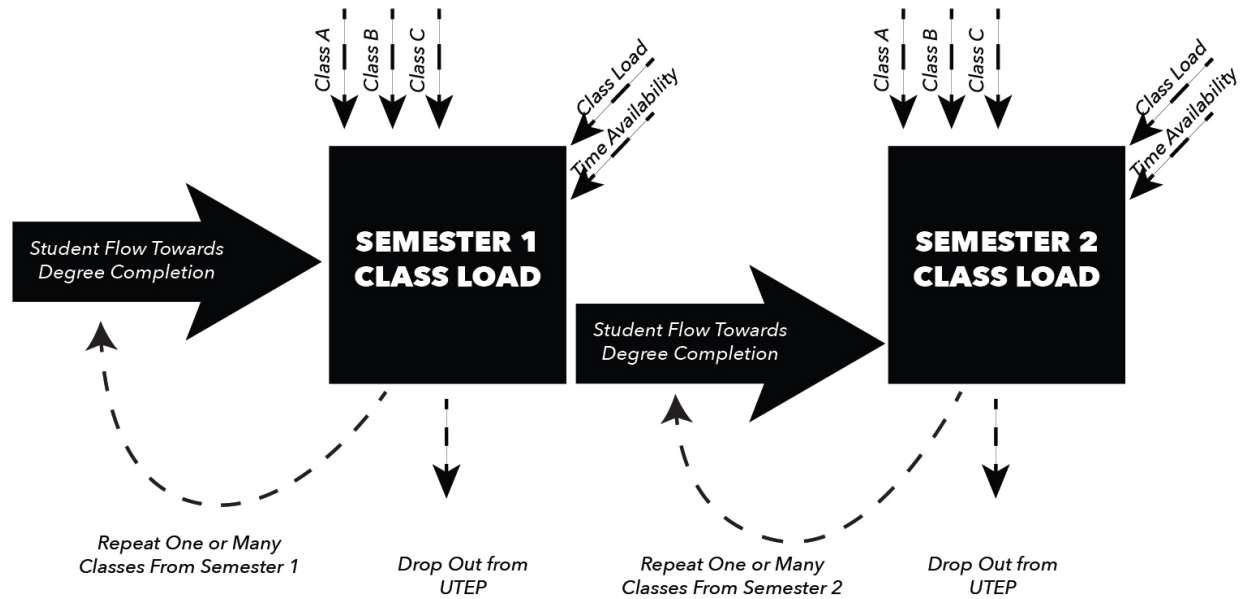


Figure 3.8: Agent Visual flow model (FIR model).

ELECTRICAL AND COMPUTER ENGINEERING															
2013-2014															
Total credits per Semester															
Math Placement in Calculus:															
English Placement in ENGL 1311:															
LOWER DIVISION	MATH1411*	4	EE1305*	26	EE1105*	25		PHYS2420*	5	ENGL1311*	1	Choose UNV	15	18	
	Calc 1	N	Intro EE	R	EE1305 lab	R		Intro Mech	R	Engl Cmp	N				
	MATH1312*	17	EE2369*	32	EE2169*	28		PHYS2421*	6	ENGL1312*	2	HIST1301*	10	17	
	Calc 2	N	Dig. Sys 1	N	EE2369 Lab	N		Fid & Wave	N	Crit Wrtg	N	US Hist 1			
	MATH2326*	15	EE2350*	29	EE2372*	33		CHEM1305*	21	COMM1302*	3			15	
	Diff Eq.	N	Circuit 1	N	Soft Dsgn 1	N		Chem 1	N	Bsn Comm	N				
	MATH2313*	16	EE2351*	30	EE2151*	27	EE2353*	31		Choose ART	5	HIST1302*	11	16	
	Calc 3	N	Circuit 2	N	EE2351 Lab	N	C.T. Signal	N				US Hist 2			
UPPER DIVISION	MATH3323*	20	EE3338*	41	EE3138*	35	EE3353*	43	EE3325*	39	EE3321*	38		16	
	Matrx Algb	N	Electron 1	N	EE3338 Lab	N	D.T. Signal	N	Ap Quantum	N	EMF	N			
	EE3384*	40	EE3340*	42	EE3376*	44	EE3176*	36	EE3195*	37	EE3329*	40	Choose HMN	7	17
	Probability	N	Electron 2	N	Micro 1	N	EE3376 Lab	N	J.P.O.	N	Elec. Dev	N			
			EE4220*	47	EE41xx	46	EExxxx	50	EExxxx	51	CE2326*	14	POLS2310*	12	15
		S. Proj 1	N	Lab	N	Elective	N	Elective	N	Econ Sci Engr	N	Int Pol			
		EE4230	48	TECH	54	EExxxx	52	EExxxx	53			POLS2311*	13	14	
		S. Proj 2	N	Tech Elec	N	Elective	N	Elective	N			Am Gov			
TOTAL cr =														128	

Figure 3.9. Excel file of BSEE degree plan showing the class workflow sequence.

After the students used the system, they were surveyed to find out the differences between the previous system and the iAdvise system. The survey used the following characteristics as the criteria for the comparison: ease of use, time to complete the process and new information available to the student. More precisely, the survey instrument focused on the students' preference of system based on usability. Another area that the survey focused on was the prevention of taking classes that do not count towards the student's degree. Additionally, the survey also probed the functionality of the system in helping students in load balancing the classes with non-school related commitments. Lastly, the survey asked if the student was able to determine the relationship between credits enrolled per semester and the direct connection that this has with the expected graduation date.

Finally, this new methodology directly proves the hypothesis by designing a system that bridges the gap in information from the two sides: the agent and the operator, just like in the Smart Grid model. The system directly addresses the lack of information flow between the agents' class loads and the operators' finite resources by building a real-time two-way communication channel. The methodology addresses the performance of the system in comparison to the currently used system by having the agents compare and decide which system they would prefer and why.

How is the hypothesis proven using this methodology?

This methodology uses both a quantitative and a qualitative analysis to provide answers to the hypothesis questions. Each analysis (quantitative and qualitative) have the ability to provide a different insight needed to address all of the hypothesis questions. The quantitative research helped us in the quantification of the data. It allowed the generalization of results from a sample to an entire population of relevance. It is not uncommon that a quantitative research is followed by a qualitative research with the objective to explore selected findings more in depth. Qualitative

research is particularly of great relevance when the objective is to find the fundamental reasons and motivations of a problem. At the same time this type of research normally produces ideas and hypotheses that would lend themselves well for a quantitative research. In order to better address all of the research questions both qualitative and quantitative research were completed using three different surveys. The statistical analysis based on the sample size for the three surveys are listed in table 3.1. Figure 3.10 shows the iAdvise system and the workflow within the system to complete the registration process. In Figure 3.10 shows fewer number of task blocks than figure 3.2.

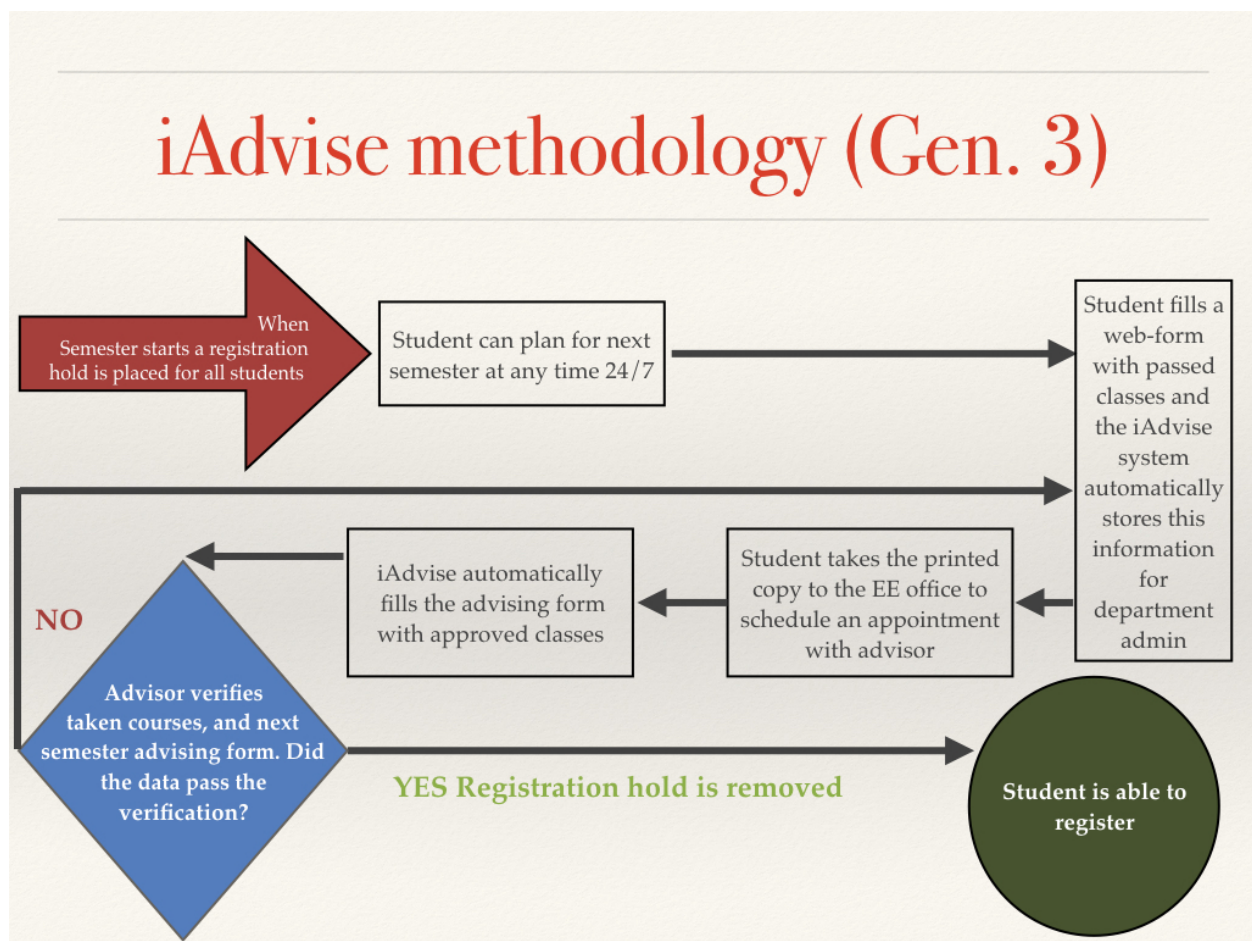


Figure 3.10. Flow chart of iAdvise advising system at the EE department at UTEP.

Table 3.1. Statistical Information on the surveys.

	n	Population	Confidence level
Survey 1	38	Pre-Engineering 486	95%
Survey 2	107	Pre-Engineering 486	95%
Survey 3	58	Electrical Engineering:- 434	95%

Degree completion rates and time to graduation are considered among the most important indicators for institutional quality as previously mentioned. These two indicators have been proven in the literature review to be mainly caused by: flawed student schedule planning, enrollment for less than 15 credit hours per semester, school/work overload, and diminishing resources to universities and colleges. The iAdvise system developed in this study addresses each of the causes previously mentioned. Moreover, this proposed methodology shows the results of three survey instruments in which all of them consistently indicate the addressing of the causes of the two main indicators. All of the questions of the final survey instrument are shown in the results sections and these results are discussed further in this study. All of the hypothesis questions are proven by the functionality results of the iAdvise system and the rating of the system by the agents and the operators.

Preliminary first and second survey instruments

In the early stages of the system design, data regarding user system acceptance was gathered using 2 survey instruments. These were the first surveys regarding the qualitative characteristics of the iAdvise system. Results on the following fronts are shown in the results sections:

- Initial results on agent performance in iteration 1 (Quantitative Survey on the results of how fast the agents perceive to be moving through the system).
- Agent perception of the system (Qualitative Survey) and Operator perception of the system.

Another flank of this study is the student perceived value of a tool like iAdvise. There were experiments conducted to analyze student perceived value of the system by the agents before and after they used the iAdvise system. The first of these surveys instruments was given to a group of 38 students. This first preliminary survey addressed the agent interest in a system that had certain technological characteristics. The second of these surveys instruments was given to a group of 107 students. This preliminary survey instrument helps the development of a DCS capable of addressing the students' needs in regards to the gap of information or data needed for the students to take their individual optimal selection of courses per semester. Additionally, for this study, a final post-survey was given to all of the agents using the system after they had used it. This survey was conducted by an electronic survey after the usage of the iAdvise Multi-agent distributed control system.

Final Survey Instrument

The purpose of the final survey instrument is to discover the the main aspects of the iAdvise Multi-agent control system. The first aspect that is covered in this survey is the discovery of the difference in system performance (how well is the system accomplishing the different objectives) and perception of the students that have used the LMS/Excel system and the iAdvise system. This final survey is particularly important due to the fact that the students confirm or deny the ability of the iAdvise Multi-agent control system to provide a new layer of information before they plan for their next semester. This final survey was given to 120 students from which 65 responses were

collected. Finally, this last survey helped us discover what new information the agents see after using the iAdvise Multi-agent system.

Functionality of the system

The iAdvise system was designed to address the well-known causes of extended times to graduation. These causes are discussed extensively in the literature review section and these are:

1. Flawed student schedule planning
2. School/work overload
3. Semester enrollment under 15 credit hours
4. Administration diminishing allocation of resources
5. Competing family demands and other non-school related commitments
6. Heterogeneous cohorts

Specifically, the functionality of the iAdvise system addresses the flawed student schedule planning by implementing a complex system of checks. This system of course checks ensures that the student only sees classes that he/she is academically ready to enroll in based on classes that the student has already taken. The iAdvise displays a table of classes color coded to simplify viewing. Agents see the classes that they can register for in a white background. The agents see classes that they have already received credit for with a green background. The system shows classes that have a co-requisite and that need to be taken in parallel with another class with a yellow background. The iAdvise system will show classes that the student should not register due to a lack of pre-requisites in a gray background. Figure 3.11 shows this table of classes for a student that has taken the following courses: ENGL 1301, ENGL1312, Math 1411, PHYL 1301, and HIST 1301. In addition to the previously mentioned courses, this example shows a situation in which the student already completed any remedial Math and/or English courses such as pre-calculus, English for

non-native speakers, and/or English 0111. The selection of courses that the students see as available to enroll in is based on their past course history (this is very similar to the Smart Grid SCADA controls in which the agent has flexibility of the local control, but only within a range). The iAdvise system simplifies the check of coerequisites and prerequisites for each class. It is as simple as typing the class code without having to look for the class schedule. Figure 3.11 shows an example of the actual iAdvise system providing feedback to an agent after the agent has completed the class history form within the iAdvise Multi-agent control system.

ELECTRICAL AND COMPUTER ENGINEERING									
2014 - 2015									
blank 00	Math Placement in Calculus: Yes	Blank 04	English Placement in RWS1301:Yes	total credits per semester					
LOWER DIVISION									19
1st year, 1st Sem	MATH 1411* Calc 1	EE 1305* Intro EE	EE 1105* EE1105 Lab	CS 1320* Comp Prog	PHYS 2420* Intro Mech	26 Blank	UNIV 1301* Univ Sem	4 of 18	Blank
1st year, 2nd Sem	MATH 1312* Calc 2	EE 2369* Dig. Sys 1	EE 2169* EE2369 LAB	34 blank	PHYS 2421* Fld & Wavesgray	RWS 1301* Rhet Cmp 1	HIST 1301* US Hist 1	6 of 17	39
2nd year, 1st Sem	MATH 2326* Diff Eq.	EE 2350* Circuits 1	EE 2372* Soft. Design 1	44- blank	Choose Sci DB	RWS 1302* Rhet Cmp 2	47-blank	3 of 15	49
2nd year, 2nd Sem	MATH 2313* Calc. 3	EE 2351* Circuits 2	EE 2151* EE2351 Lab	EE 2353* C.T. Signal	55-blank	Choose Sci dB	HIST 1302* US Hist 2	0 of 16	59
UPPER DIVISION									69
3rd year, 1st Sem	MATH 3323* Matr. Albr.	EE 3338* Electron 1	EE 3138* EE3338 Lab	EE 3353* D.T. Signal	EE 3325* Ap Quantum	EE 3321* EMF	77-blank	0 of 16	79
3rd year, 2nd Sem	EE 3384* Probability	EE 3340* Electron 2.	EE 3376* Micro 1	EE 3176* EE3376 Lab	EE 3195* J.P.O.	EE 3329* Elec. Dev.	phil1301 Introduction to Philosophy DB	3 of 17	89
4th year, 1st Sem	EE 41XX* class40 dB	EE 4220* S. Proj.1	93-blank	EE XXXX* class43 Elective dB	EE XXXX* class44 Elective dB	CE 2326* Econ Sci Engr	POLS 2310* Int Pol	0 of 15	99
4th year, 2nd Sem	PROF Prof Option	EE 4230* S. Proj.2	103-blank	EE XXXX* class45 Elective dB	EE XXXX* class46 Elective dB	106-blank	POLS 2311* Am Gov	0 of 14	109
110	111	112	113	114	115	116	Total cr=	16	119

Figure 3.11: Table extracted from the iAdvise workflow page.

The iAdvise functionality addresses the school/work/other commitments challenge by implementing a basic algorithm that counts the hours committed per week by each student and compares that to the 60 hour/week productivity rule developed by Dr. Mulinazzi. The iAdvise system provides feedback to the student in 3 ranges: under committed, balanced load, and

overcommitted. This algorithm is shown in figure 3.12. The iAdvise Multi-agent control system displays the result of the load balancing algorithm right after the workflow table, providing the agent a new piece of information that was not provided by the previous system.

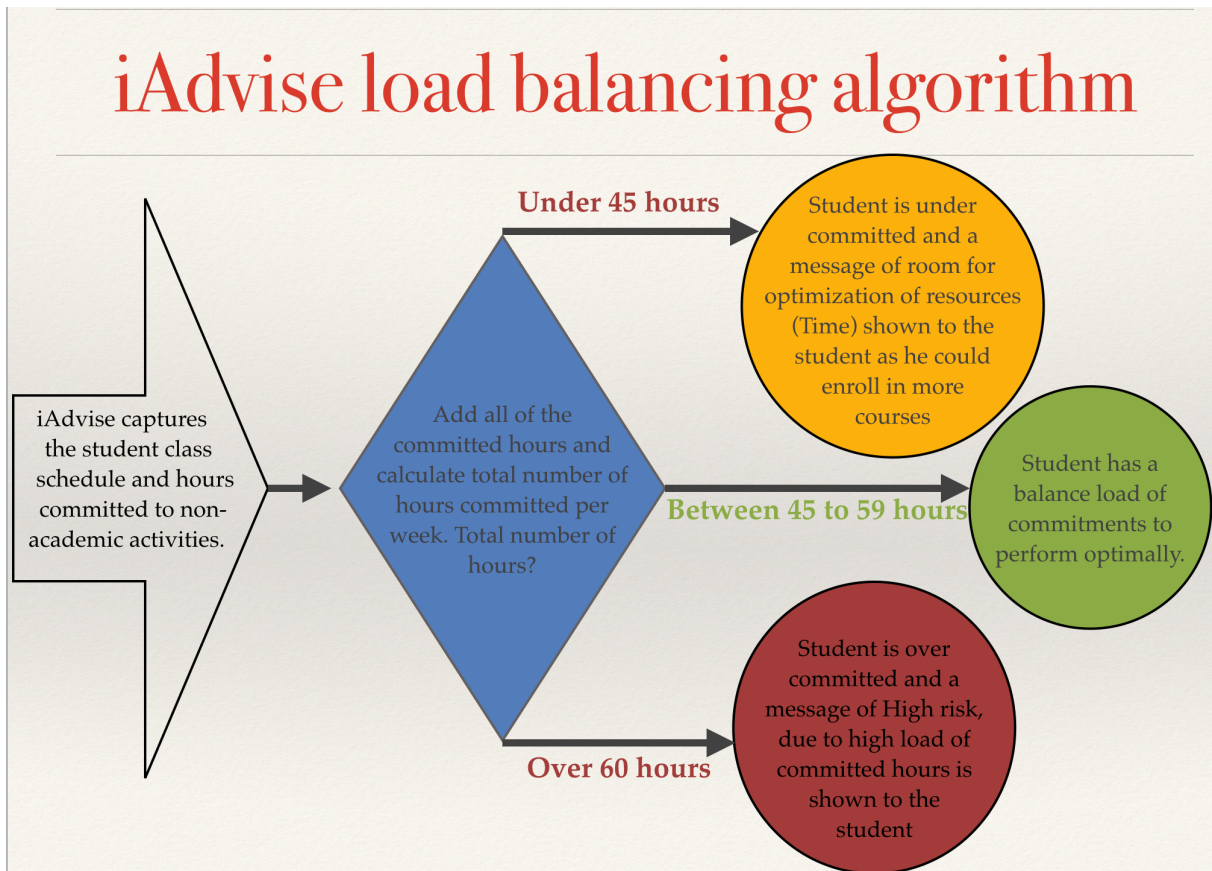


Figure 3.12: Load balancing algorithm in detail.

The iAdvise system tackles the scenario of students registered less than 15 credit hours with a two-fold approach. First, it detects if the student is overloaded or not by doing the check specified in the blue rhombus shown in figure 3.12. From this check there can be three outcomes based on the amount of courses enrolled and the number of non-academic commitment of the student. In the case that the student is not overloaded, the iAdvise system displays a message in which it informs the student that due to the information provided to the system he/she may be wasting resources (time) by not enrolling in the courses that their full potential (time) can manage.

The second part of this two-fold approach is based on showing the student different virtual expected graduation dates in which he/she enrolls on 16, 15, 12 and 6 credits per semester. These enrollment cases (16, 15, 12, and 6) are most common cases in credit enrollment. These settings show the agent possible outcomes of following these types of enrollments. All of the predictions are taking into account that specific agent's curriculum progression. The system also calculates the expected graduation date based on the current selection of classes that the student is planning to enroll. This new piece of information provided to the student is shown in figure 3.13. This credit load per semester correlation to the graduation date may have been known by the agents, but the iAdvise makes this correlation between credits enrolled and expected graduation date an explicit piece of new information readily available. Some students decide to go part-time after being full-time students and they lower their enrollment to 6 credits per semester. The effect of enrolling only for 6 credits is shown along with the new expected graduation date. This piece of data can inform the students of the additional time that it will take for them to graduate due to their new part-time status. The iAdvise Multi-agent control system addresses the challenge of heterogeneous cohorts by empowering each agent with the control of their own advising choices, making this custom tailored advising more meaningful to the agent. Just like in the Smart Grid the end user takes more control of their consumption of electricity, here in the iAdvise system the agent takes a bit more control over their advising (consumption of courses). The thinking behind the design of the iAdvise system was the assumption that each agent's situation is different, just like in the Smart Grid the energy consumption profile of each agent is different. The calculations shown in figure 3.13 assume that students will pass the remainder of all the courses they need to graduate.

Note 2: Do not forget to save and print this page for your advising appointment.

Future Analysis: Degree Progression and Expected Graduation date
(assuming best case scenario: no class repeats, and only enrolling on classes towards your degree)

Credits Passed: 16 out of 128 credits.

This represents: **13** % of completion of the degree plan.

If you take **15 credits** as you previously stated, you can expect to graduate in: **8** semesters.

The last semester credit load will need to be: **7** credits. Expected Graduation date: **Spring of 2020**

If you take **16 credits** starting next semester you can expect to graduate in: **7** semesters.

The last semester credit load will need to be: **16** credits. Expected Graduation date: **Fall of 2019**

If you take **15 credits** starting next semester you can expect to graduate in: **8** semesters.

The last semester credit load will need to be: **7** credits. Expected Graduation date: **Spring of 2020**

If you take **12 credits** starting next semester you can expect to graduate in: **10** semesters.

The last semester credit load will need to be: **4** credits. Expected Graduation date: **Spring of 2021**

If you take **6 credits (part-time)** starting next semester you can expect to graduate in: **19** semesters.

The last semester credit load will need to be: **4** credits. Expected Graduation date: **Fall of 2025**

Figure 3.13: Expected graduation dates calculated by iAdvise.

The iAdvise system addresses the diminishing allocation of resources by showing department administrators students' selection of classes in real-time. The operators' dashboard helps operators immediately detect potential bottlenecks in the system, or underutilized resources that can be repurposed to improve the flow of agents through the system. For example, figure 3.14 shows the expected enrollment of classes for summer 2016. This feature allows the operator to move the department resources to have a greater impact on the flow of agents across the system. Another important piece of information shown in figure 3.14 is the column "students enrolled per semester". This column shows the number of agents planning to take a class within the "1st year 1st semester". The way iAdvise shows the data allows the operator to quickly see how many students are supposed to go on into "1st year 2nd semester". The tool used to do this by the operator in the 2nd generation system was a web report pulled from the school's main student database. The web report required the operator to manipulate the data to generate a list of classes and enrollment.

This classes and enrollment list was not user friendly at all. The operator would spend hours having to fish for the right data. The functionality of the iAdvise system prevents the operator from spending a long time searching for this enrollment data. Another important feature of the iAdvise system is its ability to show classes that students have not been successful in getting credit for. These two pieces of information were no available before the design of the iAdvise system. Using the new information, the operators can potentially discover bottlenecks and allow the operators to re-enforce those classes by adding agent support. To conclude this section, the functionality of the iAdvise system addresses the challenge of heterogeneous cohorts by providing individualized advising for each agent. Since every agent has independent behavior, the system accommodates for that behavior and produces an advising recommendation based on that specific agent's needs. iAdvise avoids the one-size-fits-all model and provides a framework to prove the research questions through the functionality of the system.

Bachelor of Science–Electrical and Computer Engineering -->Operator Student Enrolling Data<--
Semester to Analyze: [summer2016](#).
Currently the system has: **39** students enrolled in the selected semester.
Friday, April 29th, 2016

Cell Color Scheme :

Class has between 0 students enrolling	Class has 1 to 10 students enrolling	Class has over 11 to 24 students enrolling	Class has between 25 to 45 students enrolling	Class has between over 45 students enrolling
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Workflow Section

ELECTRICAL AND COMPUTER ENGINEERING

2014 - 2015								
blank 00	Math Placement in Calculus: Yes			Blank 04	English Placement in RWS1301:Yes			Students enrolled per class
LOWER DIVISION								
1st year, 1st Sem	MATH 1411* Calc 1 Students enrolled: 12	EE 1305* Intro EE Students enrolled: 7	EE 1105* EE1105 Lab Students enrolled: 15	CS 1320* Comp Prog Students enrolled: 31	PHYS 2420* Intro Mech Students enrolled: 15	26 Blank	UNIV 1301* Univ Sem Students enrolled: 31	111
1st year, 2nd Sem	MATH1312* CALC 2 Students enrolled: 31	EE 2369* DIG. SYS 1 Students enrolled: 14	EE 2169* EE2369 LAB Students enrolled: 17	34 blank	PHYS 2421* Fld & Waves Students enrolled: 0	RWS1301/ENGL1311 Students enrolled: 0	HIST 1301* US Hist 1 Students enrolled: 0	62
2nd year, 1st Sem	MATH 2326* Diff Eq. Students enrolled: 19	EE 2350* Circuits 1 Students enrolled: 31	EE2372* Soft. Design 1 Students enrolled: 11	44- blank	DB	RWS 1302 Rhet Cmp 2 Students enrolled: 3	47-blank	64
2nd year, 2nd Sem	MATH 2313* Calc. 3 Students enrolled: 0	EE 2351* Circuits 2 Students enrolled: 11	EE 2151* EE2351 Lab Students enrolled: 24	EE 2353* C.T. Signal Students enrolled: 0	55-blank	dB	HIST 1302* US Hist 2 Students enrolled: 0	35

Figure 3.14: Operator's expected class enrollment by class.

Map of the Multi-agent distributed control system

After answering the question “Does the iAdvise Multi-agent control system prevent you from enrolling in classes that do not count towards your degree?” the next question is how well does the iAdvise system perform this task? In the results section this data is listed and discussed extensively. In order to understand these results and the reason behind them, the functionality of the system needs to be discussed. The system works by enabling the agents and the operators to extract data and to communicate information using the iAdvise system. The iAdvise system stores and processes information in a concise and efficient manner to provide instant feedback to the agents and operators.

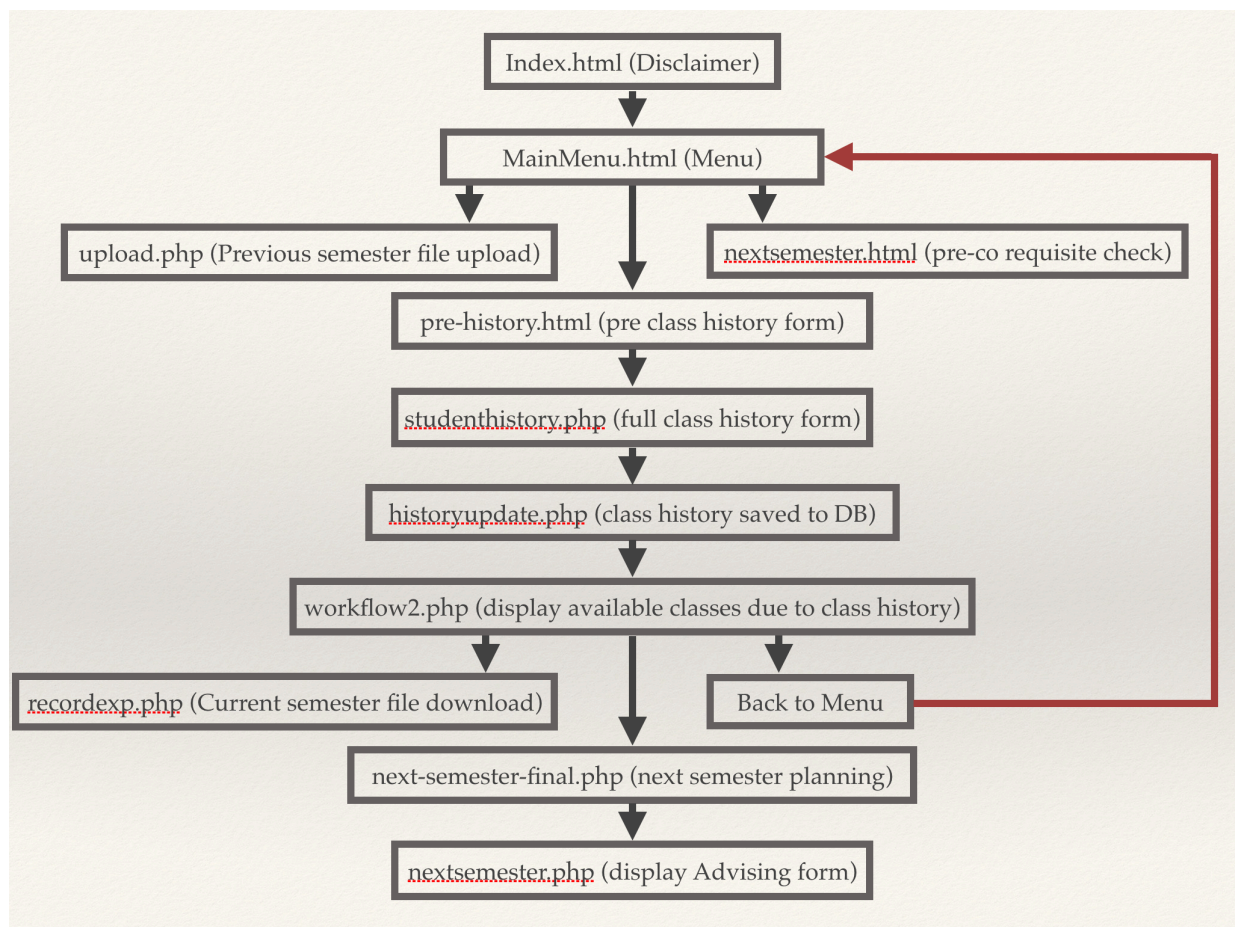


Figure 3.15: iAdvise agent dashboard map.

Figure 3.15 maps every section of the online tool from the agents' perspective, and it shows the workflow of the forms that were programmed within the iAdvise application. Next to the file name in parenthesis, the main function of the file is shown. For example, the file index.html contains the disclaimer that each of the students have to agree to in order to proceed with the usage of the iAdvise system. All of the source code from the files in figure 3.14 is listed in Appendix B. The results in the next chapter show how the performance of the system answers the main research question. The iAdvise Multi-agent control system is based on a two prong approach to solving the challenge. First, the system requires the student to fill out the online form and then provides an analysis of the data entered by the student. Figure 3.15 shows a map of the agents' system, focusing on the approach from the student perspective. In comparison, figure 3.16 shows the operator dashboard is a smaller and more concise system.

Figure 3.16 maps every section of the online tool from the operator's perspective. This figure shows the entire operator's dashboard and the different paths that can be taken. Next to the file name in parenthesis the main function of the file is shown. For example, the file enrollment.php will display a webpage with the intended enrollment numbers for the semester picked by the operator (just like figure 3.14). Another design feature that was implemented while developing the system was the flexibility to add, erase, or modify classes and their interdependencies from the curriculum. The EE curriculum is revised every two years and a tool for the operators was developed to avoid any programming changes. From the operator dashboard, the classes to the curriculum can be added, substituted and/or deleted. The operator can easily view the correct curriculum and easily modify the pre-requisites and/or co-requisites of a specific course or courses. This feature makes the system appealing to other departments since it can be easily modified to be used for a different curriculum.

Operator Dashboard Map

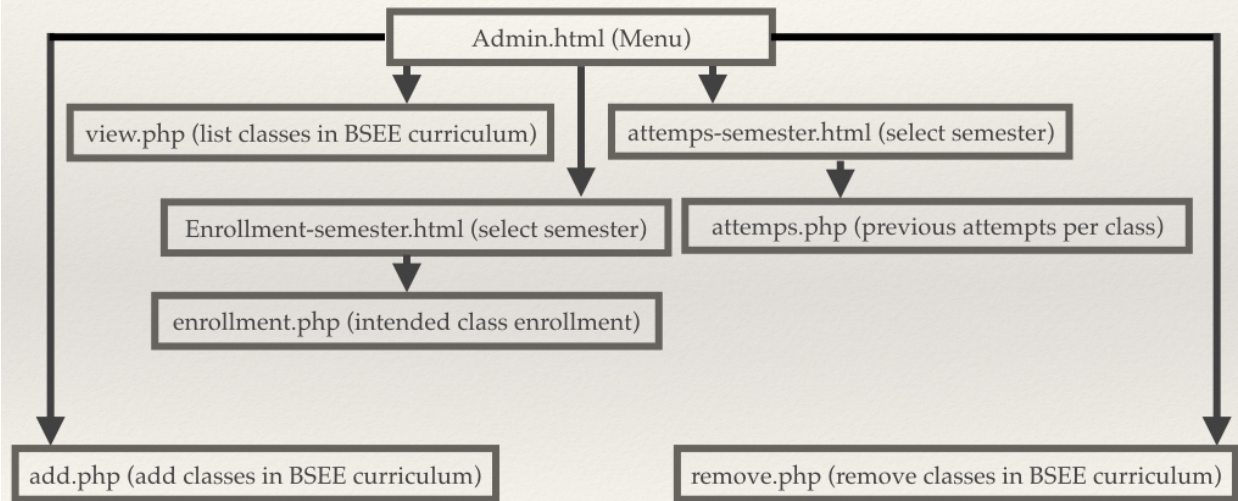


Figure 3.16: Operator dashboard map.

Chapter 4: Results

Preliminary results from first and second survey instruments

The first set of results was gathered during the Summer of 2015, these initial results showed a promising acceptance rate of an advising system by the students surveyed. These results are shown in Figure 4.1(n=38). In this pre-survey students overwhelmingly expressed the need for an online tool to keep track of their curriculum progression and how it relates to the classes that they have signed up for. Along these same preferences, students wanted a system that could help them with their class load balancing, taking into account a part-time job or other time commitments. The students' responses by this preliminary survey undisputedly show a need for an advising tool. These initial results justified the development of this tool.

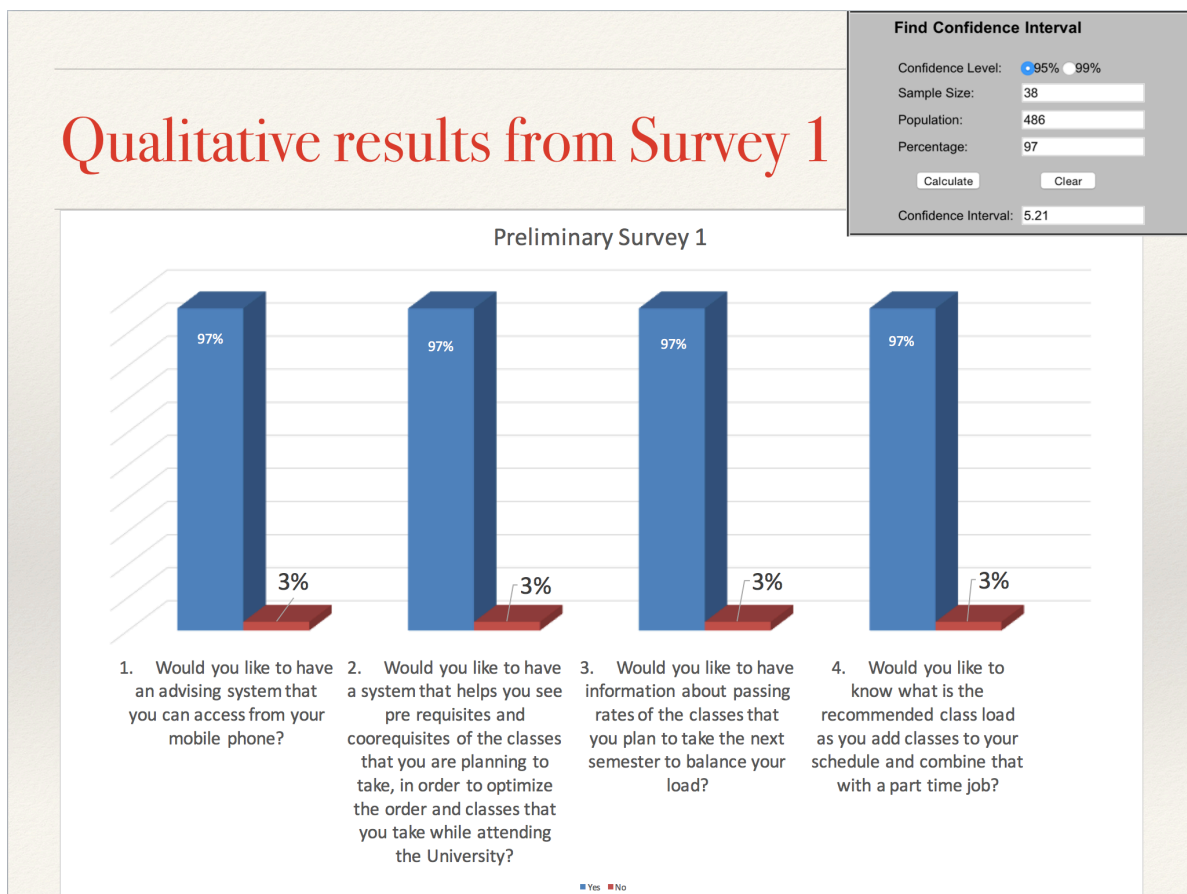


Figure 4.1: Results of the first preliminary survey.

A second survey instrument was used after the first model of the distributed control system was developed and implemented into an online system. Subsequently, after the design of the model was shown and explained to the students, feedback was gathered before it was used by the students, and this feedback was focused only on the students' perception of a DCS vs a Face to Face system. The current advising system on the LMS website was used as an example in comparison to the DCS. A positive response from agents and operators (students and department administrators) was obtained after the results of the second survey instrument was analyzed. Historically, from the current system (LMS website), there are fewer cases of students enrolling in courses where they lack the proper prerequisites due to student class scheduling errors. Figure 4.2 shows the evolution of the advising process/system that has been used for advising purposes. In this figure, the main characteristics are listed within each of the approaches to advising. It is important to highlight that the iAdvise system will be a 3rd generation advising system.

One important benefit that surfaced during the transition from the first generation (appointment only advising) to the second generation (LMS website and appointment) advising system, is that using the LMS allowed the department to reallocate resources due to the load reduction on the advisors. The EE department used to have 3 fulltime employees devoted to student advising. After the transition from the first generation to the second advising system, it was concluded that only one full-time advisor was necessary along with two part-time student advisors (MS students acting as undergraduate advisors). The number of students advised per semester has increased using this second generation system. Previously 160 students were advised per semester (Fall 2013); then 240 students were advised during Fall 2014. Using the current data from this first implementation plus more historical data that is available, a benchmark was created before the Distributed Control System was implemented and used by the agents and operators.

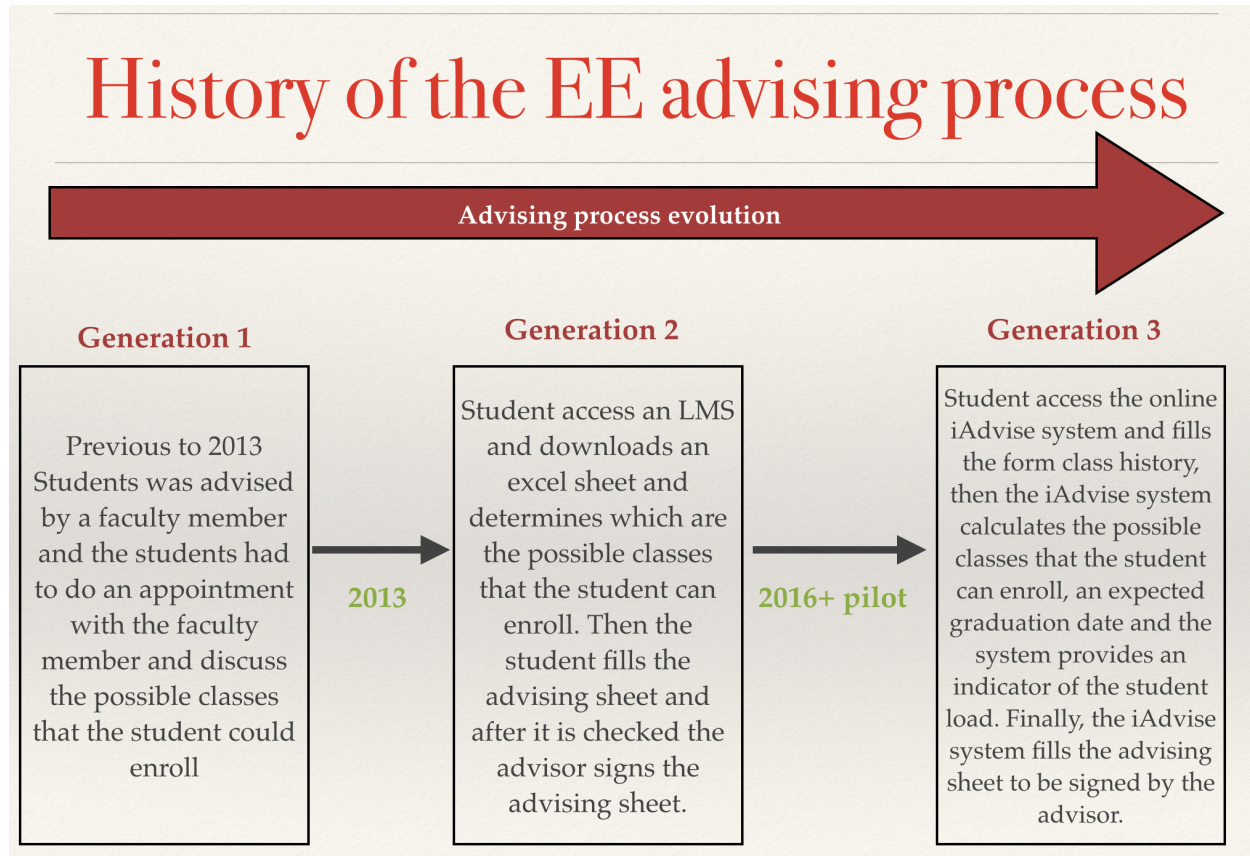


Figure 4.2: This shows the evolution and main features of the advising systems.

Statistics on the performance of the iAdvise system were collected during the advising season in the the Spring 2016 semester and these are shown in the final results section. The following are the preliminary results from the second survey. These results focus on the user preferences of advising systems, and computing platforms to get advised. The results of the pre-attitudinal survey contain the reply from 107 participants out of 113 possible responses (N=107), which translates to 94% of the students responding to the survey. This survey consisted of 6 questions, one was a Likert-type, two questions were a multiple choice, another two questions were yes or no and a final open-ended question. All of the questions and their results are shown in this section. Table 4.1 shows the results of question 1.

Question 1 was the following: “Please number your ideal advising system from 1 to 4 (1 being the most preferred and 4 the least preferred).

- A. _____ Face to face by appointment
- B. _____ Online system that is mobile compatible
- C. _____ An application that you install on a desktop computer
- D. _____ Other

Table 4.1. Results from fall 2015 pre-development question 1.

System Type	Most Preferred	Preferred	not preferred	east Preferred	Average
Face 2 Face	78	16	8	5	3.56
Mobile	21	54	28	1	2.86
Desktop	10	29	48	16	2.27
Other	1	6	10	59	0.97

After grouping the answers in two groups: “at least preferred” and “at least not preferred” we found the following percentages shown in figure 4.3.

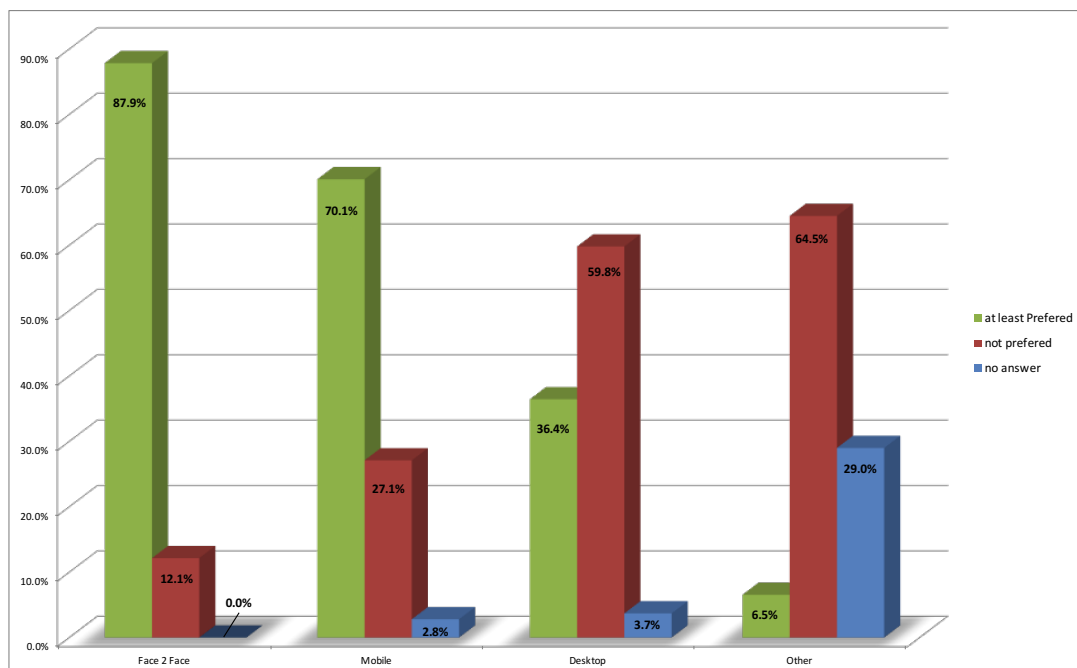


Figure 4.3. Percentage preference of different advising systems.

Question 2 directly addresses the students' preferred advising method. Specifically question 2 is: "What type of advising would you prefer?"

- a) I would like a manual system where I make an appointment and go to and advisor to get help with the pre-requisites and coerequisites of the classes that I plan to take.
- b) I would like an electronic system that is running 24/7 and helps me with the pre-requisites and coerequisites of the classes that I am planning to take as well as provides additional information such as success rates of the classes I plan to take to help with the load balancing.
- c) Other: _____ explain: _____"

Table 4.2. Results from fall 2015 pre-development question 2.

What type of advising would you prefer?				
	Face to face with advisor	Electronic system that is running 24/7	Other	Total
Students	61	46	0	107
Percentage	57%	43%	0%	100%

Question 3 asks the students if they would like to have the student success/failure information per class. This was not included in the final implementation of the iAdvise system, but the database and code design of the system can easily implement this piece of information in a future version of the iAdvise system. Specifically, question 3 was the following: "Would you like to have information about previous students' success rates for the classes that you plan to take the next semester to balance your load?"

- a) Yes
- b) No

Table 4.3. Results from fall 2015 pre-development question 3.

Would you like to have information about previous students success rates of the classes that you plan to take the next semester to balance your load?			
	Yes	No	Total
Students	103	4	107
Percentage	96.30%	3.70%	100.00%

Question 4 focused on a load balancing feature, and as in the previous question, the student reaction to this questions was overwhelming and it almost reached 100%. Question 4 was the following: “Would you like to know what is the recommended class load as you add classes to your schedule and combine that with a part time job?”

- a. Yes
- b. No

Table 4.4. Results from fall 2015 pre-development question 4.

Would you like to know what is the recommended class load as you add classes to your schedule and combine that with a part time job?			
	Yes	No	Total
Students	105	2	107
Percentage	98%	2%	100%

Question 5 focused specifically on the load of activities devoted to school, other non-academic commitments. This question yielded very valuable information due to the fact that it showed specifically how many hours students devote to those other activities. Specifically question 5 was the following: “What other commitments do you have every week (select all that apply)?

- a) School Full-time
- b) School Part-time
- c) Work _____ hr/week
- d. Family commitments _____ hrs/week
- e. Other commitments _____ hrs/week

Table 4.5. Results from fall 2015 pre-development question 5.

What other commitments do you have every week?					
	Student FT	Student PT	Work	Family	Other
Students	104	3	33	38	33
Percentage	97.20%	2.80%	30.80%	35.50%	30.80%

In addition to Table 4.5, an average of Work/Family/Other commitments was calculated resulting in 52.12 hours per week. This is a real high number of student committed hours to activities overall. As discussed in chapter 2, according to the study conducted by Dr. Mulinazzi, a person can be productive for 60 hours per week constantly for the length of a 16-week semester. Given this fact, and after analyzing question 5, it can be seen that students only have 7.88 hours available for unexpected commitments, as 52.12 hours on average are already committed. Table 6 shown below displays the students' simplified preference by grouping the answers from the students on question one into two groups. These two groups being "preferred" and "not preferred".

Table 4.6. Students' preference grouped by preferred and not preferred to Question 1.

Advising System Type			
System Type	at least Preferred	not preferred	no answer
Face 2 Face	87.90%	12.10%	0.00%
Mobile	70.10%	27.10%	2.80%
Desktop	36.40%	59.80%	3.70%
Other	6.50%	64.50%	29.00%

All of the results from the preliminary survey 1 and the survey 2 prove the fact that students agree on the need of a system that could help them to make choices based on more information that is not currently available to them. It also shows that current students prefer a system that has a face-to-face component and that is also available in a mobile and a desktop format.

Final results from final survey instrument

The results from a third and final survey instrument are shown in this section. This third survey was designed to measure two aspects of the iAdvise system. The first aspect measured was if the system was reaching the goals and, if that is the case, how good it was performing at reaching those goals. In other words, is the system functional and what is the performance. The first question focusses on the agent choice of advising system. It is very important to consider the fact that agents have used both systems, this brings more relevance to the question since they can compare them. Table 4.7 shows the agent's response to this question. As it can be seen, the iAdvise overwhelmingly is preferred over the current system.

Question 1. To see classes you would like to enroll in, do you prefer...

- a) The iAdvise system
- b) The Excel file form

Table 4.7. Results from post development question 1 Spring 2016.

1. Which would you prefer to use to see classes that you would like to enroll in?		
The iAdvise System	49	92%
The Excel file form	4	8%

One of the main causes of extended time to graduation according to the literature review is the fact that students form flawed schedules. Not choosing the right course is one of the worst scenarios since it creates a non-optimal usage of time and money. Question number two directly asks students about the ability of the iAdvise to prevent them from enrolling in courses that do not count towards their degree. Table 4.8 shows clearly that the vast majority of the agents agree on the positive impact of using iAdvise in preventing them from choosing classes that would use their resources non-optimally.

Question 2. Do you believe a system like iAdvise can prevent you from enrolling in classes that do not count towards your degree?

- a) Yes
- b) No

Table 4.8. Results from post development question 2 Spring 2016.

2. Do you believe a system like iAdvise can prevent you from enrolling in classes that do not count towards your degree?		
Yes	49	92%
No	4	8%

The next question from the third survey focusses on the easy access to information that could be gathered by the agent but, due to the inaccessibility, the agent very seldom looks for it. Even if the agents understand the notion of “the more credits that I enroll in and pass the faster I graduate”, it is not often that agents actually take the time to calculate their time to graduation. According to Landis, an expert in the field of engineering education, the more time and effort a student devotes to planning their career (setting up time milestones), the more successful they will be. The iAdvise Multi-agent control system provides the agent with the tools to make that planning easy and readily available even by using their mobile phone. It can be seen from the results that 85% of the agents agree on the statement that the iAdvise control system provides them with the information expected graduation date as shown in table 4.9. This question provides a positive answer to the second research question “Does the Multi-Agent control system provide the agents with more control over their advising process?”. Preventing the agents from enrolling in courses that are not needed, empowers them by providing information when it is needed.

Question 3. After using the iAdvise system, do you have an idea of your expected graduation date?

- a) Yes
- b) No

Table 4.9. Results from post development question 3 Spring 2016.

3. After using the iAdvise system do you have an idea of your expected graduation date?		
Yes	45	85%
No	8	15%

Expected graduation date is a powerful piece of information and while designing the survey instrument, we decided to have this question as a follow-up to question number three. The purpose was to investigate if the agents would be motivated by discovering their expected graduation date according to their course enrollment and specific to their curriculum progression at the time of using the iAdvise system. As expected, agents reacted positively to the discovery of their expected graduation date. What was unexpected from the results was the positive bias that was discovered with an acceptance of 87% as displayed in table 4.10.

Question 4. Does seeing your graduation date motivate you?

- a) Yes
- b) No

Table 4.10. Results from post development question 4 Spring 2016.

4. Does seeing your expected graduation date motivate you?		
Yes	46	87%
No	7	13%

The results from question number four addresses the important relationship between courses enrolled in and graduation date. The iAdvise provides information of different scenarios using past course history plus agent specified credits to be enrolled in. The iAdvise tries to make

the agent aware of the different outcomes for graduation dates. From the response of the agents it is clear that the iAdvise Multi-agent control system is functional with a high performance in this category. The goal of informing the agents of this relationship was accomplished at a 98%.

Question 5. After using the iAdvise system do you see the actual impact of the relationship between credits enrolled in per semester to your graduation date?

- a) Yes
- b) No

Table 4.11. Results from post development question 5 Spring 2016.

5. After using the iAdvise system do you see the actual impact of the relationship between credits enrolled per semester and your graduation		
Yes	52	98%
No	1	2%

Question number six was designed to measure the ability of the iAdvise system to provide information to the agent in regards to load balancing. The iAdvise algorithm is based on the measurement of devoted time to 3 areas: Academics, Work and Family. From the results shown in table 4.12 it can be seen that according to the agents' responses to the survey, 87% of them can better plan their semester load in conjunction with their academic commitments. This question is on high importance since the results back up the positive answer to the second research question "Does the Multi-Agent control system provide the agents with more control over their advising process?".

Question 6. After using the iAdvise system can you better plan your semester class load in combination to your outside school commitments (work and/or family) based on your available time?

- a) Yes

b) No

Table 4.12. Results from post development question 6 Spring 2016.

6. After using the iAdvise system can you better plan your semester class load in conjunction with your outside school commitments (work and/or family) based on your available time?		
Yes	46	87%
No	7	13%

Question seven focused on agents' recent experience and how that translates to long-term accomplishment based on the usage of the iAdvise system. This question measured the agents' trust in the system to provide support in accomplishing the agents' goal of on-time graduation. The results from the survey can be seen in table 4.13. These results show that 92% of the agents agree with the positive effect of using the iAdvise Multi-agent control system. This is an outstanding acceptance rate for this category.

Question 7. If you keep using the iAdvise semester after semester do you think you can graduate on time? (4.5 years)

a) Yes

b) No

Table 4.13. Results from post development question 7 Spring 2016.

7. If you keep using the iAdvise system semester after semester, do you think you can graduate on time (4.5 years)?		
Yes	49	92%
No	4	8%

Question eight focused on the ease of use of the iAdvise Multi-agent control system. The agents have previously used both systems and can compare them and provide their assessment of both systems using as criteria "ease of use". In table 4.14 the results show that agents find the iAdvise

system an easier to use advising tool when compared to the generation 2, the Excel file method. This question directly relates to our research question “Can a Multi-agent control system be applied to an advising system?” After analyzing the results, the answer has to be yes due to the answer in question eight in which agents not only compare it to the present system, but agents actually prefer the iAdvise Multi-agent control system.

Question 8. Which system would you say is easier to use?

- a) iAdvise
- b) Excel File editing of “BSEE_2014_v5.xlsx”

Table 4.14. Results from post development question 8 Spring 2016.

8. Which system would you say is easier to use?		
The iAdvise System	44	83%
The Excel file form	9	17%

Question nine focuses on the performance of the iAdvise Multi-agent control system in comparison to the current second generation advising system. One of the final results of the advising system is to be able to fill out the advising form and submit it for registration. The results of this analysis are shown in table 4.15. These results provide a great insight relating performance of the iAdvise system in comparison to the second generation system. While the second generation advising process does this manual process, the iAdvise system provides the form ready to be printed or saved as a PDF for the agent. The iAdvise system facilitates the process for the advisor by pointing out the classes that need to be validated in order for the advisor to sign the advising form. Agents agree 94% to 6% in this study that the iAdvise Multi-agent control system is faster than the current system.

Question 9. Does the iAdvise system help you fill out the “Academic advising form” faster and easier than previously?

- a) Yes
- b) No

Table 4.15. Results from post development question 9 Spring 2016.

9. Does the iAdvise system help you complete the “Academic Advising Form” faster and easier than the previously established process by your EE		
Yes	50	94%
No	3	6%

Another performance question is question ten. This question focuses on the comparison to the current second generation advising system and the iAdvise Multi-agent control system in the area of class interdependencies and how fast the agents can obtain the answers. The second generation system is semi-automatic and, as mentioned before, it requires a desktop computer with MS Excel installed in order for the macros functions to run. The iAdvise Multi-agent control system is an agnostic web-based, mobile-friendly system that does not require specialized software. The results in table 4.16 show a clear 94% preference of the iAdvise Multi-agent system over the second generation advising process. Once more these results back up the positive answer to the research question “Does the Multi-Agent control system provide the agents with more control over their advising process?” By providing a faster way to perform a task the system is inviting the agent to take more control of their advising process.

Question 10. Does the iAdvise system help you check class pre-requisites and co-requisites faster than with previous method (previous method was using the Excel File editing of “BSEE_2014_v5.xlsx”)?

- a) Yes

b) No

Table 4.16. Results from post development question 10 Spring 2016.

10. Does the iAdvise system help you check class pre-requisites and co-requisites faster than with previous methods? (the previous method was using the Excel File editing of "BSEE_2014_v5.xlsx" or the degree plan)?		
Yes	50	94%
No	3	6%

Q11. What do you think of the iAdvise system?

Most common adjectives of the system were: faster, good, better

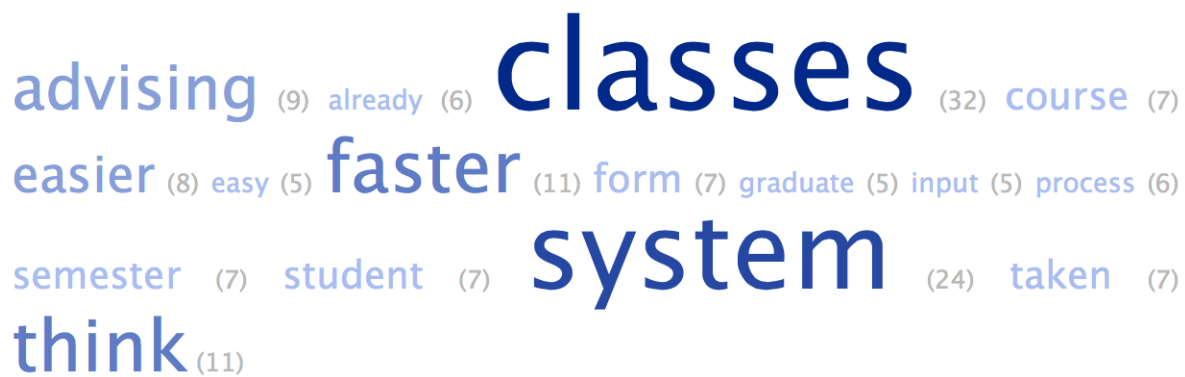


Figure 4.4. Shows a tag cloud with the most common words from question 11.

Question 12. What other features would you add to the iAdvise system?

Some of the comments suggested that the iAdvise Multi-agent control system could use more graphics to make it even more appealing to the agents. The automatic check of transcripts was another common suggestion. Finally, it was suggested to develop a link to the UTEP Banner database to be able to automatically provide CRN numbers and specific class times.

Finally, after analyzing all of the evidence from the functional perspective it was proven that the agents have more information available to them in a faster and user-friendly fashion

empowering them to take more informed advising decisions. From this perspective it was also proven that operators now have more data available to make better use of departmental resources in a way that more agents flow across the BSEE curriculum. From the functional perspective it is clear that the research question of “Can a Multi-agent control system be applied to an advising system?” can be answered with a “YES it can”. From the pre-survey 1, pre-survey 2 and final post survey it can be seen that the answers by the agents align to the same answer as the functional perspective. After the results from all of the surveys were compiled it is clear that the agents not only believe that the iAdvise Multi-agent control system can be applied to an advising system, but the agents actually prefer the iAdvise system over the current system in place. In the same way, from the functional perspective, the positive answer to the secondary question “Does the Multi-Agent control system provides the agents with more control over their advising process?” supports the research findings. The evidence not only supports the answer “YES”, but it provides performance metrics that prove that the iAdvise Multi-agent control system performs faster and is easy to use in comparison to the second generation system in place. Previously, operators were not able to see future enrollment per class and there was no information of student enrollment tendencies before census day. It is proven from the functional perspective that the operators now have access to the first class enrollment estimator based on a pre-advising process. The operators previously did not have this degree of visibility of the system; therefore, it is safe to affirm the answer to the third research question “Can a Multi-agent control system improve the operator’s visibility on the system?” is YES.

Chapter 5: Conclusion

Conclusions from the first and second survey instruments

From the analysis of the results of attitudinal surveys relating to academic technologies for the past 5 years, it can clearly be seen that the students' perception of technology and learning changes in a positive direction after the proper usage of technology by students (Perez et al. 2013). This Multi agent control system provides an option to traditional advising methods by providing a custom advising solution taking into consideration external factors affecting the students' lives. Moreover, the Multi agent control system is on a platform that is very popular (mobile app) among college students making it very appealing to them. The attitudinal surveys from this study clearly show the same effect similar to attitudinal surveys from other technology applications used in the classroom. Additionally, results of the two pre surveys show that the students have two mayor preference systems. The face-to-face system has an approval rate of 87% among the students. The second preference is to have a mobile application for advising with an approval rate of 70.1%. The comments from the final survey also support this finding. Some of the students commented that the system was great and that it should be the default advising system, but they wanted to have additional access to face-to-face advising in case there was a question that required advisor feedback. These results show evidence of approval of the iAdvise system by students. Another interesting finding is the fact that, on average, the students surveyed have 52.1 hours per week committed to school and other activities. This makes an excellent case for the need for the iAdvise system that can be accessed 24/7 for advising without the need for the students to spend time scheduling a meeting for advising in addition to the length of the advising meeting itself. Even in the event that an appointment with an advisor is needed, the length of this meeting is potentially reduced significantly.

Conclusions from the final survey instrument after agents and operators used the DCS (iAdvise)

In conclusion and based on the functional results, the answer to the main research question of: “Can a Multi-agent distributed control system be applied to an advising system?” the answer is YES, since the iAdvise system can perform better than the second generation using the evidence from the functional results and student perception. Furthermore, we can answer the first secondary question: “Can an advising system modeled after a Multi-agent distributed control system provide more control to the agents over their individualized advising?” The answer again based on the functional and qualitative results is YES. The Multi-agent distributed control system provides more information to the agent empowering them to use this new information to better manage their flow across the system. Lastly, the answer is provided to the second secondary question “Can an advising system modeled after a Multi-agent distributed control system improve the operator visibility over the advising system?” Based on the functional results the answer is YES due to the fact that the Multi-agent control provides more visibility by showing the intended enrollment for the next semester, bottleneck information based on previous class attempts, and total level enrollment. The the Multi-agent control system, iAdvise, provides an option and/or an enhancement to traditional advising methods. The the Multi-agent control system provides a customized advising solution tailored to each student and taking into consideration external factors affecting the students’ lives. Moreover, the Multi-agent control system is on a platform that is very popular (Android/Apple mobile compatible) among college students making it very appealing to them. Most importantly, based on all of the post usage survey results, the iAdvise system proves that a Multi-agent distributed control system provides a new way to optimize human and infrastructure resources.

Advisors were also interviewed after using the iAdvise and their assessment of the iAdvise system is that it makes checking pre-requisites and co-requisites easier for the students and for the advisors. Specifically, the advisors pointed out that they used the system to expedite the class pre-requisite/co-requisite search and the filling of the advising form. Advisors also predicted that the advisor student meetings focusing on this pre-requisite/co-requisite area will take a minimal amount of time as this check is quicker.

Operators reported that looking at the previous enrollment reports and producing the reports is easier (one click) than running the web reports from Banner and analyzing them as it has been done in the past. Operators also reported that now a predictive enrollment for next semester can easily be accessed. Previously there was no predictive report for the next semester. Finally, operators also reported that agent flow bottlenecks are now available in the operator dashboard using the information of previous attempts.

The optimization process of the Multi-agent distributed control system happens on the agent processes as well as in the operator processes, making it a win-win situation for both entities. The evidence from this study shows that for the demographics of the University of Texas at El Paso, the optimization of these resources maximize the flow of agents across the educational system and minimize time losses in an educational setting.

Chapter 6: Future work

Implementation of historical passing rates

After designing and deploying the iAdvise system and based on the final survey results, the logical next step is to add another variable to the student load. This variable should be the percentage passing rate of students for each class using historical values. The addition of this critical information could potentially help the student to plan course selection better and it will enable the student to balance the class load based on the class difficulty. The backend database of the system was designed in a way that could easily implement this future feature to the iAdvise program. The design also included room for expansion for future features that at this point in time may not be recognized as possible upgrades of the iAdvise application.

Longitudinal analysis of the impact of iAdvise

After several cohorts have used the distributed control system, another important future work is the longitudinal analysis of how these compare to the flow of agents that have not used the system. The comparison can be done using the historical values of agent flow using the Excel and web report method. This longitudinal analysis could help the operators with the visibility of enhancements and new additions to the iAdvise system based on trend of agent flow. The iAdvise system was designed to gather data for multiple semesters in an easy and systematic fashion. As more and more data becomes available, post survey data may increase or decrease which may have an effect on agent flow.

Characterization of parameters for the FIR model

Another area in which the research could expand is into the characterization of the transfer function $h(n)$ for each class. After the characterization of each class has been obtained, the research can expand into the analysis of the different combinations of classes. This characterization can also expand into the relationship that the transfer function of one class has with the relationship of another. The previous information for the characterization can be obtained using the longitudinal data acquired by iAdvise system. The longitudinal data will yield enough information to discover an optimal setting for parameters such as size for the window m , as well as the effects of other factors in the transfer function $h(n)$ for each class (i.e. change of room, room size, instructor, etc.). The usage of the model can provide the data needed to generate the analysis of the combinations of different classes and their effect on agent flow across the system.

Improvement of the predictive expected graduation date algorithm

The predictive expected graduation date algorithm is based on degree percentage completed and credits enrolled in per semester assuming that all future classes will be passed. Another area that could benefit from future work is the design of another expected graduation date algorithm that is based on the critical path classes passed. The usage of the critical path for expected graduation date could provide a more accurate date. Due to the rigidity of the BSEE curriculum and the iAdvise system design, this feature should be easy to implement. Another addition to this predictive analysis could be the implementation of the national average of courses repeated by college students. This national average of courses repeated will be added to the calculated time and a new, more accurate prediction could be obtained.

Link to the University course catalog

Another addition to the iAdvise system is a direct link to the university course catalog for iAdvise course listings. This link of the databased will be used to to provide the students with the class times and the course reference number (CRN) of the sections of the classes are offered. This link could also provide the students valuable information about instructors teaching each section and the room and building where the class will take place. The addition of this database link will further streamline, not the advising process, but the registration process, making it even easier for the students to select desired class sessions.

References

- Creighton L.M., 2007. Factors Affecting the Graduation Rates of University Students from Underrepresented Populations, *International Electronic Journal for Leadership in Learning*, v11 Article 7.
- Knox, W., Lindsay, P., & Kolb, M. 1993. *Does college make a difference? Long term changes in activities and attitudes*. Westport, CT: Greenwood Press.
- Baum, S., Ma, J., & Payea, K. 2010. *Education pays 2010: The benefits of higher education for individuals and society*. New York: College Board.
- Astin, A. W., & Oseguera, L. 2004. The declining “equity” of American higher education. *Review of Higher Education*, 27(3), 321–341
- Bowen, W. G., & Bok, D. 1998. *The shape of the river*. Princeton, NJ: Princeton University Press.
- Astin, A. W. 1977. *Four critical years*. San Francisco: Jossey-Bass.
- Astin, A. W. 1993. *What matters in college? Four critical years revisited*. San Francisco: Jossey-Bass.
- Chickering, A. W. 1974. *Commuting vs. resident students: Overcoming educational inequities of living off-campus*. San Francisco: Jossey-Bass.
- Pascarella, E. T., & Terenzini, P. T. 1991. *How college affects students*. San Francisco: Jossey-Bass.
- Astin, A. W. and Astin, H.S. 1993. Undergraduate Science Education: the Impact of Different College Environments on the Educational Pipeline in the Sciences. Los Angeles, CA: Higher Education Research Institute.
- Cox, R.D. 2009. *The college fear factor: How students and professors misunderstand one another*. Cambridge, MA: Harvard University Press.
- Rosenbaum, J.E., Deil-Amen, R. J., & Person, A. 2006. *After admission: From college access to college success*. New York: Russell Sage Foundation
- Braxton, J. M., & Hirschy, A. S. 2005. Theoretical developments in the study of college student departure. In A. Seidman (Ed.), *College student retention: Formula for student success* (pp. 61–87). Westport, CT: Praeger Publishers.
- Braxton, J. M., & Lien, L. 2000. The viability of academic integration as a central construct in Tinto’s interactionalist theory of college student departure. In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 11–28). Nashville, TN: Vanderbilt University Press.
- Berger, J. B., & Braxton, J. M. 1998. Revising Tinto’s interactionalist theory of student departure through theory elaboration: Examining the role of organizational attributes in the persistence process. *Research in Higher Education*, 39(2), 103–119.
- Jacobsen, D. M. 1998, "Adoption patterns of faculty who integrate computer technology for teaching and learning in higher education," World Conference on Educational Multimedia and Hypermedia & World Conference on Educational Telecommunications

- Schroeder R., et al., "TQM in Education: Changing the Culture of Schools" 1997; nsf.gov. http://www.nsf.gov/award_search/showAward.do?AwardNumber=9712991. (accessed: 4/1/2015).
- U.S. Department of Education National Center for Education Statistics, 2015. <http://nces.ed.gov/fastfacts/display.asp?id=40>, . (accessed: 2/25/2016).
- Hamilton R. 2012, "At UTEP, Success Is Not All About Graduation Rates", March 2, 2012, http://www.nytimes.com/2012/03/02/us/utep-calls-for-success-criteria-other-than-graduation-rates.html?pagewanted=all&_r=0
- Kuh, G. D., Gonyea, R. M., & Palmer, M. 2001. The disengaged commuter student: Factor or fiction? *Commuter Perspectives*, 27, 2–5.
- Brunk-Chavez & Fredericksen. 2008. Predicting Success: Increasing Retention and Pass Rates in College Composition. WPA: Writing Program Administration Volume 32, Number 1, Council of Writing Program Administrators.
- U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS). 2014. "Fall Enrollment Survey" (IPEDS-EF:90-99); and IPEDS Spring 2001 through Spring 2014, Enrollment component. See *Digest of Education Statistics 2014*, table 303.70.
- Complete College America. 2011. Time is the enemy. Postsecondary Analytics, from http://www.completecollege.org/docs/Time_Is_the_Energy.pdf (accessed: 2/26/2016).
- Pelletier, S. G. 2010. 1st ed. Rockville, Maryland: American Association of State Colleges and Universities. (accessed: 2/26/2016).
- "State Funding History Tables: FY 1980—FY 2014." U.S. Department of Education Budget History. N.p., 08 Feb. 2016. Web. 01 Mar. 2016.
- The University of Texas at El Paso Website,. "UTEP Enrollment". N.p., 2016. (accessed: 3/1/2016).
- U. S. Department of Labor. Bureau of Labor Statistics Data. Consumer Price Index. N.p., http://data.bls.gov/timeseries/CUUR0000SA0L1E?output_view=pct_12mths (accessed: 3/10/2016).
- Adelman, C. 2004. *Principal Indicators of Student Academic Histories in Postsecondary Education, 1972-2000*. Washington, DC: U.S. Department of Education, Institute of Education Sciences.
- Adelman, C. 2004. *The Empirical Curriculum: Changes in Postsecondary Course-Taking, 1972-2000*. Washington, DC: U.S. Department of Education.
- U.S. Department of Education. 1999. National Center for Education Statistics. Credit Production and Progress Toward the Bachelor's Degree: An Analysis of Postsecondary Transcripts for Beginning Students at 4- Year Institutions, NCES 1999–057, by Alexander C. McCormick. Project Officer: Dennis Carroll. Washington DC.
- Nate J., Reidy L., Droll M., and LeMon R. E. 2012. "Program Requirements for Associate's and Bachelor's Degrees: A National Survey."

- Texas Comptroller of Public Accounts. "ED 11: Eliminate Funding for Excessive Undergraduate Credit Hours." Window on State Government. n.d. <http://www.window.state.tx.us/tp4/tp4/c111.html> (accessed Nov. 23, 2011).
- Complete College America. 2013. How Full-Time are "Full-Time" Students? Postsecondary Analytics, from <http://completecollege.org/pdfs/2013-10-14-how-full-time.pdf> (accessed: 3/12/2016).
- Adelman, C. The Toolbox Revisited: Paths to Degree Completion From High School Through College. Washington, D.C.: U.S. Department of Education, 2006.
- Hillier, Frederick S. and Lieberman, Gerald J., 2005. *Introduction to operations research*, McGraw-Hill Higher Education, p. xxv, 1061 p.
- Needleman, T. (1993) It's not just for big firms *Accounting Technology*, 9, 59-64.
- Lowe, C. W. (1966) *Critical path analysis by bar chart: the new role of job progress charts*, Business Publications, London,.
- Moder, J. J. and Phillips, C. R. 1964. *Project management with CPM and PERT*, Reinhold Pub. Corp., New York,.
- Doloi, H. K. and Jaafari, A. 2002. Toward a dynamic simulation model for strategic decision-making in life-cycle project management *Project Management Journal*, 33, 23-39,.
- Winter, R. M. 2003. Computing the near-longest path *AACE International Transactions*, PS111,.
- Baram, G. E. 1994. Delay analysis - Issues not for granted *Transactions of AACE International*, 1994, DCL5.1-9,.
- Just, M. R. and Murphy, J. P. 1994. The effect of resource constraints on project schedules *Transactions of AACE International*, 1994, DCL2.1-5,.
- Newbold, R. C. 1998. *Project management in the fast lane : applying the theory of constraints*, St. Lucie Press, Boca Raton, Fla.
- AACE 1990. American Association of Cost Engineers. Cost Engineers' Notebook. Vol. I, AACE, Inc., 1990.
- Archibald, R. D. and Villoria, R. L. 1966. *Network-based management systems (PERT/ CPM)*, Wiley, New York,.
- Hossain, M. R., Oo Than, A. M., Ali, A. B. M. S., 2010. "Evolution of Smart Grid and Some Pertinent Issues", Universities Power Engineering Conference (AUPEC).
- Farhangi H. 2010. The path of the smart grid. *IEEE Power and Energy Magazine*, 8(1):18–28.
- Tomoiağă, B.; Chindriș, M.; Sumper, A.; Sudria-Andreu, A.; Villafafila-Robles, R. Pareto Optimal Reconfiguration of Power Distribution Systems Using a Genetic Algorithm Based on NSGA-II. *Energies* 2013, 6, 1439-1455.
- Ilic, M., 2007. "From hierarchical to open access electric power systems," Proceedings of the IEEE, Vol. 95, Issue 5, pp.1060-1084, May 2007.
- Frye W. 2008. Transforming the electricity system to meet future demand and reduce greenhouse gas emissions. Cisco Internet Business Solutions Group

- Gharavi H. and Ghafurian R. 2011. Smart grid: The electric energy system of the future. *Proceedings of the IEEE*, 99(6):917 – 921.
- Overman T.M. and Sackman R.W. 2010. High assurance smart grid: Smart grid control systems communications architecture. *IEEE SmartGrid-Comm' 10*, pages 19–24.
- Fang X., Misra, S., Xue G., Yang D. 2012 "Smart Grid — The New and Improved Power Grid: A Survey," *Communications Surveys & Tutorials*, IEEE, vol.14, no.4, pp.944,980, Fourth Quarter.
- Energy Information Administration. 2013."Electricity Demand Patterns Matter For Valuing Electricity Supply Resources - Today In Energy - ". 2013. Eia.Gov. <http://www.eia.gov/todayinenergy/detail.cfm?id=12711>.
- Gungor V. C. and Lambert F. C. 2006. A survey on communication networks for electric system automation. *Computer Networks*, 50(7):877–897.
- Chen S., Song S., Li L., and Shen. J. 2009. Survey on smart grid technology. *Power System Technology*, 33(8):1–7, April.
- Baumeister T. 2010. Literature review on smart grid cyber security, Technical Report, <http://csdl.ics.hawaii.edu/techreports/10-11/10-11.pdf>.
- Brown H. E. and Suryanarayanan S.. 2009. A survey seeking a definition of a smart distribution system. *North American Power Symposium'09*, pages 1–7.
- Vasconcelos J.. 2008. Survey of regulatory and technological developments concerning smart metering in the European Union electricity market, <http://cadmus.eui.eu/handle/1814/9267>. EUI RSCAS PP.
- Hassan R. and Radman G. 2010 Survey on smart grid. *IEEE SoutheastCon 2010*, pages 210–213.
- Rohjansand S. , Uslar M. , Bleiker R., Gonzalez J., Specht M. , Suding T. , and Weidelt T. 2010 Survey of smart grid standardization studies and recommendations. *IEEE SmartGridComm' 10*, pages 583–587.
- Uslar M., Rohjansand M. , Bleiker R., Gonzalez J., Specht M., Suding T., and Weidelt T. 2010. Survey of smart grid standardization studies and recommendations - part 2. *IEEE PES'10*, pages 1–6.
- Akyol B. , Kirkham H. , Clements S. , and Hadley M. 2010. A survey of wireless communications for the electric power system. Prepared for the U.S. Department of Energy.
- Chen T. M. 2010. Survey of cyber security issues in smart grids. *Cyber Security, Situation Management, and Impact Assessment II; and Visual Analytics for Homeland Defense and Security II* (part of SPIE DSS2010), pages 77090D–1–77090D–11.
- Wang W., Xu Y., and Khanna M.. 2011. A survey on the communication architectures in smart grid. *Computer Networks*, 55:3604–3629.
- Mohsenian-Rad A.-H., Wong V. W. S., Jatskevich J., Schober R., and Leon-Garcia A. 2010. Autonomous demand-side management based on game-theoretic energy consumption scheduling for the future smart grid. *IEEE Transactions on Smart Grid*, 1(3):320–331.
- O'Neill D., Levorato M., Goldsmith A. , and Mitra U. 2010. Residential demand response using reinforcement learning. *IEEE SmartGrid-Comm' 10*, pages 409–414.

- Ochoa L. F. and Harrison G. P. 2011. Minimizing energy losses: Optimal accommodation and smart operation of renewable distributed generation. *IEEE Transactions on Power Systems*, 26(1):198–205.
- Rahimi F. and Ipakchi A. 2010. Demand response as a market resource under the smart grid paradigm. *IEEE Transactions on Smart Grid*, 1(1):82–88.
- National Institute of Standards and Technology. 2010. NIST framework and roadmap for smart grid interoperability standards, release 1.0, [http://www.nist.gov/publicaffairs/releases/upload/smartgrid interoperability final.pdf](http://www.nist.gov/publicaffairs/releases/upload/smartgrid%20interoperability%20final.pdf).
- Gonzalez V. and Esparza D. 2010. “Work in progress - advising tool to improve the time for graduation and the transfer of students from a community college to engineering school,” *Proc. 40th ASEE/IEEE Frontiers in Education*, Washington, DC, pp. T3H- 1–T3H-2.
- Taneja J., Culler D., and Dutta P. 2010. Towards cooperative grids: Sensor/actuator networks for renewables integration. *IEEE SmartGrid- Comm’ 10*, pages 531–536.
- Ghosh S., Kalagnanam J., Katz D., Squillante M., Zhang X., and Feinberg E. 2010. Incentive design for lowest cost aggregate energy demand reduction. *IEEE SmartGridComm’ 10*, pages 519–524.
- Landis, R., 2013, “Studying Engineering: A Road Map to a Rewarding Career”, 4th Edition, Discovery Press.
- Mulinazzi, T.E. and Schrock, S. D., 2010. “Are Students ENTITLED to High Grades”. *Proceedings of the 2010 Midwest Section Conference of the American Society for Engineering Education*
- Flores B. 2007. "CAMPUS DIVERSITY FACTS", [http://research.utep.edu/ Default.aspx?tabid=44271](http://research.utep.edu/Default.aspx?tabid=44271), 1995-2007, (accessed 4/1/2015).
- Perez, O. A., Pitcher, M. T., Espinoza, P. A., Gomez, H., Gonzalez, V., Hemmitt, H., Anaya, R. H., Golding, P. 2013. *A Three Year Longitudinal Study of Mobile Technology and Analysis of the Impact on STEM-Based Courses* Paper presented at 2013 ASEE Annual Conference, Atlanta, Georgia. <https://peer.asee.org/19137>
- Colby S. L., and Ortman J. M., 2014. *Projections of the Size and Composition of the U.S. Population: 2014 to 2060*, Current Population Reports, P25-1143, U.S. Census Bureau, Washington, DC.
- Barenji. V. A., Barenji,V. R. and Majid H. 2013.”Structural Modeling of a RFID-enabled Reconfigurable Architecture for a Flexible Manufacturing System." *ITG-Fachbericht-Smart SysTech*.
- Sikora, Riyaz, and Michael J. Shaw. 1998. ”A multi-agent framework for the coordination and integration of information systems." *Management Science*44.11-Part-2: S65-S78.
- National Communications System, 2004. Supervisory Control and Data Acquisition (SCADA) Systems.
- Liu, R., et al. 2005 "An RFID-based distributed control system for mass customization manufacturing." *Parallel and Distributed Processing and Applications*. Springer Berlin Heidelberg. 1039-1049.

Stamminger R., and Anstett V., 2013 "The Effect of Variable Electricity Tariffs in the Household on Usage of Household Appliances," *Smart Grid and Renewable Energy*, Vol. 4 No. 4, 2013, pp. 353-365.

National Action Plan for Energy Efficiency, 2009. Customer Incentives for Energy Efficiency Through Electric and Natural Gas Rate Design. Prepared by William Prindle, ICF International, Inc. <http://www.epa.gov/eeactionplan>

Appendix A

BSEE Curriculum and all of the interdependencies

Appendix A shows two tables with all of the classes in the BSEE curriculum and all of their interdependencies. Each class has the following fields: “ID#”, “Code”, “Long Name”, “Pre-1”, “Pre-2”, “Pre-3”, “Pre-4”, “Pre-5”, “Pre-6”, “Pre-7”, “Pre-8”, “Pre-9”, “Coreq-1”, “Coreq-2”, “Coreq-3”, and “Credits”. Next, each of the fields is defined to provide the decoding information within this document. This is the listing of the fields in the first table. The “ID#” field shows the unique identifier of a class within the BSEE curriculum. The “Code” field shows the abbreviation of the course by using letters and numbers codified for each class. This “Code” field is defined in the next paragraph. The “Long name” field briefly describes the class in more detail. The “Pre-1” field specifies the first prerequisite for the class. The “Pre-2” field specifies the second prerequisite for the class. The “Pre-3” field specifies the third prerequisite for the class. The “Pre-4” field specifies the fourth prerequisite for the class. The “Pre-5” field specifies the fifth prerequisite for the class. The “Pre-6” field specifies the sixth prerequisite for the class. Due to space limitations this 2-D table had to be broken down to two tables: the first table is 9 columns by 188 rows. The table was spitted in order to fit in this document. The original table’s width is 16 columns by 188 rows. The second table displays the remaining fields. The “Pre-7” field specifies the seventh prerequisite for the class. The “Pre-8” field specifies the eight prerequisite for the class. The “Pre-9” field specifies the ninth prerequisite for the class. The “Coreq-1” specifies the first co-requisite for the class. The “Coreq-2” specifies the second co-requisite for the class. The “Coreq-3” specifies the third co-requisite for the class. Finally, the “Credits” field species how many credits the class is.

The course numbering is defined by the Texas Common Course Numbering (TCCN) system. To understand each course code, here is the definition of the TCCN. “The University of Texas at El Paso participates in the Texas Common Course Numbering (TCCN) System, which was developed to facilitate the transfer of general academic courses among Texas colleges and universities. Common courses are those freshman and sophomore level courses taught throughout

Texas, which correspond with the general description of courses or category of courses included in the Lower Division Academic Course Guide Manual. A UTEP course determined to be equivalent to a course listed in the Guide has the common course number listed below the UTEP course title in the individual course description of this catalog and a Texas state symbol is to the left of the course prefix and number. Students interested in transferring can refer to the common course number in each college or university catalog to determine course transferability among institutions.

Course Numbering System is defined as described next. Each course offered by The University of Texas at El Paso is identified by a four-digit course number. The first number indicates the level: 0 = developmental, 1 = freshman, 2 = sophomore, 3 = junior, 4 = senior, 5 or 6 = graduate. The second number indicates the semester credit hour value of the course. The last two numbers identify the course within its particular department. Lower-Division Courses are designated by a 1 or 2 as the first digit of the course number. Upper-Division/Advanced Courses are designated by a 3 or 4 as the first digit of the course number. The student should refer to the departmental and college requirements for specific conditions, if any, imposed on registration in advanced courses. Finally, Graduate Courses are designated by a 5 or 6 as the first digit of the course number”.

Course Information			Prerequisites					
ID#	Code	Long name	Pre-1	Pre-2	Pre-3	Pre-4	Pre-5	Pre-6
1	Core Ia	Ia - English	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
2	ENGL1311*	Expos. English Composition	ENGLtest	Freshman	Freshman	Freshman	Freshman	Freshman
3	ENGL1312*	Research & Critical Writ	ENGL1311*	Freshman	Freshman	Freshman	Freshman	Freshman
4	RWS1301*	Rhetoric and Composition I	ENGLtest	Freshman	Freshman	Freshman	Freshman	Freshman
5	RWS1302*	Rhetoric and Composition II	RWS1301*	Freshman	Freshman	Freshman	Freshman	Freshman
6	RWS1601*	Rhetoric, Composition, Communication	ENGLtest	Freshman	Freshman	Freshman	Freshman	Freshman

7	Core Ib	Ib - Speech	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
8	COMM1301*	Public Speaking	ENGLtest	Freshman	Freshman	Freshman	Freshman	Freshman
9	COMM1302*	Business/Profession Comm	ENGLtest	Freshman	Freshman	Freshman	Freshman	Freshman
10	Core II	II - Mathematics	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
11	MATH1411*	Calculus I	MATH1508*	Freshman	Freshman	Freshman	Freshman	Freshman
12	MATH1508*	Pre-Calculus	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
13	Core III	III - Natural Science	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
14	PHYS2420*	Introductory Mechanics	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
15	PHYS2421*	Fields and Waves	PHYS2420*	Freshman	Freshman	Freshman	Freshman	Freshman
16	Core IV	IV -Language, Philosophy, & Culture	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
17	Choose HMN	<-- Select	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
18	ENGL2311*	English Literature	ENGL1312*	Freshman	Freshman	Freshman	Freshman	Freshman
19	ENGL2312*	English Literature	ENGL1312*	Freshman	Freshman	Freshman	Freshman	Freshman
20	ENGL2313*	Intro to American Fiction	ENGL1312*	Freshman	Freshman	Freshman	Freshman	Freshman
21	ENGL2314*	Intro to American Drama	ENGL1312*	Freshman	Freshman	Freshman	Freshman	Freshman
22	ENGL2318*	Intro to American Poetry	ENGL1312*	Freshman	Freshman	Freshman	Freshman	Freshman
23	FREN2322*	The Making of the "Other Americas"	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
24	HIST2301*	World History to 1500	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
25	HIST2302*	World History since 1500	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
26	PHIL1301*	Introduction to Philosophy	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
27	PHIL2306*	Ethics	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
28	RS1301*	Introduction to Religious Studies	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
29	SPAN2340*	Seeing and Naming: Conversations about Latin American Culture	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
30	WS2300*	Intro. to Women's Studies	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
31	WS2350*	Global Feminism	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
32	Other HUMN*	HUMN core. See Substitution -->	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
33	Core V	V - Visual and performing Arts	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
34	Choose ART	<-- Select	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
35	ART1300*	Art Appreciation	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

36	ARTH1305*	History Art I	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
37	ARTH1306*	History Art II	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
38	DANC1304*	Dance Appreciation	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
39	FILM1390*	Intro to Art of Motion	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
40	MUSL1321*	Intro to Music History	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
41	MUSL1324*	Music Appreciation	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
42	MUSL1327*	Jazz to Rock	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
43	THEA1313*	Intro to Theatre	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
44	Other ART	ART core. See Substitution -->	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
45	Other ART 2	ART core. See Substitution -->	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
46	Core VI	VI - U.S. History	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
47	HIST1301*	History of the U.S. to 1865	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
48	HIST1302*	History of the U.S. since 1865	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
49	Core VII	VII - Political Science	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
50	POLS2310*	Introduction to Politics	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
51	POLS2311*	American Govt. & Politics	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
52	Core VIII	VIII - Social and Behavioral Sci.	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
53	CE2326*	Econ. For Engrs & Scientists	Sophomore	Freshman	Freshman	Freshman	Freshman	Freshman
54	Core IX	IX - Institutional Option	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
55	Choose UNV	<-- Select	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
56	UNIV1301*	Seminar/Critical Inquiry	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
57	UNIV2350*	Interdisciplinary Tech/Soc	Sophomore	ENGL1312*	Freshman	Freshman	Freshman	Freshman
58	CS1320*	Computer Programming Sci/Engr	MATH1508*	Freshman	Freshman	Freshman	Freshman	Freshman
59		Empty	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
60		Empty	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
61	Freshman	Freshmen Prerequisites						
62	Sophomore	Sophomore Prerequisites	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
63	Junior	Junior Prerequisites	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
64	Senior	Senior Prerequisites	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
65		Empty	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
66	Non-Major	Required Non-major	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

67	MATH1312*	Calculus II	MATH1411*	Freshman	Freshman	Freshman	Freshman	Freshman
68	MATH2313*	Calculus III	MATH1312*	Freshman	Freshman	Freshman	Freshman	Freshman
69	MATH2326*	Differential Equations	MATH1312*	Freshman	Freshman	Freshman	Freshman	Freshman
70	MATH3323*	Matrix Algebra	MATH1312*	Freshman	Freshman	Freshman	Freshman	Freshman
71	Choose Sci	<-- Select Science or Math	MATH1508*	Freshman	Freshman	Freshman	Freshman	Freshman
72	CHEM1305*	General Chemistry	MATH1508*	Freshman	Freshman	Freshman	Freshman	Freshman
73	BIOL1305*	General Biology	MATH1508*	Freshman	Freshman	Freshman	Freshman	Freshman
74	MATH2300*	Discrete Math	MATH1411*	Freshman	Freshman	Freshman	Freshman	Freshman
75	Other Sci	See Substitution -->	MATH1508*	Freshman	Freshman	Freshman	Freshman	Freshman
76		Empty	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
77	ENGLtest	English Placement	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
78	PROF	Professional Option	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
79	Major Req	Required Major	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
80	EE1105*	Lab for EE 1305	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
81	EE1305*	Intro to Electrical Engineer	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
82	EE2151*	Lab for EE 2351	EE1105*	Freshman	Freshman	Freshman	Freshman	Freshman
83	EE2169*	Lab for EE 2369	EE1305*	Freshman	Freshman	Freshman	Freshman	Freshman
84	EE2350*	Electric Circuits I	EE1305*	MATH1312*	Freshman	Freshman	Freshman	Freshman
85	EE2351*	Electric Circuits II	EE2350*	MATH2326*	PHYS2421*	Freshman	Freshman	Freshman
86	EE2353*	Continuous Time Signals & Systems	EE2350*	MATH1312*	MATH2326*	Freshman	Freshman	Freshman
87	EE2369*	Digital Systems Design I	EE1305*	Freshman	Freshman	Freshman	Freshman	Freshman
88	EE2372*	Software Design I	CS1320*	Freshman	Freshman	Freshman	Freshman	Freshman
89	EE3138*	Lab for EE 3338	EE2351*	EE2151*	Freshman	Freshman	Freshman	Freshman
90	EE3176*	Lab for EE 3376	EE2169*	EE2369*	EE2372*	Freshman	Freshman	Freshman
91	EE3195*	Junior Professional Orientation	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
92	EE3321*	Electromagnetic Field Theory	EE2351*	MATH2313*	MATH2326*	PHYS2421*	Freshman	Freshman
93	EE3325*	Applied Quantum Mech for EE	EE2350*	MATH1312*	MATH2326*	PHYS2421*	Freshman	Freshman
94	EE3329*	Electronic Devices	EE3321*	EE3325*	Freshman	Freshman	Freshman	Freshman
95	EE3338*	Electronics I	EE2351*	Freshman	Freshman	Freshman	Freshman	Freshman
96	EE3340*	Electronics II	EE3338*	Freshman	Freshman	Freshman	Freshman	Freshman
97	EE3353*	Discrete Time Signals & System	EE2353*	MATH2326*	Freshman	Freshman	Freshman	Freshman
98	EE3376*	Microprocessor Systems I	EE2350*	EE2369*	EE2372*	Freshman	Freshman	Freshman
99	EE3384*	Probabilistic Methods-Engr/Sci	MATH2313*	EE2353*	Freshman	Freshman	Freshman	Freshman
100	EE4220*	Senior Project Lab I	EE3138*	EE3176*	EE3195*	EE3321*	EE3340*	EE3353*
101	EE4230	Senior Project Lab II	EE4220*	Freshman	Freshman	Freshman	Freshman	Freshman
102	Elective 1	Major Elective Block 1	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

103	EE41xx	<-- Choose Experiential Learning	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
104	EE4142	Lab for EE 4342	EE3176*	Freshman	Freshman	Freshman	Freshman	Freshman
105	EE4153	Lab for EE 4353	EE3329*	Freshman	Freshman	Freshman	Freshman	Freshman
106	EE4171	Engineering Problems	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
107	EE4178	Lab for EE 4378	EE3176*	Freshman	Freshman	Freshman	Freshman	Freshman
108	EE4181	Coop I	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
109	EE4182	Coop II	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
110	EE4183	Coop III	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
111	Other EE option1	See Substitution -->	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
112	Elective2	Major Elective Block 2	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
113	EExxxx	<-- Choose EE Option courses	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
114	EE3354	Intro to Communication Networks	EE2351*	EE2372*	Freshman	Freshman	Freshman	Freshman
115	EE3372	Software Design II	EE2372*	EE3176*	EE3376*	Freshman	Freshman	Freshman
116	EE3385	Energy Conversion	EE3321*	PHYS2420*	Freshman	Freshman	Freshman	Freshman
117	EE4341	Communication Systems	EE3353*	EE3384*	Freshman	Freshman	Freshman	Freshman
118	EE4342	Digital Systems Design II	EE3376*	Freshman	Freshman	Freshman	Freshman	Freshman
119	EE4347	Applied Electromagnetics	EE3321*	Freshman	Freshman	Freshman	Freshman	Freshman
120	EE4350	Integrat Cir/Semiconduct Devic	EE3329*	Freshman	Freshman	Freshman	Freshman	Freshman
121	EE4351	Physiol. Syst & Measurements	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
122	EE4352	Power Electronics	EE3338*	Freshman	Freshman	Freshman	Freshman	Freshman
123	EE4353	VLSI Nanotechnology	EE3329*	Freshman	Freshman	Freshman	Freshman	Freshman
124	EE4354	Tomographic Imaging	EE4383	Freshman	Freshman	Freshman	Freshman	Freshman
125	EE4356	Real Time Signal Proc	EE3353*	EE3376*	Freshman	Freshman	Freshman	Freshman
126	EE4357	Biomechatronics	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
127	EE4358	Med Diag & Therap Instrum	EE4385	Freshman	Freshman	Freshman	Freshman	Freshman
128	EE4359	Biomedical Signal & Image Proc	EE4383	Freshman	Freshman	Freshman	Freshman	Freshman
129	EE4360	Telemedicine & Imaging Inform	Junior	Freshman	Freshman	Freshman	Freshman	Freshman
130	EE4361	Fiber Optic Communications	EE3338*	EE3321*	Freshman	Freshman	Freshman	Freshman
131	EE4364	Systems & Controls	EE3353*	Freshman	Freshman	Freshman	Freshman	Freshman
132	EE4365	Topics in Soft Computing	EE3353*	EE3384*	Freshman	Freshman	Freshman	Freshman
133	EE4366	Fuzzy Logic and Engineering	EE3353*	EE3384*	Freshman	Freshman	Freshman	Freshman
134	EE4371	Engineering Problems	Junior	Freshman	Freshman	Freshman	Freshman	Freshman

135	EE4372	Microcontroller Applications	EE3376*	EE3340*	Freshman	Freshman	Freshman	Freshman
136	EE4374	Operating Systems Design	EE3372	Freshman	Freshman	Freshman	Freshman	Freshman
137	EE4375	VLSI Design I	EE3329*	Freshman	Freshman	Freshman	Freshman	Freshman
138	EE4376	CMOS Digital Circuit Design	EE3329*	Freshman	Freshman	Freshman	Freshman	Freshman
139	EE4378	Microprocessor Systems II	EE3376*	Freshman	Freshman	Freshman	Freshman	Freshman
140	EE4379	Computer Architecture	EE3376*	Freshman	Freshman	Freshman	Freshman	Freshman
141	EE4380	Microwave Communications	EE3321*	Freshman	Freshman	Freshman	Freshman	Freshman
142	EE4382	Antenna Engineering	EE3321*	Freshman	Freshman	Freshman	Freshman	Freshman
143	EE4383	Digital Signal Processing	EE3353*	Freshman	Freshman	Freshman	Freshman	Freshman
144	EE4385	Biomedical Instrumentation	EE3340*	Freshman	Freshman	Freshman	Freshman	Freshman
145	EE4386	Computational Methods In EE	EE3321*	Freshman	Freshman	Freshman	Freshman	Freshman
146	EE4388	Digital Communications	EE3353*	EE3384*	Freshman	Freshman	Freshman	Freshman
147	EE4389	High Resolution Radar	EE3321*	EE3353*	Freshman	Freshman	Freshman	Freshman
148	EE4395	Special Topics-Electrical Engr	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
149	Other EE	See Substitution -->	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
150	EE5118	Laboratory for EE 5318	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
151	EE5300	Probability & Random Processes	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
152	EE5301	Computational Methods for EE	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
153	EE5302	Linear Systems Analysis	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
154	EE5306	Antenna Theory	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
155	EE5311	Semiconductor Device Physics	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
156	EE5313	Modern Semiconductor Devices	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
157	EE5315	Nanoelectronics	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
158	EE5318	Electronic Material Processing	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
159	EE5323	Adv Digital Communications	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
160	EE5324	Statistical Detection and Estimation	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
161	EE5325	Telemedicine & Img Informatics	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
162	EE5330	Data Communications	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
163	EE5332	Coding and Error Correction	Senior	Freshman	Freshman	Freshman	Freshman	Freshman

164	EE5333	Data Compression	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
165	EE5336	Adv Fiber Optic Communications	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
166	EE5341	Systems Engineering Fundamtl	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
167	EE5351	Physiological Systms Measurmts	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
168	EE5352	Med Diag & Therapct Instrmtn	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
169	EE5353	Biomed Signal & Image Process	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
170	EE5354	Tomographic Imaging	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
171	EE5356	Telemedicine & Img Informatics	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
172	EE5357	Biomechatronics	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
173	EE5360	Computer Vision	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
174	EE5366	Fuzzy Logic & Engineering	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
175	EE5369	CMOS Digital Circuit Design	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
176	EE5370	Operating Systems	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
177	EE5371	Digital Signal Processing	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
178	EE5372	Image Processing	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
179	EE5374	Advanced Digital Systems Design I	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
180	EE5375	ASIC Design and Test	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
181	EE5376	Computer Architecture I	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
182	EE5378	Advanced VLSI Design	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
183	EE5379	Networks Protocols	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
184	EE5390	Special Topics Electrical Engr	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
185	EE5392	Research Methods	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
186	EE9998	future	Senior	Freshman	Freshman	Freshman	Freshman	Freshman
187	EE9999	future	Senior	Freshman	Freshman	Freshman	Freshman	Freshman

The continuation of the table with the inter dependencies among the classes in the EE program is shown in the next page as part of Appendix A. Due to the fact that some classes have up to 9 pre-requisites and up to 3 co-requisites the table had to be spitted among 2 part.

Course Information				Prerequisites			Corequisites		
ID#	Code	Long name	Credits	Pre-7	Pre-8	Pre-9	Coreq-1	Coreq-2	Coreq-3
1	Core Ia	Ia - English	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
2	ENGL1311*	Expos. English Composition	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
3	ENGL1312*	Research & Critical Writ	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
4	RWS1301*	Rhetoric and Composition I	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
5	RWS1302*	Rhetoric and Composition II	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
6	RWS1601*	Rhetoric, Composition, Communication	6	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
7	Core Ib	Ib - Speech	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
8	COMM1301*	Public Speaking	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
9	COMM1302*	Business/Profession Comm	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
10	Core II	II - Mathematics	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
11	MATH1411*	Calculus I	4	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
12	MATH1508*	Pre-Calculus	5	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
13	Core III	III - Natural Science	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
14	PHYS2420*	Introductory Mechanics	4	Freshman	Freshman	Freshman	MATH1411*	Freshman	Freshman
15	PHYS2421*	Fields and Waves	4	Freshman	Freshman	Freshman	MATH1312*	Freshman	Freshman
16	Core IV	IV -Language, Philosophy, & Culture	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
17	Choose HMN	<-- Select	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

18	ENGL2311*	English Literature	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
19	ENGL2312*	English Literature	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
20	ENGL2313*	Intro to American Fiction	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
21	ENGL2314*	Intro to American Drama	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
22	ENGL2318*	Intro to American Poetry	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
23	FREN2322*	The Making of the "Other Americas"	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
24	HIST2301*	World History to 1500	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
25	HIST2302*	World History since 1500	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
26	PHIL1301*	Introduction to Philosophy	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
27	PHIL2306*	Ethics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
28	RS1301*	Introduction to Religious Studies	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
29	SPAN2340*	Seeing and Naming: Conversations about Latin American Culture	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
30	WS2300*	Intro. to Women's Studies	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
31	WS2350*	Global Feminism	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
32	Other HUMN*	HUMN core. See Substitution -->	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
33	Core V	V - Visual and performing Arts	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
34	Choose ART	<-- Select	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
35	ART1300*	Art Appreciation	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
36	ARTH1305*	History Art I	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
37	ARTH1306*	History Art II	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
38	DANC1304*	Dance Appreciation	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
39	FILM1390*	Intro to Art of Motion	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
40	MUSL1321*	Intro to Music History	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
41	MUSL1324*	Music Appreciation	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

42	MUSL1327*	Jazz to Rock	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
43	THEA1313*	Intro to Theatre	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
44	Other ART	ART core. See Substitution -->	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
45	Other ART 2	ART core. See Substitution -->	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
46	Core VI	VI - U.S. History	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
47	HIST1301*	History of the U.S. to 1865	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
48	HIST1302*	History of the U.S. since 1865	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
49	Core VII	VII - Political Science	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
50	POLS2310*	Introduction to Politics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
51	POLS2311*	American Govt. & Politics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
52	Core VIII	VIII - Social and Behavioral Sci.	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
53	CE2326*	Econ. For Engrs & Scientists	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
54	Core IX	IX - Institutional Option	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
55	Choose UNV	<-- Select	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
56	UNIV1301*	Seminar/Critical Inquiry	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
57	UNIV2350*	Interdisciplinary Tech/Soc	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
58	CS1320*	Computer Programming Sci/Engr	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
59		Empty	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
60		Empty	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
61	Freshman	Freshmen Prerequisites	0						
62	Sophomore	Sophomore Prerequisites	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
63	Junior	Junior Prerequisites	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
64	Senior	Senior Prerequisites	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
65		Empty	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
66	Non-Major	Required Non-major	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
67	MATH1312*	Calculus II	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

68	MATH2313*	Calculus III	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
69	MATH2326*	Differential Equations	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
70	MATH3323*	Matrix Algebra	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
71	Choose Sci	<-- Select Science or Math	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
72	CHEM1305*	General Chemistry	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
73	BIOL1305*	General Biology	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
74	MATH2300*	Discrete Math	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
75	Other Sci	See Substitution -->	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
76		Empty	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
77	ENGLtest	English Placement	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
78	PROF	Professional Option	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
79	Major Req	Required Major	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
80	EE1105*	Lab for EE 1305	1	Freshman	Freshman	Freshman	EE1305*	MATH1411*	Freshman
81	EE1305*	Intro to Electrical Engineer	3	Freshman	Freshman	Freshman	EE1105*	MATH1411*	Freshman
82	EE2151*	Lab for EE 2351	1	Freshman	Freshman	Freshman	EE2351*	Freshman	Freshman
83	EE2169*	Lab for EE 2369	1	Freshman	Freshman	Freshman	EE2369*	Freshman	Freshman
84	EE2350*	Electric Circuits I	3	Freshman	Freshman	Freshman	MATH2326*	PHYS2421*	Freshman
85	EE2351*	Electric Circuits II	3	Freshman	Freshman	Freshman	EE2151*	Freshman	Freshman
86	EE2353*	Continuous Time Signals & Systems	3	Freshman	Freshman	Freshman	EE2351*	Freshman	Freshman
87	EE2369*	Digital Systems Design I	3	Freshman	Freshman	Freshman	EE2169*	Freshman	Freshman
88	EE2372*	Software Design I	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
89	EE3138*	Lab for EE 3338	1	Freshman	Freshman	Freshman	EE3338*	Freshman	Freshman
90	EE3176*	Lab for EE 3376	1	Freshman	Freshman	Freshman	EE3376*	Freshman	Freshman
91	EE3195*	Junior Professional Orientation	1	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
92	EE3321*	Electromagnetic Field Theory	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
93	EE3325*	Applied Quantum Mech for EE	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
94	EE3329*	Electronic Devices	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
95	EE3338*	Electronics I	3	Freshman	Freshman	Freshman	EE3138*	Freshman	Freshman
96	EE3340*	Electronics II	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

97	EE3353*	Discrete Time Signals & System	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
98	EE3376*	Microprocessor Systems I	3	Freshman	Freshman	Freshman	EE3176*	Freshman	Freshman
99	EE3384*	Probabilistic Methods-Engr/Sci	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
100	EE4220*	Senior Project Lab I	2	EE3376*	CE2326*	EE3325*	EE3329*	Freshman	Freshman
101	EE4230	Senior Project Lab II	2	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
102	Elective 1	Major Elective Block 1	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
103	EE41xx	<-- Choose Experiential Learning	1	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
104	EE4142	Lab for EE 4342	1	Freshman	Freshman	Freshman	EE4342	Freshman	Freshman
105	EE4153	Lab for EE 4353	1	Freshman	Freshman	Freshman	EE4353	Freshman	Freshman
106	EE4171	Engineering Problems	1	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
107	EE4178	Lab for EE 4378	1	Freshman	Freshman	Freshman	EE4378	Freshman	Freshman
108	EE4181	Coop I	1	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
109	EE4182	Coop II	1	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
110	EE4183	Coop III	1	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
111	Other EE option1	See Substitution -->	1	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
112	Elective2	Major Elective Block 2	0	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
113	EExxxx	<-- Choose EE Option courses	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
114	EE3354	Intro to Communication Networks	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
115	EE3372	Software Design II	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
116	EE3385	Energy Conversion	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
117	EE4341	Communication Systems	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
118	EE4342	Digital Systems Design II	3	Freshman	Freshman	Freshman	EE4142	Freshman	Freshman
119	EE4347	Applied Electromagnetics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
120	EE4350	Integrat Cir/Semiconduct Devic	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
121	EE4351	Physiol. Syst & Measurements	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
122	EE4352	Power Electronics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
123	EE4353	VLSI Nanotechnology	3	Freshman	Freshman	Freshman	EE4153	Freshman	Freshman
124	EE4354	Tomographic Imaging	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

125	EE4356	Real Time Signal Proc	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
126	EE4357	Biomechatronics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
127	EE4358	Med Diag & Therap Instrum	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
128	EE4359	Biomedical Signal & Image Proc	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
129	EE4360	Telemedicine & Imaging Inform	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
130	EE4361	Fiber Optic Communications	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
131	EE4364	Systems & Controls	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
132	EE4365	Topics in Soft Computing	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
133	EE4366	Fuzzy Logic and Engineering	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
134	EE4371	Engineering Problems	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
135	EE4372	Microcontroller Applications	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
136	EE4374	Operating Systems Design	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
137	EE4375	VLSI Design I	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
138	EE4376	CMOS Digital Circuit Design	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
139	EE4378	Microprocessor Systems II	3	Freshman	Freshman	Freshman	EE4178	Freshman	Freshman
140	EE4379	Computer Architecture	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
141	EE4380	Microwave Communications	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
142	EE4382	Antenna Engineering	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
143	EE4383	Digital Signal Processing	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
144	EE4385	Biomedical Instrumentation	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
145	EE4386	Computational Methods In EE	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
146	EE4388	Digital Communications	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
147	EE4389	High Resolution Radar	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
148	EE4395	Special Topics-Electrical Engr	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
149	Other EE	See Substitution -->	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
150	EE5118	Laboratory for EE 5318	1	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

151	EE5300	Probability & Random Processes	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
152	EE5301	Computational Methods for EE	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
153	EE5302	Linear Systems Analysis	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
154	EE5306	Antenna Theory	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
155	EE5311	Semiconductor Device Physics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
156	EE5313	Modern Semiconductor Devices	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
157	EE5315	Nanoelectronics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
158	EE5318	Electronic Material Processing	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
159	EE5323	Adv Digital Communications	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
160	EE5324	Statistical Detection and Estimation	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
161	EE5325	Telemedicine & Img Informatics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
162	EE5330	Data Communications	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
163	EE5332	Coding and Error Correction	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
164	EE5333	Data Compression	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
165	EE5336	Adv Fiber Optic Communications	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
166	EE5341	Systems Engineering Fundamtl's	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
167	EE5351	Physiological Systms Measurmts	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
168	EE5352	Med Diag & Therapctc Instrmntn	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
169	EE5353	Biomed Signal & Image Process	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
170	EE5354	Tomographic Imaging	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
171	EE5356	Telemedicine & Img Informatics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
172	EE5357	Biomechatronics	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
173	EE5360	Computer Vision	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
174	EE5366	Fuzzy Logic & Engineering	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
175	EE5369	CMOS Digital Circuit Design	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
176	EE5370	Operating Systems	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

177	EE5371	Digital Signal Processing	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
178	EE5372	Image Processing	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
179	EE5374	Advanced Digital Systems Design I	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
180	EE5375	ASIC Design and Test	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
181	EE5376	Computer Architecture I	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
182	EE5378	Advanced VLSI Design	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
183	EE5379	Networks Protocols	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
184	EE5390	Special Topics Electrical Engr	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
185	EE5392	Research Methods	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
186	EE9998	future	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman
187	EE9999	future	3	Freshman	Freshman	Freshman	Freshman	Freshman	Freshman

Appendix B

This appendix contains the code to program the iAdvise system.

iAdvise code:index.html

```
<html>
<link rel="shortcut icon" href="favicon192.ico">

<h3> Welcome to the iAdvise internet portal. </h3>
```

We fore see this student tool as the future of advising where student can plan ahead the course to be taken in the future
 and provide a load balancing help so that students can optimize the way they use their time, money and plan their path to graduation.

Disclaimer:

If you choose to continue, you are agreeing to comply with and be bound by the following terms and conditions of use. If you disagree with any part of these terms and conditions, you may not continue.

Terms of use:

1. Your use of any information or materials on sites you access is entirely at your own risk, for which we shall not be liable.

2. You agree that, though this portal, you will not perform any of the following acts:
 Attempt to access devices or resources to which you have no explicit, legitimate rights
 - Copy, reproduce, or transmit any information or data record or files or other than your own information.
 - Try to launch network attacks of any kind including sql injection, session hijacking or interception, port scans, DoS/DDoS, packet floods, replays or injections, or other such activity with malicious intent.
 - Transmit malicious software such as viruses, Trojan horses, and worms
 - Surreptitiously install software or make configuration changes to any device or application, by means of the installation or execution of key loggers, registry keys, or other executable or active application or script

3. You agree that you will use the access provided here responsibly and only for your own career planing and with full regard to the safety, security, and privacy of all other users, devices, and resources.

4. You understand that unauthorized use of resources through this portal may give rise to a claim for damages and/or be a criminal offense.

I AGREE to the terms above and want to continue

I DO NOT AGREE to the terms above and will continue my advising using the traditional method

</html>

IAADVISE CODE:MAINMENU.HTML

<html>

<head>

<link rel="shortcut icon" href=".\\favicon.ico">

</head>

<h3> iAdvise Main Student Menu </h3>

<!-- Test Database connection --> <!--This was comment out to be used on production with no public access only to the admin pages -->

<!--
-->

<!--test script -->

<!--
-->

<!-- Admin Dashboard --> <!--This was comment out to be used on production with no public access only to the admin pages -->

<!--
-->

<!--Student Checklist -->

<!--
-->

Student Class History Analysis

Load Student Class History from File

Student next semester Planning (Check classes that you can enroll based on prerequisites and co-requisites)


```

<!--<a href="http://localhost:8888/iadvise/student/flowchart.html">Student Flowchart
Form</a>-->
<br>
<br>
</html>

```

iAdvise code:pre-history.html

```

<html>
<head>
<style>
.error {color: #FF0000;}
</style>
</head>

<body>

<?php
// define variables and set to empty values
//other error is for expansion
$nameErr = $emailErr = $800Err = $otherErr = "";
$name = $email = $gender = $comment = $800number2 = "";

if ($_SERVER["REQUEST_METHOD"] == "POST") {
    if (empty($_POST["textboxname2"])) {
        $nameErr = "Name is required";
    } else {
        $name = test_input($_POST["textboxname2"]);
        // check if name only contains letters and whitespace
        if (!preg_match("/^[a-zA-Z ]*$/",$name)) {
            $nameErr = "Only letters and white space allowed";
        }
    }
}

if (empty($_POST["textboxemail2"])) {
    $emailErr = "Email is required";
} else {
    $email = test_input($_POST["textboxemail2"]);
    // check if e-mail address is well-formed
    if (!filter_var($email, FILTER_VALIDATE_EMAIL)) {
        $emailErr = "Invalid email format";
    }
}

if (empty($_POST["textbox800number2"])) {

```

```

    $800number2 = "";
} else {
    $800number2 = test_input($_POST["txtbox800number2"]);
    // check if 800 address syntax is valid
    if (!preg_match("/^[0-9][0-9][0-9][0-9][0-9]*$/",$800number2)) {
        // check if txtbox800number2 only contains 5 numbers
        $800Err = "Invalid 800 Number";
    }
}
}

```

```

function test_input($data) {
    $data = trim($data);
    $data = stripslashes($data);
    $data = htmlspecialchars($data);
    return $data;
}
?>

```

<head>Bachelor of Science - Electrical and Computer Engineering Degree Plan (Pre-checklist)</head>

Catalog: 2014-DRAFT

<form action="studenthistory.php" method="post" >
Full Name: <input type="text" name="txtboxname2">

UTEP E-mail: <input type="text" name="txtboxemail2">

UTEP 800: <input type="text" name="txtbox800number2">

Ready to enroll or passed <u>ENGL1311?</u>
<select name='dropdownengl1311'>
 <option value=A>blank</option>
 <option value=1>Yes</option>
 <option value=0>No</option>
</select>

Ready to enroll or passed <u>MATH1411 Calculus:?</u>
<select name='dropdownmath1411'>

```

        <option value=A>blank</option>
        <option value=1>Yes</option>
        <option value=0>No</option>
</select>
<br>
<font color=Green>First semester enrolled: </font>
<select name='dropdownfirstsemesterenrolled'>
    <option value=blank>blank</option>
    <option value=spring2013>Fall2008 and before</option>
    <option value=spring2013>Spring 2009</option>
    <option value=summer2013>Summer 2009</option>
    <option value=fall2013>Fall 2009</option>
    <option value=spring2013>Spring 2010</option>
    <option value=summer2013>Summer 2010</option>
    <option value=fall2013>Fall 2010</option>
    <option value=spring2013>Spring 2011</option>
    <option value=summer2013>Summer 2011</option>
    <option value=fall2013>Fall 2011</option>
    <option value=spring2012>Spring 2012</option>
    <option value=summer2012>Summer 2012</option>
    <option value=fall2012>Fall 2012</option>
    <option value=spring2013>Spring 2013</option>
    <option value=summer2013>Summer 2013</option>
    <option value=fall2013>Fall 2013</option>
    <option value=spring2014>Spring 2014</option>
    <option value=summer2014>Summer 2014</option>
    <option value=fall2014>Fall 2014</option>
    <option value=spring2015>Spring 2015</option>
    <option value=summer2015>Summer 2015</option>
    <option value=fall2015>Fall 2015</option>
    <option value=inprogress>In Progress</option>
</select>
<br>
<font color=Green>How many credits do you plan to take next semester: </font>
<select name='dropdownnextsemcredits'>
    <option value=blank>blank</option>
    <option value=21>21</option>
    <option value=20>20</option>
    <option value=19>19</option>
    <option value=18>18</option>
    <option value=17>17</option>
    <option value=16>16</option>
    <option value=15>15</option>
    <option value=14>14</option>
    <option value=13>13</option>
    <option value=12>12</option>

```



```

        <option value=11>11</option>
        <option value=10>10</option>
        <option value=9>9</option>
        <option value=8>8</option>
        <option value=7>7</option>
        <option value=6>6</option>
        <option value=5>5</option>
        <option value=4>4</option>
        <option value=3>3</option>
        <option value=2>2</option>
        <option value=1>1</option>

</select>
<br>
<br>
<font color=red>hours committed to other activities other than school (Family, work, religious,
etc.) for the semester selected:</font>
<select name='workinghrs'>
    <option value="20">20</option>
    <option value="1">1</option>
    <option value="2">2</option>
    <option value="3">3</option>
    <option value="4">4</option>
    <option value="5">5</option>
    <option value="6">6</option>
    <option value="7">7</option>
    <option value="8">8</option>
    <option value="9">9</option>
    <option value="10">10</option>
    <option value="11">11</option>
    <option value="12">12</option>
    <option value="13">13</option>
    <option value="14">14</option>
    <option value="15">15</option>
    <option value="16">16</option>
    <option value="17">17</option>
    <option value="18">18</option>
    <option value="19">19</option>
    <option value="20">20</option>
    <option value="21">21</option>
    <option value="22">22</option>
    <option value="23">23</option>
    <option value="24">24</option>
    <option value="25">25</option>
    <option value="26">26</option>
    <option value="27">27</option>

```

```

        <option value="28">28</option>
        <option value="29">29</option>
        <option value="30">30</option>
        <option value="31">31</option>
        <option value="32">32</option>
        <option value="33">33</option>
        <option value="34">34</option>
        <option value="35">35</option>
        <option value="36">36</option>
        <option value="37">37</option>
        <option value="38">38</option>
        <option value="39">39</option>
        <option value="40">40</option>
        <option value="41">over 40</option>
    </select>
    <br>

    <input type="submit" name="submit" value="Submit">
</form>
</body>
</html>

```

iAdvise code:studenthistory.php

```

<?php
session_start();
$servername = "localhost";
$username = "iadviceuser";
$password = "smartadvice2016.";
$dbname = "iadvice";
$core1a="Core 1a"; //use quotes for strings
$math1411="MATH1411";
$core3="core 3";
$core4="core 4";
$core5="core 5";
$core6="core 6";
$core7="core 7";
$core8="core 8";
$core9="core 9";
$core10="required non-major";
$core11="core 11"; //core 11 is composed of Major required LOWER division courses (21
credits)
$core12="major required"; //core 12 is composed of Major required UPPER division courses (21
credits)
$selective1="elective1";
$selective2="elective2";

```

```

$professional="professional";

echo "<html>";
echo '';
echo "<head>Bachelor of Science-Electrical and Computer Engineering <b>-->Checklist<--</b></head><br>";
echo "Degree Plan (<b>checklist</b>)";
echo " Catalogs: 2014-DRAFT<br>";
echo "<body class=\"page_bg\">";
echo date('l, F jS, Y'); //other php code here echo "</body>";
//echo $username; //used for testing

//update the information from the pre-history form
//updating the classplaning table
//variable loading from the form fields values of the pre-history form
//Local variables
$fullname2=$_POST['textboxname2'];
$utepemail2=$_POST['textboxemail2'];
$utep8002=$_POST['textbox800number2'];
$dropdownengl1311=$_POST['dropdownengl1311'];
$dropdownmath1411=$_POST['dropdownmath1411'];
$precal = "math1508";
$precalpass = "notpassed";
$englpass = "notpassed";
$dropdownfirstsemesterenrolled=$_POST[dropdownfirstsemesterenrolled];
$dropdownnextsemcredits=$_POST[dropdownnextsemcredits];
$localworking=$_POST[workinghrs];

//check for blank textboxes in the previous page http://localhost:8888/iadvise/student/pre-history.html
function display_error_message($user_text) {
if ($user_text == "") {
echo "<br>";
echo "<font color=red><b>One or more blank text boxes detected in 7 seconds you will be directed back to fix the problem</b></font>";

echo '<meta http-equiv="refresh" content="7;url=../student/pre-history.html" />';

}
else {
//echo "<br>";
//echo "<font color=green>All Text boxes from previous page filled</font>"; //troubleshoot to make sure the textboxes were filled

```

```

    }
}

if ($_SERVER['REQUEST_METHOD'] == 'POST'){

    //$first = trim($_POST['txtboxname2']);
    //$second = trim($_POST['txtboxemail2']);
    //$third = trim($_POST['txtbox800number2']);

    display_error_message($fullname2);
    display_error_message($utepemail2);
    display_error_message($utep8002);
}

//session variables
$_SESSION['name'] = $fullname2;
$_SESSION['email'] = $utepemail2;
$_SESSION['utep800'] = $utep8002;
$_SESSION['workinghrs']=$localworking;

echo "<br>";
echo '<u> Welcome <font color=blue>';
echo $fullname2;
echo "</font> to your personalized advising session</u>" ;

if ($dropdownmath1411=="1"){
    $precalpass = "was passed"; //ready for 1411 math
}
echo "<br>Precal ready? "; //check to make sure precal has been passed, based on student form
print $precalpass;
echo " , ";
if ($dropdownengl1311=="1"){
    $englpass = "was passed"; //ready for 1311 English
}
echo "<br>English ready? "; //check to make sure precal has been passed, based on student form
print $englpass;


//Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

```

```
$sql = "INSERT INTO studenthistory
(fullname,utepemail,utep800,firstsemesterenrolled,nextsemcredits,engl1311ready,math1411read
y,class47, classgrade47, workhrs) VALUES
```

```
(' $fullname2', '$utepemail2', '$utep8002', '$dropdownfirstsemesterenrolled', '$dropdownnextsemcre
dits', '$dropdownengl1311', '$dropdownmath1411', '$precal', '$precalpass', '$localworking');" ;
```

```
if ($conn->query($sql) === TRUE) {
    echo "<br>Student History record created successfully <br>";
} else {
    echo "Error updating record: " . $conn->error;
}
}
```

```
$conn->close();
```

```
echo "<br>"; // research why closing /html here and not at the bottom may ha an unintended
effect
```

```
//grade Function for the grades of each class
```

```
function gradedropdown($classgrade){
echo <<<END
<select name='$classgrade'>
    <option value=blank>blank</option>
    <option value=A>A</option>
    <option value=B>B</option>
    <option value=C>C</option>
    <option value=D>D</option>
    <option value=F>F</option>
    <option value=P>P</option>
    <option value=TA>TA</option>
    <option value=TB>TB</option>
    <option value=TC>TC</option>
    <option value=TCR>TCR</option>
```

```
</select>
```

```
END;
```

```
}
```

```
//YesNo Function for the Yes no questions on form
```

```
function yesno($answer1){
echo <<<END
<select name='$answer1'>
    <option value=A>Yes</option>
    <option value=B>No</option>
    <option value=C>In Progress</option>
```

```
</select>
```

```
END;
```

```
}
```

```

//Semester completed Function for the Yes no questions on form
function semestercompleted($answer2){
echo <<<END
<select name='$answer2'>
    <option value=blank>blank</option>
    <option value=spring2013>Fall2008 and before</option>
        <option value=spring2013>Spring 2009</option>
    <option value=summer2013>Summer 2009</option>
    <option value=fall2013>Fall 2009</option>
        <option value=spring2013>Spring 2010</option>
    <option value=summer2013>Summer 2010</option>
    <option value=fall2013>Fall 2010</option>
        <option value=spring2013>Spring 2011</option>
    <option value=summer2013>Summer 2011</option>
    <option value=fall2013>Fall 2011</option>
        <option value=spring2012>Spring 2012</option>
    <option value=summer2012>Summer 2012</option>
    <option value=fall2012>Fall 2012</option>
    <option value=spring2013>Spring 2013</option>
    <option value=summer2013>Summer 2013</option>
    <option value=fall2013>Fall 2013</option>
    <option value=spring2014>Spring 2014</option>
    <option value=summer2014>Summer 2014</option>
    <option value=fall2014>Fall 2014</option>
    <option value=spring2015>Spring 2015</option>
    <option value=summer2015>Summer 2015</option>
    <option value=fall2015>Fall 2015</option>
    <option value=inprogress>In Progress</option>
</select>
END;
}
function classtries($answer3){
echo <<<END
<select name='$answer3'>
    <option value=0>0</option>
    <option value=1>1</option>
    <option value=2>2</option>
    <option value=3>3</option>
    <option value=4>4</option>
    <option value=5>5</option>
    <option value=6>6</option>
</select>
END;
}

```

```

// Create connection Setup
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Database Connection failed: " . $conn->connect_error);
}
echo "Database Connected successfully <br>";
echo "<font color='Blue'>Student History<br> Please fill the following form with classes already
taken</font>";

//echo $score1a; //debugging purposes display variable for testing contents
$sql = "SELECT * FROM `bsee` where `core` LIKE '%$score1a%' order by `classcode`";
$result = $conn->query($sql);

echo "<br>";
echo "<b>A. Core Curriculum (45 SCH)</b> <br>";
echo "<b>(minimum of <u>C</u> required)</b> <br>";
echo "<br>";
echo "<b>1. Communications (6 credit hours required)</b>";
echo "<br>";

//start of the form
echo "<form action=historyupdate.php method=post>";

//Start Listing of classes
echo "<select name='commclass1'>";
while ($row = $result->fetch_assoc()) {
    echo "<option value='" . $row['classcode'] . "'>" . $row['classcode'] . "</option>";
}
echo "</select>";
//comm class 1 properties
echo "<td>Semester completed</td>";
semestercompleted("commclass1semestercompleted");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";
//
echo "<td>Final Grade</td>";
gradedropdown("commclass1Grade");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";
//
echo "<td>Previous Attempts</td>";
classtries("commclass1tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

```

```

//Second Line of Core 1A
$sql2 = "SELECT * FROM `bsee` where `core` LIKE '%$core1a%' order by `classcode` LIMIT
1,2"; //select second class on Mysql
$result2 = $conn->query($sql2);
echo "<br>";
echo "<select name='commclass2'>";
while ($row2 = $result2->fetch_assoc()) {
    echo "<option value=\"" . $row2['classcode'] . "\"> " . $row2['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("commclass2semestercompleted");
echo "<tr><td>".$row2["classid"]." ".$row2["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("commclass2Grade");
echo "<tr><td>".$row2["classid"]." ".$row2["classcode"]."</td></tr>";

echo "<td>Previous Attempts</td>";
classtries("commclass2tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";
echo "<br>";
echo "<br>";

//Mathematics section core 2
echo "<b>2. Mathematics (3)</b>";
$sql3 = "SELECT * FROM `bsee` where `classcode` LIKE '%$math1411%' order by
`classcode`"; //select second class on Mysql
$result3 = $conn->query($sql3);
echo "<br>";
echo "<select name='dropdownmath1411'>";
while ($row3 = $result3->fetch_assoc()) {
    echo "<option value=\"" . $row3['classcode'] . "\"> " . $row3['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("math1411semestercompleted1");
echo "<tr><td>".$row3["classid"]." ".$row3["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("math1411Grade");
echo "<tr><td>".$row3["classid"]." ".$row3["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("math1411tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

```



```

echo "<br>";
echo "<br>";
// 3. Life and Physical Sciences (6) core 3
echo "<b>3. Life and Physical Sciences (6)</b>";
$sql4 = "SELECT * FROM `bsee` where `core` LIKE '%$core3%' order by `classcode`"; //select
fist physics class default is ASCending
$result4 = $conn->query($sql4);
echo "<br>";
echo "<select name='dropdowncore3-1'>";
while ($row4 = $result4->fetch_assoc()) {
    echo "<option value='" . $row4['classcode'] . "'>" . $row4['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core3-1semestercompleted");
echo "<tr><td>". $row4["classid"]." ". $row4["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core3-1Grade");
echo "<tr><td>". $row4["classid"]." ". $row4["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core3-1tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";

// second Physics class
$sql5 = "SELECT * FROM `bsee` where `core` LIKE '%$core3%' order by `classcode` DESC";
//select fist physics class
$result5 = $conn->query($sql5);
echo "<br>";
echo "<select name='dropdowncore3-2'>";
while ($row5 = $result5->fetch_assoc()) {
    echo "<option value='" . $row5['classcode'] . "'>" . $row5['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core3-2semestercompleted");
echo "<tr><td>". $row5["classid"]." ". $row5["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core3-2Grade");
echo "<tr><td>". $row5["classid"]." ". $row5["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core3-2tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";

echo "<br>";
echo "<br>";

```

```
//4. Language, Philosophy, & Culture (3)
echo "<b>4. Language, Philosophy, & Culture (3)</b> <br>";
echo "<b>Select one:</b>";
$sql6 = "SELECT * FROM `bsee` where `core` LIKE '%$core4%' order by `classcode`"; //all
possible classes in core 4
$result6 = $conn->query($sql6);
echo "<br>";
echo "<select name='dropdowncore4'>";
echo "<option value=blank>choose HSM</option>";
while ($row6 = $result6->fetch_assoc()) {
    echo "<option value='" . $row6['classcode'] . "'>" . $row6['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core4semestercompleted");
echo "<tr><td>".$row6['classid']. " ".$row6["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core4Grade");
echo "<tr><td>".$row6["classid"]. " ".$row6["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core4tries");
echo "<tr><td>".$row["classid"]. " ".$row["classcode"]."</td></tr>";
echo "<br>";
echo "<br>";
```

```
//5. Visual and Performing Arts (3)
echo "<b>5. Visual and Performing Arts (3) </b><br>";
echo "<b>Select one:</b>";
$sql7 = "SELECT * FROM `bsee` where `core` LIKE '%$core5%' order by `classcode`"; //all
possible classes in core 5
$result7 = $conn->query($sql7);
echo "<br>";
echo "<select name='dropdowncore5'>";
echo "<option value=blank>choose ART</option>";
while ($row7 = $result7->fetch_assoc()) {
    echo "<option value='" . $row7['classcode'] . "'>" . $row7['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core5semestercompleted");
echo "<tr><td>".$row7["classid"]. " ".$row7["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core5Grade");
echo "<tr><td>".$row7["classid"]. " ".$row7["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
```

```

classtries("core5tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";
echo "<br>";
echo "<br>";

//6. U.S. History (6)
echo "<b>6. U.S. History (6)</b>";
$sql8 = "SELECT * FROM `bsee` where `core` LIKE '%$core6%' order by `classcode`"; //select
fist history class default is ASCending
$result8 = $conn->query($sql8);
echo "<br>";
echo "<select name='dropdowncore6-1'>";
while ($row8 = $result8->fetch_assoc()) {
    echo "<option value='' . $row8['classcode'] . '>' . $row8['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core6-1semestercompleted");
echo "<tr><td>".$row8["classid"]." ".$row8["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core6-1Grade");
echo "<tr><td>".$row8["classid"]." ".$row8["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core6-1tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// second History class
$sql9 = "SELECT * FROM `bsee` where `core` LIKE '%$core6%' order by `classcode` DESC";
//select fist physics class
$result9 = $conn->query($sql9);
echo "<br>";
echo "<select name='dropdowncore6-2'>";
while ($row9 = $result9->fetch_assoc()) {
    echo "<option value='' . $row9['classcode'] . '>' . $row9['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core6-2semestercompleted");
echo "<tr><td>".$row9["classid"]." ".$row9["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core6-2Grade");
echo "<tr><td>".$row9["classid"]." ".$row9["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core6-2tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";
echo "<br>";

```

```

echo "<br>";

//7. Political Science (6)
echo "<b>7. Political Science (6)</b> <br>";
echo "<b>all 6 SCH must be completed at the same institution</b>";
$sql10 = "SELECT * FROM `bsee` where `core` LIKE '%$score7%' order by `classcode`";
//select fist history class default is ASCending
$result10 = $conn->query($sql10);
echo "<br>";
echo "<select name='dropdowncore7-1'>";
while ($row10 = $result10->fetch_assoc()) {
    echo "<option value='" . $row10['classcode'] . "'>" . $row10['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core7-1semestercompleted");
echo "<tr><td>".$row10["classid"]." ".$row10["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core7-1Grade");
echo "<tr><td>".$row10["classid"]." ".$row10["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core7-1tries");
echo "<tr><td>".$row10["classid"]." ".$row10["classcode"]."</td></tr>";
//echo "<br>";

// second History class
$sql11 = "SELECT * FROM `bsee` where `core` LIKE '%$score7%' order by `classcode`
DESC"; //select fist physics class
$result11 = $conn->query($sql11);
echo "<br>";
echo "<select name='dropdowncore7-2'>";
while ($row11 = $result11->fetch_assoc()) {
    echo "<option value='" . $row11['classcode'] . "'>" . $row11['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core7-2semestercompleted");
echo "<tr><td>".$row11["classid"]." ".$row11["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core7-2Grade");
echo "<tr><td>".$row11["classid"]." ".$row11["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core7-2tries");
echo "<tr><td>".$row11["classid"]." ".$row11["classcode"]."</td></tr>";
echo "<br>";
echo "<br>";

```

```

//8. Social and Behavioral Sciences (3)
echo "<b>8. Social and Behavioral Sciences (3)</b>";
$sql12 = "SELECT * FROM `bsee` where `core` LIKE '%$score8%' order by `classcode`";
//select social and behaivioral class default is ASCending
$result12 = $conn->query($sql12);
echo "<br>";
echo "<select name='dropdowncore8'>";
while ($row12 = $result12->fetch_assoc()) {
    echo "<option value='" . $row12['classcode'] . "'>" . $row12['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core8semestercompleted");
echo "<tr><td>".$row12["classid"]." ".$row12["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core8Grade");
echo "<tr><td>".$row12["classid"]." ".$row12["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core8tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";
echo "<br>";
echo "<br>";

//9. Institutionally Designated Option (6) core 9
echo "<b>9. Institutionally Designated Option (6)</b>";
$sql13 = "SELECT * FROM `bsee` where `core` LIKE '%$score9%' order by `classid`"; //select
fist Institutional class default is ASCending
$result13 = $conn->query($sql13);
echo "<br>";
echo "<select name='dropdowncore9-1'>";
while ($row13 = $result13->fetch_assoc()) {
    echo "<option value='" . $row13['classcode'] . "'>" . $row13['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core9-1semestercompleted");
echo "<tr><td>".$row13["classid"]." ".$row13["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core9-1Grade");
echo "<tr><td>".$row13["classid"]." ".$row13["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core9-1tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";
//echo "<br>";

```

```

// second Institutional class core 9
$sql14 = "SELECT * FROM `bsee` where `core` LIKE '%$core9%' order by `classcode`";
//select last Institutional class
$result14 = $conn->query($sql14);
echo "<br>";
echo "<select name='dropdowncore9-2'>";
while ($row14 = $result14->fetch_assoc()) {
    echo "<option value='" . $row14['classcode'] . "'>" . $row14['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core9-2semestercompleted");
echo "<tr><td>". $row14["classid"]." ". $row14["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core9-2Grade");
echo "<tr><td>". $row14["classid"]." ". $row14["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core9-2tries");
echo "<tr><td>". $row14["classid"]." ". $row14["classcode"]."</td></tr>";
echo "<br>";
echo "<br>";

//B Foundational Math & Science (15 SCH)
echo "<b>B. Foundational Math & Science (15 SCH)</b><br>";
echo "<b>(minimum of <u>C</u> grade required)</b>";
$sql15 = "SELECT * FROM `bsee` where `core` LIKE '%$core10%' order by `classid` LIMIT 0,1"; //select fist Foundational Math class default is ASCending
$result15 = $conn->query($sql15);
echo "<br>";
echo "<select name='dropdowncore10-1'>";
while ($row15 = $result15->fetch_assoc()) {
    echo "<option value='" . $row15['classcode'] . "'>" . $row15['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core10-1semestercompleted");
echo "<tr><td>". $row15["classid"]." ". $row15["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core10-1Grade");
echo "<tr><td>". $row15["classid"]." ". $row15["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core10-1tries");
echo "<tr><td>". $row15["classid"]." ". $row15["classcode"]."</td></tr>";
//echo "<br>";

// second Foundational Math & Science class core Non-major required

```

```

$sql16 = "SELECT * FROM `bsee` where `core` LIKE '%$core10%' order by `classid` LIMIT
1,1"; //select second Institutional class
$result16 = $conn->query($sql16);
echo "<br>";
echo "<select name='dropdowncore10-2'>";
while ($row16 = $result16->fetch_assoc()) {
    echo "<option value=" . $row16['classcode'] . "> . $row16['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core10-2semestercompleted");
echo "<tr><td>". $row16["classid"]. " ". $row16["classcode"]. "</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core10-2Grade");
echo "<tr><td>". $row16["classid"]. " ". $row16["classcode"]. "</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core10-2tries");
echo "<tr><td>". $row16["classid"]. " ". $row16["classcode"]. "</td></tr>";

// third Foundational Math & Science class core Non-major required
$sql17 = "SELECT * FROM `bsee` where `core` LIKE '%$core10%' order by `classid` LIMIT
2,1"; //select third Institutional class
$result17 = $conn->query($sql17);
echo "<br>";
echo "<select name='dropdowncore10-3'>";
while ($row17 = $result17->fetch_assoc()) {
    echo "<option value=" . $row17['classcode'] . "> . $row17['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core10-3semestercompleted");
echo "<tr><td>". $row17["classid"]. " ". $row17["classcode"]. "</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core10-3Grade");
echo "<tr><td>". $row17["classid"]. " ". $row17["classcode"]. "</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core10-3tries");
echo "<tr><td>". $row17["classid"]. " ". $row17["classcode"]. "</td></tr>";

// fourth Foundational Math & Science class core Non-major required
$sql18 = "SELECT * FROM `bsee` where `core` LIKE '%$core10%' order by `classid` LIMIT
3,1"; //select fourth Institutional class
$result18 = $conn->query($sql18);
echo "<br>";
echo "<select name='dropdowncore10-4'>";
while ($row18 = $result18->fetch_assoc()) {

```

```

    echo "<option value=\"" . $row18['classcode'] . ">" . $row18['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core10-4semestercompleted");
echo "<tr><td>". $row18["classid"]." ". $row18["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core10-4Grade");
echo "<tr><td>". $row18["classid"]." ". $row18["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core10-4tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";

// fifth Foundational Math & Science class core Non-major required
$sql19 = "SELECT * FROM `bsee` where `core` LIKE '%$score10%' order by `classid` LIMIT
4,10"; //select fifth Institutional class with a max listing of 10 elements
$result19 = $conn->query($sql19);
echo "<br>";
echo "<select name='dropdowncore10-5'>";
echo "<option value=blank>choose SCI</option>";
while ($row19 = $result19->fetch_assoc()) {
    echo "<option value=\"" . $row19['classcode'] . ">" . $row19['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core10-5semestercompleted");
echo "<tr><td>". $row19["classid"]." ". $row19["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core10-5Grade");
echo "<tr><td>". $row19["classid"]." ". $row19["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core10-5tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";
echo "<br>";
echo "<br>";

//C Major: Required Lower Division Courses (21 SCH)
echo "<b>C. Major: Required Lower Division Courses (21 SCH)</b><br>";
echo "<b>(minimum of <u>C</u> grade required)</b>";
$sql20 = "SELECT * FROM `bsee` where `core` LIKE '%$score11%' order by `classid` LIMIT
0,1"; //select fist lower division required class default is ASCending
$result20 = $conn->query($sql20);
echo "<br>";
echo "<select name='dropdowncore11-1'>";
while ($row20 = $result20->fetch_assoc()) {
    echo "<option value=\"" . $row20['classcode'] . ">" . $row20['classcode'] . "</option>";
}

```



```

}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core11-1semestercompleted");
echo "<tr><td>".$row20["classid"]." ".$row20["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core11-1Grade");
echo "<tr><td>".$row20["classid"]." ".$row20["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core11-1tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// second Major: Required Lower Division Course required
$sql21 = "SELECT * FROM `bsee` where `core` LIKE '%$core11%' order by `classid` LIMIT 1,1"; //select second lower division required class
$result21 = $conn->query($sql21);
echo "<br>";
echo "<select name='dropdowncore11-2'>";
while ($row21 = $result21->fetch_assoc()) {
    echo "<option value='' . $row21['classcode'] . ''> . $row21['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core11-2semestercompleted");
echo "<tr><td>".$row21["classid"]." ".$row21["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core11-2Grade");
echo "<tr><td>".$row21["classid"]." ".$row21["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core11-2tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// third Major: Required Lower Division Course
$sql22 = "SELECT * FROM `bsee` where `core` LIKE '%$core11%' order by `classid` LIMIT 2,1"; //select third lower division required class
$result22 = $conn->query($sql22);
echo "<br>";
echo "<select name='dropdowncore11-3'>";
while ($row22 = $result22->fetch_assoc()) {
    echo "<option value='' . $row22['classcode'] . ''> . $row22['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core11-3semestercompleted");
echo "<tr><td>".$row22["classid"]." ".$row22["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";

```

```

gradedropdown("core11-3Grade");
echo "<tr><td>".$row22["classid"]." ".$row22["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core11-3tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// fourth Major: Required Lower Division Course
$sql23 = "SELECT * FROM `bsee` where `core` LIKE '%$core11%' order by `classid` LIMIT
3,1"; //select fourth lower division required class
$result23 = $conn->query($sql23);
echo "<br>";
echo "<select name='dropdowncore11-4'>";
while ($row23 = $result23->fetch_assoc()) {
    echo "<option value='' . $row23['classcode'] . ''> . $row23['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core11-4semestercompleted");
echo "<tr><td>".$row23["classid"]." ".$row23["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core11-4Grade");
echo "<tr><td>".$row23["classid"]." ".$row23["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core11-4tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// fifth Major: Required Lower Division Course
$sql24 = "SELECT * FROM `bsee` where `core` LIKE '%$core11%' order by `classid` LIMIT
4,1"; //select fifth lower division required class
$result24 = $conn->query($sql24);
echo "<br>";
echo "<select name='dropdowncore11-5'>";
while ($row24 = $result24->fetch_assoc()) {
    echo "<option value='' . $row24['classcode'] . ''> . $row24['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core11-5semestercompleted");
echo "<tr><td>".$row24["classid"]." ".$row24["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core11-5Grade");
echo "<tr><td>".$row24["classid"]." ".$row24["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core11-5tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

```

```

// sixth Major: Required Lower Division Course required
$sql25 = "SELECT * FROM `bsee` where `core` LIKE '%$score11%' order by `classid` LIMIT
5,1"; //select sixth lower division required class
$result25 = $conn->query($sql25);
echo "<br>";
echo "<select name='dropdowncore11-6'>";
while ($row25 = $result25->fetch_assoc()) {
    echo "<option value='" . $row25['classcode'] . "'>" . $row25['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core11-6semestercompleted");
echo "<tr><td>". $row25["classid"]." ". $row25["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core11-6Grade");
echo "<tr><td>". $row25["classid"]." ". $row25["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core11-6tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";

// seventh Major: Required Lower Division Course
$sql26 = "SELECT * FROM `bsee` where `core` LIKE '%$score11%' order by `classid` LIMIT
6,1"; //select seventh lower division required class
$result26 = $conn->query($sql26);
echo "<br>";
echo "<select name='dropdowncore11-7'>";
while ($row26 = $result26->fetch_assoc()) {
    echo "<option value='" . $row26['classcode'] . "'>" . $row26['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core11-7semestercompleted");
echo "<tr><td>". $row26["classid"]." ". $row26["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core11-7Grade");
echo "<tr><td>". $row26["classid"]." ". $row26["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core11-7tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";

// eighth Major: Required Lower Division Course
$sql27 = "SELECT * FROM `bsee` where `core` LIKE '%$score11%' order by `classid` LIMIT
7,1"; //select eighth lower division required class
$result27 = $conn->query($sql27);
echo "<br>";
echo "<select name='dropdowncore11-8'>";

```

```

while ($row27 = $result27->fetch_assoc()) {
    echo "<option value=\"" . $row27['classcode'] . ">" . $row27['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core11-8semestercompleted");
echo "<tr><td>". $row27["classid"]." ". $row27["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core11-8Grade");
echo "<tr><td>". $row27["classid"]." ". $row27["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core11-8tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";

// ninth Major: Required Lower Division Course
$sql28 = "SELECT * FROM `bsee` where `core` LIKE '%$core11%' order by `classid` LIMIT
8,1"; //select ninth lower division required class
$result28 = $conn->query($sql28);
echo "<br>";
echo "<select name='dropdowncore11-9'>";
while ($row28 = $result28->fetch_assoc()) {
    echo "<option value=\"" . $row28['classcode'] . ">" . $row28['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core11-9semestercompleted");
echo "<tr><td>". $row28["classid"]." ". $row28["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core11-9Grade");
echo "<tr><td>". $row28["classid"]." ". $row28["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core11-9tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";
echo "<br>";
echo "<br>";

//D Major: Required Upper Division Courses (32 SCH)
echo "<b> D. Major: Required Upper Division Courses (32 SCH)</b><br>";
echo "<b>(minimum of <u>C</u> grade required)</b>";
$sql29 = "SELECT * FROM `bsee` where `core` LIKE '%$core12%' order by `classid` LIMIT
0,1"; //select fist Required Upper Division Courses class default is ASCending
$result29 = $conn->query($sql29);
echo "<br>";
echo "<select name='dropdowncore12-1'>";
while ($row29 = $result29->fetch_assoc()) {
    echo "<option value=\"" . $row29['classcode'] . ">" . $row29['classcode'] . "</option>";
}

```

```

}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-1semestercompleted");
echo "<tr><td>".$row29["classid"]." ".$row29["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-1Grade");
echo "<tr><td>".$row29["classid"]." ".$row29["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-1tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// second Required Upper Division Courses
$sql30 = "SELECT * FROM `bsee` where `core` LIKE '%Score12%' order by `classid` LIMIT 1,1"; //select second Required Upper Division Courses
$result30 = $conn->query($sql30);
echo "<br>";
echo "<select name='dropdowncore12-2'>";
while ($row30 = $result30->fetch_assoc()) {
    echo "<option value='' . $row30['classcode'] . ''> . $row30['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-2semestercompleted");
echo "<tr><td>".$row30["classid"]." ".$row30["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-2Grade");
echo "<tr><td>".$row30["classid"]." ".$row30["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-2tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// third Required Upper Division Courses
$sql31 = "SELECT * FROM `bsee` where `core` LIKE '%Score12%' order by `classid` LIMIT 2,1"; //select third Required Upper Division Courses
$result31 = $conn->query($sql31);
echo "<br>";
echo "<select name='dropdowncore12-3'>";
while ($row31 = $result31->fetch_assoc()) {
    echo "<option value='' . $row31['classcode'] . ''> . $row31['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-3semestercompleted");
echo "<tr><td>".$row31["classid"]." ".$row31["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";

```

```

gradedropdown("core12-3Grade");
echo "<tr><td>".$row31["classid"]." ".$row31["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-3tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// fourth Required Upper Division Courses
$sql32 = "SELECT * FROM `bsee` where `core` LIKE '%$score12%' order by `classid` LIMIT
3,1"; //select fourth Required Upper Division Courses
$result32 = $conn->query($sql32);
echo "<br>";
echo "<select name='dropdowncore12-4'>";
while ($row32 = $result32->fetch_assoc()) {
    echo "<option value='' . $row32['classcode'] . ''> . $row32['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-4semestercompleted");
echo "<tr><td>".$row32["classid"]." ".$row32["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-4Grade");
echo "<tr><td>".$row32["classid"]." ".$row32["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-4tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// fifth Required Upper Division Courses
$sql33 = "SELECT * FROM `bsee` where `core` LIKE '%$score12%' order by `classid` LIMIT
4,1"; //select fifth Required Upper Division Courses
$result33 = $conn->query($sql33);
echo "<br>";
echo "<select name='dropdowncore12-5'>";
while ($row33 = $result33->fetch_assoc()) {
    echo "<option value='' . $row33['classcode'] . ''> . $row33['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-5semestercompleted");
echo "<tr><td>".$row33["classid"]." ".$row33["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-5Grade");
echo "<tr><td>".$row33["classid"]." ".$row33["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-5tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

```

```

// sixth Required Upper Division Courses
$sql34 = "SELECT * FROM `bsee` where `core` LIKE '%$score12%' order by `classid` LIMIT
5,1"; //select sixth Required Upper Division Courses
$result34 = $conn->query($sql34);
echo "<br>";
echo "<select name='dropdowncore12-6'>";
while ($row34 = $result34->fetch_assoc()) {
    echo "<option value='" . $row34['classcode'] . "'>" . $row34['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-6semestercompleted");
echo "<tr><td>". $row34["classid"]." ". $row34["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-6Grade");
echo "<tr><td>". $row34["classid"]." ". $row34["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-6tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";

// seventh Required Upper Division Courses
$sql35 = "SELECT * FROM `bsee` where `core` LIKE '%$score12%' order by `classid` LIMIT
6,1"; //select seventh Required Upper Division Courses
$result35 = $conn->query($sql35);
echo "<br>";
echo "<select name='dropdowncore12-7'>";
while ($row35 = $result35->fetch_assoc()) {
    echo "<option value='" . $row35['classcode'] . "'>" . $row35['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-7semestercompleted");
echo "<tr><td>". $row35["classid"]." ". $row35["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-7Grade");
echo "<tr><td>". $row35["classid"]." ". $row35["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-7tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";

// eighth Required Upper Division Courses
$sql36 = "SELECT * FROM `bsee` where `core` LIKE '%$score12%' order by `classid` LIMIT
7,1"; //select eighth Required Upper Division Courses
$result36 = $conn->query($sql36);
echo "<br>";
echo "<select name='dropdowncore12-8'>";

```

```

while ($row36 = $result36->fetch_assoc()) {
    echo "<option value=\"" . $row36['classcode'] . ">" . $row36['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-8semestercompleted");
echo "<tr><td>". $row36["classid"]. " ". $row36["classcode"]. "</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-8Grade");
echo "<tr><td>". $row36["classid"]. " ". $row36["classcode"]. "</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-8tries");
echo "<tr><td>". $row["classid"]. " ". $row["classcode"]. "</td></tr>";

// ninth Required Upper Division Courses
$sql37 = "SELECT * FROM `bsee` where `core` LIKE '%$core12%' order by `classid` LIMIT
8,1"; //select ninth Required Upper Division Courses
$result37 = $conn->query($sql37);
echo "<br>";
echo "<select name='dropdowncore12-9'>";
while ($row37 = $result37->fetch_assoc()) {
    echo "<option value=\"" . $row37['classcode'] . ">" . $row37['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-9semestercompleted");
echo "<tr><td>". $row37["classid"]. " ". $row37["classcode"]. "</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-9Grade");
echo "<tr><td>". $row37["classid"]. " ". $row37["classcode"]. "</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-9tries");
echo "<tr><td>". $row["classid"]. " ". $row["classcode"]. "</td></tr>";

// tenth Required Upper Division Courses
$sql38 = "SELECT * FROM `bsee` where `core` LIKE '%$core12%' order by `classid` LIMIT
9,1"; //select 10th Required Upper Division Courses
$result38 = $conn->query($sql38);
echo "<br>";
echo "<select name='dropdowncore12-10'>";
while ($row38 = $result38->fetch_assoc()) {
    echo "<option value=\"" . $row38['classcode'] . ">" . $row38['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-10semestercompleted");

```



```

echo "<tr><td>".$row38["classid"]." ".$row38["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-10Grade");
echo "<tr><td>".$row38["classid"]." ".$row38["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-10tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

```

```

// eleventh Required Upper Division Courses
$sql39 = "SELECT * FROM `bsee` where `core` LIKE '%$core12%' order by `classid` LIMIT 10,1"; //select 11th Required Upper Division Courses
$result39 = $conn->query($sql39);
echo "<br>";
echo "<select name='dropdowncore12-11'>";
while ($row39 = $result39->fetch_assoc()) {
    echo "<option value='' . $row39['classcode'] . ''> . $row39['classcode'] . </option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-11semestercompleted");
echo "<tr><td>".$row39["classid"]." ".$row39["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-11Grade");
echo "<tr><td>".$row39["classid"]." ".$row39["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-11tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

```

```

//12th Required Upper Division Courses
$sql40 = "SELECT * FROM `bsee` where `core` LIKE '%$selective1%' order by `classid`";
//select 12th Required Upper Division Courses
$result40 = $conn->query($sql40);
echo "<br>";
echo "<select name='dropdowncore12-12'>";
echo "<option value=blank>Elective 1</option>";
while ($row40 = $result40->fetch_assoc()) {
    echo "<option value='' . $row40['classcode'] . ''> . $row40['classcode'] . </option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-12semestercompleted");
echo "<tr><td>".$row40["classid"]." ".$row40["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-12Grade");
echo "<tr><td>".$row0["classid"]." ".$row40["classcode"]."</td></tr>";

```

```

echo "<td>Previous Attempts</td>";
classtries("core12-12tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// 13th Required Upper Division Courses
$sql41 = "SELECT * FROM `bsee` where `core` LIKE '%$score12%' order by `classid` LIMIT 11,1"; //select 13th Required Upper Division Courses
$result41 = $conn->query($sql41);
echo "<br>";
echo "<select name='dropdowncore12-13'>";
while ($row41 = $result41->fetch_assoc()) {
    echo "<option value='\" . $row41['classcode'] . "\">\" . $row41['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-13semestercompleted");
echo "<tr><td>".$row41["classid"]." ".$row41["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-13Grade");
echo "<tr><td>".$row41["classid"]." ".$row41["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-13tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// 14th Required Upper Division Courses
$sql42 = "SELECT * FROM `bsee` where `core` LIKE '%$score12%' order by `classid` LIMIT 12,1"; //select 14th Required Upper Division Courses
$result42 = $conn->query($sql42);
echo "<br>";
echo "<select name='dropdowncore12-14'>";
while ($row42 = $result42->fetch_assoc()) {
    echo "<option value='\" . $row42['classcode'] . "\">\" . $row42['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("core12-14semestercompleted");
echo "<tr><td>".$row42["classid"]." ".$row42["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("core12-14Grade");
echo "<tr><td>".$row42["classid"]." ".$row42["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("core12-14tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";
echo "<br>";
echo "<br>";

```

```

//E. Major: EE Concentration (12 SCH)
echo "<b> E. Major: EE Concentration (12 SCH)</b><br>";
echo "<b><u>see advisor for list of approved courses </u> </b>";
$sql43 = "SELECT * FROM `bsee` where `core` LIKE '%$selective2%' order by `classid`";
//select fist Major: EE Concentration class default is ASCending
$result43 = $conn->query($sql43);
echo "<br>";
echo "<select name='dropdownselective2-1'>";
echo "<option value=blank>EExxxx</option>";
while ($row43 = $result43->fetch_assoc()) {
    echo "<option value='" . $row43['classcode'] . "'>" . $row43['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("elective2-1semestercompleted");
echo "<tr><td>".$row43["classid"]." ".$row43["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("elective2-1Grade");
echo "<tr><td>".$row43["classid"]." ".$row43["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("elective2-1tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// second Major: EE Concentration (12 SCH)
$sql44 = "SELECT * FROM `bsee` where `core` LIKE '%$selective2%' order by `classid`";
//select second Major: EE Concentration class
$result44 = $conn->query($sql44);
echo "<br>";
echo "<select name='dropdownselective2-2'>";
echo "<option value=blank>EExxxx</option>";
while ($row44 = $result44->fetch_assoc()) {
    echo "<option value='" . $row44['classcode'] . "'>" . $row44['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("elective2-2semestercompleted");
echo "<tr><td>".$row44["classid"]." ".$row44["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("elective2-2Grade");
echo "<tr><td>".$row44["classid"]." ".$row44["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("elective2-2tries");
echo "<tr><td>".$row["classid"]." ".$row["classcode"]."</td></tr>";

// third Major: EE Concentration (12 SCH)

```

```

$sql45 = "SELECT * FROM `bsee` where `core` LIKE '%$selective2%' order by `classid`";
//select third Major: EE Concentration class
$result45 = $conn->query($sql45);
echo "<br>";
echo "<select name='dropdownselective2-3'>";
echo "<option value=blank>EExxxx</option>";
while ($row45 = $result45->fetch_assoc()) {
    echo "<option value='" . $row45['classcode'] . "'>" . $row45['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("elective2-3semestercompleted");
echo "<tr><td>". $row45["classid"]." ". $row45["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("elective2-3Grade");
echo "<tr><td>". $row45["classid"]." ". $row45["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("elective2-3tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";

// fourth Major: EE Concentration (12 SCH)
$sql46 = "SELECT * FROM `bsee` where `core` LIKE '%$selective2%' order by `classid`";
//select fourth Major: EE Concentration class
$result46 = $conn->query($sql46);
echo "<br>";
echo "<select name='dropdownselective2-4'>";
echo "<option value=blank>EExxxx</option>";
while ($row46 = $result46->fetch_assoc()) {
    echo "<option value='" . $row46['classcode'] . "'>" . $row46['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("elective2-4semestercompleted");
echo "<tr><td>". $row46["classid"]." ". $row46["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("elective2-4Grade");
echo "<tr><td>". $row46["classid"]." ". $row46["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("elective2-4tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";
echo "<br>";

// Concentration:
$sql47 = "SELECT * FROM `concentrations` order by `tableid`"; //Concentration
$result47 = $conn->query($sql47);
echo "<br>";

```

```

echo "<select name='dropdownconcentration'>";
echo "<option value=blank>Pick your concentration</option>";
while ($row47 = $result47->fetch_assoc()) {
    echo "<option value='" . $row47['concentrations'] . "'>" . $row47['concentrations'] .
"</option>";
}
echo "</select>";
echo "<br>";
echo "<br>";

//F. Professional Option (3 SCH) or extra credits
// see advisor for approved courses
echo "<b> F. Professional Option (3 SCH) or extra credits</b><br>";
echo "<b><u>see advisor for list of approved courses </u> </b>";
$sql48 = "SELECT * FROM `bsee` where `core` LIKE '%$professional%' order by `classid`";
//select fist Major: EE Concentration class default is ASCending
$result48 = $conn->query($sql48);
echo "<br>";
echo "<select name='dropdownprofessional-1'>";
echo "<option value=blank>Blank</option>";
while ($row48 = $result48->fetch_assoc()) {
    echo "<option value='" . $row48['classcode'] . "'>" . $row48['classcode'] . "</option>";
}
echo "</select>";
echo "<td>Semester completed</td>";
semestercompleted("professional-1semestercompleted");
echo "<tr><td>". $row48["classid"]." ". $row48["classcode"]."</td></tr>";
echo "<td>Final Grade</td>";
gradedropdown("professional-1Grade");
echo "<tr><td>". $row48["classid"]." ". $row48["classcode"]."</td></tr>";
echo "<td>Previous Attempts</td>";
classtries("professional-1tries");
echo "<tr><td>". $row["classid"]." ". $row["classcode"]."</td></tr>";

$conn->close();

echo "<br>";
echo "<input type=submit>";
echo "</form>";
echo "</body>";
echo "</html>";
?>

```

iAdvise code:historyupdate.php

<?php

```

session_start();

$servername = "localhost";
$username = "iadviceuser";
$password = "smartadvice2016.";
$dbname = "iadvice";

echo "<html>";
echo '';
echo "<head>Bachelor of Science-Electrical and Computer Engineering</head><br>";
echo "Degree Plan (checklist)";
echo " Catalogs: 2014-DRAFT<br>";
echo "<body class=\"page_bg\">";
echo date('l, F jS, Y'); //other php code here echo "</body>";
echo "<br>";

//update the information from the Student history form
//updating the studenthistory table
//variable loading from the form dropdown fields values of the studenthistory.php
//session_start();
$localname = $_SESSION['name'];
$localutepemail = $_SESSION['email'];
$localutep800 = $_SESSION['utep800'];
$localworking=$_SESSION['workinghrs'];

//copy the dropdown selections from the form to the local php variables
//core 1. comm classes
$class1=$_POST['commclass1'];
$class1term=$_POST['commclass1semestercompleted'];
$class1grade=$_POST['commclass1Grade'];
$class1tries=$_POST['commclass1tries'];

$class2=$_POST['commclass2'];
$class2term=$_POST['commclass2semestercompleted'];
$class2grade=$_POST['commclass2Grade'];
$class2tries=$_POST['commclass2tries'];

//Core 2. mathematics class
$class3=$_POST['dropdownmath1411'];
$class3term=$_POST['math1411semestercompleted1'];
$class3grade=$_POST['math1411Grade'];
$class3tries=$_POST['math1411tries'];

//Core 3 Life and physical sciences
$class4=$_POST['dropdowncore3-1'];

```

```
$class4term=$_POST['core3-1semestercompleted'];  
$class4grade=$_POST['core3-1Grade'];  
$class4tries=$_POST['core3-1tries'];
```

```
$class5=$_POST['dropdowncore3-2'];  
$class5term=$_POST['core3-2semestercompleted'];  
$class5grade=$_POST['core3-2Grade'];  
$class5tries=$_POST['core3-2tries'];
```

//Core 4 Language, Philosophy, & Culture (3)

```
$class6=$_POST['dropdowncore4'];  
$class6term=$_POST['core4semestercompleted'];  
$class6grade=$_POST['core4Grade'];  
$class6tries=$_POST['core4tries'];
```

//Core 5. 5. Visual and Performing Arts (3)

```
$class7=$_POST['dropdowncore5'];  
$class7term=$_POST['core5semestercompleted'];  
$class7grade=$_POST['core5Grade'];  
$class7tries=$_POST['core5tries'];
```

//Core 6. U.S. History

```
$class8=$_POST['dropdowncore6-1'];  
$class8term=$_POST['core6-1semestercompleted'];  
$class8grade=$_POST['core6-1Grade'];  
$class8tries=$_POST['core6-1tries'];
```

```
$class9=$_POST['dropdowncore6-2'];  
$class9term=$_POST['core6-2semestercompleted'];  
$class9grade=$_POST['core6-2tries'];
```

//Core 7. Political Science

```
$class10=$_POST['dropdowncore7-1'];  
$class10term=$_POST['core7-1semestercompleted'];  
$class10grade=$_POST['core7-1Grade'];  
$class10tries=$_POST['core7-1tries'];
```

```
$class11=$_POST['dropdowncore7-2'];  
$class11term=$_POST['core7-2semestercompleted'];  
$class11grade=$_POST['core7-2Grade'];  
$class11tries=$_POST['core7-2tries'];
```

//Core 8. Social and Behavioral Sciences

```
$class12=$_POST['dropdowncore8'];  
$class12term=$_POST['core8semestercompleted'];  
$class12grade=$_POST['core8Grade'];
```

```

$class12tries=$_POST['core8tries'];

//Core 9. Institutionally Designated Option
$class13=$_POST['dropdowncore9-1'];
$class13term=$_POST['core9-1semestercompleted'];
$class13grade=$_POST['core9-1Grade'];
$class13tries=$_POST['core9-1tries'];

$class14=$_POST['dropdowncore9-2'];
$class14term=$_POST['core9-2semestercompleted'];
$class14grade=$_POST['core9-2Grade'];
$class14tries=$_POST['core9-2tries'];

//Core 10. Foundational Math & Science
$class15=$_POST['dropdowncore10-1'];
$class15term=$_POST['core10-1semestercompleted'];
$class15grade=$_POST['core10-1Grade'];
$class15tries=$_POST['core10-1tries'];

$class16=$_POST['dropdowncore10-2'];
$class16term=$_POST['core10-2semestercompleted'];
$class16grade=$_POST['core10-2Grade'];
$class16tries=$_POST['core10-2tries'];

$class17=$_POST['dropdowncore10-3'];
$class17term=$_POST['core10-3semestercompleted'];
$class17grade=$_POST['core10-3Grade'];
$class17tries=$_POST['core10-3tries'];

$class18=$_POST['dropdowncore10-4'];
$class18term=$_POST['core10-4semestercompleted'];
$class18grade=$_POST['core10-4Grade'];
$class18tries=$_POST['core10-4tries'];

$class19=$_POST['dropdowncore10-5'];
$class19term=$_POST['core10-5semestercompleted'];
$class19grade=$_POST['core10-5Grade'];
$class19tries=$_POST['core10-5tries'];

//C Major: Required Lower Division Courses (21 SCH)
$class20=$_POST['dropdowncore11-1'];
$class20term=$_POST['core11-1semestercompleted'];
$class20grade=$_POST['core11-1Grade'];
$class20tries=$_POST['core11-1tries'];

$class21=$_POST['dropdowncore11-2'];

```


\$class21term=\$_POST['core11-2semestercompleted'];
\$class21grade=\$_POST['core11-2Grade'];
\$class21tries=\$_POST['core11-2tries'];

\$class22=\$_POST['dropdowncore11-3'];
\$class22term=\$_POST['core11-3semestercompleted'];
\$class22grade=\$_POST['core11-3Grade'];
\$class22tries=\$_POST['core11-3tries'];

\$class23=\$_POST['dropdowncore11-4'];
\$class23term=\$_POST['core11-4semestercompleted'];
\$class23grade=\$_POST['core11-4Grade'];
\$class23tries=\$_POST['core11-4tries'];

\$class24=\$_POST['dropdowncore11-5'];
\$class24term=\$_POST['core11-5semestercompleted'];
\$class24grade=\$_POST['core11-5Grade'];
\$class24tries=\$_POST['core11-5tries'];

\$class25=\$_POST['dropdowncore11-6'];
\$class25term=\$_POST['core11-6semestercompleted'];
\$class25grade=\$_POST['core11-6Grade'];
\$class25tries=\$_POST['core11-6tries'];

\$class26=\$_POST['dropdowncore11-7'];
\$class26term=\$_POST['core11-7semestercompleted'];
\$class26grade=\$_POST['core11-7Grade'];
\$class26tries=\$_POST['core11-7tries'];

\$class27=\$_POST['dropdowncore11-8'];
\$class27term=\$_POST['core11-8semestercompleted'];
\$class27grade=\$_POST['core11-8Grade'];
\$class27tries=\$_POST['core11-8tries'];

\$class28=\$_POST['dropdowncore11-9'];
\$class28term=\$_POST['core11-9semestercompleted'];
\$class28grade=\$_POST['core11-9Grade'];
\$class28tries=\$_POST['core11-9tries'];

//D Major: Required Upper Division Courses (32 SCH)

\$class29=\$_POST['dropdowncore12-1'];
\$class29term=\$_POST['core12-1semestercompleted'];
\$class29grade=\$_POST['core12-1Grade'];
\$class29tries=\$_POST['core12-1tries'];

\$class30=\$_POST['dropdowncore12-2'];

\$class30term=\$_POST['core12-2semestercompleted'];
 \$class30grade=\$_POST['core12-2Grade'];
 \$class30tries=\$_POST['core12-2tries'];

 \$class31=\$_POST['dropdowncore12-3'];
 \$class31term=\$_POST['core12-3semestercompleted'];
 \$class31grade=\$_POST['core12-3Grade'];
 \$class31tries=\$_POST['core12-3tries'];

 \$class32=\$_POST['dropdowncore12-4'];
 \$class32term=\$_POST['core12-4semestercompleted'];
 \$class32grade=\$_POST['core12-4Grade'];
 \$class32tries=\$_POST['core12-4tries'];

 \$class33=\$_POST['dropdowncore12-5'];
 \$class33term=\$_POST['core12-5semestercompleted'];
 \$class33grade=\$_POST['core12-5Grade'];
 \$class33tries=\$_POST['core12-5tries'];

 \$class34=\$_POST['dropdowncore12-6'];
 \$class34term=\$_POST['core12-6semestercompleted'];
 \$class34grade=\$_POST['core12-6Grade'];
 \$class34tries=\$_POST['core12-6tries'];

 \$class35=\$_POST['dropdowncore12-7'];
 \$class35term=\$_POST['core12-7semestercompleted'];
 \$class35grade=\$_POST['core12-7Grade'];
 \$class35tries=\$_POST['core12-7tries'];

 \$class36=\$_POST['dropdowncore12-8'];
 \$class36term=\$_POST['core12-8semestercompleted'];
 \$class36grade=\$_POST['core12-8Grade'];
 \$class36tries=\$_POST['core12-8tries'];

 \$class37=\$_POST['dropdowncore12-9'];
 \$class37term=\$_POST['core12-9semestercompleted'];
 \$class37grade=\$_POST['core12-9Grade'];
 \$class37tries=\$_POST['core12-9tries'];

 \$class38=\$_POST['dropdowncore12-10'];
 \$class38term=\$_POST['core12-10semestercompleted'];
 \$class38grade=\$_POST['core12-10Grade'];
 \$class38tries=\$_POST['core12-10tries'];

 \$class39=\$_POST['dropdowncore12-11'];
 \$class39term=\$_POST['core12-11semestercompleted'];

```
$class39grade=$_POST['core12-11Grade'];  
$class39tries=$_POST['core12-11tries'];
```

```
$class40=$_POST['dropdowncore12-12'];  
$class40term=$_POST['core12-12semestercompleted'];  
$class40grade=$_POST['core12-12Grade'];  
$class40tries=$_POST['core12-12tries'];
```

```
$class41=$_POST['dropdowncore12-13'];  
$class41term=$_POST['core12-13semestercompleted'];  
$class41grade=$_POST['core12-13Grade'];  
$class41tries=$_POST['core12-13tries'];
```

```
$class42=$_POST['dropdowncore12-14'];  
$class42term=$_POST['core12-14semestercompleted'];  
$class42grade=$_POST['core12-14Grade'];  
$class42tries=$_POST['core12-14tries'];
```

```
//E. Major: EE Concentration Elective 1 (12 SCH)  
$class43=$_POST['dropdownelective2-1'];  
$class43term=$_POST['elective2-1semestercompleted'];  
$class43grade=$_POST['elective2-1Grade'];  
$class43tries=$_POST['elective2-1tries'];
```

```
$class44=$_POST['dropdownelective2-2'];  
$class44term=$_POST['elective2-2semestercompleted'];  
$class44grade=$_POST['elective2-2Grade'];  
$class44tries=$_POST['elective2-2tries'];
```

```
$class45=$_POST['dropdownelective2-3'];  
$class45term=$_POST['elective2-3semestercompleted'];  
$class45grade=$_POST['elective2-3Grade'];  
$class45tries=$_POST['elective2-3tries'];
```

```
$class46=$_POST['dropdownelective2-4'];  
$class46term=$_POST['elective2-4semestercompleted'];  
$class46grade=$_POST['elective2-4Grade'];  
$class46tries=$_POST['elective2-4tries'];
```

```
// Selected Concentration
```

```
$concentration=$_POST['dropdownconcentration'];
```

```
$class48=$_POST['dropdownprofessional-1'];  
$class48term=$_POST['professional-1semestercompleted'];  
$class48grade=$_POST['professional-1Grade'];
```

```

$class48tries=$_POST['professional-1tries'];

//debugin purposes erase for prod
//echo "<br>";
//echo "class1:";
//echo $class1;
//echo "class1term:";
//echo $class1term;
//echo "class1grade:";
//echo $class1grade;
//echo "<font color=green>";
//echo $class1tries;
//echo "</font>";

//Create connection, update query dbfield=$local variable
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}
$sql = "UPDATE studenthistory SET class1='$class1', classterm1='$class1term',
classgrade1='$class1grade', triesclass1='$class1tries',class2='$class2', classterm2='$class2term',
classgrade2='$class2grade', triesclass2='$class2tries',class3='$class3', classterm3='$class3term',
classgrade3='$class3grade', triesclass3='$class3tries',class4='$class4', classterm4='$class4term',
classgrade4='$class4grade', triesclass4='$class4tries',class5='$class5', classterm5='$class5term',
classgrade5='$class5grade', triesclass5='$class5tries',class6='$class6', classterm6='$class6term',
classgrade6='$class6grade', triesclass6='$class6tries',class7='$class7', classterm7='$class7term',
classgrade7='$class7grade', triesclass7='$class7tries',class8='$class8', classterm8='$class8term',
classgrade8='$class8grade', triesclass8='$class8tries',class9='$class9', classterm9='$class9term',
classgrade9='$class9grade', triesclass9='$class9tries',class10='$class10',
classterm10='$class10term', classgrade10='$class10grade', triesclass10='$class10tries',
class11='$class11', classterm11='$class11term', classgrade11='$class11grade',
triesclass11='$class11tries',class12='$class12', classterm12='$class12term',
classgrade12='$class12grade', triesclass12='$class12tries',class13='$class13',
classterm13='$class13term', classgrade13='$class13grade',
triesclass13='$class13tries',class14='$class14', classterm14='$class14term',
classgrade14='$class14grade', triesclass14='$class14tries',class15='$class15',
classterm15='$class15term', classgrade15='$class15grade',
triesclass15='$class15tries',class16='$class16', classterm16='$class16term',
classgrade16='$class16grade', triesclass16='$class16tries',class17='$class17',
classterm17='$class17term', classgrade17='$class17grade',
triesclass17='$class17tries',class18='$class18', classterm18='$class18term',
classgrade18='$class18grade', triesclass18='$class18tries',class19='$class19',
classterm19='$class19term', classgrade19='$class19grade',
triesclass19='$class19tries',class20='$class20', classterm20='$class20term',
classgrade20='$class20grade', triesclass20='$class20tries', class21='$class21',

```

```

classterm21='$class21term', classgrade21='$class21grade',
triesclass21='$class21tries',class22='$class22', classterm22='$class22term',
classgrade22='$class22grade', triesclass22='$class22tries',class23='$class23',
classterm23='$class23term', classgrade23='$class23grade',
triesclass23='$class23tries',class24='$class24', classterm24='$class24term',
classgrade24='$class24grade', triesclass24='$class24tries',class25='$class25',
classterm25='$class25term', classgrade25='$class25grade',
triesclass25='$class25tries',class26='$class26', classterm26='$class26term',
classgrade26='$class26grade', triesclass26='$class26tries',class27='$class27',
classterm27='$class27term', classgrade27='$class27grade',
triesclass27='$class27tries',class28='$class28', classterm28='$class28term',
classgrade28='$class28grade', triesclass28='$class28tries',class29='$class29',
classterm29='$class29term', classgrade29='$class29grade',
triesclass29='$class29tries',class30='$class30', classterm30='$class30term',
classgrade30='$class30grade', triesclass30='$class30tries', class31='$class31',
classterm31='$class31term', classgrade31='$class31grade',
triesclass31='$class31tries',class32='$class32', classterm32='$class32term',
classgrade32='$class32grade', triesclass32='$class32tries',class33='$class33',
classterm33='$class33term', classgrade33='$class33grade',
triesclass33='$class33tries',class34='$class34', classterm34='$class34term',
classgrade34='$class34grade', triesclass34='$class34tries',class35='$class35',
classterm35='$class35term', classgrade35='$class35grade',
triesclass35='$class35tries',class36='$class36', classterm36='$class36term',
classgrade36='$class36grade', triesclass36='$class36tries',class37='$class37',
classterm37='$class37term', classgrade37='$class37grade',
triesclass37='$class37tries',class38='$class38', classterm38='$class38term',
classgrade38='$class38grade', triesclass38='$class38tries',class39='$class39',
classterm39='$class39term', classgrade39='$class39grade',
triesclass39='$class39tries',class40='$class40', classterm40='$class40term',
classgrade40='$class40grade', triesclass40='$class40tries', class41='$class41',
classterm41='$class41term', classgrade41='$class41grade',
triesclass41='$class41tries',class42='$class42', classterm42='$class42term',
classgrade42='$class42grade', triesclass42='$class42tries',class43='$class43',
classterm43='$class43term', classgrade43='$class43grade',
triesclass43='$class43tries',class44='$class44', classterm44='$class44term',
classgrade44='$class44grade', triesclass44='$class44tries',class45='$class45',
classterm45='$class45term', classgrade45='$class45grade',
triesclass45='$class45tries',class46='$class46', classterm46='$class46term',
classgrade46='$class46grade', triesclass46='$class46tries',
concentration='$concentration',class48='$class48', classterm48='$class48term',
classgrade48='$class48grade', triesclass48='$class48tries' WHERE utepemail='$localutepemail'
";

```

```

if ($conn->query($sql) === TRUE) {
    echo "<br>Student History record was <u>UPDATED successfully</u> <br>";
} else {

```

```

    echo "Error updating record: " . $conn->error;
}

echo "<br>";
echo "credits completed ";
echo "<font color=red> will be displayed at the bottom of the next page along with an
<u>estimated</u> projection on your expected graduation date.</font>";
echo "<br>";
echo "<br>";
$conn->close();
echo "<br>";
echo '<u> to continue <font color=blue>';
echo $localname;
echo "</font> with your personalized advising session click on the button below</u>" ;
echo "<br>";
echo "<a id=\"mybutton\" href=\"workflow2.php\" title=\"to workflow\"><button>Student Class
Workflow</button></a>";
echo "</body>";
echo "</html>";

?>

```

iAdvise code:workflow2.php

```

<?php
session_start();
$localname = $_SESSION['name'];
$localutepemail = $_SESSION['email'];
$localutep800 = $_SESSION['utep800'];
$localworking = $_SESSION['workinghrs'];
echo '';
echo "<head>Bachelor of Science-Electrical and Computer Engineering <b>-->Workflow<--
</b></head><br>";
echo " <font color=blue><u>";
echo $localname;
echo ", ";
echo $localutep800;
echo "</u><br></font>";
echo " Catalogs: 2014-DRAFT<br>";
echo date('l, F jS, Y'); //other php code here echo "</body>";
echo "<br>";
echo "Cell Color Scheme :";
print "<table border=\"1\" style=\"width:100%\" >\n";
print "<tr>\n";

```

```
print "<td colspan=\"3\" style=background-color:green>Class earned credit</td><td
colspan=\"3\" style=background-color:white>Class ready to enroll</td><td colspan=\"3\"
style=background-color:yellow>Class requires a corequisite, but ready to enroll</td><td
colspan=\"3\" style=background-color:gray>Can not enroll in this class due to a missing Pre-
requisite</td>";
print "</table>";
```

```
echo "</u></font><br>Workflow Section";
```

```
echo "<font color=blue><u> Do not forget to save as PDF or print. Take this PDF or print out to
your advising appointment </font> <br></u>";
echo "<body class=\"page_bg\">";
```

```
$servername = "localhost";
$username = "iadviceuser";
$password = "smartadvice2016.";
$dbname = "iadvice";
$color= "gray";
$scalcready="No";
$english1301ready="No";
$creditspassed=0; //total credits passed
$credits11=0; //credits passed year 1 semester 1
$credits12=0; //credits passed year 1 semester 2
$credits21=0; //credits passed year 2 semester 1
$credits22=0; //credits passed year 2 semester 2
$credits31=0; //credits passed year 3 semester 1
$credits32=0; //credits passed year 3 semester 2
$credits41=0; //credits passed year 4 semester 1
$credits42=0; //credits passed year 4 semester 2
$degreepercentage=0; //Percentage of degree completion
$creditslefttofinish=0;
$dyncredits=0;
$dynsemestertograduate=0;
$semesterstograduate16=0;
$semesterstograduate15=0;
$semesterstograduate14=0;
$semesterstograduate12=0;
$semesterstograduate6=0;
$dynlastsemester=0;
$lastsemester16=0;
$lastsemester15=0;
$lastsemester14=0;
$lastsemester12=0;
```

```

$lastsemester6=0;
$dynexpgraddate=0;
$expgraddate16=0;
$expgraddate15=0;
$expgraddate14=0;
$expgraddate12=0;
$expgraddate6=0;
$dynoffset=0;
$offset6=0;
$offset12=0;
$offset14=0;
$offset15=0;
$offset16=0;
$dyndate=0;
$date12=0;
$date14=0;
$date15=0;
$date16=0;
$varclass19= "blank";
$varclass7= "blank";
$varclass6= "blank";
$varclass40= "blank";
$varclass40co="";
$varclass43= "blank";
$varclass44= "blank";
$varclass45= "blank";
$varclass46= "blank";

$green = "green"; //variable with string green for classes passed at UTEP
$pink = "pink"; //variable with string pink for transfered classes to UTEP
$gray = "gray"; //variable with string pink for class not ready to enroll

//Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}
//testing 1 {
//echo "<b>Calculus Class:</b>";
$sql3 = "SELECT * FROM `studenthistory` WHERE `fullname`='$localname' "; //select record
of current user on Mysql
//$sql = "SELECT * FROM `studenthistory` WHERE `fullname`=\"tono97\"";
$result3 = $conn->query($sql3);
//echo "<br>";

```



```

while ($row3 = $result3->fetch_assoc()) {
$dyncredits=$row3[nextsemcredits];
//echo $row3[nextsemcredits];

if ($row3[class40] == "ee4178") {
    echo " you have a match. Have a good day! this is for testing purposes";
    $green="green";
} else {
    // echo " No Class match. Have a good night! this is for testing purposes";
} //close else
}
echo "<br>";

//testing1}
echo "<html>";
print "<body>";
print "<font color = \"black\"><u><center> ELECTRICAL AND COMPUTER
ENGINEERING</center></u></font><br>";
print "<font color = \"black\"><u><center> 2014 - 2015</center></u></font>\n";
print "<table border=\"1\" style=\"width:100%\" >\n";

print "<tr>\n";
print "<td>blank 00</td>\n";
print "    <td colspan=\"3\" style=background-color: "; //stop to set color of cel

//check status of precal taken, in progress or not taken
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
if ( $row3[math1411ready] == "1" ){
    $color="green"; //credit at UTEP already?
    $scalcready="Yes";
    }
if ( $row3[math1411ready] == "0" ){
    $color="white"; //Ready to enroll, if not taken students should start by enrolling to this class
    $scalcready="No";
    }
    if ( $row3[math1411ready] == "blank" ){
    $color="red"; //Student did not choose an option for this dropdown in the studenthistory.php
    $scalcready="Missing Option in the previous form";
    }
} //closing the while
print $color;
$color="gray"; //back to default gray color

print ">Math Placement in Calculus: "; //continue printing the cell
print $scalcready;

```

```

print "</td>\n ";
print "\n";
print "    <td>Blank 04</td>\n";
print "    <td colspan=\"3\" style=background-color:\"; //stop to set color of cel

```

```

//check status of ENGL1311 taken, in progress or not taken
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
if ( $row3[engl1311ready] == "1" ){
    $color="green"; //credit at UTEP already?
    $english1301ready="Yes";
    }
if ( $row3[engl1311ready] == "0" ){
    $color= "white"; //Ready to enroll, if not taken students should start by enrolling to this class
    $english1301ready="No";
    }
    if ( $row3[engl1311ready] == "blank" ){
    $color= "red"; //Student did not choose an option for this dropdown in the studenthistory.php
    $english1301ready="Missing Option in the previous form";
    }
} //closing the while
print $color;
$color="gray"; //back to default gray color

```

```

print ">English Placement in RWS1301:";
print $english1301ready;
print "</td>\n ";
print "\n";
print "    <td>total credits per <br>semester</td>\n";
print "    <td>09</td>\n";
print " </tr>\n";
print " \n";
print " \n";
print " <tr>\n";
print "        <td colspan=\"9\" >LOWER DIVISION</td>\n";
print "    <td>19</td>\n";
print " </tr>\n";
print " \n";
print " <tr>\n";
print "        <td>1st year, 1st Sem</td>\n";
print "    <td style=background-color:\";
//***** math 1411

```

```

//check status of math1411 taken, in progress or not taken ***this needs to be check again

```

```

$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {

if (($row3[class3] == "MATH1411") && ($row3[classterm3] != "blank") &&
($row3[math1411ready] == "1" )){
    if ( ($row3[classgrade3] == "A")||($row3[classgrade3] == "B")||($row3[classgrade3] ==
"C")||($row3[classgrade3] == "TA")||($row3[classgrade3] == "TB")||($row3[classgrade3] ==
"TC")||($row3[classgrade3] == "TCR")||($row3[classgrade3] == "P") ){
        $color="green"; //credit at UTEP already? if taken or in progress,
when, is math1411 ready? second check passing grade ABC
        $creditspassed=$creditspassed+4;
        $credits11=$credits11+4;
    }
}

if (($row3[classterm3] == "blank") && ($row3[classgrade3] == "blank") &&
($row3[math1411ready] == "1" ) && ($row3[class47] == "math1508") &&
($row3[classgrade47] == "was passed")){ //1411 not taken, or attempted but not passed but
ready to be taken
    if ( ($row3[classgrade3] != "A") && ($row3[classgrade3] != "B") &&
($row3[classgrade3] != "C")&&($row3[classgrade3] != "TA") && ($row3[classgrade3] !=
"TB") && ($row3[classgrade3] != "TC")&& ($row3[classgrade3] != "TCR") &&
($row3[classgrade3] != "P") ) {
        $color="white"; //credit at UTEP already? if taken or in progress,
when, is math1411 ready? second check passing grade ABC
    } //have not passed the class and CHECK prerequisite already taken then it
is ready to enroll
}

//if () { //coo requisite passed check needed ready to register 1411
//      echo "yellow";
//      }

if (($row3[classterm3] == "blank") && ($row3[classgrade3] == "blank") &&
($row3[math1411ready] == "0" )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for 1411
}

} //close the while

print $color;
$color="gray"; //back to default gray color

print ">MATH 1411* <br> Calc 1</td>\n"; // end of cell 21 see reference

print " <td style=background-color:";
//*****EE1305

```

```

//check status of EE1305 taken, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//EE1305 has NO PREREQUISITES
$color="white"; //have not passed the class and CHECK prerequisite already taken and passed
then it is ready to enroll
if (($row3[class21] == "ee1305") && ($row3[classterm21] != "blank")) {
    if ( ($row3[classgrade21] == "A")||($row3[classgrade21] == "B")||($row3[classgrade21]
== "C")||($row3[classgrade21] == "TA")||($row3[classgrade21] == "TB")||($row3[classgrade21]
== "TC")||($row3[classgrade21] == "TCR")||($row3[classgrade21] == "P")) {
        $color="green"; //credit at UTEP already? if taken, when, is math1411
ready? second check passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits11=$credits11+3;
    }
}
if (($row3[classgrade21] == "blank") && (($row3[classterm20] == "blank") &&
($row3[classgrade20] == "blank")) || (($row3[classterm3] == "blank") && ($row3[classgrade3]
== "blank"))){ //coo requisite passed check needed ready to register 1411
    $color="yellow";
}
//if (($row3[classterm3] == "blank") && ($row3[classgrade3] == "blank") &&
($row3[math1411ready] == "0")){
//    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for 1411 NO PREREQUISITES
//    }
} //close the while

print $color;
$color="gray"; //back to default gray color

print ">EE 1305* <br> Intro EE</td> \n";

print " <td style=background-color:'"; //*****EE1105
//check status of EE1105 taken, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//EE1105 has NO PREREQUISITES
$color="white"; //have not passed the class and CHECK prerequisite already taken and passed
then it is ready to enroll
if (($row3[class20] == "ee1105") && ($row3[classterm20] != "blank")) {
    if ( ($row3[classgrade20] == "A")||($row3[classgrade20] == "B")||($row3[classgrade20]
== "C")||($row3[classgrade20] == "TA")||($row3[classgrade20] == "TB")||($row3[classgrade20]
== "TC")||($row3[classgrade20] == "TRC")||($row3[classgrade20] == "P")) {
        $color="green"; //credit at UTEP already? if taken, when, is math1411
ready? second check passing grade ABC
    }
}
}

```

```

        $creditspassed=$creditspassed+1;
        $credits11=$credits11+1;
    }
}
if (($row3[classgrade20] == "blank") && (($row3[classterm21] == "blank") &&
($row3[classgrade21] == "blank"))) || (($row3[classterm3] == "blank") && ($row3[classgrade3]
== "blank"))){ //coo requisite passed check needed ready to register 1411
    $color="yellow";
}
//if (($row3[classterm3] == "blank") && ($row3[classgrade3] == "blank") &&
($row3[math1411ready] == "0" )){
//    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for 1411 NO PREREQUISITES
//    }

} //close the while

print $color;
$color="gray"; //back to default gray color

print ">EE 1105* <br> EE1105 Lab</td>\n";

print " <td style=background-color:"; //*****CS1320
//check status of CS1320 taken, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//EE1105 has NO PREREQUISITES
$color="white"; //have not passed the class and CHECK prerequisite already taken and passed
then it is ready to enroll
if (($row3[class14] == "cs1320") && ($row3[classterm20] != "blank" )){
    if ( ($row3[classgrade14] == "A")||($row3[classgrade14] == "B")||($row3[classgrade14]
== "C")||($row3[classgrade14] == "TA")||($row3[classgrade14] == "TB")||($row3[classgrade14]
== "TC")||($row3[classgrade14] == "TCR")||($row3[classgrade14] == "P" ) ){
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits11=$credits11+3;
    }
}
}
//corequisite passed check needed ready to register CS1320, NO COREQUISITE FOR CS1320
//if (($row3[classgrade20] == "blank") && (($row3[classterm21] == "blank") &&
($row3[classgrade21] == "blank"))) || (($row3[classterm3] == "blank") && ($row3[classgrade3]
== "blank"))){
//    $color="yellow";
//    }
//PRerequisite MATH1508 passed check needed ready to register CS1320, MATH1508
if (($row3[class47] == "math1508") && ($row3[classgrade47] == "notpassed") &&
($row3[math1411ready] == "0" )){

```

```

        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for CS1320
    }

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print ">CS 1320* <br> Comp Prog</td>\n";

print " <td style=background-color:"; //*****PHYS2420
//check status of PHYS2420 taken, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//PHYS2420 has NO PREREQUISITES
$color="white"; //have not passed the class and CHECK prerequisite already taken and passed
then it is ready to enroll
if (($row3[class4] == "phys2420") && ($row3[classterm4] != "blank") ) {
    if ( ($row3[classgrade4] == "A")||($row3[classgrade4] == "B")||($row3[classgrade4] ==
"C")||($row3[classgrade4] == "TA")||($row3[classgrade4] == "TB")||($row3[classgrade4] ==
"TC")||($row3[classgrade4] == "TCR")||($row3[classgrade4] == "P") ) {
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
            $creditspassed=$creditspassed+4;
            $credits11=$credits11+4;
        }
    }
}

//corequisite passed check needed ready to register phys2420,COREQUISITE FOR phys2420 is
math1411
if ( ( ($row3[classgrade3] == "blank") && ($row3[classterm3] == "blank") ) || (
($row3[classgrade3] != "A") && ($row3[classgrade3] != "B") && ($row3[classgrade3] !=
"C")&&($row3[classgrade3] != "TA") && ($row3[classgrade3] != "TB") &&
($row3[classgrade3] != "TC")&& ($row3[classgrade3] != "TCR")&& ($row3[classgrade3] !=
"P") ) ) {
    $color="yellow";
}

//PRerequisite NONE passed check needed ready to register CS1320
//if (($row3[class47] == "math1508") && ($row3[classgrade47] == "notpassed") &&
($row3[math1411ready] == "0" )){
//    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for CS1320
//    }

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print ">PHYS 2420* <br> Intro Mech</td>\n";

```

```

print "    <td>26 Blank</td> \n";

print "    <td style=background-color:"; //*****UNIV1301
//check status of UNIV1301 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//UNIV1301 has NO PREREQUISITES
$color="white"; //have not passed the class and CHECK prerequisite already taken and passed
then it is ready to enroll
if (($row3[class13] == "univ1301") && ($row3[classterm13] != "blank") ){
    if ( ($row3[classgrade13] == "A")||($row3[classgrade13] ==
"B")||($row3[classgrade13] == "C")||($row3[classgrade13] == "TA")||($row3[classgrade13] ==
"TB")||($row3[classgrade13] == "TCR")||($row3[classgrade13] == "P") ){
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade ABC
                                $creditspassed=$creditspassed+3;
                                $credits11=$credits11+3;
                                }
        }
//corequisite passed check needed ready to register univ1301,COREQUISITE FOR univ1301 is
NONE
//if (((($row3[classgrade3] == "blank") && ($row3[classterm3] == "blank")) ||
(($row3[classgrade3] != "A") && ($row3[classgrade3] != "B") && ($row3[classgrade3] !=
"C"))){
//            $color="yellow";
//            }
//PRerequisite is NONE passed check needed ready to register univ1301
//if (($row3[class47] == "math1508") && ($row3[classgrade47] == "notpassed") &&
($row3[math1411ready] == "0" )){
//            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for CS1320
//            }
                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print ">UNIV 1301* <br> Univ Sem</td>\n";

//credits for this semester
print "    <td>"; //passed credits from this semester so far
print "<font color=blue>";
print $credits11;
print "</font>";
print "<font color=black>";
print " of 18</td>\n";
print "    <td>Blank</td>\n";
print " </tr>\n"; //end of row

```

```

print " \n";
print "    <tr>\n"; //start new row
print "        <td>1st year, 2nd Sem</td>\n";

print "    <td style=background-color:"; //*****MATH1312
//check status of MATH1312 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//MATH1312 has math1411 as prerequisite
$color="white"; //have not passed the class and CHECK prerequisite already taken and passed
then it is ready to enroll
if (($row3[class15] == "math1312") && ($row3[classterm15] != "blank")){
    if ( ($row3[classgrade15] == "A")||($row3[classgrade15] == "B")||($row3[classgrade15]
== "C")||($row3[classgrade15] == "TA")||($row3[classgrade15] == "TB")||($row3[classgrade15]
== "TC")||($row3[classgrade15] == "TCR")||($row3[classgrade15] == "P") ) {
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade ABC
                                $creditspassed=$creditspassed+3;
                                $credits12=$credits12+3;
                                }
    }
//corequisite passed check needed ready to register math1312,COREQUISITE FOR math1312 is
NONE
//if (((($row3[classgrade3] == "blank") && ($row3[classterm3] == "blank"))) ||
(($row3[classgrade3] != "A") && ($row3[classgrade3] != "B") && ($row3[classgrade3] !=
"C"))) ){
//        $color="yellow";
//    }
//PRErequisite is math1411 passed check needed ready to register univ1301
if (((($row3[classgrade3] == "blank") && ($row3[classterm3] == "blank"))) || (
($row3[classgrade3] != "A") && ($row3[classgrade3] != "B") && ($row3[classgrade3] !=
"C")&&($row3[classgrade3] != "TA") && ($row3[classgrade3] != "TB") &&
($row3[classgrade3] != "TC")&& ($row3[classgrade3] != "TCR")&& ($row3[classgrade3] !=
"P") )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for CS1320
    }
} //close the while

print $color;
$color="gray"; //back to default gray color
print ">MATH 1312* <br> Calc 2</td>\n";

print "    <td style=background-color:"; //*****EE2369
//check status of EE2369 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {

```



```

//EE2369 has EE1305 as prerequisite and corequisite ee2169
//EE2369 has not been TAKEN and CHECK prerequisite already taken and not passed then it is
ready to enroll
if ( ( $row3[class27] == "ee2369") && ($row3[classterm27] == "blank") ) ||
($row3[classgrade27] == "blank") ){
    if (($row3[classgrade27] != "A") && ($row3[classgrade27] != "B") &&
($row3[classgrade27] != "C") && ($row3[classgrade27] != "TA") && ($row3[classgrade27] !=
"TB") && ($row3[classgrade27] != "TC") && ($row3[classgrade27] != "TCR") &&
($row3[classgrade27] != "P") ){
        $color = "white"; //this means the class has not been taken, or intended
and student got something different than A,B,C,TA,TB,TCR,P
    }
}

//check if taken and successfully passed
if (($row3[class27] == "ee2369") && ($row3[classterm27] != "blank") ){
    if (($row3[classgrade27] == "A")||($row3[classgrade27] == "B")||($row3[classgrade27]
== "C")||($row3[classgrade27] == "TA")||($row3[classgrade27] == "TB")||($row3[classgrade27]
== "TC")||($row3[classgrade27] == "TCR")||($row3[classgrade27] == "P") ) {
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits12=$credits12+3;
    }
}

//corequisite passed check needed ready to register ee2369 ,COREQUISITE FOR ee2369 is
ee2169
if ( ($color=="white") && (($row3[classgrade23] == "blank") && ($row3[classterm23] ==
"blank")) || ( ($row3[classgrade23] != "A") && ($row3[classgrade23] != "B") &&
($row3[classgrade23] != "C")&&($row3[classgrade23] != "TA") && ($row3[classgrade23] !=
"TB") && ($row3[classgrade23] != "TC")&& ($row3[classgrade23] != "TCR")&&
($row3[classgrade23] != "P") ) ) {
    $color="yellow";
}

//PRerequisite is ee1305 passed check needed ready to register EE2369
if (((($row3[classgrade21] == "blank") && ($row3[classterm21] == "blank")) || (
($row3[classgrade21] != "A") && ($row3[classgrade21] != "B") && ($row3[classgrade21] !=
"C") && ($row3[classgrade21] != "TA") && ($row3[classgrade21] != "TB") &&
($row3[classgrade21] != "TC")&& ($row3[classgrade21] != "TCR")&& ($row3[classgrade21]
!= "P") )) {
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee2369
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 2369* <br> Dig. Sys 1</td> \n";

```

```

print "    <td style=background-color:"; //*****EE2169

//check status of EE2169 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//EE2169 has EE1305 as prerequisite and corequisite ee2369
//EE2169 has not been TAKEN and CHECK prerequisite already taken and not passed then it is
ready to enroll
if ((( $row3[class23] == "ee2169") && ($row3[classterm23] == "blank")) ||
($row3[classgrade23] == "blank")) {
    if ( ($row3[classgrade23] != "A")&&($row3[classgrade23] !=
"B")&&($row3[classgrade23] != "C")&&($row3[classgrade23] !=
"TA")&&($row3[classgrade23] != "TB")&&($row3[classgrade23] != "TC")
&&($row3[classgrade23] != "TCR")&&($row3[classgrade23] != "P") ) {
        $color = "white"; //this means the class has not been taken, or intended
and student got something different than ABC
    }
}

//check if taken and successfully passed
if (( $row3[class23] == "ee2169") && ($row3[classterm23] != "blank") ) {
    if ( ($row3[classgrade23] == "A")||($row3[classgrade23] == "B")||($row3[classgrade23]
== "C")||($row3[classgrade23] == "TA")||($row3[classgrade23] == "TB")||($row3[classgrade23]
== "TC")||($row3[classgrade23] == "TCR")||($row3[classgrade23] == "P") ) {
        $color = "green"; //credit at UTEP already? if taken, second check
        passing grade ABC
        $creditspassed=$creditspassed+1;
        $credits12=$credits12+1;
    }
}

//corequisite passed check needed ready to register ee2169 ,COREQUISITE FOR ee2169 is
ee2369
if ( ($color=="white") && (( $row3[classgrade27] == "blank") && ($row3[classterm27] ==
"blank")) || ( ($row3[classgrade27] != "A") && ($row3[classgrade27] != "B") &&
($row3[classgrade27] != "C")&& ($row3[classgrade27] != "TA")&& ($row3[classgrade27] !=
"TB")&& ($row3[classgrade27] != "TC")&& ($row3[classgrade27] != "TCR")&&
($row3[classgrade27] != "P") ) ) {
    $color="yellow";
}

//PRerequisite is ee1305 passed check needed ready to register EE2369
if ((( $row3[classgrade21] == "blank") && ($row3[classterm21] == "blank")) || (
($row3[classgrade21] != "A") && ($row3[classgrade21] != "B") && ($row3[classgrade21] !=
"C") &&($row3[classgrade21] != "TA") && ($row3[classgrade21] != "TB") &&
($row3[classgrade21] != "TC")&& ($row3[classgrade21] != "TCR")&& ($row3[classgrade21]
!= "P") )){

```

```

        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee2369
    }

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color

print " >EE 2169* <br> EE2369 LAB</td>\n";

print " <td>34 blank</td>\n";

print " <td style=background-color: "; //*****PHYS2421

//check status of PHYS2421 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//PHYS2421 has PHYS2420 as prerequisite and corequisite math1312

//PHYS2421 has not been TAKEN or taken and not passed CHECK then it is ready to enroll
if ((( $row3[class5] == "phys2421") && ($row3[classterm5] == "blank" )) || ($row3[classgrade5]
== "blank" ) || ($row3[classgrade5] == "F" )) {
    if ( ($row3[classgrade5] != "A")&&($row3[classgrade5] != "B")&&($row3[classgrade5]
!= "C")&&($row3[classgrade5] != "TA")&&($row3[classgrade5] !=
"TB")&&($row3[classgrade5] != "TC")&&($row3[classgrade5] !=
"TCR")&&($row3[classgrade5] != "P" )) {
        $color="white"; //this means the class has not been taken, or intended
and student got something different than ABC
    }
}

//check if taken and successfully passed
if (( $row3[class5] == "phys2421") && ($row3[classterm5] != "blank" )) {
    if ( ($row3[classgrade5] == "A") || ($row3[classgrade5] == "B") || ($row3[classgrade5] ==
"C") || ($row3[classgrade5] == "TA") || ($row3[classgrade5] == "TB") || ($row3[classgrade5] ==
"TC") || ($row3[classgrade5] == "TCR") || ($row3[classgrade5] == "P" )) {
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABCTATBTCTCRP
        $creditspassed=$creditspassed+4;
        $credits12=$credits12+4;
    }
}

//corequisite passed check needed ready to register phys2421 ,COREQUISITE FOR phys2421 is
math1312 class15 ****check logic for coorequisite
if ($color=="white") {

```

```

        if ( (($row3[classgrade15] == "blank") && ($row3[classterm15] ==
"blank")) || ( ($row3[classgrade15] != "A") && ($row3[classgrade15] != "B") &&
($row3[classgrade15] != "C")&&($row3[classgrade15] != "TA") && ($row3[classgrade15] !=
"TB") && ($row3[classgrade15] != "TC")&& ($row3[classgrade15] != "TCR")&&
($row3[classgrade15] != "P") ) ) {
            $color="yellow";
        }
    }
//PRErequisite is phys2420 passed check needed ready to register phys2421
if (((($row3[classgrade4] == "blank") && ($row3[classterm4] == "blank")) || (
($row3[classgrade4] != "A") && ($row3[classgrade4] != "B") && ($row3[classgrade4] !=
"C")&&($row3[classgrade4] != "TA") && ($row3[classgrade4] != "TB") &&
($row3[classgrade4] != "TC")&& ($row3[classgrade4] != "TCR")&& ($row3[classgrade4] !=
"P") ) )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for phys2421
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">PHYS 2421* <br>Fld & Waves";
print $color;
print "</td>\n";

print " <td style=background-color:"; //*****RWS1301/ENGL1311
//check status of RWS1301/ENGL1311 taken?, in progress or not taken ***this needs to be
check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ENGL1311 has English TEST as prerequisite and corequisite NONE
//PENGL1311 has not been TAKEN or taken and or taken and not passed CHECK then it is
ready to enroll due to eng readiness ($row3[engl1311ready] == "1")
if (((($row3[class1] == "ENGL1311") && ($row3[classterm1] == "blank") &&
($row3[engl1311ready] == "1")) || ($row3[classgrade1] == "blank") )){
    if ( ($row3[classgrade1] != "A")&&($row3[classgrade1] !=
"B")&&($row3[classgrade1] != "C")&&($row3[classgrade1] != "TA")&&($row3[classgrade1]
!= "TB")&&($row3[classgrade1] != "TC")&&($row3[classgrade1] !=
"TCR")&&($row3[classgrade1] != "P") )){
        $color="white"; //this means the class has not been taken, or intended
and student got something different than ABC
    }
}
}

//check if taken and successfully passed
if (($row3[class1] == "ENGL1311") && ($row3[classterm1] != "blank") ){

```

```

        if (($row3[classgrade1] == "A")||($row3[classgrade1] == "B")||($row3[classgrade1] ==
"C")||($row3[classgrade1] == "TA")||($row3[classgrade1] == "TB")||($row3[classgrade1] ==
"TC")||($row3[classgrade1] == "TCR")||($row3[classgrade1] == "P") ) {
            $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
                $creditspassed=$creditspassed+3;
                $credits12=$credits12+3;
            }
        }
//corequisite passed check needed ready to register ENGL1311 ,COREQUISITE FOR
ENGL1311 is none
//if ( ($color=="white") && (($row3[classgrade15] == "blank") && ($row3[classgrade15] ==
"blank")) || (($row3[classgrade15] != "A") && ($row3[classgrade15] != "B") &&
($row3[classgrade15] != "C")) ) {
//            $color="yellow";
//        }
//PRErequisite is passing th English test for this we use the following drop box
$row3[engl1311ready] == "0")
if (($row3[engl1311ready] == "0")){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for phys2421
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">RWS 1301*<br> Rhett Cmp 1</td></td> \n";

print " <td style=background-color: "; //*****HIST 1301

//check status of HIST 1301 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//HIST 1301 has NONE as prerequisite and corequisite NONE
$color="white"; //Since there is no prerequisite
//PENGL1311 has not been TAKEN or taken and or taken and not passed CHECK then it is
ready to enroll due to eng readiness ($row3[engl1311ready] == "1")
if (((($row3[class8] == "hist1301") && ($row3[class8term] == "blank")) || ($row3[classgrade8]
== "blank")) ) {
    if ( ($row3[classgrade8] != "A")&&($row3[classgrade8] !=
"B")&&($row3[classgrade8] != "C")&&($row3[classgrade8] != "TA")&&($row3[classgrade8]
!= "TB")&&($row3[classgrade8] != "TC")&&($row3[classgrade8] !=
"TCR")&&($row3[classgrade8] != "P")) {
        $color="white"; //this means the class has not been taken, or intended
and student got something different than ABC
    }
}
}

```

```

//check if taken and successfully passed
if (($row3[class8] == "hist1301") && ($row3[classterm8] != "blank") ){
    if ( ($row3[classgrade8] == "A")||($row3[classgrade8] == "B")||($row3[classgrade8] ==
"C")||($row3[classgrade8] == "TA")||($row3[classgrade8] == "TB")||($row3[classgrade8] ==
"TC")||($row3[classgrade8] == "TCR")||($row3[classgrade8] == "P") ){
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits12=$credits12+3;
    }
}

//corequisite passed check needed ready to register hist1301 ,COREQUISITE FOR hist1301 is
none
//if ( $color=="white") && (($row3[classgrade15] == "blank") && ($row3[classterm15] ==
"blank")) || (($row3[classgrade15] != "A") && ($row3[classgrade15] != "B") &&
($row3[classgrade15] != "C")) ){
    //        $color="yellow";
    //    }
//PRErequisite is NONE
//if (($row3[engl1311ready] == "0")){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for phys2421
//    }

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print ">HIST 1301*<br> US Hist 1</td>\n";

print " <td>"; //passed credits from this semester so far
print "<font color=blue>";
print $credits12;
print "</font>";
print "<font color=black>";
print " of 17</td>\n";

print " <td>39</td>\n";
print " </tr>\n";
print " <tr>\n";
print " <td>2nd year, 1st Sem</td>\n";
print " <td style=background-color:"; //***** math2326

//check status of math2326 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//math2326 has math 1312 as prerequisite and corequisite NONE

```

```

//PENGL1311 has not been TAKEN or taken and or taken and not passed CHECK then it is
ready to enroll due to eng readiness ($row3[engl1311ready] == "1")
if ((($row3[class17] == "math2326") && ($row3[classterm17] == "blank")) ||
($row3[classgrade17] == "blank")){
    if ( ($row3[classgrade27] != "A")&&($row3[classgrade17] !=
"B")&&($row3[classgrade17] != "C")&&($row3[classgrade27] !=
"TA")&&($row3[classgrade17] != "TB")&&($row3[classgrade17] !=
"TC")&&($row3[classgrade17] != "TCR")&&($row3[classgrade17] != "P")){
        $color="white"; //this means the class has not been taken, or intended
and student got something different than ABC
    }
}

//check if taken and successfully passed
if (($row3[class17] == "math2326") && ($row3[classterm17] != "blank")){
    if ( ($row3[classgrade17] == "A")||($row3[classgrade17] == "B")||($row3[classgrade17]
== "C")||($row3[classgrade17] == "TA")||($row3[classgrade17] == "TB")||($row3[classgrade17]
== "TC")||($row3[classgrade17] == "TCR")||($row3[classgrade17] == "P")){
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits21=$credits21+3;
    }
}

//corequisite passed check needed ready to register math2326 ,COREQUISITE FOR math2326 is
none
//if ( ($color=="white") && (($row3[classgrade15] == "blank") && ($row3[classterm15] ==
"blank")) || (($row3[classgrade15] != "A") && ($row3[classgrade15] != "B") &&
($row3[classgrade15] != "C"))) ){
    //      $color="yellow";
    //      }

//PRErequisite is math1312(class15 on db) passed check needed ready to register math2326
if ( ( ($row3[classgrade15] == "blank") && ($row3[classterm15] == "blank")) || (
($row3[classgrade15] != "A") && ($row3[classgrade15] != "B") && ($row3[classgrade15] !=
"C") && ($row3[classgrade15] != "TA") && ($row3[classgrade15] != "TB") &&
($row3[classgrade15] != "TC")&& ($row3[classgrade15] != "TCR")&& ($row3[classgrade15]
!= "P")) ){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for math2326
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">MATH 2326*<br> Diff Eq.</td>\n";

print " <td style=background-color:"; //***** ee2350
//check status of ee2350 taken?, in progress or not taken ***this needs to be check again

```

```

$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee2350 has (2 prerequisites: ee1305, math1312) and (2 corequisites:math2326, phys2421)
//PENGL1311 has not been TAKEN or taken and or taken and not passed CHECK then it is
ready to enroll due to eng readiness ($row3[engl1311ready] == "1")
if (((($row3[class24] == "ee2350") && ($row3[classterm24] == "blank"))) ||
($row3[classgrade24] == "blank")) {
    if ( ($row3[classgrade24] != "A")&&($row3[classgrade24] !=
"B")&&($row3[classgrade24] != "C")&&($row3[classgrade24] !=
"TA")&&($row3[classgrade24] != "TB")&&($row3[classgrade24] !=
"TC")&&($row3[classgrade24] != "TCR")&&($row3[classgrade24] != "P") ) {
        $color="white"; //this means the class has not been taken, or intended
and student got something different than ABC
    }
}
//check if taken and successfully passed
if (($row3[class24] == "ee2350") && ($row3[classterm24] != "blank") ) {
    if ( ($row3[classgrade24] == "A")||($row3[classgrade24] == "B")||($row3[classgrade24]
== "C")||($row3[classgrade24] == "TA")||($row3[classgrade24] == "TB")||($row3[classgrade24]
== "TC")||($row3[classgrade24] == "TCR")||($row3[classgrade24] == "P") ) {
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits21=$credits21+3;
    }
}
//corequisite passed check needed ready to register COREQUISITE FOR ee2350 are: math2326-
class17, phys2421-class5
if ( ($color=="white") && (($row3[classgrade17] == "blank") && ($row3[classterm17] ==
"blank"))) || ( ($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") &&
($row3[classgrade17] != "C")&&($row3[classgrade17] != "TA") && ($row3[classgrade17] !=
"TB") && ($row3[classgrade17] != "TC")&& ($row3[classgrade17] != "TCR")&&
($row3[classgrade17] != "P") ) ) {
    $color="yellow";
}
//phys2421-class5 coorequisite check
if ( ($color=="white" || $color=="yellow") && (($row3[classgrade5] == "blank") &&
($row3[classterm5] == "blank"))) || ( ($row3[classgrade5] != "A") && ($row3[classgrade5] !=
"B") && ($row3[classgrade5] != "C")&&($row3[classgrade5] != "TA") &&
($row3[classgrade5] != "TB") && ($row3[classgrade5] != "TC")&& ($row3[classgrade5] !=
"TCR")&& ($row3[classgrade5] != "P") ) ) {
    $color="yellow";
}
//PREquisites are math1312(class15 on db) and ee1305 (class21 on db) passed check needed
ready to register math2326

```



```

if ((($row3[classgrade15] == "blank") && ($row3[classterm15] == "blank")) || (
($row3[classgrade15] != "A") && ($row3[classgrade15] != "B") && ($row3[classgrade15] !=
"C")&&($row3[classgrade15] != "TA") && ($row3[classgrade15] != "TB") &&
($row3[classgrade15] != "TC")&& ($row3[classgrade15] != "TCR")&& ($row3[classgrade15]
!= "P") )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for math2326
}
//ee1305 (class21 on db)
    if ((($row3[classgrade21] == "blank") && ($row3[classterm21] == "blank")) || (
($row3[classgrade21] != "A") && ($row3[classgrade21] != "B") && ($row3[classgrade21] !=
"C")&&($row3[classgrade21] != "TA") && ($row3[classgrade21] != "TB") &&
($row3[classgrade21] != "TC") && ($row3[classgrade21] != "TCR")&& ($row3[classgrade21]
!= "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for math2326
    }
} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 2350*<br> Circuits 1</td> \n";

print " <td style=background-color: "; //***** ee2372 --class28 db

//check status of ee2372 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee2372 has (1 prerequisites: cs1320 class14) and (0 corequisites:)
//
if ((($row3[class28] == "ee2372") && ($row3[classterm28] == "blank")) ||
($row3[classgrade28] == "blank")){
    if ( ($row3[classgrade28] != "A")&&($row3[classgrade28] !=
"B")&&($row3[classgrade28] != "C")&&($row3[classgrade28] !=
"TA")&&($row3[classgrade28] != "TB")&&($row3[classgrade28] !=
"TC")&&($row3[classgrade28] != "TCR") &&($row3[classgrade28] != "P") ) {
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC
    }
}

//check if taken and successfully passed
if (($row3[class28] == "ee2372") && ($row3[classterm28] != "blank")) {
    if ( ($row3[classgrade28] == "A")||($row3[classgrade28] == "B")||($row3[classgrade28]
== "C")||($row3[classgrade28] == "TA")||($row3[classgrade28] == "TB")||($row3[classgrade28]
== "TC")||($row3[classgrade28] == "TCR")||($row3[classgrade28] == "P") ) {
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
    }
}

```

```

        $creditspassed=$creditspassed+3;
        $credits21=$credits21+3;
    }
}
//corequisite check section
// passed check needed ready to register COREQUISITE FOR ee2350 are: none
//if ( ($color=="white") && (($row3[classgrade17] == "blank") && ($row3[classterm17] ==
"blank")) || (($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") &&
($row3[classgrade17] != "C")) ) {
//      $color="yellow";
//      }

//PRErequisites check section
// ee2372 has (1 prerequisites: cs1320 class14) passed check needed ready to register ee2372
if (((($row3[classgrade14] == "blank") && ($row3[classterm14] == "blank")) || (
($row3[classgrade14] != "A") && ($row3[classgrade14] != "B") && ($row3[classgrade14] !=
"C")&&($row3[classgrade14] != "TA") && ($row3[classgrade14] != "TB") &&
($row3[classgrade14] != "TC")&& ($row3[classgrade14] != "TCR")&& ($row3[classgrade14]
!= "P") )) {
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for math2326
    }
} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 2372*<br> Soft. Design 1</td>\n";

print " <td>44- blank</td>\n";

/*****
*****DB
//this cell will require to extract the information of db history and brief description from class db
(prerequisite to
//this science class are math1508 for 3 of the options and for the 4th one is math1411
print " <td style=background-color:";
//pick color

$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee2372 has (1 prerequisites: math1508 class47 or math1411 class3 ) and (0 corequisites:)
//get the class taken and put it in a variable
$varclass19=$row3[class19];

if (((($row3[class19] == "chem1305")||($row3[class19] == "biol1305")||($row3[class19] ==
"math2300") )&& ($row3[classterm19] == "blank")) || ($row3[classgrade19] == "blank")) {

```

```

        if ( ($row3[classgrade19] != "A")&&($row3[classgrade19] !=
" B")&&($row3[classgrade19] != "C")&&($row3[classgrade19] !=
"TA")&&($row3[classgrade19] != "TB")&&($row3[classgrade19] !=
"TC")&&($row3[classgrade19] != "TCR")&&($row3[classgrade19] != "P") ) {
            $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC
        }
    }
//check if taken and successfully passed
if (((($row3[class19] == "chem1305")||($row3[class19] == "biol1305")||($row3[class19] ==
"math2300")) && ($row3[classterm19] != "blank"))){
    if ( ($row3[classgrade19] == "A")||($row3[classgrade19] == "B")||($row3[classgrade19]
== "C")||($row3[classgrade19] == "TA")||($row3[classgrade19] == "TB")||($row3[classgrade19]
== "TC")||($row3[classgrade19] == "TCR")||($row3[classgrade19] == "P") ) {
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits21=$credits21+3;
    }
}
//corequisite check section
// passed check needed ready to register COREQUISITE FOR ee2350 are: none
//if ( ($color=="white") && (($row3[classgrade17] == "blank") && ($row3[classterm17] ==
"blank")) || (($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") &&
($row3[classgrade17] != "C")) ) {
//        $color="yellow";
//    }

//PRerequisites check section
// ee2372 has (1 prerequisites: math1508 class47 or math1411 class3) passed check needed ready
to register Choose SCI
if (((($row3[classgrade3] == "blank") && ($row3[classterm3] == "blank")) || (
($row3[classgrade3] != "A") && ($row3[classgrade3] != "B") && ($row3[classgrade3] !=
"C")&&($row3[classgrade3] != "TA") && ($row3[classgrade3] != "TB") &&
($row3[classgrade3] != "TC")&& ($row3[classgrade3] != "TCR")&& ($row3[classgrade3] !=
"P") )) {
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for Choose SCI
}

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print ">"; //finish picking the color of the cell

//display the class picked if none was picked the print Choose Sci

```

```

if ($varclass19=="blank"){
    print "Choose Sci";
}

else {
    echo $varclass19;
}

print "<br>";

$sql4 = "SELECT * FROM `bsee` WHERE `classcode`='$varclass19' "; //select record of
current user on Mysql
$result4 = $conn->query($sql4);
while ($row4 = $result4->fetch_assoc()) {
    echo $row4[classname];
}
print "<br><u> DB </u>";
print "</td>\n";

/*****
*****DB

print "    <td style=background-color:"; //***** rws1302/ENGL1312 --class2 db
//check status of ee2372 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
    //rws1302/ENGL1312 has (1 prerequisites: rws1302/ENGL1312 class1) and (0 corequisites:)
    //rws1302/ENGL1312 has not been TAKEN or taken and or taken and not passed CHECK
    if (((($row3[class2] == "ENGL1312") && ($row3[classterm2] == "blank")) ||
    ($row3[classgrade2] == "blank")) ){
        if ( ($row3[classgrade2] != "A")&&($row3[classgrade2] !=
        "B")&&($row3[classgrade2] != "C")&&($row3[classgrade2] != "TA")&&($row3[classgrade2]
        != "TB")&&($row3[classgrade2] != "TC")&&($row3[classgrade2] !=
        "TCR")&&($row3[classgrade2] != "P")) ){
            $color="white"; //this means the class has not been taken, or if intended
            and student got something different than ABC
        }
    }
    //check if taken and successfully passed
    if (((($row3[class2] == "ENGL1312") && ($row3[classterm2] != "blank")) ){
        if ( ($row3[classgrade2] == "A")||($row3[classgrade2] == "B")||($row3[classgrade2] ==
        "C")||($row3[classgrade2] == "TA")||($row3[classgrade2] == "TB")||($row3[classgrade2] ==
        "TC")||($row3[classgrade2] == "TCR")||($row3[classgrade2] == "P")) ){
            $color="green"; //credit at UTEP already? if taken, second check
            passing grade ABC
            $creditspassed=$creditspassed+3;
            $credits21=$credits21+3;

```

```

    }
}
//corequisite check section
// passed check needed ready to register COREQUISITE FOR ee2350 are: none
//if ( ($color=="white") && (($row3[classgrade17] == "blank") && ($row3[classterm17] ==
"blank")) || (($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") &&
($row3[classgrade17] != "C"))) {
//      $color="yellow";
//      }
//PRerequisites check section
// ENGL1312 has (1 prerequisites: ENGL1311 class1) passed check needed ready to register
ENGL1312
if (((($row3[classgrade1] == "blank") && ($row3[classterm1] == "blank")) || (
($row3[classgrade1] != "A") && ($row3[classgrade1] != "B") && ($row3[classgrade1] !=
"C"))&&($row3[classgrade1] != "TA") && ($row3[classgrade1] != "TB") &&
($row3[classgrade1] != "TC"))&& ($row3[classgrade1] != "TCR"))&& ($row3[classgrade1] !=
"P") )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for math2326
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print " >RWS 1302*<br> Rhet Cmp 2</td> \n";

print " <td>47-blank</td>\n";

print " <td>"; //passed credits from 2nd year 1st semester
print "<font color=blue>";
print $credits21;
print "</font>";
print "<font color=black>";
print " of 15</td>\n";

print " <td>49</td>\n";
print " </tr>\n";
print " <tr>\n";

print " <td>2nd year, 2nd Sem</td>\n";

print " <td style=background-color:"; //***** math2313 --class16 db
//check status of MATH2313 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//MATH2313 has (1 prerequisites: MATH1312 class15) and (0 corequisites:)
//MATH2313 has not been TAKEN or taken and or taken and not passed CHECK

```

```

if ((($row3[class16] == "math2313") && ($row3[classterm16] == "blank")) ||
($row3[classgrade16] == "blank")) {
    if ( ($row3[classgrade16] != "A")&&($row3[classgrade16] !=
"B")&&($row3[classgrade16] != "C")&&($row3[classgrade16] !=
"TA")&&($row3[classgrade16] != "TB")&&($row3[classgrade16] !=
"TC")&&($row3[classgrade16] != "TCR")&&($row3[classgrade16] != "P")) {
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC
    }
}
//check if taken and successfully passed
if (($row3[class16] == "math2313") && ($row3[classterm16] != "blank")) {
    if ( ($row3[classgrade16] == "A")||($row3[classgrade16] == "B")||($row3[classgrade16]
== "C")||($row3[classgrade16] == "TA")||($row3[classgrade16] == "TB")||($row3[classgrade16]
== "TC")||($row3[classgrade16] == "TCR") ||($row3[classgrade16] == "P")) {
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits22=$credits22+3;
    }
}
//COrequisite check section
// passed check needed ready to register COREQUISITE FOR ee2350 are: none
//if ( ($color=="white") && (($row3[classgrade17] == "blank") && ($row3[classterm17] ==
"blank")) || (($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") &&
($row3[classgrade17] != "C"))) {
//        $color="yellow";
//    }

//PRErequisites check section
// math2313 has (1 prerequisites: math1312 class15) passed check needed ready to register
math2313
if ((($row3[classgrade15] == "blank") && ($row3[classterm15] == "blank")) || (
($row3[classgrade15] != "A") && ($row3[classgrade15] != "B") && ($row3[classgrade15] !=
"C")&&($row3[classgrade15] != "TA") && ($row3[classgrade15] != "TB") &&
($row3[classgrade15] != "TC")&& ($row3[classgrade15] != "TCR") && ($row3[classgrade15]
!= "P")) {
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for math2326
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">MATH 2313*<br> Calc. 3</td>\n";

print " <td style=background-color:"; //***** ee2351 --class25 db

```

```

//check status of ee2351 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee2351 has (3 prerequisites: ee2350 class24, math2326 class17, phys2421 class4) and (1
corequisites: ee2151 class22)
//ee2351 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class25] == "ee2351") && ($row3[classterm25] == "blank")) ||
($row3[classgrade25] == "blank"))){
    if ( ($row3[classgrade25] != "A")&&($row3[classgrade25] !=
"B")&&($row3[classgrade25] != "C")&&($row3[classgrade25] !=
"TA")&&($row3[classgrade25] != "TB")&&($row3[classgrade25] !=
"TC")&&($row3[classgrade25] != "TCR")&&($row3[classgrade25] != "P") )){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC
    }
}

//check if taken and successfully passed
if (($row3[class25] == "ee2351") && ($row3[classterm25] != "blank") ){
    if ( ($row3[classgrade25] == "A")||($row3[classgrade25] == "B")||($row3[classgrade25]
== "C")||($row3[classgrade25] == "TA")||($row3[classgrade25] == "TB")||($row3[classgrade25]
== "TC")||($row3[classgrade25] == "TCR")||($row3[classgrade25] == "P") ){
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits22=$credits22+3;
    }
}

//Corequisite check section
// passed check needed ready to register 1to ee2351 corequisites: ee2151 class22
if ( ($color=="white") && (($row3[classgrade22] == "blank") && ($row3[classterm22] ==
"blank")) || ( ($row3[classgrade22] != "A") && ($row3[classgrade22] != "B") &&
($row3[classgrade22] != "C")&&($row3[classgrade22] != "TA") && ($row3[classgrade22] !=
"TB") && ($row3[classgrade22] != "TC") && ($row3[classgrade22] != "TCR") &&
($row3[classgrade22] != "P") ) ){
    $color="yellow";
}

//PREquisites check section
// ee2351 has (3 prerequisites: ee2350 class24, math2326 class17, phys2421 class4) passed check
needed ready to register ee2351
if (((($row3[classgrade24] == "blank") && ($row3[classterm24] == "blank")) || (
($row3[classgrade24] != "A") && ($row3[classgrade24] != "B") && ($row3[classgrade24] !=
"C")&&($row3[classgrade24] != "TA") && ($row3[classgrade24] != "TB") &&
($row3[classgrade24] != "TC")&& ($row3[classgrade24] != "TCR")&& ($row3[classgrade24]
!= "P") ))){
    $color="gray"; //have not passed the class ee2350 class24 and check for
prerequisite not passed not ready for ee2351
}

```

```

    }
    if ((($row3[classgrade17] == "blank") && ($row3[classterm17] == "blank")) || (
($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") && ($row3[classgrade17] !=
"C")&&($row3[classgrade17] != "TA") && ($row3[classgrade17] != "TB") &&
($row3[classgrade17] != "TC") && ($row3[classgrade17] != "TCR")&& ($row3[classgrade17]
!= "P")) ){
        $color="gray"; //have not passed the class math2326 class17 and check for
prerequisite not passed not ready for ee2351
    }
    if ((($row3[classgrade4] == "blank") && ($row3[classterm4] == "blank")) || (
($row3[classgrade4] != "A") && ($row3[classgrade4] != "B") && ($row3[classgrade4] != "C")
&&($row3[classgrade4] != "TA") && ($row3[classgrade4] != "TB") && ($row3[classgrade4]
!= "TC") && ($row3[classgrade4] != "TCR")&& ($row3[classgrade4] != "P")) ){
        $color="gray"; //have not passed the class phys2421 class4 and check for
prerequisite not passed not ready for ee2351
    }

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print " >EE 2351*<br> Circuits 2</td> \n";

print " <td style=background-color: "; //***** ee2151 --class25 db
//check status of ee2151 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee2151 has (1 prerequisites: ee1105 class20) and (1 corequisites: ee2351 class25)
//ee2151 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class22] == "ee2151") && ($row3[classterm22] == "blank")) ||
($row3[classgrade22] == "blank")) ){
    if ( ($row3[classgrade22] != "A")&&($row3[classgrade22] !=
"B")&&($row3[classgrade22] != "C") && ($row3[classgrade22] !=
"TA")&&($row3[classgrade22] != "TB")&&($row3[classgrade22] !=
"TC")&&($row3[classgrade22] != "TCR")&&($row3[classgrade22] != "P")) ){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC
    }
}

//check if taken and successfully passed
if (($row3[class22] == "ee2151") && ($row3[classterm22] != "blank")) {
    if ( ($row3[classgrade22] == "A")||($row3[classgrade22] == "B")||($row3[classgrade22]
== "C")||($row3[classgrade22] == "TA")||($row3[classgrade22] == "TB")||($row3[classgrade22]
== "TC")||($row3[classgrade22] == "TCR")||($row3[classgrade22] == "P")) ){
        $color="green"; //credit at UTEP already? if taken, second check
    }
}

passing grade ABC
        $creditspassed=$creditspassed+1;
        $credits22=$credits22+1;

```



```

    }
}
//COrequisite check section
// passed check needed ready to register to ee2151 1 corequisites: ee2351 class25
if ( ($color=="white") && (($row3[classgrade25] == "blank") && ($row3[classterm25] ==
"blank"))) || ( ($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") &&
($row3[classgrade25] != "C") &&($row3[classgrade25] != "TA") && ($row3[classgrade25] !=
"TB") && ($row3[classgrade25] != "TC") && ($row3[classgrade25] != "TCR") &&
($row3[classgrade25] != "P") ) ) {
    $color="yellow";
}
//PRErequisites check section
// ee2351 has (1 prerequisites: ee1105 class20) passed check needed ready to register ee2351
if (((($row3[classgrade20] == "blank") && ($row3[classterm20] == "blank"))) || (
($row3[classgrade20] != "A") && ($row3[classgrade20] != "B") && ($row3[classgrade20] !=
"C")&&($row3[classgrade20] != "TA") && ($row3[classgrade20] != "TB") &&
($row3[classgrade20] != "TC") && ($row3[classgrade20] != "TCR")&& ($row3[classgrade20]
!= "P") )) {
    $color="gray"; //have not passed the class ee1105 class20 and check for
prerequisite not passed not ready for ee2351
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print " >EE 2151* <br> EE2351 Lab</td>\n";

print " <td style=background-color:"; //***** ee2353 --class26 db
//check status of ee2353 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee2353 has (3 prerequisites: ee2350 class24, math1312 class15, math2326 class17) and (1
corequisites: ee2351 class25)
//ee2353 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class26] == "ee2353") && ($row3[classterm26] == "blank"))) ||
($row3[classgrade26] == "blank")) {
    if ( ($row3[classgrade26] != "A")&&($row3[classgrade26] !=
"B")&&($row3[classgrade26] != "C")&&($row3[classgrade26] !=
"TA")&&($row3[classgrade26] != "TB")&&($row3[classgrade26] !=
"TC")&&($row3[classgrade26] != "TCR")&&($row3[classgrade26] != "P") ) {
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC
    }
}
}
//check if taken and successfully passed
if (((($row3[class26] == "ee2353") && ($row3[classterm26] != "blank")) ) {

```

```

        if ( ($row3[classgrade26] == "A")||($row3[classgrade26] == "B")||($row3[classgrade26]
== "C")||($row3[classgrade26] == "TA")||($row3[classgrade26] == "TB")||($row3[classgrade26]
== "TC")||($row3[classgrade26] == "TCR")||($row3[classgrade26] == "P") ) {
            $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
                $creditspassed=$creditspassed+3;
                $credits22=$credits22+3;
            }
        }
//Corequisite check section
// passed check needed ready to register to ee2151 1 corequisites: ee2351 class25
if ( ($color=="white") && (($row3[classgrade25] == "blank") && ($row3[classterm25] ==
"blank")) || ( ($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") &&
($row3[classgrade25] != "C")&&($row3[classgrade25] != "TA") && ($row3[classgrade25] !=
"TB") && ($row3[classgrade25] != "TC") && ($row3[classgrade25] != "TCR")&&
($row3[classgrade25] != "P") ) ) {
    $color="yellow";
}
//PREquisites check section
// ee2353 has (3 prerequisites: ee2350 class24, math1312 class15, math2326 class17) passed
check needed ready to register ee2353
if (((($row3[classgrade24] == "blank") && ($row3[classterm24] == "blank")) || (
($row3[classgrade24] != "A") && ($row3[classgrade24] != "B") && ($row3[classgrade24] !=
"C")&&($row3[classgrade24] != "TA") && ($row3[classgrade24] != "TB") &&
($row3[classgrade24] != "TC") && ($row3[classgrade24] != "TCR") && ($row3[classgrade24]
!= "P") )) {
    $color="gray"; //have not passed the class ee2350 class24 and check for
prerequisite not passed not ready for ee2353
}
if (((($row3[classgrade15] == "blank") && ($row3[classterm15] == "blank")) || (
($row3[classgrade15] != "A") && ($row3[classgrade15] != "B") && ($row3[classgrade15] !=
"C")&&($row3[classgrade15] != "TA") && ($row3[classgrade15] != "TB") &&
($row3[classgrade15] != "TC")&& ($row3[classgrade15] != "TCR")&& ($row3[classgrade15]
!= "P") )) {
    $color="gray"; //have not passed the class ee1105 class20 and check for
prerequisite not passed not ready for ee2353
}
if (((($row3[classgrade17] == "blank") && ($row3[classterm17] == "blank")) || (
($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") && ($row3[classgrade17] !=
"C")&&($row3[classgrade17] != "TA") && ($row3[classgrade17] != "TB") &&
($row3[classgrade17] != "TC") && ($row3[classgrade17] != "TCR")&& ($row3[classgrade17]
!= "P") )) {
    $color="gray"; //have not passed the class math2326 class17 and check for
prerequisite not passed not ready for ee2353
}
} //close the while

```

```

print $color;
$color="gray"; //back to default gray color
print " >EE 2353* <br> C.T. Signal</td>\n";

print " <td>55-blank</td>\n";
//*****
*****2 DB start
//this next class needs to be pulled from the table studenthistory and the short description from
table bsee
//print " <td style=background-color:pink >class7 Art <br>Get from dB</td> \n";

print " <td style=background-color:";
//pick color

$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee2372 has (0 prerequisites: 0 ) and (0 corequisites:)
//get the class taken and put it in a variable
$varclass7=$row3[class7];

if (((($row3[class7] == "art1300"))||($row3[class7] == "arth1305"))||($row3[class7] ==
"arth1306"))||($row3[class7] == "danc1304"))||($row3[class7] == "film1390"))||($row3[class7] ==
"musl1321"))||($row3[class7] == "musl1324"))||($row3[class7] == "musl1327"))||($row3[class7]
== "thea1313"))||($row3[class7] == "blank"))&& ($row3[class7] == "blank") )||
($row3[classgrade7] == "blank") ){
    if (($row3[classgrade7] != "A")&&($row3[classgrade7] != "B")&&($row3[classgrade7]
!= "C")&&($row3[classgrade7] != "TA")&&($row3[classgrade7] !=
"TB")&&($row3[classgrade7] != "TC")&&($row3[classgrade7] !=
"TCR")&&($row3[classgrade7] != "P") ){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC
    }
}

//check if taken and successfully passed
if (($row3[class7] == "art1300"))||($row3[class7] == "arth1305"))||($row3[class7] ==
"arth1306"))||($row3[class7] == "danc1304"))||($row3[class7] == "film1390"))||($row3[class7] ==
"musl1321"))||($row3[class7] == "musl1324"))||($row3[class7] == "musl1327"))||($row3[class7]
== "thea1313")){
    if ( ($row3[classgrade7] == "A")||($row3[classgrade7] == "B")||($row3[classgrade7] ==
"C")||($row3[classgrade7] == "TA")||($row3[classgrade7] == "TB")||($row3[classgrade7] ==
"TC")||($row3[classgrade7] == "TCR")||($row3[classgrade7] == "P") ){
        $color="green"; //credit at UTEP already? if taken, second check
    }
}

passing grade ABC
$creditspassed=$creditspassed+3;
$credits22=$credits22+3;

```

```

    }
}
//corequisite check section
// passed check needed ready to register COREQUISITE FOR ee2350 are: none
//if ( ($color="white") && (($row3[classgrade17] == "blank") && ($row3[classterm17] ==
"blank")) || (($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") &&
($row3[classgrade17] != "C"))) {
//      $color="yellow";
//      }
//PRerequisites check section
// ee2372 has (0 prerequisites: ) passed check needed ready to register Choose SCI
//if (((($row3[classgrade3] == "blank") && ($row3[classterm3] == "blank")) ||
(($row3[classgrade3] != "A") && ($row3[classgrade3] != "B") && ($row3[classgrade3] !=
"C")))) {
//      $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for Choose SCI
//      }

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print ">"; //finish picking the color of the cell

//display the class picked if none was picked the print Choose Art
if ($varclass7=="blank"){
    print "Choose Sci";
                                                                    }
    else {
        echo $varclass7;
    }
print "<br>";

$sql4 = "SELECT * FROM `bsee` WHERE `classcode`='$varclass7' "; //select record of current
user on Mysql
$result4 = $conn->query($sql4);
while ($row4 = $result4->fetch_assoc()) {
    echo $row4[classname];
}
print "<u> dB </u>";
print "</td>\n";

//*****
*****2 DB End

print "    <td style=background-color:"; //***** hist1302 --class9 db
//check status of hist1302 taken?, in progress or not taken ***this needs to be check again

```

```

$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//hist1302 has (0 prerequisites: ) and (0 corequisites: )
$color="white"; //Since there is no prerequisite
//hist1302 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class9] == "hist1302") && ($row3[classterm9] == "blank"))) || ($row3[classgrade9]
== "blank"))){
    if ( ($row3[classgrade9] != "A")&&($row3[classgrade9] != "B")&&($row3[classgrade9]
!= "C")&&($row3[classgrade9] != "TA")&&($row3[classgrade9] !=
"TB")&&($row3[classgrade9] != "TC")&&($row3[classgrade9] != "TCR")
&&($row3[classgrade9] != "P")) ){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC
    }
}
//check if taken and successfully passed
if (($row3[class9] == "hist1302") && ($row3[classterm9] != "blank")) {
    if ( ($row3[classgrade9] == "A")||($row3[classgrade9] == "B")||($row3[classgrade9] ==
"C")||($row3[classgrade9] == "TA")||($row3[classgrade9] == "TB")||($row3[classgrade9] ==
"TC")||($row3[classgrade9] == "TCR")||($row3[classgrade9] == "P")) ){
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits22=$credits22+3;
    }
}
//Corequisite check section
// passed check needed ready to register to ee2151 1 corequisites: ee2351 class25
//if ( ($color=="white") && (($row3[classgrade25] == "blank") && ($row3[classterm25] ==
"blank"))) || (($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") &&
($row3[classgrade25] != "C")) ){
//        $color="yellow";
//    }
//PREquisites check section
// ee2353 has (3 prerequisites: ee2350 class24, math1312 class15, math2326 class17) passed
check needed ready to register ee2353
//if (((($row3[classgrade24] == "blank") && ($row3[classterm24] == "blank"))) ||
(($row3[classgrade24] != "A") && ($row3[classgrade24] != "B") && ($row3[classgrade24] !=
"C"))){
//        $color="gray"; //have not passed the class ee2350 class24 and check for
prerequisite not passed not ready for ee2353
//    }
} //close the while

print $color;
$color="gray"; //back to default gray color
print " >HIST 1302*<br> US Hist 2</td><n";

```

```

print "    <td>"; //passed credits from 2nd year 2nd semester
print "<font color=blue>";
print $credits22;
print "</font>";
print "<font color=black>";
print " of 16</td>\n";

print "    <td>59</td>\n";
print " </tr>\n";
print " \n";
print " <tr>\n";
print "        <td colspan=\"9\" >UPPER DIVISION</td>\n";
print "    <td>69</td>\n";
print " </tr>\n";
print " \n";
print "    <tr>\n";
//*****
*****

print "        <td>3rd year, 1st Sem</td>\n";
//*****
*****

print "    <td style=background-color: "; //***** math3323 --class18 db
//check status of math3323 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//math3323 has (1 prerequisites: math1312 class15 ) and (0 corequisites: )
//math3323 has not been TAKEN or taken and or taken and not passed CHECK
if ((( $row3[class18] == "math3323") && ( $row3[classterm18] == "blank")) ||
( $row3[classgrade18] == "blank")) {
    if ( ( $row3[classgrade18] != "A")&&( $row3[classgrade18] !=
"B")&&( $row3[classgrade18] != "C")&&( $row3[classgrade18] !=
"TA")&&( $row3[classgrade18] != "TB")&&( $row3[classgrade18] !=
"TC")&&( $row3[classgrade18] != "TCR")&&( $row3[classgrade18] != "P") ) {
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC
    }
}

//check if taken and successfully passed
if (( $row3[class18] == "math3323") && ( $row3[classterm18] != "blank")) {
    if ( ( $row3[classgrade18] == "A") || ( $row3[classgrade18] == "B") || ( $row3[classgrade18]
== "C") || ( $row3[classgrade18] == "TA") || ( $row3[classgrade18] == "TB") || ( $row3[classgrade18]
== "TC") || ( $row3[classgrade18] == "TCR") || ( $row3[classgrade18] == "P") ) {
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC

```

```

        $creditspassed=$creditspassed+3;
        $credits31=$credits31+3;
    }
}
//COrerequisite check section
// passed check needed ready to register to ee2151 1 corequisites: ee2351 class25
//if ( ($color=="white") && (($row3[classgrade25] == "blank") && ($row3[classterm25] ==
"blank")) || (($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") &&
($row3[classgrade25] != "C")) ) {
//      $color="yellow";
//      }
//PREquisites check section
// math3323 has (3 prerequisites: math1312 class15, ) passed check needed ready to register
math3323
if (((($row3[classgrade15] == "blank") && ($row3[classterm15] == "blank")) || (
($row3[classgrade15] != "A") && ($row3[classgrade15] != "B") && ($row3[classgrade15] !=
"C")&&($row3[classgrade15] != "TA") && ($row3[classgrade15] != "TB") &&
($row3[classgrade15] != "TC") && ($row3[classgrade15] != "TCR") && ($row3[classgrade15]
!= "P") )) {
    $color="gray"; //have not passed the class math1312 class15 and check for
prerequisite not passed not ready for math3323
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print " >MATH 3323*<br> Matrx Albr.</td>\n";

print " <td style=background-color: "; //***** ee3338 --class35 db

//check status of EE3338 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//EE3338 has (1 prerequisites: ee2351 class25 ) and (1 corequisites: ee3138 class29)
//EE3338 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class35] == "ee3338") && ($row3[classterm35] == "blank")) ||
($row3[classgrade35] == "blank")) {
    if (($row3[classgrade35] != "A")&&($row3[classgrade35] !=
"B")&&($row3[classgrade35] != "C")&&($row3[classgrade35] !=
"TA")&&($row3[classgrade35] != "TB")&&($row3[classgrade35] !=
"TC")&&($row3[classgrade35] != "TCR")&&($row3[classgrade35] != "P")) {
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}
}
//check if taken and successfully passed
if (($row3[class35] == "ee3338") && ($row3[classterm35] != "blank")) {

```

```

        if ( ($row3[classgrade35] == "A")||($row3[classgrade35] == "B")||($row3[classgrade35]
== "C")||($row3[classgrade35] == "TA")||($row3[classgrade35] == "TB")||($row3[classgrade35]
== "TC") ||($row3[classgrade35] == "TCR") ||($row3[classgrade35] == "P") ) {
            $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
                $creditspassed=$creditspassed+3;
                $credits31=$credits31+3;
            }
        }
//COrerequisite check section
// ee3338 passed check needed ready to register to 1 corequisites: ee3138 class29
if ( ($color=="white") && (($row3[classgrade29] == "blank") && ($row3[classterm29] ==
"blank"))) || ( ($row3[classgrade29] != "A") && ($row3[classgrade29] != "B") &&
($row3[classgrade29] != "C") && ($row3[classgrade29] != "TA") && ($row3[classgrade29] !=
"TB") && ($row3[classgrade29] != "TC") && ($row3[classgrade29] != "TCR")&&
($row3[classgrade29] != "P") ) ) {
    $color="yellow";
}
//PRerequisite check section
// ee3338 has (1 prerequisites: 1 prerequisites: ee2351 class25 ) passed check needed ready to
register ee3338
if (((($row3[classgrade25] == "blank") && ($row3[classterm25] == "blank"))) || (
($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") && ($row3[classgrade25] !=
"C") && ($row3[classgrade25] != "TA") && ($row3[classgrade25] != "TB") &&
($row3[classgrade25] != "TC") && ($row3[classgrade25] != "TCR")&& ($row3[classgrade25]
!= "P") )) {
    $color="gray"; //have not passed the class ee2351 class25 and check for
prerequisite not passed not ready for ee3338
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 3338*<br> Electron 1</td> \n";

print " <td style=background-color: "; //***** ee3138 --class29 db
//check status of EE3138 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//EE3138 has (2 prerequisites: ee2351 class25, ee2151 class22 ) and (1 corequisites: ee3338
class35)
//EE3138 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class29] == "ee3138") && ($row3[classterm29] == "blank"))) ||
($row3[classgrade29] == "blank")) {
    if ( ($row3[classgrade29] != "A")&&($row3[classgrade29] !=
"B")&&($row3[classgrade29] != "C")&&($row3[classgrade29] !=

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"TA")&&($row3[classgrade29] != "TB")&&($row3[classgrade29] !=
"TC")&&($row3[classgrade29] != "TCR")&&($row3[classgrade29] != "P") ) {
    $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
}
}

//check if taken and successfully passed
if (($row3[class29] == "ee3138") && ($row3[classterm29] != "blank") ) {
    if (($row3[classgrade29] == "A") || ($row3[classgrade29] == "B") || ($row3[classgrade29]
== "C") || ($row3[classgrade29] == "TA") || ($row3[classgrade29] == "TB") || ($row3[classgrade29]
== "TC") || ($row3[classgrade29] == "TCR") || ($row3[classgrade29] == "P") ) {
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+1;
        $credits31=$credits31+1;
    }
}

//COrerequisite check section
// passed check needed ready to register to 1 corequisites: ee3338 class35
if ( ($color=="white") && (($row3[classgrade35] == "blank") && ($row3[classterm35] ==
"blank")) || ( ($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") &&
($row3[classgrade35] != "C") && ($row3[classgrade35] != "TA") && ($row3[classgrade35] !=
"TB") && ($row3[classgrade35] != "TC") && ($row3[classgrade35] != "TCR") &&
($row3[classgrade35] != "P") ) ) {
    $color="yellow";
}

//PRerequisite check section
// ee3338 has (1 prerequisites: 2 prerequisites: ee2351 class25, ee2151 class22 ) passed check
needed ready to register ee3138
if (((($row3[classgrade25] == "blank") && ($row3[classterm25] == "blank")) || (
($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") && ($row3[classgrade25] !=
"C")&&($row3[classgrade25] != "TA") && ($row3[classgrade25] != "TB") &&
($row3[classgrade25] != "TC")&& ($row3[classgrade25] != "TCR")&& ($row3[classgrade25]
!= "P") )) {
    $color="gray"; //have not passed the class ee2351 class25 and check for
prerequisite not passed not ready for ee3138
}

if (((($row3[classgrade22] == "blank") && ($row3[classterm22] == "blank")) || (
($row3[classgrade22] != "A") && ($row3[classgrade22] != "B") && ($row3[classgrade22] !=
"C") && ($row3[classgrade22] != "TA") && ($row3[classgrade22] != "TB") &&
($row3[classgrade22] != "TC") && ($row3[classgrade22] != "TCR")&& ($row3[classgrade22]
!= "P") )) {
    $color="gray"; //have not passed the class ee2151 class22 and check for
prerequisite not passed not ready for ee3138
}
}

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} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 3138* <br> EE3338 Lab</td>\n";

print " <td style=background-color:"; //***** ee3353 --class37 db
//check status of EE3353 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//EE3353 has (2 prerequisites: ee2353 class26, math2326 class17 ) and (0 corequisites: )
//EE3353 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class37] == "ee3353") && ($row3[classterm37] == "blank")) ||
($row3[classgrade37] == "blank"))){
    if (($row3[classgrade37] != "A")&&($row3[classgrade37] !=
"B")&&($row3[classgrade37] != "C") &&($row3[classgrade37] !=
"TA")&&($row3[classgrade37] != "TB")&&($row3[classgrade37] !=
"TC")&&($row3[classgrade37] != "TCR")&&($row3[classgrade37] != "P")){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}

//check if taken and successfully passed
if (($row3[class37] == "ee3353") && ($row3[classterm37] != "blank")){
    if (($row3[classgrade37] == "A")||($row3[classgrade37] == "B")||($row3[classgrade37]
== "C")||($row3[classgrade37] == "TA")||($row3[classgrade37] == "TB")||($row3[classgrade37]
== "TC")||($row3[classgrade37] == "TCR")||($row3[classgrade37] == "P")){
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits31=$credits31+3;
    }
}

//COrerequisite check section NO corequisite comment out
// passed check needed ready to register to 1 corequisites: ee3338 class35
//if ( ($color=="white") && (($row3[classgrade35] == "blank") && ($row3[classterm35] ==
"blank")) || (($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") &&
($row3[classgrade35] != "C"))) ){
//    $color="yellow";
//}

//PREquisites check section
// ee3338 has (prerequisites: 2 prerequisites: ee2353 class26, math2326 class17) passed check
needed ready to register ee3353
if (((($row3[classgrade26] == "blank") && ($row3[classterm26] == "blank")) ||
(($row3[classgrade26] != "A") && ($row3[classgrade26] != "B") && ($row3[classgrade26] !=
"C")&&($row3[classgrade26] != "TA")&&($row3[classgrade26] !=

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"TB")&&($row3[classgrade26] != "TC")&&($row3[classgrade26] !=
"TCR")&&($row3[classgrade26] != "P") )){
    $color="gray"; //have not passed the class ee2353 class26 and check for
prerequisite not passed not ready for ee3353
}
if((( $row3[classgrade17] == "blank") && ($row3[classterm17] == "blank")) ||
(( $row3[classgrade17] != "A") && ($row3[classgrade17] != "B") && ($row3[classgrade17] !=
"C")&&($row3[classgrade17] != "TA")&&($row3[classgrade17] !=
"TB")&&($row3[classgrade17] != "TC")&&($row3[classgrade17] !=
"TCR")&&($row3[classgrade17] != "P") )){
    $color="gray"; //have not passed the class math2326 class17 and check for
prerequisite not passed not ready for ee3353
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 3353* <br> D.T. Signal</td>\n";

print " <td style=background-color:"; //***** ee3325 --class33 db
//check status of ee3325 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee3325 has (4 prerequisites: ee2350 class24, math1312 class15, math2326 class17, phys2421
class5) and (0 corequisites: )
//ee3325 has not been TAKEN or taken and or taken and not passed CHECK
if((( $row3[class33] == "ee3325") && ($row3[classterm33] == "blank")) ||
($row3[classgrade33] == "blank"))){
    if (( $row3[classgrade33] != "A")&&($row3[classgrade33] !=
"B")&&($row3[classgrade33] != "C")&&($row3[classgrade33] !=
"TA")&&($row3[classgrade33] != "TB")&&($row3[classgrade33] !=
"TC")&&($row3[classgrade33] != "TCR")&&($row3[classgrade33] != "P") )){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}
//check if taken and successfully passed
if (( $row3[class33] == "ee3325") && ($row3[classterm33] != "blank") ){
    if (( $row3[classgrade33] == "A")||($row3[classgrade33] == "B")||($row3[classgrade33]
== "C")||($row3[classgrade33] == "TA")||($row3[classgrade33] == "TB")||($row3[classgrade33]
== "TC")||($row3[classgrade33] == "TCR")||($row3[classgrade33] == "P") )){
        $color="green"; //credit at UTEP already? if taken, second check
    }
}
passing grade ABC
$creditspassed=$creditspassed+3;
$credits31=$credits31+3;

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    }
}
//COrerequisite check section NO corequisite comment out
// passed check needed ready to register to 1 corequisites: ee3338 class35
//if ( ($color=="white") && (($row3[classgrade35] == "blank") && ($row3[classterm35] ==
"blank")) || (($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") &&
($row3[classgrade35] != "C"))) {
//      $color="yellow";
//      }

//PRErequisites check section
// ee3325 has (prerequisites: 4 prerequisites: ee2350 class24, math1312 class15, math2326
class17, phys2421 class5) passed check needed ready to register ee3325
if (((($row3[classgrade24] == "blank") && ($row3[classterm24] == "blank")) ||
(($row3[classgrade24] != "A") && ($row3[classgrade24] != "B") && ($row3[classgrade24] !=
"C")&&($row3[classgrade24] != "TA")&&($row3[classgrade24] !=
"TB")&&($row3[classgrade24] != "TC")&&($row3[classgrade24] !=
"TCR")&&($row3[classgrade24] != "P") )) {
    $color="gray"; //have not passed the class ee2350 class24 and check for
prerequisite not passed not ready for ee3325
}
if (((($row3[classgrade15] == "blank") && ($row3[classterm15] == "blank")) ||
(($row3[classgrade15] != "A") && ($row3[classgrade15] != "B") && ($row3[classgrade15] !=
"C")&&($row3[classgrade15] != "TA")&&($row3[classgrade15] !=
"TB")&&($row3[classgrade15] != "TC")&&($row3[classgrade15] !=
"TCR")&&($row3[classgrade15] != "P") )) {
    $color="gray"; //have not passed the class math1312 class15 and check for
prerequisite not passed not ready for ee3325
}
if (((($row3[classgrade17] == "blank") && ($row3[classterm17] == "blank")) ||
(($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") && ($row3[classgrade17] !=
"C")&&($row3[classgrade17] != "TA")&&($row3[classgrade17] !=
"TB")&&($row3[classgrade17] != "TC")&&($row3[classgrade17] !=
"TCR")&&($row3[classgrade17] != "P") )) {
    $color="gray"; //have not passed the class math2326 class17 and check for
prerequisite not passed not ready for ee3325
}
if (((($row3[classgrade5] == "blank") && ($row3[classterm5] == "blank")) ||
(($row3[classgrade5] != "A") && ($row3[classgrade5] != "B") && ($row3[classgrade5] !=
"C")&&($row3[classgrade5] != "TA")&&($row3[classgrade5] != "TB")&&($row3[classgrade5]
!= "TC")&&($row3[classgrade5] != "TCR")&&($row3[classgrade5] != "P") )) {
    $color="gray"; //have not passed the class phys2421 class5 and check for
prerequisite not passed not ready for ee3325
}

} //close the while

print $color;

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$color="gray"; //back to default gray color
print ">EE 3325* <br> Ap Quantum</td>\n";

print " <td style=background-color:"; //***** ee3321 --class32 db
//check status of ee3321 taken?, in progress or not taken
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee3321 has (4 prerequisites: ee2351 class25, math2313 class16, math2326 class17, phys2421
class5) and (0 corequisites: )
//ee3321 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class32] == "ee3321") && ($row3[classterm32] == "blank")) ||
($row3[classgrade32] == "blank"))){
    if (($row3[classgrade32] != "A")&&($row3[classgrade32] !=
"B")&&($row3[classgrade32] != "C")&&($row3[classgrade32] !=
"TA")&&($row3[classgrade32] != "TB")&&($row3[classgrade32] !=
"TC")&&($row3[classgrade32] != "TCR")&&($row3[classgrade32] != "P"))){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}

//check if taken and successfully passed
if (($row3[class32] == "ee3321") && ($row3[classterm33] != "blank")){
    if (($row3[classgrade32] == "A")||($row3[classgrade32] == "B")||($row3[classgrade32]
== "C")||($row3[classgrade32] == "TA")||($row3[classgrade32] == "TB")||($row3[classgrade32]
== "TC")||($row3[classgrade32] == "TCR")||($row3[classgrade32] == "P"))){
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade A,B,C,tA,tB,tC,tcr,P
        $creditspassed=$creditspassed+3;
        $credits31=$credits31+3;
    }
}

//COrerequisite check section NO corequisite comment out
// passed check needed ready to register to 1 corequisites: ee3338 class35
//if ( ($color=="white") && (($row3[classgrade35] == "blank") && ($row3[classterm35] ==
"blank")) || (($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") &&
($row3[classgrade35] != "C")) ){
//    $color="yellow";
//}

//PREquisites check section
// ee3321 has (prerequisites: 4 prerequisites: ee2351 class25, math2313 class16, math2326
class17, phys2421 class5) passed check needed ready to register ee3325
if (((($row3[classgrade25] == "blank") && ($row3[classterm25] == "blank")) ||
(($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") && ($row3[classgrade25] !=
"C")&&($row3[classgrade25] != "TA")&&($row3[classgrade25] !=

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"TB")&&($row3[classgrade25] != "TC")&&($row3[classgrade25] !=
"TCR")&&($row3[classgrade25] != "P") )){
    $color="gray"; //have not passed the class ee2351 class25 and check for
prerequisite not passed not ready for ee3321
}
if ((($row3[classgrade16] == "blank") && ($row3[classterm16] == "blank")) ||
(($row3[classgrade16] != "A") && ($row3[classgrade16] != "B") && ($row3[classgrade16] !=
"C")&&($row3[classgrade16] != "TA")&&($row3[classgrade16] !=
"TB")&&($row3[classgrade16] != "TC")&&($row3[classgrade16] !=
"TCR")&&($row3[classgrade16] != "P") )){
    $color="gray"; //have not passed the class math2313 class16 and check for
prerequisite not passed not ready for ee3321
}
if ((($row3[classgrade17] == "blank") && ($row3[classterm17] == "blank")) ||
(($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") && ($row3[classgrade17] !=
"C")&&($row3[classgrade17] != "TA")&&($row3[classgrade17] !=
"TB")&&($row3[classgrade17] != "TC")&&($row3[classgrade17] !=
"TCR")&&($row3[classgrade17] != "P") )){
    $color="gray"; //have not passed the class math2326 class17 and check for
prerequisite not passed not ready for ee3321
}
if ((($row3[classgrade5] == "blank") && ($row3[classterm5] == "blank")) ||
(($row3[classgrade5] != "A") && ($row3[classgrade5] != "B") && ($row3[classgrade5] != "C")
&&($row3[classgrade5] != "TA")&&($row3[classgrade5] != "TB")&&($row3[classgrade5] !=
"TC")&&($row3[classgrade5] != "TCR")&&($row3[classgrade5] != "P") )){
    $color="gray"; //have not passed the class phys2421 class5 and check for
prerequisite not passed not ready for ee3321
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 3321* <br> EMF</td> \n";

print " <td>77-blank</td>\n";

print " <td>"; //passed credits from 2nd year 2nd semester
print "<font color=blue>";
print $credits31;
print "</font>";
print "<font color=black>";
print " of 16</td>\n";

print " <td>79</td>\n";

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print " </tr>\n";
print " <tr>\n";
//*****
*****

print " <td>3rd year, 2nd Sem</td>\n";
//*****
*****

print " <td style=background-color:"; //***** ee3384 --class39 db
//check status of ee3384 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee3384 has (2 prerequisites: math2313 class16, ee2353 class26) and (0 corequisites: )
//ee3384 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class39] == "ee3384") && ($row3[classterm39] == "blank")) ||
($row3[classgrade39] == "blank"))){
    if (($row3[classgrade39] != "A")&&($row3[classgrade39] !=
"B")&&($row3[classgrade39] != "C")&&($row3[classgrade39] !=
"TA")&&($row3[classgrade39] != "TB")&&($row3[classgrade39] !=
"TC")&&($row3[classgrade39] != "TCR")&&($row3[classgrade39] != "P"))){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}
//check if taken and successfully passed
if (($row3[class39] == "ee3384") && ($row3[classterm39] != "blank")){
    if (($row3[classgrade39] == "A")||($row3[classgrade39] == "B")||($row3[classgrade39]
== "C")||($row3[classgrade39] == "TA")||($row3[classgrade39] == "TB")||($row3[classgrade39]
== "TC")||($row3[classgrade39] == "TCR")||($row3[classgrade39] == "P"))){
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits32=$credits32+3;
    }
}
//COrerequisite check section NO corequisite comment out
// passed check needed ready to register to 1 corequisites: ee3338 class35
//if ( ($color=="white") && (($row3[classgrade35] == "blank") && ($row3[classterm35] ==
"blank")) || (($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") &&
($row3[classgrade35] != "C"))) ){
//     $color="yellow";
// }

//PREquisites check section
// ee3384 has (prerequisites: 2 prerequisites: math2313 class16, ee2353 class26) passed check
needed ready to register ee3384

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if ((($row3[classgrade16] == "blank") && ($row3[classterm16] == "blank")) ||
(($row3[classgrade16] != "A") && ($row3[classgrade16] != "B") && ($row3[classgrade16] !=
"C")&&($row3[classgrade16] != "TA")&&($row3[classgrade16] !=
"TB")&&($row3[classgrade16] != "TC")&&($row3[classgrade16] !=
"TCR")&&($row3[classgrade16] != "P") )){
    $color="gray"; //have not passed the class math2313 class16 and check for
prerequisite not passed not ready for ee3384
}
if ((($row3[classgrade26] == "blank") && ($row3[classterm26] == "blank")) ||
(($row3[classgrade126] != "A") && ($row3[classgrade26] != "B") && ($row3[classgrade26] !=
"C")&&($row3[classgrade26] != "TA")&&($row3[classgrade26] !=
"TB")&&($row3[classgrade26] != "TC")&&($row3[classgrade26] !=
"TCR")&&($row3[classgrade26] != "P") )){
    $color="gray"; //have not passed the class ee2353 class26 and check for
prerequisite not passed not ready for ee3384
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 3384* <br> Probability</td>\n";

print " <td style=background-color:"; //***** ee3340 --class36 db
//check status of ee3340 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
    //ee3340 has (1 prerequisites: ee3338 class35) and (0 corequisites: )
    //ee3340 has not been TAKEN or taken and or taken and not passed CHECK
    if ((($row3[class36] == "ee3340") && ($row3[classterm36] == "blank")) ||
($row3[classgrade36] == "blank")){
        if (($row3[classgrade36] != "A")&&($row3[classgrade36] !=
"B")&&($row3[classgrade36] != "C")&&($row3[classgrade36] !=
"TA")&&($row3[classgrade36] != "TB")&&($row3[classgrade36] !=
"TC")&&($row3[classgrade36] != "TCR")&&($row3[classgrade36] != "P") ){
            $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
        }
    }

    //check if taken and successfully passed
    if (($row3[class36] == "ee3340") && ($row3[classterm36] != "blank")){
        if (($row3[classgrade36] == "A")||($row3[classgrade36] == "B")||($row3[classgrade36]
== "C")||($row3[classgrade36] == "TA")||($row3[classgrade36] == "TB")||($row3[classgrade36]
== "TC")||($row3[classgrade36] == "TCR")||($row3[classgrade36] == "P") ){
            $color="green"; //credit at UTEP already? if taken, second check
            passing grade ABC
        }
    }
}

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        $creditspassed=$creditspassed+3;
        $credits32=$credits32+3;
    }
}
//COrerequisite check section NO corequisite comment out
// passed check needed ready to register to 1 corequisites: ee3338 class35
//if ( ($color=="white") && (($row3[classgrade35] == "blank") && ($row3[classterm35] ==
"blank")) || (($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") &&
($row3[classgrade35] != "C")) ){
//      $color="yellow";
//
}

//PRerequisites check section
// ee3340 has (prerequisites: 1 prerequisites: ee3338 class35) passed check needed ready to
register ee3384
if (((($row3[classgrade35] == "blank") && ($row3[classterm35] == "blank")) ||
(($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") && ($row3[classgrade35] !=
"C")&&($row3[classgrade35] != "TA")&&($row3[classgrade35] !=
"TB")&&($row3[classgrade35] != "TC")&&($row3[classgrade35] !=
"TCR")&&($row3[classgrade35] != "P") ))){
    $color="gray"; //have not passed the class ee3338 class35 and check for
prerequisite not passed not ready for ee3340
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 3340* <br> Electron 2.</td> \n";

print " <td style=background-color:"; //***** ee3376 --class38 db
//check status of ee3376 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee3376 has (3 prerequisites: ee2350 class24, ee2369 class27, ee2372 class28) and (1
corequisites: ee3176 class30 )
//ee3376 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class38] == "ee3376") && ($row3[classterm38] == "blank")) ||
($row3[classgrade38] == "blank")) ){
    if (($row3[classgrade38] != "A")&&($row3[classgrade38] !=
"B")&&($row3[classgrade38] != "C")&&($row3[classgrade38] !=
"TA")&&($row3[classgrade38] != "TB")&&($row3[classgrade38] !=
"TC")&&($row3[classgrade38] != "TCR")&&($row3[classgrade38] != "P") ){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}
}
//check if taken and successfully passed

```

```

if (($row3[class38] == "ee3376") && ($row3[classterm38] != "blank")) {
    if (($row3[classgrade38] == "A") || ($row3[classgrade38] == "B") || ($row3[classgrade38]
    == "C") || ($row3[classgrade38] == "TA") || ($row3[classgrade38] == "TB") || ($row3[classgrade38]
    == "TC") || ($row3[classgrade38] == "TCR") || ($row3[classgrade38] == "P")) {
        $color="green"; //credit at UTEP already? if taken, second check
    passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits32=$credits32+3;
    }
}

//COrerequisite check section
// passed check needed ready to register to 1 corequisites: ee3176 class30
if ( ($color=="white") && (($row3[classgrade30] == "blank") && ($row3[classterm30] ==
"blank")) || (($row3[classgrade30] != "A") && ($row3[classgrade30] != "B") &&
($row3[classgrade30] != "C")&&($row3[classgrade30] != "TA")&&($row3[classgrade30] !=
"TB")&&($row3[classgrade30] != "TC")&&($row3[classgrade30] !=
"TCR")&&($row3[classgrade30] != "P")) ) {
    $color="yellow";
}

//PREREQUISITES check section
// ee3325 has (prerequisites: 3 prerequisites: ee2350 class24, ee2369 class27, ee2372 class28)
passed check needed ready to register ee3325
if (((($row3[classgrade24] == "blank") && ($row3[classterm24] == "blank")) ||
(($row3[classgrade24] != "A") && ($row3[classgrade24] != "B") && ($row3[classgrade24] !=
"C")&&($row3[classgrade24] != "TA")&&($row3[classgrade24] !=
"TB")&&($row3[classgrade24] != "TC")&&($row3[classgrade24] !=
"TCR")&&($row3[classgrade24] != "P")) )) {
    $color="gray"; //have not passed the class ee2350 class24 and check for
prerequisite not passed not ready for ee3376
}

if (((($row3[classgrade27] == "blank") && ($row3[classterm27] == "blank")) ||
(($row3[classgrade27] != "A") && ($row3[classgrade27] != "B") && ($row3[classgrade27] !=
"C")&&($row3[classgrade27] != "TA")&&($row3[classgrade27] !=
"TB")&&($row3[classgrade27] != "TC")&&($row3[classgrade27] !=
"TCR")&&($row3[classgrade27] != "P")) )) {
    $color="gray"; //have not passed the class ee2369 class27 and check for
prerequisite not passed not ready for ee3376
}

if (((($row3[classgrade28] == "blank") && ($row3[classterm28] == "blank")) ||
(($row3[classgrade28] != "A") && ($row3[classgrade28] != "B") && ($row3[classgrade28] !=
"C")&&($row3[classgrade28] != "TA")&&($row3[classgrade28] !=
"TB")&&($row3[classgrade28] != "TC")&&($row3[classgrade28] !=
"TCR")&&($row3[classgrade28] != "P")) )) {
    $color="gray"; //have not passed the class ee2372 class28 and check for
prerequisite not passed not ready for ee3376
}

```

```

    }

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 3376* <br> Micro 1</td>\n";

print "  <td style=background-color: "; //***** ee3176 --class30 db
//check status of ee3176 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee3176 has (3 prerequisites: ee2169 class23, ee2369 class27, ee2372 class28) and (1
corequisites: ee3376 class38 )
//ee3176 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class30] == "ee3176") && ($row3[classterm30] == "blank")) ||
($row3[classgrade30] == "blank"))){
    if (($row3[classgrade30] != "A")&&($row3[classgrade30] !=
"B")&&($row3[classgrade30] != "C") &&($row3[classgrade30] !=
"TA")&&($row3[classgrade30] != "TB")&&($row3[classgrade30] !=
"TC")&&($row3[classgrade30] != "TCR")&&($row3[classgrade30] != "P")){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}

//check if taken and successfully passed
if (($row3[class30] == "ee3176") && ($row3[classterm30] != "blank")){
    if (($row3[classgrade30] == "A")||($row3[classgrade30] == "B")||($row3[classgrade30]
== "C")||($row3[classgrade30] == "TA")||($row3[classgrade30] == "TB")||($row3[classgrade30]
== "TC")||($row3[classgrade30] == "TCR")||($row3[classgrade30] == "P")){
        $color="green"; //credit at UTEP already? if taken, second check
    }
}

passing grade ABC
        $creditspassed=$creditspassed+1;
        $credits32=$credits32+1;
    }
}

//Corequisite check section
// passed check needed ready to register to 1 corequisites: ee3376 class38
if ( ($color=="white") && (($row3[classgrade38] == "blank") && ($row3[classterm38] ==
"blank")) || (($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") &&
($row3[classgrade38] != "C") &&($row3[classgrade38] != "TA")&&($row3[classgrade38] !=
"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P")) ) ){
    $color="yellow";
}

//PREquisites check section

```

```

// ee3325 has (prerequisites: 3 prerequisites: ee2169 class23, ee2369 class27, ee2372 class28)
passed check needed ready to register ee3325
if ((($row3[classgrade23] == "blank") && ($row3[classterm23] == "blank")) ||
(($row3[classgrade23] != "A") && ($row3[classgrade23] != "B") && ($row3[classgrade23] !=
"C")&&($row3[classgrade23] != "TA")&&($row3[classgrade23] !=
"TB")&&($row3[classgrade23] != "TC")&&($row3[classgrade23] !=
"TCR")&&($row3[classgrade23] != "P") )){
    $color="gray"; //have not passed the class ee2169 class23 and check for
prerequisite not passed not ready for ee3176
}
if ((($row3[classgrade27] == "blank") && ($row3[classterm27] == "blank")) ||
(($row3[classgrade27] != "A") && ($row3[classgrade27] != "B") && ($row3[classgrade27] !=
"C")&&($row3[classgrade27] != "TA")&&($row3[classgrade27] !=
"TB")&&($row3[classgrade27] != "TC")&&($row3[classgrade27] !=
"TCR")&&($row3[classgrade28] != "P") )){
    $color="gray"; //have not passed the class ee2369 class27 and check for
prerequisite not passed not ready for ee3176
}
if ((($row3[classgrade28] == "blank") && ($row3[classterm28] == "blank")) ||
(($row3[classgrade28] != "A") && ($row3[classgrade28] != "B") && ($row3[classgrade28] !=
"C")&&($row3[classgrade28] != "TA")&&($row3[classgrade28] !=
"TB")&&($row3[classgrade28] != "TC")&&($row3[classgrade28] !=
"TCR")&&($row3[classgrade28] != "P") )){
    $color="gray"; //have not passed the class ee2372 class28 and check for
prerequisite not passed not ready for ee3176
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print " >EE 3176* <br> EE3376 Lab </td>\n";

print " <td style=background-color:"; //***** ee3195 --class31 db
//check status of ee3195 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee3195 has (1 prerequisites:to be junior more than 60 credits) and (0 corequisites: )
//ee3195 has not been TAKEN or taken and or taken and not passed CHECK
if ((($row3[class31] == "ee3195") && ($row3[classterm31] == "blank")) ||
($row3[classgrade31] == "blank")){
    if (($row3[classgrade31] != "A")&&($row3[classgrade31] !=
"B")&&($row3[classgrade31] != "C")&&($row3[classgrade31] !=
"TA")&&($row3[classgrade31] != "TB")&&($row3[classgrade31] !=
"TC")&&($row3[classgrade31] != "TCR")&&($row3[classgrade31] != "P") ){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}

```

```

    }
//check if taken and successfully passed
if (($row3[class31] == "ee3195") && ($row3[classterm31] != "blank")){
    if (($row3[classgrade31] == "A")||($row3[classgrade31] == "B")||($row3[classgrade31]
== "C")||($row3[classgrade31] == "TA")||($row3[classgrade31] == "TB")||($row3[classgrade31]
== "TC")||($row3[classgrade31] == "TCR")||($row3[classgrade31] == "P"))){
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade ABC
        $creditspassed=$creditspassed+1;
        $credits32=$credits32+1;
    }
}

//COrerequisite check section No corequisite comment out section
// passed check needed ready to register to 1 corequisites: ee3376 class38
//if ( ($color=="white") && (($row3[classgrade38] == "blank") && ($row3[classterm38] ==
"blank")) || (($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") &&
($row3[classgrade38] != "C"))) ){
    //        $color="yellow";
    //
}

//PRerequisites check section
// ee3195 has (prerequisites 0 classes but a prerequisite of junior 60 credits
if ($creditspassed < 60){
    $color="gray"; //have not passed the class ee2169 class23 and check for
prerequisite not passed not ready for ee3195
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 3195* <br> J.P.O.</td>\n";

```

```

print " <td style=background-color:"; //***** ee3329 --class34 db
//check status of ee3195 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee3195 has (2 prerequisites:ee3321 class32, ee3325 class33) and (0 corequisites: )
//ee3195 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class34] == "ee3329") && ($row3[classterm34] == "blank")) ||
($row3[classgrade34] == "blank"))){
    if (($row3[classgrade34] != "A")&&($row3[classgrade34] !=
"B")&&($row3[classgrade34] != "C")&&($row3[classgrade34] !=
"TA")&&($row3[classgrade34] != "TB")&&($row3[classgrade34] !=
"TC")&&($row3[classgrade34] != "TCR")&&($row3[classgrade34] != "P"))){

```

```

        $color="white"; //this means the class has not been taken, or if intended
        and student got something different than ABC and there is a blank on when he took it
    }
}
//check if taken and successfully passed
if (($row3[class34] == "ee3329") && ($row3[classterm34] != "blank")) {
    if (($row3[classgrade34] == "A") || ($row3[classgrade34] == "B") || ($row3[classgrade34]
    == "C") || ($row3[classgrade34] == "TA") || ($row3[classgrade34] == "TB") || ($row3[classgrade34]
    == "TC") || ($row3[classgrade34] == "TCR") || ($row3[classgrade34] == "P")) {
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits32=$credits32+3;
    }
}
//Corequisite check section No corequisite comment out section
// passed check needed ready to register to 1 corequisites: ee3376 class38
//if ( ($color=="white") && (($row3[classgrade38] == "blank") && ($row3[classterm38] ==
"blank")) || (($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") &&
($row3[classgrade38] != "C"))) {
//        $color="yellow";
//    }

//PREquisites check section
// ee3325 has (prerequisites: 2 prerequisites:ee3321 class32, ee3325 class33) passed check
needed ready to register ee3329
if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C")&&($row3[classgrade32] != "TA")&&($row3[classgrade32] !=
"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")))) {
    $color="gray"; //have not passed the class ee3321 class32 and check for
prerequisite not passed not ready for ee3329
}
if (((($row3[classgrade33] == "blank") && ($row3[classterm33] == "blank")) ||
(($row3[classgrade33] != "A") && ($row3[classgrade33] != "B") && ($row3[classgrade33] !=
"C")&&($row3[classgrade33] != "TA")&&($row3[classgrade33] !=
"TB")&&($row3[classgrade33] != "TC")&&($row3[classgrade33] !=
"TCR")&&($row3[classgrade33] != "P")))) {
    $color="gray"; //have not passed the class ee3325 class33 and check for
prerequisite not passed not ready for ee3329
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 3329* <br> Elec. Dev.</td> \n";

```



```

    }
}
//corequisite check section
// passed check needed ready to register COREQUISITE FOR ee2350 are: none
//if ( ($color="white") && (($row3[classgrade17] == "blank") && ($row3[classterm17] ==
"blank")) || (($row3[classgrade17] != "A") && ($row3[classgrade17] != "B") &&
($row3[classgrade17] != "C"))) {
//          $color="yellow";
//          }

//PRErequisites check section
// (1 prerequisites: engl1312 class2) passed check needed ready to register Choose HMN
if (((($row3[classgrade2] == "blank") && ($row3[classterm2] == "blank")) ||
(($row3[classgrade2] != "A") && ($row3[classgrade2] != "B") && ($row3[classgrade2] !=
"C"))&&($row3[classgrade2] != "TA")&&($row3[classgrade2] != "TB")&&($row3[classgrade2]
!= "TC")&&($row3[classgrade2] != "TCR")&&($row3[classgrade2] != "P") )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for Choose SCI
    }

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print ">"; //finish picking the color of the cell

//display the class picked if none was picked the print Choose Sci
if ($varclass6=="blank"){
    print "Choose HMN";
                                                                    }
    else {
        echo $varclass6;
    }

print "<br>";

$sql4 = "SELECT * FROM `bsee` WHERE `classcode`='$varclass6' "; //select record of current
user on Mysql
$result4 = $conn->query($sql4);
while ($row4 = $result4->fetch_assoc()) {
echo $row4[classname];
} //close the while $row4
print "<br> <u> DB </u>";
print "</td>\n";

//*****
***** 2DB end

```



```

print "    <td>"; //passed credits from 3nd year 2nd semester
print "<font color=blue>";
print $credits32;
print "</font>";
print "<font color=black>";
print " of 17</td>\n";

print "    <td>89</td>\n";
print " </tr>\n";
print "    <tr>\n";
print "        <td>4th year, 1st Sem</td>\n";

//*****
//*****
// class40 Experiential learning
//*****
//***** 2DB start
//this cell will require to extract the information of db history and brief description from class db
(prerequisites to
//this exp learning class are junior for 5 of the options and prerequisite ee3176 for ee4142 and
ee4378 and
//prerequisite ee3329 for ee4153
print "    <td style=background-color:";
//pick color

$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//((1 prerequisites: engl1312 class2 ) and (0 corequisites:)
//get the class taken and put it in a variable
$varclass40=$row3[class40];

if((((($row3[class40] == "ee4142")||($row3[class40] == "ee4153")||($row3[class40] ==
"ee4171")||($row3[class40] == "ee4178")||($row3[class40] == "ee4181")||($row3[class40] ==
"ee4182")||($row3[class40] == "ee4183") )&& ($row3[class40] == "blank")) ||
($row3[classgrade40] == "blank")) ){
    if (($row3[classgrade40] != "A")&&($row3[classgrade40] !=
"B")&&($row3[classgrade40] != "C")&&($row3[classgrade40] !=
"TA")&&($row3[classgrade40] != "TB")&&($row3[classgrade40] !=
"TC")&&($row3[classgrade40] != "TCR")&&($row3[classgrade40] != "P") ) {
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC
    }
}

```

```

    }
//check if taken and successfully passed
if ( ( $row3[class40] == "ee4142" ) || ( $row3[class40] == "ee4153" ) || ( $row3[class40] ==
"ee4171" ) || ( $row3[class40] == "ee4178" ) || ( $row3[class40] == "ee4181" ) || ( $row3[class40] ==
"ee4182" ) || ( $row3[class40] == "ee4183" ) ) && ( $row3[class40] != "blank" ) ) {
    if ( ( $row3[classgrade40] == "A" ) || ( $row3[classgrade40] == "B" ) || ( $row3[classgrade40]
== "C" ) || ( $row3[classgrade28] == "TA" ) || ( $row3[classgrade40] == "TB" ) || ( $row3[classgrade40]
== "TC" ) || ( $row3[classgrade40] == "TCR" ) || ( $row3[classgrade40] == "P" ) ) {
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits41=$credits41+3;
    }
}

//corequisites for 3 courses --> ee4142 corequisite ee4342, for ee4153 corequisite ee4353 for
ee4178 corequisite ee4378
// passed check needed ready to register COREQUISITE FOR ee4142 or ee4253 or ee4178 are:
ee4342 or ee4353 or ee4378 respectively

//*****check for a logic error on the first of the prerequisite check since it is
different from the two below, one of the 2 forms has to be right
if ( ( $row3[class40] == "ee4142" ) && ( ( $row3[classgrade40] == "blank" ) &&
( $row3[classgrade40] != "A" ) && ( $row3[classgrade40] != "B" ) && ( $row3[classgrade40] !=
"C" ) && ( $row3[classgrade40] != "TA" ) && ( $row3[classgrade40] !=
"TB" ) && ( $row3[classgrade40] != "TC" ) && ( $row3[classgrade40] !=
"TCR" ) && ( $row3[classgrade40] != "P" ) ) ) {
    $color="yellow";
    $varclass40co="ee4342";
}

if ( ( $row3[class40] == "ee4153" ) && ( ( $row3[classgrade40] != "A" ) && ( $row3[classgrade40]
!= "B" ) && ( $row3[classgrade40] != "C" ) && ( $row3[classgrade40] !=
"TA" ) && ( $row3[classgrade40] != "TB" ) && ( $row3[classgrade40] !=
"TC" ) && ( $row3[classgrade40] != "TCR" ) && ( $row3[classgrade40] != "P" ) ) ) {
    $color="yellow";
    $varclass40co="ee4353";
}

if ( ( $row3[class40] == "ee4178" ) && ( ( $row3[classgrade40] != "A" ) && ( $row3[classgrade40]
!= "B" ) && ( $row3[classgrade40] != "C" ) && ( $row3[classgrade40] !=
"TA" ) && ( $row3[classgrade40] != "TB" ) && ( $row3[classgrade40] !=
"TC" ) && ( $row3[classgrade40] != "TCR" ) && ( $row3[classgrade40] != "P" ) ) ) {
    $color="yellow";
    $varclass40co="ee4378";
}

```

//PREquisites check section

```

// (different prerequisites for the different classes that are an option for class40

//if pre1 prerequisites check for ee4142 and ee4178 which is ee3176 class30
if ( (($row3[class40] == "ee4142")||($row3[class40] == "ee4178")) && (($row3[classgrade40]
!= "A") && ($row3[classgrade40] != "B") && ($row3[classgrade40] !=
"C")&&($row3[classgrade40] != "TA")&&($row3[classgrade40] !=
"TB")&&($row3[classgrade40] != "TC")&&($row3[classgrade40] !=
"TCR")&&($row3[classgrade40] != "P") ) ) { //if pre1
    if (((($row3[classgrade30] == "blank") && ($row3[classterm30] == "blank")) ||
(($row3[classgrade30] != "A") && ($row3[classgrade30] != "B") && ($row3[classgrade30] !=
"C")&&($row3[classgrade30] != "TA")&&($row3[classgrade30] !=
"TB")&&($row3[classgrade30] != "TC")&&($row3[classgrade30] !=
"TCR")&&($row3[classgrade30] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
} // close if pre1

//if pre2 prerequisites check for ee4153 which is ee3329 class34
if ( ($row3[class40] == "ee4153") && (($row3[classgrade40] != "A") &&
($row3[classgrade40] != "B") && ($row3[classgrade40] != "C")&&($row3[classgrade40] !=
"TA")&&($row3[classgrade40] != "TB")&&($row3[classgrade40] !=
"TC")&&($row3[classgrade40] != "TCR")&&($row3[classgrade40] != "P") ) ) { //if pre2

    if (((($row3[classgrade34] == "blank") && ($row3[classterm34] == "blank")) ||
(($row3[classgrade34] != "A") && ($row3[classgrade34] != "B") && ($row3[classgrade34] !=
"C")&&($row3[classgrade34] != "TA")&&($row3[classgrade34] !=
"TB")&&($row3[classgrade34] != "TC")&&($row3[classgrade34] !=
"TCR")&&($row3[classgrade34] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
} // close if pre2

//if pre3 prerequisites check for being junior
if ( (($row3[class40] == "ee4171")||($row3[class40] == "ee4181")||($row3[class40] ==
"ee4182")||($row3[class40] == "ee4183")||($row3[class40] == "blank")) &&
(($row3[classgrade40] != "A") && ($row3[classgrade40] != "B") && ($row3[classgrade40] !=
"C")&&($row3[classgrade40] != "TA")&&($row3[classgrade40] !=
"TB")&&($row3[classgrade40] != "TC")&&($row3[classgrade40] !=
"TCR")&&($row3[classgrade40] != "P") ) ) { //if pre3
    if ( $creditspassed<60 ) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
} // close if pre3

```

```

                                                                    } //close the while
print $color;
$color="gray"; //back to default gray color
print ">"; //finish picking the color of the cell

//display the class picked if none was picked then print if there is a corequisite
if ($varclass40=="blank"){
    print "EE 41XX* class40";
}
else {
    echo $varclass40;
}

print "<br>";

$sql4 = "SELECT * FROM `bsee` WHERE `classcode`='$varclass40' "; //select record of
current user on Mysql
$result4 = $conn->query($sql4);
while ($row4 = $result4->fetch_assoc()) {
echo $row4[classname];
//to print the corequisite class due to the fact that this will be a class chosen as an Elective class
in either class 43, 44, 45, 46 uncomment to display
//if ($varclass40co != ""){
//print " coreq. ";
//}
//echo $varclass40co;
} //close the while $row4
print "<u> dB </u>";
print "</td>\n";

/*****
***** 2DB end
*****/

print "    <td style=background-color:"; //***** ee4220 --class41 db

//check status of ee4220 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//4220 has (9 prerequisites:ee3138 class29 ,ee3176 class30, ee3195 class31, ee3321 class32,
ee3340 class36
//CONT prerequisites ee3353 class37, ee3376 class38, ce2326 class12, ee3325 class33 )
//4220 has (1 corequisites: ee3329 class34 )

```

```

//ee4220 has not been TAKEN or taken and or taken and not passed CHECK
if ((($row3[class41] == "ee4220") && ($row3[classterm41] == "blank")) ||
($row3[classgrade41] == "blank")) {
    if (($row3[classgrade41] != "A") && ($row3[classgrade41] !=
"B") && ($row3[classgrade41] != "C") && ($row3[classgrade41] !=
"TA") && ($row3[classgrade41] != "TB") && ($row3[classgrade41] !=
"TC") && ($row3[classgrade41] != "TCR") && ($row3[classgrade41] != "P")) {
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}

//check if taken and successfully passed
if (($row3[class41] == "ee4220") && ($row3[classterm41] != "blank")) {
    if (($row3[classgrade41] == "A") || ($row3[classgrade41] == "B") || ($row3[classgrade41]
== "C") || ($row3[classgrade41] == "TA") || ($row3[classgrade41] == "TB") || ($row3[classgrade41]
== "TC") || ($row3[classgrade41] == "TCR") || ($row3[classgrade40] == "P")) {
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade ABC
        $creditspassed=$creditspassed+2;
        $credits41=$credits41+2;
    }
}

//COrerequisite check section No corequisite comment out section
// passed check needed ready to register to 1 corequisites: ee3329 class34
if ( ($color=="white") && (($row3[classgrade34] == "blank") && ($row3[classterm34] ==
"blank")) || (($row3[classgrade34] != "A") && ($row3[classgrade34] != "B") &&
($row3[classgrade34] != "C") && ($row3[classgrade34] != "TA") && ($row3[classgrade34] !=
"TB") && ($row3[classgrade34] != "TC") && ($row3[classgrade34] !=
"TCR") && ($row3[classgrade34] != "P")) ) ) {
    $color="yellow";
}

//PRerequisites check section
// ee3325 has 9 prerequisites: ce2326 class12, ee3138 class29 ,ee3176 class30, ee3195 class31,
ee3321 class32, , ee3325 class33
//CONT prerequisites ee3340 class36, ee3353 class37, ee3376 class38 )
// passed check needed ready to register ee4220

//prerequisite check for ce2326 class12
if ((($row3[classgrade12] == "blank") && ($row3[classterm12] == "blank")) ||
(($row3[classgrade12] != "A") && ($row3[classgrade12] != "B") && ($row3[classgrade12] !=
"C") && ($row3[classgrade12] != "TA") && ($row3[classgrade12] !=
"TB") && ($row3[classgrade12] != "TC") && ($row3[classgrade12] !=
"TCR") && ($row3[classgrade12] != "P")) ) ) {
    $color="gray"; //have not passed the class ce2326 class12 and check for
prerequisite not passed not ready for ee4220
}

```

```

    }
//prerequisite check for ee3138 class29
if ((($row3[classgrade29] == "blank") && ($row3[classterm29] == "blank")) ||
(($row3[classgrade29] != "A") && ($row3[classgrade29] != "B") && ($row3[classgrade29] !=
"C")&&($row3[classgrade29] != "TA")&&($row3[classgrade29] !=
"TB")&&($row3[classgrade29] != "TC")&&($row3[classgrade29] !=
"TCR")&&($row3[classgrade29] != "P") )){
    $color="gray"; //have not passed the class ee3138 class29 and check for
prerequisite not passed not ready for ee4220
}
//prerequisite check for ee3176 class30
if ((($row3[classgrade30] == "blank") && ($row3[classterm30] == "blank")) ||
(($row3[classgrade30] != "A") && ($row3[classgrade30] != "B") && ($row3[classgrade30] !=
"C")&&($row3[classgrade30] != "TA")&&($row3[classgrade30] !=
"TB")&&($row3[classgrade30] != "TC")&&($row3[classgrade30] !=
"TCR")&&($row3[classgrade30] != "P") )){
    $color="gray"; //have not passed the class ee3176 class30 and check for
prerequisite not passed not ready for ee4220
}
//prerequisite check for ee3195 class31
if ((($row3[classgrade31] == "blank") && ($row3[classterm31] == "blank")) ||
(($row3[classgrade31] != "A") && ($row3[classgrade31] != "B") && ($row3[classgrade31] !=
"C")&&($row3[classgrade31] != "TA")&&($row3[classgrade31] !=
"TB")&&($row3[classgrade31] != "TC")&&($row3[classgrade31] !=
"TCR")&&($row3[classgrade31] != "P") )){
    $color="gray"; //have not passed the class ee3195 class31 and check for
prerequisite not passed not ready for ee4220
}
//prerequisite check for ee3321 class32
if ((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C")&&($row3[classgrade32] != "TA")&&($row3[classgrade32] !=
"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P") )){
    $color="gray"; //have not passed the class ee3321 class32 and check for
prerequisite not passed not ready for ee4220
}
//prerequisite check for ee3325 class33
if ((($row3[classgrade33] == "blank") && ($row3[classterm33] == "blank")) ||
(($row3[classgrade33] != "A") && ($row3[classgrade33] != "B") && ($row3[classgrade33] !=
"C")&&($row3[classgrade33] != "TA")&&($row3[classgrade33] !=
"TB")&&($row3[classgrade33] != "TC")&&($row3[classgrade33] !=
"TCR")&&($row3[classgrade33] != "P") )){
    $color="gray"; //have not passed the class ee3325 class33 and check for
prerequisite not passed not ready for ee4220
}

```

```

//prerequisite check for ee3340 class36
if ((($row3[classgrade36] == "blank") && ($row3[classterm36] == "blank")) ||
(($row3[classgrade36] != "A") && ($row3[classgrade36] != "B") && ($row3[classgrade36] !=
"C")&&($row3[classgrade36] != "TA")&&($row3[classgrade36] !=
"TB")&&($row3[classgrade36] != "TC")&&($row3[classgrade36] !=
"TCR")&&($row3[classgrade36] != "P") )){
    $color="gray"; //have not passed the class ee3340 class36 and check for
prerequisite not passed not ready for ee4220
}
//prerequisite check for ee3353 class37
if ((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C")&&($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P") )){
    $color="gray"; //have not passed the class ee3353 class37 and check for
prerequisite not passed not ready for ee4220
}
//prerequisite check for ee3376 class38
if ((($row3[classgrade38] == "blank") && ($row3[classterm38] == "blank")) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C")&&($row3[classgrade38] != "TA")&&($row3[classgrade38] !=
"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P") )){
    $color="gray"; //have not passed the class ee3376 class38 and check for
prerequisite not passed not ready for ee4220
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 4220* <br> S. Proj.1 </td> \n";

print " <td>93-blank</td>\n";

//*****
//Elective class43 Elective Pull from Db ?</td>\n";
//*****
***** 2DB startClass 43 elective -->EEXXXX
//this cell will require to extract the information of db history and brief description from class db
(prerequisites to
//this senior EEconcentration classes vary wide therefore a case by case approach was used
print " <td style=background-color:";
//pick color

```

```

$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//(1 prerequisites: engl1312 class2 ) and (0 corequisites:)
//get the class taken and put it in a variable
$varclass43=$row3[class43]; //first get the class that was chosen from the student history db into
a local variable

// Check if there is the intent to take that class or if it was intended
if ((( $row3[class43] == "ee3354") || ($row3[class43] == "ee3372") || ($row3[class43] ==
"ee3385") || ($row3[class43] == "ee4341") || ($row3[class43] == "ee4342") || ($row3[class43] ==
"ee4347") || ($row3[class43] == "ee4350") || ($row3[class43] == "ee4351") || ($row3[class43] ==
"ee4352") || ($row3[class43] == "ee4353") || ($row3[class43] == "ee4354") || ($row3[class43] ==
"ee4356") || ($row3[class43] == "ee4357") || ($row3[class43] == "ee4358") || ($row3[class43] ==
"ee4359") || ($row3[class43] == "ee4360") || ($row3[class43] == "ee4361") || ($row3[class43] ==
"ee4364") || ($row3[class43] == "ee4365") || ($row3[class43] == "ee4366") || ($row3[class43] ==
"ee4371") || ($row3[class43] == "ee4372") || ($row3[class43] == "ee4374") || ($row3[class43] ==
"ee4375") || ($row3[class43] == "ee4376") || ($row3[class43] == "ee4378") || ($row3[class43] ==
"ee4379") || ($row3[class43] == "ee4380") || ($row3[class43] == "ee4382") || ($row3[class43] ==
"ee4383") || ($row3[class43] == "ee4385") || ($row3[class43] == "ee4386") || ($row3[class43] ==
"ee4388") || ($row3[class43] == "ee4389") || ($row3[class43] == "ee4395") || ($row3[class43] ==
"other ee") || ($row3[class43] == "ee5118") || ($row3[class43] == "ee5300") || ($row3[class43]
== "ee5301") || ($row3[class43] == "ee5302") || ($row3[class43] == "ee5306") || ($row3[class43]
== "ee5311") || ($row3[class43] == "ee5313") || ($row3[class43] == "ee5315") || ($row3[class43]
== "ee5318") || ($row3[class43] == "ee5323") || ($row3[class43] == "ee5324") || ($row3[class43]
== "ee5325") || ($row3[class43] == "ee5330") || ($row3[class43] == "ee5332") || ($row3[class43]
== "ee5333") || ($row3[class43] == "ee5336") || ($row3[class43] == "ee5341") || ($row3[class43]
== "ee5351") || ($row3[class43] == "ee5352") || ($row3[class43] == "ee5353") || ($row3[class43]
== "ee5354") || ($row3[class43] == "ee5356") || ($row3[class43] == "ee5357") || ($row3[class43]
== "ee5360") || ($row3[class43] == "ee5366") || ($row3[class43] == "ee5369") || ($row3[class43]
== "ee5370") || ($row3[class43] == "ee5371") || ($row3[class43] == "ee5372") || ($row3[class43]
== "ee5374") || ($row3[class43] == "ee5375") || ($row3[class43] == "ee5376") || ($row3[class43]
== "ee5378") || ($row3[class43] == "ee5379") || ($row3[class43] == "ee5390") || ($row3[class43]
== "ee5392")) && ($row3[class43] == "blank")) || ($row3[classgrade43] == "blank")){
    if (($row3[classgrade43] != "A")&&($row3[classgrade43] !=
"B")&&($row3[classgrade43] != "C")&&($row3[classgrade43] !=
"TA")&&($row3[classgrade43] != "TB")&&($row3[classgrade43] !=
"TC")&&($row3[classgrade43] != "TCR")&&($row3[classgrade43] != "P") ) {
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABCTATBTC or TCR
    }
}

//Check corequisites for the classes that have corequisites
//corequisite for ee4342 is ee4142
if ( ($row3[class43] == "ee4342") && (($row3[classgrade43] != "A") && ($row3[classgrade43]
!= "B") && ($row3[classgrade43] != "C") && ($row3[classgrade43] !=

```



```

"TA")&&($row3[classgrade43] != "TB")&&($row3[classgrade43] !=
"TC")&&($row3[classgrade43] != "TCR")&&($row3[classgrade43] != "P") ) ){
    $color="yellow";
    $varclass43co="ee4142";
}

//corequisite for ee4353 is ee4153
if ( ($row3[class43] == "ee4353") && (($row3[classgrade43] != "A") && ($row3[classgrade43]
!= "B") && ($row3[classgrade43] != "C") &&($row3[classgrade43] !=
"TA")&&($row3[classgrade43] != "TB")&&($row3[classgrade43] !=
"TC")&&($row3[classgrade43] != "TCR")&&($row3[classgrade43] != "P") ) ){
    $color="yellow";
    $varclass43co="ee4378";
}

//corequisite for ee4378 is ee4178
if ( ($row3[class43] == "ee4378") && (($row3[classgrade43] != "A") && ($row3[classgrade43]
!= "B") && ($row3[classgrade43] != "C") &&($row3[classgrade43] !=
"TA")&&($row3[classgrade43] != "TB")&&($row3[classgrade43] !=
"TC")&&($row3[classgrade43] != "TCR")&&($row3[classgrade43] != "P") ) ){
    $color="yellow";
    $varclass43co="ee4378";
}

//PRErequisites check section
// different prerequisites for the different classes that are an option for class43 are several
// actually 18 different checks have to be perform for the 72 possible classes

//if pre1 prerequisites check for ee2351 which is class25 and ee2372 which class28
if ( $row3[class43] == "ee3354" ){ //if pre1
    //check for class ee2351 class25
    if (((($row3[classgrade25] == "blank") && ($row3[classterm25] == "blank")) ||
(($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") && ($row3[classgrade25] !=
"C") &&($row3[classgrade25] != "TA")&&($row3[classgrade25] !=
"TB")&&($row3[classgrade25] != "TC")&&($row3[classgrade25] !=
"TCR")&&($row3[classgrade25] != "P") ))){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
    //check for class ee2372 class28
    if (((($row3[classgrade28] == "blank") && ($row3[classterm28] == "blank")) ||
(($row3[classgrade28] != "A") && ($row3[classgrade28] != "B") && ($row3[classgrade28] !=
"C") &&($row3[classgrade28] != "TA")&&($row3[classgrade28] !=
"TB")&&($row3[classgrade28] != "TC")&&($row3[classgrade28] !=
"TCR")&&($row3[classgrade28] != "P") ))){

```

```

        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
} // close if pre1

//if pre2 prerequisites check for prerequisites for ee3372 which are (ee2372 class28) and (ee3176
class30 )and (ee3376 class38)
if ( $row3[class43] == "ee3354" ){ //if pre2
//check for class ee2372 class28
    if ((( $row3[classgrade28] == "blank") && ( $row3[classterm28] == "blank")) ||
(( $row3[classgrade28] != "A") && ( $row3[classgrade28] != "B") && ( $row3[classgrade28] !=
"C") && ( $row3[classgrade28] != "TA") && ( $row3[classgrade28] !=
"TB") && ( $row3[classgrade28] != "TC") && ( $row3[classgrade28] !=
"TCR") && ( $row3[classgrade28] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
    }
//check for ee3176 class30
    if ((( $row3[classgrade30] == "blank") && ( $row3[classterm30] == "blank")) ||
(( $row3[classgrade30] != "A") && ( $row3[classgrade30] != "B") && ( $row3[classgrade30] !=
"C") && ( $row3[classgrade30] != "TA") && ( $row3[classgrade30] !=
"TB") && ( $row3[classgrade30] != "TC") && ( $row3[classgrade30] !=
"TCR") && ( $row3[classgrade30] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
    }
//check for ee3376 class38
    if ((( $row3[classgrade38] == "blank") && ( $row3[classterm38] == "blank")) ||
(( $row3[classgrade38] != "A") && ( $row3[classgrade38] != "B") && ( $row3[classgrade38] !=
"C") && ( $row3[classgrade38] != "TA") && ( $row3[classgrade38] !=
"TB") && ( $row3[classgrade38] != "TC") && ( $row3[classgrade38] !=
"TCR") && ( $row3[classgrade38] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
    }
} // close if pre2

//if pre3 prerequisites check for prerequisites for ee3385 which are (ee3321 class32) and
(phys2420 class4 )
if ( $row3[class43] == "ee3385" ){ //if pre3
//check for class ee3321 class32
    if ((( $row3[classgrade32] == "blank") && ( $row3[classterm32] == "blank")) ||
(( $row3[classgrade32] != "A") && ( $row3[classgrade32] != "B") && ( $row3[classgrade32] !=
"C") && ( $row3[classgrade32] != "TA") && ( $row3[classgrade32] !=
"TB") && ( $row3[classgrade32] != "TC") && ( $row3[classgrade32] !=
"TCR") && ( $row3[classgrade32] != "P")    )){

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        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3385
    }
//check for phys2420 class4
    if ((($row3[classgrade4] == "blank") && ($row3[classterm4] == "blank")) ||
(($row3[classgrade4] != "A") && ($row3[classgrade4] != "B") && ($row3[classgrade4] != "C")
&&($row3[classgrade4] != "TA")&&($row3[classgrade4] != "TB")&&($row3[classgrade4] !=
"TC")&&($row3[classgrade4] != "TCR")&&($row3[classgrade4] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3385
    }
} // close if pre3

//if pre4 prerequisites check for prerequisites for ee4341, ee4365, ee4366, ee4388, which are
(ee3353 class37) and (ee3384 class39 )
if ( ($row3[class43] == "ee4341") || ($row3[class43] == "ee4365") || ($row3[class43] ==
"ee4366") || ($row3[class43] == "ee4388") ){ //if pre4
//check for class ee3353 class37
    if ((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") &&($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
//check for ee3384 class39
    if ((($row3[classgrade39] == "blank") && ($row3[classterm39] == "blank")) ||
(($row3[classgrade39] != "A") && ($row3[classgrade39] != "B") && ($row3[classgrade39] !=
"C") &&($row3[classgrade39] != "TA")&&($row3[classgrade39] !=
"TB")&&($row3[classgrade39] != "TC")&&($row3[classgrade39] !=
"TCR")&&($row3[classgrade39] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
} // close if pre4

//if pre5 prerequisites check for prerequisites for ee4342, ee4372, ee4378, ee4379 which are
(ee3376 class38)
if ( ($row3[class43] == "ee4342") || ($row3[class43] == "ee4372") || ($row3[class43] ==
"ee4378") || ($row3[class43] == "ee4379") ){ //if pre5
//check for class ee3376 class38
    if ((($row3[classgrade38] == "blank") && ($row3[classterm38] == "blank")) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C") &&($row3[classgrade38] != "TA")&&($row3[classgrade38] !=

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"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P")    ){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4342, ee4372, ee4378, ee4379
}
} // close if pre5

//if pre6 prerequisites check for prerequisites for ee4347, ee4380, ee4382, ee4386 which are
(ee3321 class32)
if ( ($row3[class43] == "ee4347") || ($row3[class43] == "ee4380") || ($row3[class43] ==
"ee4382") || ($row3[class43] == "ee4386") ){ //if pre6
//check for class ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA")&&($row3[classgrade32] !=
"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4347, ee4380, ee4382, ee4386
    }
} // close if pre6

//if pre7 prerequisites check for prerequisites for ee4350, ee4353, ee4375, ee4376 which are
(ee3329 class34)
if ( ($row3[class43] == "ee4350") || ($row3[class43] == "ee4353") || ($row3[class43] ==
"ee4375") || ($row3[class43] == "ee4376") ){ //if pre7
//check for class ee3329 class34
    if (((($row3[classgrade34] == "blank") && ($row3[classterm34] == "blank")) ||
(($row3[classgrade34] != "A") && ($row3[classgrade34] != "B") && ($row3[classgrade34] !=
"C") && ($row3[classgrade34] != "TA")&&($row3[classgrade34] !=
"TB")&&($row3[classgrade34] != "TC")&&($row3[classgrade34] !=
"TCR")&&($row3[classgrade34] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4350, ee4353, ee4375, ee4376
    }
} // close if pre7

//if pre8 prerequisites check for being junior, this is prerequisite for prerequisites for ee4351,
ee4357, ee4360, ee4371
if ( ($row3[class43] == "ee4351") || ($row3[class43] == "ee4357") || ($row3[class43] ==
"ee4360") || ($row3[class43] == "ee4371") ){ //if pre8
    if ( $creditspassed<60 ){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4351, ee4357, ee4360, ee4371
    }
} // close if pre8

```

```

//if pre9 prerequisites check for prerequisites for ee4352 which is (ee3338 class35 )
if ( $row3[class43] == "ee4352" ){ //if pre9
//check for class ee3338 class35
    if ((( $row3[classgrade35] == "blank") && ( $row3[classterm35] == "blank")) ||
(( $row3[classgrade35] != "A") && ( $row3[classgrade35] != "B") && ( $row3[classgrade35] !=
"C") && ( $row3[classgrade35] != "TA") && ( $row3[classgrade35] !=
"TB") && ( $row3[classgrade35] != "TC") && ( $row3[classgrade35] !=
"TCR") && ( $row3[classgrade35] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4352
    }
} // close if pre9

//if pre10 prerequisites for ee4354 SOLUTION to check prerequisite ee4383 that may be an
elective having another elective as prerequisite (first check that ee4354 was selected, then look
for the prerequisite in all of the elective options)
if ( ( $row3[class43] == "ee4354") || ( $row3[class44] == "ee4354") || ( $row3[class45] ==
"ee4354") || ( $row3[class46] == "ee4354") || ( $row3[class43] == "ee4359") || ( $row3[class44] ==
"ee4359") || ( $row3[class45] == "ee4359") || ( $row3[class46] == "ee4359") ){ //if pre10
//check for class ee4383
    if ((( $row3[class43] == "ee4383") && ( $row3[classterm43] == "blank")) &&
(( $row3[classgrade43] != "A") || ( $row3[classgrade43] != "B") || ( $row3[classgrade43] != "C") ||
( $row3[classgrade43] != "TA") || ( $row3[classgrade43] != "TB") || ( $row3[classgrade43] !=
"TC") || ( $row3[classgrade43] != "TCR") || ( $row3[classgrade43] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if ((( $row3[class44] == "ee4383") && ( $row3[classterm44] == "blank")) &&
(( $row3[classgrade44] != "A") || ( $row3[classgrade44] != "B") || ( $row3[classgrade44] != "C") ||
( $row3[classgrade44] != "TA") || ( $row3[classgrade44] != "TB") || ( $row3[classgrade44] !=
"TC") || ( $row3[classgrade44] != "TCR") || ( $row3[classgrade44] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if ((( $row3[class45] == "ee4383") && ( $row3[classterm45] == "blank")) &&
(( $row3[classgrade45] != "A") || ( $row3[classgrade45] != "B") || ( $row3[classgrade45] != "C") ||
( $row3[classgrade45] != "TA") || ( $row3[classgrade45] != "TB") || ( $row3[classgrade45] !=
"TC") || ( $row3[classgrade45] != "TCR") || ( $row3[classgrade45] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if ((( $row3[class46] == "ee4383") && ( $row3[classterm46] == "blank")) &&
(( $row3[classgrade46] != "A") || ( $row3[classgrade46] != "B") || ( $row3[classgrade46] != "C") ||
( $row3[classgrade46] != "TA") || ( $row3[classgrade46] != "TB") || ( $row3[classgrade46] !=
"TC") || ( $row3[classgrade46] != "TCR") || ( $row3[classgrade46] != "P") )){

```

```

        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    //check that the prerequisite ee4383 was among the 4 possible options
    if (($row3[class43] != "ee4383") || ($row3[class44] != "ee4383") ||
($row3[class45] != "ee4383") || ($row3[class46] != "ee4383") ){
        $color="gray"; //have not taken prerequisite class therefore not ready for ee4354
    }
} // close if pre10

```

```

//if pre11 prerequisites check for prerequisites for ee4356 which are (ee3353 class37) and
(ee3376 class38 )
if ( ($row3[class43] == "ee4356") ){ //if pre4
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
//check for ee3376 class38
    if (((($row3[classgrade38] == "blank") && ($row3[classterm38] == "blank")) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C") && ($row3[classgrade38] != "TA")&&($row3[classgrade38] !=
"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4356
    }
} // close if pre11

```

```

//if pre12 prerequisites for ee4358 SOLUTION to check prerequisite 4385 that may be an
elective having another elective as prerequisite (first check that ee4358 was selected, then look
for the prerequisite in all of the elective options)
if ( ($row3[class43] == "ee4358") || ($row3[class44] == "ee4358") || ($row3[class45] ==
"ee4358") || ($row3[class46] == "ee4358") ){ //if pre10
//check for class ee3338 class35
    if (((($row3[class43] == "ee4385") && ($row3[classterm43] == "blank")) &&
(($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
($row3[classgrade43] != "TA") || ($row3[classgrade43] != "TB") || ($row3[classgrade43] !=
"TC") || ($row3[classgrade43] != "TCR") || ($row3[classgrade43] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
}

```

```

    }
    if ((($row3[class44] == "ee4385") && ($row3[classterm44] == "blank")) &&
(($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||
($row3[classgrade44] != "TA") || ($row3[classgrade44] != "TB") || ($row3[classgrade44] !=
"TC") || ($row3[classgrade44] != "TCR") || ($row3[classgrade44] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if ((($row3[class45] == "ee4385") && ($row3[classterm45] == "blank")) &&
(($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
($row3[classgrade45] != "TA") || ($row3[classgrade45] != "TB") || ($row3[classgrade45] !=
"TC") || ($row3[classgrade45] != "TCR") || ($row3[classgrade45] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if ((($row3[class46] == "ee4385") && ($row3[classterm46] == "blank")) &&
(($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
($row3[classgrade46] != "TA") || ($row3[classgrade46] != "TB") || ($row3[classgrade46] !=
"TC") || ($row3[classgrade46] != "TCR") || ($row3[classgrade46] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
//check that the prerequisite ee4385 was among the 4 possible options in EE electives
    if (($row3[class43] != "ee4385") || ($row3[class44] != "ee4385") || ($row3[class45] !=
"ee4385") || ($row3[class46] != "ee4385") ) {
        $color="gray"; //have not taken prerequisite class 4385 therefore not ready for
ee4358
    }
} // close if pre12

//if pre13 prerequisites check for prerequisites for ee4361 which are (ee3338 class35) and
(ee3321 class32 )
if ( ($row3[class43] == "ee4361") ) { //if pre13
//check for class ee3338 class35
    if (((($row3[classgrade35] == "blank") && ($row3[classterm35] == "blank")) ||
(($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") && ($row3[classgrade35] !=
"C") && ($row3[classgrade35] != "TA") && ($row3[classgrade35] !=
"TB") && ($row3[classgrade35] != "TC") && ($row3[classgrade35] !=
"TCR") && ($row3[classgrade35] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4361
    }
//check for ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA") && ($row3[classgrade32] !=

```

```

"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")    ){
    $color="gray"; //have not passed the class and check for prerequisite  not passed
not ready for ee4361
    }
} // close if pre13

//if pre14 prerequisites check for prerequisites for ee4364, ee4383  which are (ee3353 class37)
if ( ($row3[class43] == "ee4364") || ($row3[class43] == "ee4383") ){ //if pre14
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank"))) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite  not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
} // close if pre14

//if pre15 prerequisites for ee4374 check prerequisite ee3372 that may be an elective having
another elective as prerequisite (first check that ee4374 was selected, then look for the
prerequisite in all of the elective options)
//if ( ($row3[class43] == "ee4374") || (($row3[class44] == "ee4374")|| (($row3[class45] ==
"ee4374")|| (($row3[class46] == "ee4374")    )){ //if pre10
//check for class ee3372 in electives
//    if (((($row3[class43] == "ee3372") && ($row3[classterm43] == "blank"))) &&
(($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
($row3[classgrade43] != "TA")||($row3[classgrade43] != "TB")||($row3[classgrade43] !=
"TC")||($row3[classgrade43] != "TCR")||($row3[classgrade43] != "P")    )){
//        $color="gray"; //have not passed the class and check for prerequisite  not passed
not ready for ee4383
//    }
//    if (((($row3[class44] == "ee3372") && ($row3[classterm44] == "blank"))) &&
(($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||
($row3[classgrade44] != "TA")||($row3[classgrade44] != "TB")||($row3[classgrade44] !=
"TC")||($row3[classgrade44] != "TCR")||($row3[classgrade44] != "P")    )){
//        $color="gray"; //have not passed the class and check for prerequisite  not passed
not ready for ee4383
//    }
//    if (((($row3[class45] == "ee3372") && ($row3[classterm45] == "blank"))) &&
(($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
($row3[classgrade45] != "TA")||($row3[classgrade45] != "TB")||($row3[classgrade45] !=
"TC")||($row3[classgrade45] != "TCR")||($row3[classgrade45] != "P")    )){
//        $color="gray"; //have not passed the class and check for prerequisite  not passed
not ready for ee4383

```



```

//      }
//      if ((($row3[class46] == "ee3372") && ($row3[classterm46] == "blank")) &&
(($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
($row3[classgrade46] != "TA") || ($row3[classgrade46] != "TB") || ($row3[classgrade46] !=
"TC") || ($row3[classgrade46] != "TCR") || ($row3[classgrade46] != "P")    )){
//          $color="gray"; //have not passed the class and check for prerequisite  not passed
not ready for ee4383
//      }
//check that the prerequisite ee4385 was among the 4 possible options in EE electives
//      if ( ($row3[class43] != "ee3372") || ($row3[class44] != "ee3372") || ($row3[class45] !=
"ee3372") || ($row3[class45] != "ee3372") ) {
//          $color="gray"; //have not taken prerequisite  class ee3372 therefore not ready for
ee4374
//      }
//} // close if pre15

```

```

//if pre16 prerequisites check for prerequisites for ee4385,  which are (ee3340 class36)
if ( ($row3[class43] == "ee4385") ){ //if pre16
//check for class ee3340 class36
    if (((($row3[classgrade36] == "blank") && ($row3[classterm36] == "blank")) ||
(($row3[classgrade36] != "A") && ($row3[classgrade36] != "B") && ($row3[classgrade36] !=
"C") && ($row3[classgrade36] != "TA") && ($row3[classgrade36] !=
"TB") && ($row3[classgrade36] != "TC") && ($row3[classgrade36] !=
"TCR") && ($row3[classgrade36] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite  not passed
not ready for ee4385
    }
} // close if pre16

```

```

//if pre17 prerequisites check for prerequisites for ee4389  which are (ee3321 class32) and
(ee3353 class37 )
if ( ($row3[class43] == "ee4389") ){ //if pre17
//check for ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA") && ($row3[classgrade32] !=
"TB") && ($row3[classgrade32] != "TC") && ($row3[classgrade32] !=
"TCR") && ($row3[classgrade32] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite  not passed
not ready for ee4361
    }
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA") && ($row3[classgrade37] !=

```

```

"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    ){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4389
    }
} // close if pre17

```

```

//if pre18 prerequisites check for being senior, this is prerequisite for prerequisites for ee4395,
ee5118,ee5300,ee5301,ee5302, ee5306,ee5311,ee5313,ee5315,ee5318,ee5323,ee5324, ee5325,
ee5330,ee5332, ee5333,ee 5336, ee5341, ee5351, ee5352, ee5353, ee5354, ee5356, ee5357,
ee5360, ee5366, ee5369, ee5370, ee5371, ee5372, ee5374, ee5375, ee5376, ee5378, ee5379,
ee5390, ee5392

```

```

//missing "other ee" form the possible classes

```

```

if ( ($row3[class43] == "ee4395") || ($row3[class43] == "ee5118") || ($row3[class43] ==
"ee5300") || ($row3[class43] == "ee5301") || ($row3[class43] == "ee5302") || ($row3[class43] ==
"ee5306") || ($row3[class43] == "ee5311") || ($row3[class43] == "ee5313") || ($row3[class43] ==
"ee5315") || ($row3[class43] == "ee5318") || ($row3[class43] == "ee5323") || ($row3[class43] ==
"ee5324") || ($row3[class43] == "ee5325") || ($row3[class43] == "ee5330") || ($row3[class43] ==
"ee5332") || ($row3[class43] == "ee5333") || ($row3[class43] == "ee5336") || ($row3[class43] ==
"ee5341") || ($row3[class43] == "ee5351") || ($row3[class43] == "ee5352") || ($row3[class43] ==
"ee5353") || ($row3[class43] == "ee5354") || ($row3[class43] == "ee5356") || ($row3[class43] ==
"ee5357") || ($row3[class43] == "ee5360") || ($row3[class43] == "ee5366") || ($row3[class43] ==
"ee5369") || ($row3[class43] == "ee5370") || ($row3[class43] == "ee5371") || ($row3[class43] ==
"ee5372") || ($row3[class43] == "ee5374") || ($row3[class43] == "ee5375") || ($row3[class43] ==
"ee5376") || ($row3[class43] == "ee5378") || ($row3[class43] == "ee5379") || ($row3[class43] ==
"ee5390") || ($row3[class43] == "ee5392") ){ //if pre18
    if ( $creditspassed<90 ){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4351, ee4357, ee4360, ee4371
    }
} // close if pre18

```

```

//check if taken and successfully passed

```

```

if(( ( ($row3[class43] == "ee3354") || ($row3[class43] == "ee3372") || ($row3[class43] ==
"ee3385") || ($row3[class43] == "ee4341") || ($row3[class43] == "ee4342") || ($row3[class43] ==
"ee4347") || ($row3[class43] == "ee4350") || ($row3[class43] == "ee4351") || ($row3[class43] ==
"ee4352") || ($row3[class43] == "ee4353") || ($row3[class43] == "ee4354") || ($row3[class43] ==
"ee4356") || ($row3[class43] == "ee4357") || ($row3[class43] == "ee4358") || ($row3[class43] ==
"ee4359") || ($row3[class43] == "ee4360") || ($row3[class43] == "ee4361") || ($row3[class43] ==
"ee4364") || ($row3[class43] == "ee4365") || ($row3[class43] == "ee4366") || ($row3[class43] ==
"ee4371") || ($row3[class43] == "ee4372") || ($row3[class43] == "ee4374") || ($row3[class43] ==
"ee4375") || ($row3[class43] == "ee4376") || ($row3[class43] == "ee4378") || ($row3[class43] ==
"ee4379") || ($row3[class43] == "ee4380") || ($row3[class43] == "ee4382") || ($row3[class43] ==
"ee4383") || ($row3[class43] == "ee4385") || ($row3[class43] == "ee4386") || ($row3[class43] ==
"ee4388") || ($row3[class43] == "ee4389") || ($row3[class43] == "ee4395") || ($row3[class43] ==
"other ee") || ($row3[class43] == "ee5118") || ($row3[class43] == "ee5300") || ($row3[class43] ==

```

```

== "ee5301") || ($row3[class43] == "ee5302") || ($row3[class43] == "ee5306") || ($row3[class43]
== "ee5311") || ($row3[class43] == "ee5313") || ($row3[class43] == "ee5315") || ($row3[class43]
== "ee5318") || ($row3[class43] == "ee5323") || ($row3[class43] == "ee5324") || ($row3[class43]
== "ee5325") || ($row3[class43] == "ee5330") || ($row3[class43] == "ee5332") || ($row3[class43]
== "ee5333") || ($row3[class43] == "ee5336") || ($row3[class43] == "ee5341") || ($row3[class43]
== "ee5351") || ($row3[class43] == "ee5352") || ($row3[class43] == "ee5353") || ($row3[class43]
== "ee5354") || ($row3[class43] == "ee5356") || ($row3[class43] == "ee5357") || ($row3[class43]
== "ee5360") || ($row3[class43] == "ee5366") || ($row3[class43] == "ee5369") || ($row3[class43]
== "ee5370") || ($row3[class43] == "ee5371") || ($row3[class43] == "ee5372") || ($row3[class43]
== "ee5374") || ($row3[class43] == "ee5375") || ($row3[class43] == "ee5376") || ($row3[class43]
== "ee5378") || ($row3[class43] == "ee5379") || ($row3[class43] == "ee5390") || ($row3[class43]
== "ee5392")) ) && ($row3[class43] != "blank") ){
    if (($row3[classgrade43] == "A") || ($row3[classgrade43] == "B") || ($row3[classgrade43]
== "C") || ($row3[classgrade43] == "TA") || ($row3[classgrade43] == "TB") || ($row3[classgrade43]
== "TC") || ($row3[classgrade43] == "TCR") || ($row3[classgrade43] == "P") ){
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
                                $creditspassed=$creditspassed+3;
                                $credits41=$credits41+3;
                                }
        }

} //close the while
if ($varclass43=="blank"){ // in case no class was choosen paint cell gray
    $color="gray";
}

print $color;
$color="gray"; //back to default gray color
print ">"; //finish picking the color of the cell

//display the class picked if none was picked then print if there is a corequisite
if ($varclass43=="blank"){
    print "EE XXXX* class43";
    $color="gray";
}

else {
    echo $varclass43;
}

print "<br>";

$sql4 = "SELECT * FROM `bsee` WHERE `classcode`='$varclass43' "; //select record of
current user on Mysql

```

```

$result4 = $conn->query($sql4);
while ($row4 = $result4->fetch_assoc()) {
echo $row4[classname]; //display brief class description
echo "<br>";
//to print the corequisite class due to the fact that this will be a class chosen as an Elective class
in either class 43, 44, 45, 46 uncomment to display
//if ($varclass43co != ""){
//print " coreq. ";
//}
//echo $varclass40co;
} //close the while $row4

//If left blank in the class history page print elective on the second line of the cell
if ($varclass43=="blank"){
    print "Elective";
}

else {
    echo $varclass43;
}

print "<u> dB </u>";
print "</td>\n";

/*****
***** 2DB Class 44 elective -->EEXXXX
//this cell will require to extract the information of db history and brief description from class db
(prerequisites to
//this senior EEconcentration classes vary wide therefore a case by case approach was used
print "    <td style=background-color:";
//pick color

$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//(1 prerequisites: engl1312 class2 ) and (0 corequisites:)
//get the class taken and put it in a variable
$varclass44=$row3[class44]; //first get the class that was chosen from the student history db into
a local variable

// Check if there is the intent to take that class or if it was intended
if ((( $row3[class44] == "ee3354") || ($row3[class44] == "ee3372") || ($row3[class44] ==
"ee3385") || ($row3[class44] == "ee4341") || ($row3[class44] == "ee4342") || ($row3[class44] ==
"ee4347") || ($row3[class44] == "ee4350") || ($row3[class44] == "ee4351") || ($row3[class44] ==
"ee4352") || ($row3[class44] == "ee4353") || ($row3[class44] == "ee4354") || ($row3[class44] ==
"ee4356") || ($row3[class44] == "ee4357") || ($row3[class44] == "ee4358") || ($row3[class44] ==
"ee4359") || ($row3[class44] == "ee4360") || ($row3[class44] == "ee4361") || ($row3[class44] ==
"ee4364") || ($row3[class44] == "ee4365") || ($row3[class44] == "ee4366") || ($row3[class44] ==

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"ee4371") || ($row3[class44] == "ee4372") || ($row3[class44] == "ee4374") || ($row3[class44] ==
"ee4375") || ($row3[class44] == "ee4376") || ($row3[class44] == "ee4378") || ($row3[class44] ==
"ee4379") || ($row3[class44] == "ee4380") || ($row3[class44] == "ee4382") || ($row3[class44] ==
"ee4383") || ($row3[class44] == "ee4385") || ($row3[class44] == "ee4386") || ($row3[class44] ==
"ee4388") || ($row3[class44] == "ee4389") || ($row3[class44] == "ee4395") || ($row3[class44] ==
"other ee") || ($row3[class44] == "ee5118") || ($row3[class44] == "ee5300") || ($row3[class44]
== "ee5301") || ($row3[class44] == "ee5302") || ($row3[class44] == "ee5306") || ($row3[class44]
== "ee5311") || ($row3[class44] == "ee5313") || ($row3[class44] == "ee5315") || ($row3[class44]
== "ee5318") || ($row3[class44] == "ee5323") || ($row3[class44] == "ee5324") || ($row3[class44]
== "ee5325") || ($row3[class44] == "ee5330") || ($row3[class44] == "ee5332") || ($row3[class44]
== "ee5333") || ($row3[class44] == "ee5336") || ($row3[class44] == "ee5341") || ($row3[class44]
== "ee5351") || ($row3[class44] == "ee5352") || ($row3[class44] == "ee5353") || ($row3[class44]
== "ee5354") || ($row3[class44] == "ee5356") || ($row3[class44] == "ee5357") || ($row3[class44]
== "ee5360") || ($row3[class44] == "ee5366") || ($row3[class44] == "ee5369") || ($row3[class44]
== "ee5370") || ($row3[class44] == "ee5371") || ($row3[class44] == "ee5372") || ($row3[class44]
== "ee5374") || ($row3[class44] == "ee5375") || ($row3[class44] == "ee5376") || ($row3[class44]
== "ee5378") || ($row3[class44] == "ee5379") || ($row3[class44] == "ee5390") || ($row3[class44]
== "ee5392")) && ($row3[class44] == "blank")) || ($row3[class44] == "blank"))){
    if (($row3[classgrade44] != "A")&&($row3[classgrade44] !=
"B")&&($row3[classgrade44] != "C")&&($row3[classgrade44] !=
"TA")&&($row3[classgrade44] != "TB")&&($row3[classgrade44] !=
"TC")&&($row3[classgrade44] != "TCR")&&($row3[classgrade44] != "P") ) ){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABCTATBTC or TCR
    }
}
}

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//Check corequisites for the classes that have corequisites

//corequisite for ee4342 is ee4142

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if ( ($row3[class44] == "ee4442") && (($row3[classgrade44] != "A") && ($row3[classgrade44]
!= "B") && ($row3[classgrade44] != "C") &&($row3[classgrade44] !=
"TA")&&($row3[classgrade44] != "TB")&&($row3[classgrade44] !=
"TC")&&($row3[classgrade44] != "TCR")&&($row3[classgrade44] != "P") ) ) ){
    $color="yellow";
    $varclass44co="ee4142";
}

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//corequisite for ee4353 is ee4153

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if ( ($row3[class44] == "ee4353") && (($row3[classgrade44] != "A") && ($row3[classgrade44]
!= "B") && ($row3[classgrade44] != "C") &&($row3[classgrade44] !=
"TA")&&($row3[classgrade44] != "TB")&&($row3[classgrade44] !=
"TC")&&($row3[classgrade44] != "TCR")&&($row3[classgrade44] != "P") ) ) ){
    $color="yellow";
    $varclass44co="ee4378";
}

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//corequisite for ee4378 is ee4178
if ( ($row3[class44] == "ee4378") && (($row3[classgrade44] != "A") && ($row3[classgrade44]
!= "B") && ($row3[classgrade44] != "C") && ($row3[classgrade44] !=
"TA")&&($row3[classgrade44] != "TB")&&($row3[classgrade44] !=
"TC")&&($row3[classgrade44] != "TCR")&&($row3[classgrade44] != "P") ) ) {
    $color="yellow";
    $varclass44co="ee4378";
}

//PRErequisites check section
// different prerequisites for the different classes that are an option for class44 are several
// actually 18 different checks have to be perform for the 72 possible classes

//if pre1 prerequisites check for ee2351 which is class25 and ee2372 which class28
if ( $row3[class44] == "ee3354" ){ //if pre1
    //check for class ee2351 class25
    if (((($row3[classgrade25] == "blank") && ($row3[classterm25] == "blank")) ||
(($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") && ($row3[classgrade25] !=
"C") &&($row3[classgrade25] != "TA")&&($row3[classgrade25] !=
"TB")&&($row3[classgrade25] != "TC")&&($row3[classgrade25] !=
"TCR")&&($row3[classgrade25] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
    //check for class ee2372 class28
    if (((($row3[classgrade28] == "blank") && ($row3[classterm28] == "blank")) ||
(($row3[classgrade28] != "A") && ($row3[classgrade28] != "B") && ($row3[classgrade28] !=
"C") &&($row3[classgrade28] != "TA")&&($row3[classgrade28] !=
"TB")&&($row3[classgrade28] != "TC")&&($row3[classgrade28] !=
"TCR")&&($row3[classgrade28] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
} // close if pre1

//if pre2 prerequisites check for prerequisites for ee3372 which are (ee2372 class28) and (ee3176
class30 )and (ee3376 class38)
if ( $row3[class44] == "ee3354" ){ //if pre2
//check for class ee2372 class28
    if (((($row3[classgrade28] == "blank") && ($row3[classterm28] == "blank")) ||
(($row3[classgrade28] != "A") && ($row3[classgrade28] != "B") && ($row3[classgrade28] !=
"C") &&($row3[classgrade28] != "TA")&&($row3[classgrade28] !=
"TB")&&($row3[classgrade28] != "TC")&&($row3[classgrade28] !=
"TCR")&&($row3[classgrade28] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
    }
}

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    }
//check for ee3176 class30
    if ((($row3[classgrade30] == "blank") && ($row3[classterm30] == "blank")) ||
(($row3[classgrade30] != "A") && ($row3[classgrade30] != "B") && ($row3[classgrade30] !=
"C") && ($row3[classgrade30] != "TA")&&($row3[classgrade30] !=
"TB")&&($row3[classgrade30] != "TC")&&($row3[classgrade30] !=
"TCR")&&($row3[classgrade30] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
    }
//check for ee3376 class38
    if ((($row3[classgrade38] == "blank") && ($row3[classterm38] == "blank")) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C") && ($row3[classgrade38] != "TA")&&($row3[classgrade38] !=
"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
    }
} // close if pre2

//if pre3 prerequisites check for prerequisites for ee3385 which are (ee3321 class32) and
(phys2420 class4 )
if ( $row3[class44] == "ee3385" ){ //if pre3
//check for class ee3321 class32
    if ((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA")&&($row3[classgrade32] !=
"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3385
    }
//check for phys2420 class4
    if ((($row3[classgrade4] == "blank") && ($row3[classterm4] == "blank")) ||
(($row3[classgrade4] != "A") && ($row3[classgrade4] != "B") && ($row3[classgrade4] != "C")
&&($row3[classgrade4] != "TA")&&($row3[classgrade4] != "TB")&&($row3[classgrade4] !=
"TC")&&($row3[classgrade4] != "TCR")&&($row3[classgrade4] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3385
    }
} // close if pre3

//if pre4 prerequisites check for prerequisites for ee4341, ee4365, ee4366, ee4388, which are
(ee3353 class37) and (ee3384 class39)

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if ( ($row3[class44] == "ee4341") || ($row3[class44] == "ee4365") || ($row3[class44] ==
"ee4366") || ($row3[class44] == "ee4388")) { //if pre4
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
//check for ee3384 class39
    if (((($row3[classgrade39] == "blank") && ($row3[classterm39] == "blank")) ||
(($row3[classgrade39] != "A") && ($row3[classgrade39] != "B") && ($row3[classgrade39] !=
"C") && ($row3[classgrade39] != "TA")&&($row3[classgrade39] !=
"TB")&&($row3[classgrade39] != "TC")&&($row3[classgrade39] !=
"TCR")&&($row3[classgrade39] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
} // close if pre4

//if pre5 prerequisites check for prerequisites for ee4342, ee4372, ee4378, ee4379 which are
(ee3376 class38)
if ( ($row3[class44] == "ee4342") || ($row3[class44] == "ee4372") || ($row3[class44] ==
"ee4378") || ($row3[class44] == "ee4379")) { //if pre5
//check for class ee3376 class38
    if (((($row3[classgrade38] == "blank") && ($row3[classterm38] == "blank")) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C") && ($row3[classgrade38] != "TA")&&($row3[classgrade38] !=
"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4342, ee4372, ee4378, ee4379
    }
} // close if pre5

//if pre6 prerequisites check for prerequisites for ee4347, ee4380, ee4382, ee4386 which are
(ee3321 class32)
if ( ($row3[class44] == "ee4347") || ($row3[class44] == "ee4380") || ($row3[class44] ==
"ee4382") || ($row3[class44] == "ee4386")) { //if pre6
//check for class ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA")&&($row3[classgrade32] !=

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"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")    ){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4347, ee4380, ee4382, ee4386
}
} // close if pre6

//if pre7 prerequisites check for prerequisites for ee4350, ee4353, ee4375, ee4376 which are
(ee3329 class34)
if ( ($row3[class44] == "ee4350") || ($row3[class44] == "ee4353") || ($row3[class44] ==
"ee4375") || ($row3[class44] == "ee4376") ){ //if pre7
//check for class ee3329 class34
    if (((($row3[classgrade34] == "blank") && ($row3[classterm34] == "blank")) ||
(($row3[classgrade34] != "A") && ($row3[classgrade34] != "B") && ($row3[classgrade34] !=
"C") && ($row3[classgrade34] != "TA")&&($row3[classgrade34] !=
"TB")&&($row3[classgrade34] != "TC")&&($row3[classgrade34] !=
"TCR")&&($row3[classgrade34] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4350, ee4353, ee4375, ee4376
    }
} // close if pre7

//if pre8 prerequisites check for being junior, this is prerequisite for prerequisites for ee4351,
ee4357, ee4360, ee4371
if ( ($row3[class44] == "ee4351") || ($row3[class44] == "ee4357") || ($row3[class44] ==
"ee4360") || ($row3[class44] == "ee4371") ){ //if pre8
    if ( $creditspassed<60 ){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4351, ee4357, ee4360, ee4371
    }
} // close if pre8

//if pre9 prerequisites check for prerequisites for ee4352 which is (ee3338 class35 )
if ( $row3[class44] == "ee4352" ){ //if pre9
//check for class ee3338 class35
    if (((($row3[classgrade35] == "blank") && ($row3[classterm35] == "blank")) ||
(($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") && ($row3[classgrade35] !=
"C") && ($row3[classgrade35] != "TA")&&($row3[classgrade35] !=
"TB")&&($row3[classgrade35] != "TC")&&($row3[classgrade35] !=
"TCR")&&($row3[classgrade35] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4352
    }
} // close if pre9

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//if pre10 prerequisites for ee4354 SOLUTION to check prerequisite ee4383 that may be an
elective having another elective as prerequisite (first check that ee4354 was selected, then look
for the prerequisite in all of the elective options)
if ( ($row3[class43] == "ee4354") || ($row3[class44] == "ee4354") || ($row3[class45] ==
"ee4354") || ($row3[class46] == "ee4354") || ($row3[class43] == "ee4359") || ($row3[class44] ==
"ee4359") || ($row3[class45] == "ee4359") || ($row3[class46] == "ee4359") ) { //if pre10
//check for class ee4383
    if (((($row3[class43] == "ee4383") && ($row3[classterm43] == "blank"))) &&
(($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
($row3[classgrade43] != "TA") || ($row3[classgrade43] != "TB") || ($row3[classgrade43] !=
"TC") || ($row3[classgrade43] != "TCR") || ($row3[classgrade43] != "P") )) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if (((($row3[class44] == "ee4383") && ($row3[classterm44] == "blank"))) &&
(($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||
($row3[classgrade44] != "TA") || ($row3[classgrade44] != "TB") || ($row3[classgrade44] !=
"TC") || ($row3[classgrade44] != "TCR") || ($row3[classgrade44] != "P") )) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if (((($row3[class45] == "ee4383") && ($row3[classterm45] == "blank"))) &&
(($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
($row3[classgrade45] != "TA") || ($row3[classgrade45] != "TB") || ($row3[classgrade45] !=
"TC") || ($row3[classgrade45] != "TCR") || ($row3[classgrade45] != "P") )) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if (((($row3[class46] == "ee4383") && ($row3[classterm46] == "blank"))) &&
(($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
($row3[classgrade46] != "TA") || ($row3[classgrade46] != "TB") || ($row3[classgrade46] !=
"TC") || ($row3[classgrade46] != "TCR") || ($row3[classgrade46] != "P") )) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    //check that the prerequisite ee4383 was among the 4 possible options
    if (($row3[class43] != "ee4383") || ($row3[class44] != "ee4383") ||
($row3[class45] != "ee4383") || ($row3[class46] != "ee4383") ) {
        $color="gray"; //have not taken prerequisite class therefore not ready for ee4354
    }
} // close if pre10

//if pre11 prerequisites check for prerequisites for ee4356 which are (ee3353 class37) and
(ee3376 class38 )
if ( ($row3[class44] == "ee4356") ) { //if pre4
//check for class ee3353 class37

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        if ((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA") && ($row3[classgrade37] !=
"TB") && ($row3[classgrade37] != "TC") && ($row3[classgrade37] !=
"TCR") && ($row3[classgrade37] != "P")    )){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
        }
//check for ee3376 class38
        if ((($row3[classgrade38] == "blank") && ($row3[classterm38] == "blank")) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C") && ($row3[classgrade38] != "TA") && ($row3[classgrade38] !=
"TB") && ($row3[classgrade38] != "TC") && ($row3[classgrade38] !=
"TCR") && ($row3[classgrade38] != "P")    )){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4356
        }
    } // close if pre11

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//if pre12 prerequisites for ee4358 SOLUTION to check prerequisite 4385 that may be an elective having another elective as prerequisite (first check that ee4358 was selected, then look for the prerequisite in all of the elective options)

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if ( ($row3[class43] == "ee4358") || ($row3[class44] == "ee4358") || ($row3[class45] ==
"ee4358") || ($row3[class46] == "ee4358") ) { //if pre10
//check for class ee3338 class35
        if ((($row3[class43] == "ee4385") && ($row3[classterm43] == "blank")) &&
(($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
($row3[classgrade43] != "TA") || ($row3[classgrade43] != "TB") || ($row3[classgrade43] !=
"TC") || ($row3[classgrade43] != "TCR") || ($row3[classgrade43] != "P")    )){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
        }
        if ((($row3[class44] == "ee4385") && ($row3[classterm44] == "blank")) &&
(($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||
($row3[classgrade44] != "TA") || ($row3[classgrade44] != "TB") || ($row3[classgrade44] !=
"TC") || ($row3[classgrade44] != "TCR") || ($row3[classgrade44] != "P")    )){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
        }
        if ((($row3[class45] == "ee4385") && ($row3[classterm45] == "blank")) &&
(($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
($row3[classgrade45] != "TA") || ($row3[classgrade45] != "TB") || ($row3[classgrade45] !=
"TC") || ($row3[classgrade45] != "TCR") || ($row3[classgrade45] != "P")    )){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
        }
    }

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    }
    if ((($row3[class46] == "ee4385") && ($row3[classterm46] == "blank")) &&
(($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
($row3[classgrade46] != "TA") || ($row3[classgrade46] != "TB") || ($row3[classgrade46] !=
"TC") || ($row3[classgrade46] != "TCR") || ($row3[classgrade46] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
//check that the prerequisite ee4385 was among the 4 possible options in EE electives
    if (($row3[class43] != "ee4385") || ($row3[class44] != "ee4385") || ($row3[class45] !=
"ee4385") || ($row3[class46] != "ee4385") ){
        $color="gray"; //have not taken prerequisite class 4385 therefore not ready for
ee4358
    }
} // close if pre12

//if pre13 prerequisites check for prerequisites for ee4361 which are (ee3338 class35) and
(ee3321 class32 )
if ( ($row3[class44] == "ee4361") ){ //if pre13
//check for class ee3338 class35
    if (((($row3[classgrade35] == "blank") && ($row3[classterm35] == "blank")) ||
(($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") && ($row3[classgrade35] !=
"C") && ($row3[classgrade35] != "TA") && ($row3[classgrade35] !=
"TB") && ($row3[classgrade35] != "TC") && ($row3[classgrade35] !=
"TCR") && ($row3[classgrade35] != "P") ))){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4361
    }
//check for ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA") && ($row3[classgrade32] !=
"TB") && ($row3[classgrade32] != "TC") && ($row3[classgrade32] !=
"TCR") && ($row3[classgrade32] != "P") ))){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4361
    }
} // close if pre13

//if pre14 prerequisites check for prerequisites for ee4364, ee4383 which are (ee3353 class37)
if ( ($row3[class44] == "ee4364") || ($row3[class44] == "ee4383") ){ //if pre14
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA") && ($row3[classgrade37] !=

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```

"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    ){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
} // close if pre14

//if pre15 prerequisites for ee4374 check prerequisite ee3372 that may be an elective having
another elective as prerequisite (first check that ee4374 was selected, then look for the
prerequisite in all of the elective options)
//if ( ($row3[class43] == "ee4374") || (($row3[class44] == "ee4374") || (($row3[class45] ==
"ee4374") || (($row3[class46] == "ee4374")    ){ //if pre10
//check for class ee3372 in electives
//    if (((($row3[class43] == "ee3372") && ($row3[classterm43] == "blank"))) &&
(($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
($row3[classgrade43] != "TA") || ($row3[classgrade43] != "TB") || ($row3[classgrade43] !=
"TC") || ($row3[classgrade43] != "TCR") || ($row3[classgrade43] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//        }
//    if (((($row3[class44] == "ee3372") && ($row3[classterm44] == "blank"))) &&
(($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||
($row3[classgrade44] != "TA") || ($row3[classgrade44] != "TB") || ($row3[classgrade44] !=
"TC") || ($row3[classgrade44] != "TCR") || ($row3[classgrade44] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//        }
//    if (((($row3[class45] == "ee3372") && ($row3[classterm45] == "blank"))) &&
(($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
($row3[classgrade45] != "TA") || ($row3[classgrade45] != "TB") || ($row3[classgrade45] !=
"TC") || ($row3[classgrade45] != "TCR") || ($row3[classgrade45] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//        }
//    if (((($row3[class46] == "ee3372") && ($row3[classterm46] == "blank"))) &&
(($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
($row3[classgrade46] != "TA") || ($row3[classgrade46] != "TB") || ($row3[classgrade46] !=
"TC") || ($row3[classgrade46] != "TCR") || ($row3[classgrade46] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//        }
//check that the prerequisite ee4385 was among the 4 possible options in EE electives
//    if ( ($row3[class43] != "ee3372") || ($row3[class44] != "ee3372") || ($row3[class45] !=
"ee3372") || ($row3[class46] != "ee3372")    ){
//        $color="gray"; //have not taken prerequisite class ee3372 therefore not ready for
ee4374

```

```

//      }
//} // close if pre15

//if pre16 prerequisites check for prerequisites for ee4385, which are (ee3340 class36)
if ( ($row3[class44] == "ee4385") ){ //if pre16
//check for class ee3340 class36
    if (((($row3[classgrade36] == "blank") && ($row3[classterm36] == "blank")) ||
(($row3[classgrade36] != "A") && ($row3[classgrade36] != "B") && ($row3[classgrade36] !=
"C") && ($row3[classgrade36] != "TA")&&($row3[classgrade36] !=
"TB")&&($row3[classgrade36] != "TC")&&($row3[classgrade36] !=
"TCR")&&($row3[classgrade36] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4385
    }
} // close if pre16

//if pre17 prerequisites check for prerequisites for ee4389 which are (ee3321 class32) and
(ee3353 class37 )
if ( ($row3[class44] == "ee4389") ){ //if pre17
//check for ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA")&&($row3[classgrade32] !=
"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4361
    }
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4389
    }
} // close if pre17

//if pre18 prerequisites check for being senior, this is prerequisite for prerequisites for ee4395,
ee5118,ee5300,ee5301,ee5302, ee5306,ee5311,ee5313,ee5315,ee5318,ee5323,ee5324, ee5325,
ee5330,ee5332, ee5333,ee 5336, ee5341, ee5351, ee5352, ee5353, ee5354, ee5356, ee5357,
ee5360, ee5366, ee5369, ee5370, ee5371, ee5372, ee5374, ee5375, ee5376, ee5378, ee5379,
ee5390, ee5392
//missing "other ee" form the possible classes

```

```

if ( ($row3[class44] == "ee4395") || ($row3[class44] == "ee5118") || ($row3[class44] ==
"ee5300") || ($row3[class44] == "ee5301") || ($row3[class44] == "ee5302") || ($row3[class44] ==
"ee5306") || ($row3[class44] == "ee5311") || ($row3[class44] == "ee5313") || ($row3[class44] ==
"ee5315") || ($row3[class44] == "ee5318") || ($row3[class44] == "ee5323") || ($row3[class44] ==
"ee5324") || ($row3[class44] == "ee5325") || ($row3[class44] == "ee5330") || ($row3[class44] ==
"ee5332") || ($row3[class44] == "ee5333") || ($row3[class44] == "ee5336") || ($row3[class44] ==
"ee5341") || ($row3[class44] == "ee5351") || ($row3[class44] == "ee5352") || ($row3[class44] ==
"ee5353") || ($row3[class44] == "ee5354") || ($row3[class44] == "ee5356") || ($row3[class44] ==
"ee5357") || ($row3[class44] == "ee5360") || ($row3[class44] == "ee5366") || ($row3[class44] ==
"ee5369") || ($row3[class44] == "ee5370") || ($row3[class44] == "ee5371") || ($row3[class44] ==
"ee5372") || ($row3[class44] == "ee5374") || ($row3[class44] == "ee5375") || ($row3[class44] ==
"ee5376") || ($row3[class44] == "ee5378") || ($row3[class44] == "ee5379") || ($row3[class44] ==
"ee5390") || ($row3[class44] == "ee5392")) { //if pre18
    if ( $creditspassed<90 ) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4351, ee4357, ee4360, ee4371
    }
} // close if pre18

//check if taken and successfully passed
if ( ( ($row3[class44] == "ee3354") || ($row3[class44] == "ee3372") || ($row3[class44] ==
"ee3385") || ($row3[class44] == "ee4341") || ($row3[class44] == "ee4342") || ($row3[class44] ==
"ee4347") || ($row3[class44] == "ee4350") || ($row3[class44] == "ee4351") || ($row3[class44] ==
"ee4352") || ($row3[class44] == "ee4353") || ($row3[class44] == "ee4354") || ($row3[class44] ==
"ee4356") || ($row3[class44] == "ee4357") || ($row3[class44] == "ee4358") || ($row3[class44] ==
"ee4359") || ($row3[class44] == "ee4360") || ($row3[class44] == "ee4361") || ($row3[class44] ==
"ee4364") || ($row3[class44] == "ee4365") || ($row3[class44] == "ee4366") || ($row3[class44] ==
"ee4371") || ($row3[class44] == "ee4372") || ($row3[class44] == "ee4374") || ($row3[class44] ==
"ee4375") || ($row3[class44] == "ee4376") || ($row3[class44] == "ee4378") || ($row3[class44] ==
"ee4379") || ($row3[class44] == "ee4380") || ($row3[class44] == "ee4382") || ($row3[class44] ==
"ee4383") || ($row3[class44] == "ee4385") || ($row3[class44] == "ee4386") || ($row3[class44] ==
"ee4388") || ($row3[class44] == "ee4389") || ($row3[class44] == "ee4395") || ($row3[class44] ==
"other ee") || ($row3[class44] == "ee5118") || ($row3[class44] == "ee5300") || ($row3[class44]
== "ee5301") || ($row3[class44] == "ee5302") || ($row3[class44] == "ee5306") || ($row3[class44]
== "ee5311") || ($row3[class44] == "ee5313") || ($row3[class44] == "ee5315") || ($row3[class44]
== "ee5318") || ($row3[class44] == "ee5323") || ($row3[class44] == "ee5324") || ($row3[class44]
== "ee5325") || ($row3[class44] == "ee5330") || ($row3[class44] == "ee5332") || ($row3[class44]
== "ee5333") || ($row3[class44] == "ee5336") || ($row3[class44] == "ee5341") || ($row3[class44]
== "ee5351") || ($row3[class44] == "ee5352") || ($row3[class44] == "ee5353") || ($row3[class44]
== "ee5354") || ($row3[class44] == "ee5356") || ($row3[class44] == "ee5357") || ($row3[class44]
== "ee5360") || ($row3[class44] == "ee5366") || ($row3[class44] == "ee5369") || ($row3[class44]
== "ee5370") || ($row3[class44] == "ee5371") || ($row3[class44] == "ee5372") || ($row3[class44]
== "ee5374") || ($row3[class44] == "ee5375") || ($row3[class44] == "ee5376") || ($row3[class44]
== "ee5378") || ($row3[class44] == "ee5379") || ($row3[class44] == "ee5390") || ($row3[class44]
== "ee5392")) ) && ($row3[class44] != "blank")) {

```

```

        if (($row3[classgrade44] == "A")||($row3[classgrade44] == "B")||($row3[classgrade44]
== "C")||($row3[classgrade44] == "TA")||($row3[classgrade44] == "TB")||($row3[classgrade44]
== "TC")||($row3[classgrade44] == "TCR")||($row3[classgrade44] == "P" )){
            $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
                $creditspassed=$creditspassed+3;
                $credits41=$credits41+3;
            }
        }

    } //close the while
if ($varclass44=="blank"){ // in case no class was choosen paint cell gray
    $color="gray";
}

print $color;
$color="gray"; //back to default gray color
print ">"; //finish picking the color of the cell

//display the class picked if none was picked then print if there is a corequisite
if ($varclass44=="blank"){
    print "EE XXXX* class44";
    $color="gray";
}
else {
    echo $varclass44;
}

print "<br>";

$sql4 = "SELECT * FROM `bsee` WHERE `classcode`='$varclass44' "; //select record of
current user on Mysql
$result4 = $conn->query($sql4);
while ($row4 = $result4->fetch_assoc()) {
echo $row4[classname]; //display brief class description
echo "<br>";
//to print the corequisite class due to the fact that this will be a class chosen as an Elective class
in either class 43, 44, 45, 46 uncomment to display
//if ($varclass43co != ""){
//print " coreq. ";
//}
//echo $varclass40co;
} //close the while $row4

//If left blank in the class history page print elective on the second line of the cell

```



```

if ($varclass44=="blank"){
    print "Elective";
}

else {
    echo $varclass44;
}

print "<u> dB </u>";
print "</td>\n";
//*****
*****

print "    <td style=background-color:"; //***** ce2326 --class12 db

//check status of ce2326 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
    //ce2326 has (1 prerequisites:to be sophomore more than 30 credits) and (0 corequisites: )
    //ce2326 has not been TAKEN or taken and or taken and not passed CHECK
    if ((($row3[class12] == "ce2326") && ($row3[classterm12] == "blank")) ||
        ($row3[classgrade12] == "blank")){
        if (($row3[classgrade12] != "A")&&($row3[classgrade12] !=
            "B")&&($row3[classgrade12] != "C")&&($row3[classgrade12] !=
            "TA")&&($row3[classgrade12] != "TB")&&($row3[classgrade12] !=
            "TC")&&($row3[classgrade12] != "TCR")&&($row3[classgrade12] != "P")){
            $color="white"; //this means the class has not been taken, or if intended
            and student got something different than ABC and there is a blank on when he took it
        }
    }
    //check if taken and successfully passed
    if (($row3[class12] == "ce2326") && ($row3[classterm12] != "blank")){
        if (($row3[classgrade12] == "A")||($row3[classgrade12] == "B")||($row3[classgrade12]
            == "C")||($row3[classgrade12] == "TA")||($row3[classgrade12] == "TB")||($row3[classgrade12]
            == "TC")||($row3[classgrade12] == "TCR")||($row3[classgrade12] == "P")){
            $color="green"; //credit at UTEP already? if taken, second check
            passing grade ABC TA TB TC TCR and P to get credit
            $creditspassed=$creditspassed+3;
            $credits41=$credits41+3;
        }
    }
}

//PRErequisites check section
// ee3195 has (prerequisites 0 classes but a prerequisite of sophomore 30 credits
if ($creditspassed < 30){
    $color="gray"; //have not meet the only prerequisite of the class that is to be a
    sophomore 30 credits
}

```

```

    }

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print " >CE 2326* <br> Econ Sci Engr</td> \n";

//*****
*****

print " <td style=background-color:"; //***** pols2310 --class10 db

//check status of hist1302 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//pols2310 has (0 prerequisites: ) and (0 corequisites: )
$color="white"; //Since there is no prerequisite
//pols2310 has not been TAKEN or taken and or taken and not passed CHECK
if ((( $row3[class10] == "pols2310") && ( $row3[classterm10] == "blank") ) ||
( $row3[classgrade10] == "blank" ) ){
    if (( $row3[classgrade10] != "A") && ( $row3[classgrade10] !=
"B") && ( $row3[classgrade10] != "C") && ( $row3[classgrade10] !=
"TA") && ( $row3[classgrade10] != "TB") && ( $row3[classgrade10] !=
"TC") && ( $row3[classgrade10] != "TCR") && ( $row3[classgrade10] != "P") ) ){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC TA TB TC TCR P
    }
}

//check if taken and successfully passed
if (( $row3[class10] == "pols2310") && ( $row3[classterm10] != "blank" ) ){
    if (( $row3[classgrade10] == "A") || ( $row3[classgrade10] == "B") || ( $row3[classgrade10]
== "C") || ( $row3[classgrade10] == "TA") || ( $row3[classgrade10] == "TB") || ( $row3[classgrade10]
== "TC") || ( $row3[classgrade10] == "TCR") || ( $row3[classgrade10] == "P") ) ){
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits41=$credits41+3;
    }
}

                                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print ">POLS 2310* <br> Int Pol</td>\n";

//*****
*****

```

```
//passed credits from 4th year 2st semester
//*****
*****
```

```
print "    <td>";
print "<font color=blue>";
print $credits41;
print "</font>";
print "<font color=black>";
print " of 15</td>\n";

print "    <td>99</td>\n";
print " </tr>\n";
print "        <tr>\n";
print "            <td>4th year, 2nd Sem</td>\n";
```

```
//*****
*****
```

```
print "    <td style=background-color:"; //***** PROF --class48 db
```

```
//check status of ee3195 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//PROF has (1 prerequisites:to be junior more than 60 credits) and (0 corequisites: )
//PROF has not been TAKEN or taken and or taken and not passed CHECK
if ((($row3[class48] == "PROF") && ($row3[classterm48] == "blank")) || ($row3[classgrade48]
== "blank")) {
    if (($row3[classgrade48] != "A")&&($row3[classgrade48] !=
"B")&&($row3[classgrade48] != "C")&&($row3[classgrade48] !=
"TA")&&($row3[classgrade48] != "TB")&&($row3[classgrade48] !=
"TC")&&($row3[classgrade48] != "TCR")&&($row3[classgrade48] != "P") ) {
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}

//check if taken and successfully passed
if (($row3[class48] == "PROF") && ($row3[classterm48] != "blank")) {
    if (($row3[classgrade48] == "A")||($row3[classgrade48] == "B")||($row3[classgrade48]
== "C")||($row3[classgrade48] == "TA")||($row3[classgrade48] == "TB")||($row3[classgrade48]
== "TC")||($row3[classgrade48] == "TCR")||($row3[classgrade48] == "P") ) {
        $color="green"; //credit at UTEP already? if taken, second check
    }
}

passing grade ABC
```

```

        $creditspassed=$creditspassed+3;
        $credits42=$credits42+3;
    }
}

//PRErequisites check section
// ee3195 has (prerequisites 0 classes but a prerequisite of junior 60 credits
if ($creditspassed < 60){
    $color="gray"; //have not passed the class ee2169 class23 and check for
prerequisite not passed not ready for ee3195
}

} //close the while

print $color;
$color="gray"; //back to default gray color
print " >PROF <br> Prof Option</td>\n";

/*****
*****

print " <td style=background-color:"; //***** ee4230 --class42 db

//check status of ee4230 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//ee4230 has (1 prerequisites: ee4220 class41) and (0 corequisites: )
//ee4230 has not been TAKEN or taken and or taken and not passed CHECK
if (((($row3[class42] == "ee4230") && ($row3[classterm42] == "blank")) ||
($row3[classgrade42] == "blank")) ){
    if (($row3[classgrade42] != "A")&&($row3[classgrade42] !=
"B")&&($row3[classgrade42] != "C")&&($row3[classgrade42] !=
"TA")&&($row3[classgrade42] != "TB")&&($row3[classgrade42] !=
"TC")&&($row3[classgrade42] != "TCR")&&($row3[classgrade42] != "P")) ){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABC and there is a blank on when he took it
    }
}

//check if taken and successfully passed
if (($row3[class42] == "ee4230") && ($row3[classterm42] != "blank")) {
    if (($row3[classgrade42] == "A")||($row3[classgrade42] == "B")||($row3[classgrade42]
== "C")||($row3[classgrade42] == "TA")||($row3[classgrade42] == "TB")||($row3[classgrade42]
== "TC")||($row3[classgrade42] == "TCR")||($row3[classgrade42] == "P")) ){
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits42=$credits42+3;
    }
}

```

```

    }
}
//COrerequisite check section No corequisite comment out section
// passed check needed ready to register to 1 corequisites: ee3376 class38
//if ( ($color=="white") && (($row3[classgrade38] == "blank") && ($row3[classterm38] ==
"blank")) || (($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") &&
($row3[classgrade38] != "C"))) {
//          $color="yellow";
//          }

//PREquisites check section
// ee2353 has (1 prerequisites: ee4220 class41) passed check needed ready to register ee4230
if (((($row3[classgrade41] == "blank") && ($row3[classterm41] == "blank")) ||
(($row3[classgrade41] != "A") && ($row3[classgrade41] != "B") && ($row3[classgrade41] !=
"C"))&&($row3[classgrade41] != "TA")&&($row3[classgrade41] !=
"TB")&&($row3[classgrade41] != "TC")&&($row3[classgrade41] !=
"TCR")&&($row3[classgrade41] != "P") )){
        $color="gray"; //have not passed the class ee4220 class41 and check for
prerequisite not passed not ready for ee4230
    }

} //close the while

print $color;
$color="gray"; //back to default gray color
print ">EE 4230* <br> S. Proj.2 </td> \n";

print " <td>103-blank</td>\n";
//*****
*****
// print " <td style=background-color:pink >EE XXXX* class45 <br> Elective Pull from Db
?</td>\n"; //old class45 placeholder on table
//*****
***** 2DB Class 45 elective -->EEXXXX
//this cell will require to extract the information of db history and brief description from class db
(prerequisites to
//this senior EEconcentration classes vary wide therefore a case by case approach was used
print " <td style=background-color:";
//pick color

$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//(1 prerequisites: engl1312 class2 ) and (0 corequisites:)
//get the class taken and put it in a variable

```

```
$varclass45=$row3[class45]; //first get the class that was chosen from the student history db into a local variable
```

```
// Check if there is the intent to take that class or if it was intended
```

```
if ((( $row3[class45] == "ee3354") || ($row3[class45] == "ee3372") || ($row3[class45] ==
"ee3385") || ($row3[class45] == "ee4341") || ($row3[class45] == "ee4342") || ($row3[class45] ==
"ee4347") || ($row3[class45] == "ee4350") || ($row3[class45] == "ee4351") || ($row3[class45] ==
"ee4352") || ($row3[class45] == "ee4353") || ($row3[class45] == "ee4354") || ($row3[class45] ==
"ee4356") || ($row3[class45] == "ee4357") || ($row3[class45] == "ee4358") || ($row3[class45] ==
"ee4359") || ($row3[class45] == "ee4360") || ($row3[class45] == "ee4361") || ($row3[class45] ==
"ee4364") || ($row3[class45] == "ee4365") || ($row3[class45] == "ee4366") || ($row3[class45] ==
"ee4371") || ($row3[class45] == "ee4372") || ($row3[class45] == "ee4374") || ($row3[class45] ==
"ee4375") || ($row3[class45] == "ee4376") || ($row3[class45] == "ee4378") || ($row3[class45] ==
"ee4379") || ($row3[class45] == "ee4380") || ($row3[class45] == "ee4382") || ($row3[class45] ==
"ee4383") || ($row3[class45] == "ee4385") || ($row3[class45] == "ee4386") || ($row3[class45] ==
"ee4388") || ($row3[class45] == "ee4389") || ($row3[class45] == "ee4395") || ($row3[class45] ==
"other ee") || ($row3[class45] == "ee5118") || ($row3[class45] == "ee5300") || ($row3[class45]
== "ee5301") || ($row3[class45] == "ee5302") || ($row3[class45] == "ee5306") || ($row3[class45]
== "ee5311") || ($row3[class45] == "ee5313") || ($row3[class45] == "ee5315") || ($row3[class45]
== "ee5318") || ($row3[class45] == "ee5323") || ($row3[class45] == "ee5324") || ($row3[class45]
== "ee5325") || ($row3[class45] == "ee5330") || ($row3[class45] == "ee5332") || ($row3[class45]
== "ee5333") || ($row3[class45] == "ee5336") || ($row3[class45] == "ee5341") || ($row3[class45]
== "ee5351") || ($row3[class45] == "ee5352") || ($row3[class45] == "ee5353") || ($row3[class45]
== "ee5354") || ($row3[class45] == "ee5356") || ($row3[class45] == "ee5357") || ($row3[class45]
== "ee5360") || ($row3[class45] == "ee5366") || ($row3[class45] == "ee5369") || ($row3[class45]
== "ee5370") || ($row3[class45] == "ee5371") || ($row3[class45] == "ee5372") || ($row3[class45]
== "ee5374") || ($row3[class45] == "ee5375") || ($row3[class45] == "ee5376") || ($row3[class45]
== "ee5378") || ($row3[class45] == "ee5379") || ($row3[class45] == "ee5390") || ($row3[class45]
== "ee5392")) && ($row3[class45] == "blank")) || ($row3[classgrade45] == "blank")){
    if (($row3[classgrade45] != "A")&&($row3[classgrade45] !=
"B")&&($row3[classgrade45] != "C")&&($row3[classgrade45] !=
"TA")&&($row3[classgrade45] != "TB")&&($row3[classgrade45] !=
"TC")&&($row3[classgrade45] != "TCR")&&($row3[classgrade45] != "P") )){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABCTATBTC or TCR
    }
}
```

```
//Check corequisites for the classes that have corequisites
```

```
//corequisite for ee4342 is ee4142
```

```
if ( ($row3[class45] == "ee4442") && (($row3[classgrade45] != "A") && ($row3[classgrade45]
!= "B") && ($row3[classgrade45] != "C") &&($row3[classgrade45] !=
"TA")&&($row3[classgrade45] != "TB")&&($row3[classgrade45] !=
"TC")&&($row3[classgrade45] != "TCR")&&($row3[classgrade45] != "P") ) ){
    $color="yellow";
    $varclass45co="ee4142";
```

```

    }

//corequisite for ee4353 is ee4153
if ( ($row3[class45] == "ee4353") && (($row3[classgrade45] != "A") && ($row3[classgrade45]
!= "B") && ($row3[classgrade45] != "C") && ($row3[classgrade45] !=
"TA")&&($row3[classgrade45] != "TB")&&($row3[classgrade45] !=
"TC")&&($row3[classgrade45] != "TCR")&&($row3[classgrade45] != "P") ) ) {
    $color="yellow";
    $varclass45co="ee4378";
}

//corequisite for ee4378 is ee4178
if ( ($row3[class45] == "ee4378") && (($row3[classgrade45] != "A") && ($row3[classgrade45]
!= "B") && ($row3[classgrade45] != "C") && ($row3[classgrade45] !=
"TA")&&($row3[classgrade45] != "TB")&&($row3[classgrade45] !=
"TC")&&($row3[classgrade45] != "TCR")&&($row3[classgrade45] != "P") ) ) {
    $color="yellow";
    $varclass45co="ee4378";
}

//PRErequisites check section
// different prerequisites for the different classes that are an option for class44 are several
// actually 18 different checks have to be perform for the 72 possible classes

//if pre1 prerequisites check for ee2351 which is class25 and ee2372 which class28
if ( $row3[class45] == "ee3354" ) { //if pre1
    //check for class ee2351 class25
    if (((($row3[classgrade25] == "blank") && ($row3[classterm25] == "blank")) ||
(($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") && ($row3[classgrade25] !=
"C") && ($row3[classgrade25] != "TA")&&($row3[classgrade25] !=
"TB")&&($row3[classgrade25] != "TC")&&($row3[classgrade25] !=
"TCR")&&($row3[classgrade25] != "P") ) ) ) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
    //check for class ee2372 class28
    if (((($row3[classgrade28] == "blank") && ($row3[classterm28] == "blank")) ||
(($row3[classgrade28] != "A") && ($row3[classgrade28] != "B") && ($row3[classgrade28] !=
"C") && ($row3[classgrade28] != "TA")&&($row3[classgrade28] !=
"TB")&&($row3[classgrade28] != "TC")&&($row3[classgrade28] !=
"TCR")&&($row3[classgrade28] != "P") ) ) ) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
} // close if pre1

```

```

//if pre2 prerequisites check for prerequisites for ee3372 which are (ee2372 class28) and (ee3176
class30 )and (ee3376 class38)
if ( $row3[class45] == "ee3354" ){ //if pre2
//check for class ee2372 class28
    if ((( $row3[classgrade28] == "blank") && ( $row3[classterm28] == "blank")) ||
(( $row3[classgrade28] != "A") && ( $row3[classgrade28] != "B") && ( $row3[classgrade28] !=
"C") && ( $row3[classgrade28] != "TA") && ( $row3[classgrade28] !=
"TB") && ( $row3[classgrade28] != "TC") && ( $row3[classgrade28] !=
"TCR") && ( $row3[classgrade28] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
    }
//check for ee3176 class30
    if ((( $row3[classgrade30] == "blank") && ( $row3[classterm30] == "blank")) ||
(( $row3[classgrade30] != "A") && ( $row3[classgrade30] != "B") && ( $row3[classgrade30] !=
"C") && ( $row3[classgrade30] != "TA") && ( $row3[classgrade30] !=
"TB") && ( $row3[classgrade30] != "TC") && ( $row3[classgrade30] !=
"TCR") && ( $row3[classgrade30] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
    }
//check for ee3376 class38
    if ((( $row3[classgrade38] == "blank") && ( $row3[classterm38] == "blank")) ||
(( $row3[classgrade38] != "A") && ( $row3[classgrade38] != "B") && ( $row3[classgrade38] !=
"C") && ( $row3[classgrade38] != "TA") && ( $row3[classgrade38] !=
"TB") && ( $row3[classgrade38] != "TC") && ( $row3[classgrade38] !=
"TCR") && ( $row3[classgrade38] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
    }
} // close if pre2

//if pre3 prerequisites check for prerequisites for ee3385 which are (ee3321 class32) and
(phys2420 class4 )
if ( $row3[class45] == "ee3385" ){ //if pre3
//check for class ee3321 class32
    if ((( $row3[classgrade32] == "blank") && ( $row3[classterm32] == "blank")) ||
(( $row3[classgrade32] != "A") && ( $row3[classgrade32] != "B") && ( $row3[classgrade32] !=
"C") && ( $row3[classgrade32] != "TA") && ( $row3[classgrade32] !=
"TB") && ( $row3[classgrade32] != "TC") && ( $row3[classgrade32] !=
"TCR") && ( $row3[classgrade32] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3385
    }
//check for phys2420 class4

```



```

        if ((($row3[classgrade4] == "blank") && ($row3[classterm4] == "blank")) ||
(($row3[classgrade4] != "A") && ($row3[classgrade4] != "B") && ($row3[classgrade4] != "C")
&&($row3[classgrade4] != "TA")&&($row3[classgrade4] != "TB")&&($row3[classgrade4] !=
"TC")&&($row3[classgrade4] != "TCR")&&($row3[classgrade4] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3385
    }
} // close if pre3

//if pre4 prerequisites check for prerequisites for ee4341, ee4365, ee4366, ee4388, which are
(ee3353 class37) and (ee3384 class39 )
if ( ($row3[class45] == "ee4341") || ($row3[class45] == "ee4365") || ($row3[class45] ==
"ee4366") || ($row3[class45] == "ee4388") ){ //if pre4
//check for class ee3353 class37
    if ((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") &&($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
//check for ee3384 class39
    if ((($row3[classgrade39] == "blank") && ($row3[classterm39] == "blank")) ||
(($row3[classgrade39] != "A") && ($row3[classgrade39] != "B") && ($row3[classgrade39] !=
"C") &&($row3[classgrade39] != "TA")&&($row3[classgrade39] !=
"TB")&&($row3[classgrade39] != "TC")&&($row3[classgrade39] !=
"TCR")&&($row3[classgrade39] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
} // close if pre4

//if pre5 prerequisites check for prerequisites for ee4342, ee4372, ee4378, ee4379 which are
(ee3376 class38)
if ( ($row3[class45] == "ee4342") || ($row3[class45] == "ee4372") || ($row3[class45] ==
"ee4378") || ($row3[class45] == "ee4379") ){ //if pre5
//check for class ee3376 class38
    if ((($row3[classgrade38] == "blank") && ($row3[classterm38] == "blank")) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C") &&($row3[classgrade38] != "TA")&&($row3[classgrade38] !=
"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4342, ee4372, ee4378, ee4379
    }
}

```

```

} // close if pre5

//if pre6 prerequisites check for prerequisites for ee4347, ee4380, ee4382, ee4386 which are
(ee3321 class32)
if ( ($row3[class45] == "ee4347") || ($row3[class45] == "ee4380") || ($row3[class45] ==
"ee4382") || ($row3[class45] == "ee4386") ){ //if pre6
//check for class ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[class32] == "blank"))) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA")&&($row3[classgrade32] !=
"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4347, ee4380, ee4382, ee4386
    }
} // close if pre6

//if pre7 prerequisites check for prerequisites for ee4350, ee4353, ee4375, ee4376 which are
(ee3329 class34)
if ( ($row3[class45] == "ee4350") || ($row3[class45] == "ee4353") || ($row3[class45] ==
"ee4375") || ($row3[class45] == "ee4376") ){ //if pre7
//check for class ee3329 class34
    if (((($row3[classgrade34] == "blank") && ($row3[class34] == "blank"))) ||
(($row3[classgrade34] != "A") && ($row3[classgrade34] != "B") && ($row3[classgrade34] !=
"C") && ($row3[classgrade34] != "TA")&&($row3[classgrade34] !=
"TB")&&($row3[classgrade34] != "TC")&&($row3[classgrade34] !=
"TCR")&&($row3[classgrade34] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4350, ee4353, ee4375, ee4376
    }
} // close if pre7

//if pre8 prerequisites check for being junior, this is prerequisite for prerequisites for ee4351,
ee4357, ee4360, ee4371
if ( ($row3[class45] == "ee4351") || ($row3[class45] == "ee4357") || ($row3[class45] ==
"ee4360") || ($row3[class45] == "ee4371") ){ //if pre8
    if ( $creditspassed<60 ){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4351, ee4357, ee4360, ee4371
    }
} // close if pre8

//if pre9 prerequisites check for prerequisites for ee4352 which is (ee3338 class35 )
if ( $row3[class45] == "ee4352" ){ //if pre9
//check for class ee3338 class35

```

```

        if ((($row3[classgrade35] == "blank") && ($row3[classterm35] == "blank")) ||
        (($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") && ($row3[classgrade35] !=
        "C") && ($row3[classgrade35] != "TA") && ($row3[classgrade35] !=
        "TB") && ($row3[classgrade35] != "TC") && ($row3[classgrade35] !=
        "TCR") && ($row3[classgrade35] != "P"))){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4352
        }
    } // close if pre9

```

//if pre10 prerequisites for ee4354 SOLUTION to check prerequisite ee4383 that may be an elective having another elective as prerequisite (first check that ee4354 was selected, then look for the prerequisite in all of the elective options)

```

if ( ($row3[class43] == "ee4354") || ($row3[class44] == "ee4354") || ($row3[class45] ==
"ee4354") || ($row3[class46] == "ee4354") || ($row3[class43] == "ee4359") || ($row3[class44] ==
"ee4359") || ($row3[class45] == "ee4359") || ($row3[class46] == "ee4359")){ //if pre10
//check for class ee4383

```

```

        if ((($row3[class43] == "ee4383") && ($row3[classterm43] == "blank")) &&
        (($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
        ($row3[classgrade43] != "TA") || ($row3[classgrade43] != "TB") || ($row3[classgrade43] !=
        "TC") || ($row3[classgrade43] != "TCR") || ($row3[classgrade43] != "P"))){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
        }

```

```

        if ((($row3[class44] == "ee4383") && ($row3[classterm44] == "blank")) &&
        (($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||
        ($row3[classgrade44] != "TA") || ($row3[classgrade44] != "TB") || ($row3[classgrade44] !=
        "TC") || ($row3[classgrade44] != "TCR") || ($row3[classgrade44] != "P"))){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
        }

```

```

        if ((($row3[class45] == "ee4383") && ($row3[classterm45] == "blank")) &&
        (($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
        ($row3[classgrade45] != "TA") || ($row3[classgrade45] != "TB") || ($row3[classgrade45] !=
        "TC") || ($row3[classgrade45] != "TCR") || ($row3[classgrade45] != "P"))){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
        }

```

```

        if ((($row3[class46] == "ee4383") && ($row3[classterm46] == "blank")) &&
        (($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
        ($row3[classgrade46] != "TA") || ($row3[classgrade46] != "TB") || ($row3[classgrade46] !=
        "TC") || ($row3[classgrade46] != "TCR") || ($row3[classgrade46] != "P"))){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
        }

```

//check that the prerequisite ee4383 was among the 4 possible options

```

        if (($row3[class43] != "ee4383") || ($row3[class44] != "ee4383") ||
($row3[class45] != "ee4383") || ($row3[class46] != "ee4383") ){
            $color="gray"; //have not taken prerequisite class therefore not ready for ee4354
        }
    } // close if pre10

```

```

//if pre11 prerequisites check for prerequisites for ee4356 which are (ee3353 class37) and
(ee3376 class38 )
if ( ($row3[class45] == "ee4356") ){ //if pre4
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
//check for ee3376 class38
    if (((($row3[classgrade38] == "blank") && ($row3[classterm38] == "blank")) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C") && ($row3[classgrade38] != "TA")&&($row3[classgrade38] !=
"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4356
    }
} // close if pre11

```

```

//if pre12 prerequisites for ee4358 SOLUTION to check prerequisite 4385 that may be an
elective having another elective as prerequisite (first check that ee4358 was selected, then look
for the prerequisite in all of the elective options)
if ( ($row3[class43] == "ee4358") || ($row3[class44] == "ee4358")|| ($row3[class45] ==
"ee4358")|| ($row3[class46] == "ee4358") ){ //if pre10
//check for class ee3338 class35
    if (((($row3[class43] == "ee4385") && ($row3[classterm43] == "blank")) &&
(($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
($row3[classgrade43] != "TA")||($row3[classgrade43] != "TB")||($row3[classgrade43] !=
"TC")||($row3[classgrade43] != "TCR")||($row3[classgrade43] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if (((($row3[class44] == "ee4385") && ($row3[classterm44] == "blank")) &&
(($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||

```

```

($row3[classgrade44] != "TA")||($row3[classgrade44] != "TB")||($row3[classgrade44] !=
"TC")||($row3[classgrade44] != "TCR")||($row3[classgrade44] != "P")    ){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
}
    if (((($row3[class45] == "ee4385") && ($row3[classterm45] == "blank"))) &&
(($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
($row3[classgrade45] != "TA")||($row3[classgrade45] != "TB")||($row3[classgrade45] !=
"TC")||($row3[classgrade45] != "TCR")||($row3[classgrade45] != "P")    )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
}
    if (((($row3[class46] == "ee4385") && ($row3[classterm46] == "blank"))) &&
(($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
($row3[classgrade46] != "TA")||($row3[classgrade46] != "TB")||($row3[classgrade46] !=
"TC")||($row3[classgrade46] != "TCR")||($row3[classgrade46] != "P")    )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
}
//check that the prerequisite ee4385 was among the 4 possible options in EE electives
    if (($row3[class43] != "ee4385") || ($row3[class44] != "ee4385") || ($row3[class45] !=
"ee4385") || ($row3[class46] != "ee4385") ){
    $color="gray"; //have not taken prerequisite class 4385 therefore not ready for
ee4358
}
} // close if pre12

//if pre13 prerequisites check for prerequisites for ee4361 which are (ee3338 class35) and
(ee3321 class32 )
if ( ($row3[class45] == "ee4361") ){ //if pre13
//check for class ee3338 class35
    if (((($row3[classgrade35] == "blank") && ($row3[classterm35] == "blank"))) ||
(($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") && ($row3[classgrade35] !=
"C") && ($row3[classgrade35] != "TA")&&($row3[classgrade35] !=
"TB")&&($row3[classgrade35] != "TC")&&($row3[classgrade35] !=
"TCR")&&($row3[classgrade35] != "P")    )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4361
}
//check for ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank"))) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA")&&($row3[classgrade32] !=
"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")    )){

```

```

        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4361
    }
} // close if pre13

//if pre14 prerequisites check for prerequisites for ee4364, ee4383 which are (ee3353 class37)
if ( ($row3[class45] == "ee4364") || ($row3[class45] == "ee4383") ){ //if pre14
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    ))){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
} // close if pre14

//if pre15 prerequisites for ee4374 check prerequisite ee3372 that may be an elective having
another elective as prerequisite (first check that ee4374 was selected, then look for the
prerequisite in all of the elective options)
//if ( ($row3[class43] == "ee4374") || (($row3[class44] == "ee4374") || (($row3[class45] ==
"ee4374") || ($row3[class46] == "ee4374") ) ){ //if pre10
//check for class ee3372 in electives
//    if (((($row3[class43] == "ee3372") && ($row3[classterm43] == "blank")) &&
(($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
($row3[classgrade43] != "TA") || ($row3[classgrade43] != "TB") || ($row3[classgrade43] !=
"TC") || ($row3[classgrade43] != "TCR") || ($row3[classgrade43] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//    }
//    if (((($row3[class44] == "ee3372") && ($row3[classterm44] == "blank")) &&
(($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||
($row3[classgrade44] != "TA") || ($row3[classgrade44] != "TB") || ($row3[classgrade44] !=
"TC") || ($row3[classgrade44] != "TCR") || ($row3[classgrade44] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//    }
//    if (((($row3[class45] == "ee3372") && ($row3[classterm45] == "blank")) &&
(($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
($row3[classgrade45] != "TA") || ($row3[classgrade45] != "TB") || ($row3[classgrade45] !=
"TC") || ($row3[classgrade45] != "TCR") || ($row3[classgrade45] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//    }
}

```

```

//      if ((($row3[class46] == "ee3372") && ($row3[classterm46] == "blank"))) &&
(($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
($row3[classgrade46] != "TA") || ($row3[classgrade46] != "TB") || ($row3[classgrade46] !=
"TC") || ($row3[classgrade46] != "TCR") || ($row3[classgrade46] != "P"))){
//          $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//      }
//check that the prerequisite ee4385 was among the 4 possible options in EE electives
//      if ( ($row3[class43] != "ee3372") || ($row3[class44] != "ee3372") || ($row3[class45] !=
"ee3372") || ($row3[class45] != "ee3372")){
//          $color="gray"; //have not taken prerequisite class ee3372 therefore not ready for
ee4374
//      }
//} // close if pre15

//if pre16 prerequisites check for prerequisites for ee4385, which are (ee3340 class36)
if ( ($row3[class45] == "ee4385")){ //if pre16
//check for class ee3340 class36
    if (((($row3[classgrade36] == "blank") && ($row3[classterm36] == "blank"))) ||
(($row3[classgrade36] != "A") && ($row3[classgrade36] != "B") && ($row3[classgrade36] !=
"C") && ($row3[classgrade36] != "TA") && ($row3[classgrade36] !=
"TB") && ($row3[classgrade36] != "TC") && ($row3[classgrade36] !=
"TCR") && ($row3[classgrade36] != "P"))){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4385
    }
} // close if pre16

//if pre17 prerequisites check for prerequisites for ee4389 which are (ee3321 class32) and
(ee3353 class37 )
if ( ($row3[class45] == "ee4389")){ //if pre17
//check for ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank"))) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA") && ($row3[classgrade32] !=
"TB") && ($row3[classgrade32] != "TC") && ($row3[classgrade32] !=
"TCR") && ($row3[classgrade32] != "P"))){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4361
    }
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank"))) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA") && ($row3[classgrade37] !=

```

```

"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    ){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4389
    }
} // close if pre17

```

```

//if pre18 prerequisites check for being senior, this is prerequisite for prerequisites for ee4395,
ee5118,ee5300,ee5301,ee5302, ee5306,ee5311,ee5313,ee5315,ee5318,ee5323,ee5324, ee5325,
ee5330,ee5332, ee5333,ee 5336, ee5341, ee5351, ee5352, ee5353, ee5354, ee5356, ee5357,
ee5360, ee5366, ee5369, ee5370, ee5371, ee5372, ee5374, ee5375, ee5376, ee5378, ee5379,
ee5390, ee5392

```

```

//missing "other ee" form the possible classes

```

```

if ( ($row3[class45] == "ee4395") || ($row3[class45] == "ee5118") || ($row3[class45] ==
"ee5300") || ($row3[class45] == "ee5301") || ($row3[class45] == "ee5302") || ($row3[class45] ==
"ee5306") || ($row3[class45] == "ee5311") || ($row3[class45] == "ee5313") || ($row3[class45] ==
"ee5315") || ($row3[class45] == "ee5318") || ($row3[class45] == "ee5323") || ($row3[class45] ==
"ee5324") || ($row3[class45] == "ee5325") || ($row3[class45] == "ee5330") || ($row3[class45] ==
"ee5332") || ($row3[class45] == "ee5333") || ($row3[class45] == "ee5336") || ($row3[class45] ==
"ee5341") || ($row3[class45] == "ee5351") || ($row3[class45] == "ee5352") || ($row3[class45] ==
"ee5353") || ($row3[class45] == "ee5354") || ($row3[class45] == "ee5356") || ($row3[class45] ==
"ee5357") || ($row3[class45] == "ee5360") || ($row3[class45] == "ee5366") || ($row3[class45] ==
"ee5369") || ($row3[class45] == "ee5370") || ($row3[class45] == "ee5371") || ($row3[class45] ==
"ee5372") || ($row3[class45] == "ee5374") || ($row3[class45] == "ee5375") || ($row3[class45] ==
"ee5376") || ($row3[class45] == "ee5378") || ($row3[class45] == "ee5379") || ($row3[class45] ==
"ee5390") || ($row3[class45] == "ee5392") ){ //if pre18
    if ( $creditspassed<90 ){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4351, ee4357, ee4360, ee4371
    }
} // close if pre18

```

```

//check if taken and successfully passed

```

```

if(( ( ($row3[class45] == "ee3354") || ($row3[class45] == "ee3372") || ($row3[class45] ==
"ee3385") || ($row3[class45] == "ee4341") || ($row3[class45] == "ee4342") || ($row3[class45] ==
"ee4347") || ($row3[class45] == "ee4350") || ($row3[class45] == "ee4351") || ($row3[class45] ==
"ee4352") || ($row3[class45] == "ee4353") || ($row3[class45] == "ee4354") || ($row3[class45] ==
"ee4356") || ($row3[class45] == "ee4357") || ($row3[class45] == "ee4358") || ($row3[class45] ==
"ee4359") || ($row3[class45] == "ee4360") || ($row3[class45] == "ee4361") || ($row3[class45] ==
"ee4364") || ($row3[class45] == "ee4365") || ($row3[class45] == "ee4366") || ($row3[class45] ==
"ee4371") || ($row3[class45] == "ee4372") || ($row3[class45] == "ee4374") || ($row3[class45] ==
"ee4375") || ($row3[class45] == "ee4376") || ($row3[class45] == "ee4378") || ($row3[class45] ==
"ee4379") || ($row3[class45] == "ee4380") || ($row3[class45] == "ee4382") || ($row3[class45] ==
"ee4383") || ($row3[class45] == "ee4385") || ($row3[class45] == "ee4386") || ($row3[class45] ==
"ee4388") || ($row3[class45] == "ee4389") || ($row3[class45] == "ee4395") || ($row3[class45] ==
"other ee") || ($row3[class45] == "ee5118") || ($row3[class45] == "ee5300") || ($row3[class45]

```



```

== "ee5301") || ($row3[class45] == "ee5302") || ($row3[class45] == "ee5306") || ($row3[class45]
== "ee5311") || ($row3[class45] == "ee5313") || ($row3[class45] == "ee5315") || ($row3[class45]
== "ee5318") || ($row3[class45] == "ee5323") || ($row3[class45] == "ee5324") || ($row3[class45]
== "ee5325") || ($row3[class45] == "ee5330") || ($row3[class45] == "ee5332") || ($row3[class45]
== "ee5333") || ($row3[class45] == "ee5336") || ($row3[class45] == "ee5341") || ($row3[class45]
== "ee5351") || ($row3[class45] == "ee5352") || ($row3[class45] == "ee5353") || ($row3[class45]
== "ee5354") || ($row3[class45] == "ee5356") || ($row3[class45] == "ee5357") || ($row3[class45]
== "ee5360") || ($row3[class45] == "ee5366") || ($row3[class45] == "ee5369") || ($row3[class45]
== "ee5370") || ($row3[class45] == "ee5371") || ($row3[class45] == "ee5372") || ($row3[class45]
== "ee5374") || ($row3[class45] == "ee5375") || ($row3[class45] == "ee5376") || ($row3[class45]
== "ee5378") || ($row3[class45] == "ee5379") || ($row3[class45] == "ee5390") || ($row3[class45]
== "ee5392")) ) && ($row3[classterm45] != "blank") ){
    if (($row3[classgrade45] == "A") || ($row3[classgrade45] == "B") || ($row3[classgrade45]
== "C") || ($row3[classgrade45] == "TA") || ($row3[classgrade45] == "TB") || ($row3[classgrade45]
== "TC") || ($row3[classgrade45] == "TCR") || ($row3[classgrade45] == "P")) {
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
        $creditspassed=$creditspassed+3;
        $credits42=$credits42+3;
    }
}

} //close the main

while
if ($varclass45=="blank"){ // in case no class was choosen paint cell gray
    $color="gray";
}

print $color;
$color="gray"; //back to default gray color
print ">"; //finish picking the color of the cell

//display the class picked if none was picked then print if there is a corequisite
if ($varclass45=="blank"){
    print "EE XXXX* class45";
    $color="gray";
}
else {
    echo $varclass45;
}

print "<br>";

$sql4 = "SELECT * FROM `bsee` WHERE `classcode`='$varclass45' "; //select record of
current user on Mysql

```

```

$result4 = $conn->query($sql4);
while ($row4 = $result4->fetch_assoc()) {
echo $row4[classname]; //display brief class description
echo "<br>";
//to print the corequisite class due to the fact that this will be a class chosen as an Elective class
in either class 43, 44, 45, 46 uncomment to display
//if ($varclass43co != ""){
//print " coreq. ";
//}
//echo $varclass40co;
} //close the while $row4

//If left blank in the class history page print elective on the second line of the cell
if ($varclass45=="blank"){
    print "Elective";
}

else {
    echo $varclass45;
}

print "<u> dB </u>";
print "</td>\n";
//*****
*****
//print " <td style=background-color:pink >EE XXXX* class46 <br> Elective Pull from Db
?</td>\n"; //old class46 place holder
//*****
***** 2DB Class 46 elective -->EEXXXX
//this cell will require to extract the information of db history and brief description from class db
(prerequisites to
//this senior EEconcentration classes vary wide therefore a case by case approach was used
print " <td style=background-color:";
//pick color

$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
//(1 prerequisites: eng11312 class2 ) and (0 corequisites:)
//get the class taken and put it in a variable
$varclass46=$row3[class46]; //first get the class that was chosen from the student history db into
a local variable

// Check if there is the intent to take that class or if it was intended
if ((( $row3[class46] == "ee3354") || ($row3[class46] == "ee3372") || ($row3[class46] ==
"ee3385") || ($row3[class46] == "ee4341") || ($row3[class46] == "ee4342") || ($row3[class46] ==
"ee4347") || ($row3[class46] == "ee4350") || ($row3[class46] == "ee4351") || ($row3[class46] ==
"ee4352") || ($row3[class46] == "ee4353") || ($row3[class46] == "ee4354") || ($row3[class46] ==

```

```

"ee4356") || ($row3[class46] == "ee4357") || ($row3[class46] == "ee4358") || ($row3[class46] ==
"ee4359") || ($row3[class46] == "ee4360") || ($row3[class46] == "ee4361") || ($row3[class46] ==
"ee4364") || ($row3[class46] == "ee4365") || ($row3[class46] == "ee4366") || ($row3[class46] ==
"ee4371") || ($row3[class46] == "ee4372") || ($row3[class46] == "ee4374") || ($row3[class46] ==
"ee4375") || ($row3[class46] == "ee4376") || ($row3[class46] == "ee4378") || ($row3[class46] ==
"ee4379") || ($row3[class46] == "ee4380") || ($row3[class46] == "ee4382") || ($row3[class46] ==
"ee4383") || ($row3[class46] == "ee4385") || ($row3[class46] == "ee4386") || ($row3[class46] ==
"ee4388") || ($row3[class46] == "ee4389") || ($row3[class46] == "ee4395") || ($row3[class46] ==
"other ee") || ($row3[class46] == "ee5118") || ($row3[class46] == "ee5300") || ($row3[class46]
== "ee5301") || ($row3[class46] == "ee5302") || ($row3[class46] == "ee5306") || ($row3[class46]
== "ee5311") || ($row3[class46] == "ee5313") || ($row3[class46] == "ee5315") || ($row3[class46]
== "ee5318") || ($row3[class46] == "ee5323") || ($row3[class46] == "ee5324") || ($row3[class46]
== "ee5325") || ($row3[class46] == "ee5330") || ($row3[class46] == "ee5332") || ($row3[class46]
== "ee5333") || ($row3[class46] == "ee5336") || ($row3[class46] == "ee5341") || ($row3[class46]
== "ee5351") || ($row3[class46] == "ee5352") || ($row3[class46] == "ee5353") || ($row3[class46]
== "ee5354") || ($row3[class46] == "ee5356") || ($row3[class46] == "ee5357") || ($row3[class46]
== "ee5360") || ($row3[class46] == "ee5366") || ($row3[class46] == "ee5369") || ($row3[class46]
== "ee5370") || ($row3[class46] == "ee5371") || ($row3[class46] == "ee5372") || ($row3[class46]
== "ee5374") || ($row3[class46] == "ee5375") || ($row3[class46] == "ee5376") || ($row3[class46]
== "ee5378") || ($row3[class46] == "ee5379") || ($row3[class46] == "ee5390") || ($row3[class46]
== "ee5392")) && ($row3[class46] == "blank")) || ($row3[class46] == "blank"))){
    if (($row3[classgrade46] != "A")&&($row3[classgrade46] !=
"B")&&($row3[classgrade46] != "C")&&($row3[classgrade46] !=
"TA")&&($row3[classgrade46] != "TB")&&($row3[classgrade46] !=
"TC")&&($row3[classgrade46] != "TCR")&&($row3[classgrade46] != "P") ) ){
        $color="white"; //this means the class has not been taken, or if intended
and student got something different than ABCTATBTC or TCR
    }
}
}

```

//Check corequisites for the classes that have corequisites

//corequisite for ee4342 is ee4142

```

if ( ($row3[class46] == "ee4442") && (($row3[classgrade46] != "A") && ($row3[classgrade46]
!= "B") && ($row3[classgrade46] != "C") &&($row3[classgrade46] !=
"TA")&&($row3[classgrade46] != "TB")&&($row3[classgrade46] !=
"TC")&&($row3[classgrade46] != "TCR")&&($row3[classgrade46] != "P") ) ) ){
    $color="yellow";
    $varclass46co="ee4142";
}

```

//corequisite for ee4353 is ee4153

```

if ( ($row3[class46] == "ee4353") && (($row3[classgrade46] != "A") && ($row3[classgrade46]
!= "B") && ($row3[classgrade46] != "C") &&($row3[classgrade46] !=
"TA")&&($row3[classgrade46] != "TB")&&($row3[classgrade46] !=
"TC")&&($row3[classgrade46] != "TCR")&&($row3[classgrade46] != "P") ) ) ){
    $color="yellow";
}

```

```

        $varclass46co="ee4378";
    }

//corequisite for ee4378 is ee4178
if ( ($row3[class46] == "ee4378") && (($row3[classgrade46] != "A") && ($row3[classgrade46]
!= "B") && ($row3[classgrade46] != "C") && ($row3[classgrade46] !=
"TA")&&($row3[classgrade46] != "TB")&&($row3[classgrade46] !=
"TC")&&($row3[classgrade46] != "TCR")&&($row3[classgrade46] != "P") ) ) {
    $color="yellow";
    $varclass46co="ee4378";
}

//PRErequisites check section
// different prerequisites for the different classes that are an option for class44 are several
// actually 18 different checks have to be perform for the 72 possible classes

//if pre1 prerequisites check for ee2351 which is class25 and ee2372 which class28
if ( $row3[class46] == "ee3354" ) { //if pre1
    //check for class ee2351 class25
    if (((($row3[classgrade25] == "blank") && ($row3[classterm25] == "blank")) ||
(($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") && ($row3[classgrade25] !=
"C") && ($row3[classgrade25] != "TA")&&($row3[classgrade25] !=
"TB")&&($row3[classgrade25] != "TC")&&($row3[classgrade25] !=
"TCR")&&($row3[classgrade25] != "P") )) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
    //check for class ee2372 class28
    if (((($row3[classgrade28] == "blank") && ($row3[classterm28] == "blank")) ||
(($row3[classgrade28] != "A") && ($row3[classgrade28] != "B") && ($row3[classgrade28] !=
"C") && ($row3[classgrade28] != "TA")&&($row3[classgrade28] !=
"TB")&&($row3[classgrade28] != "TC")&&($row3[classgrade28] !=
"TCR")&&($row3[classgrade28] != "P") )) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4142 and ee4178
    }
} // close if pre1

//if pre2 prerequisites check for prerequisites for ee3372 which are (ee2372 class28) and (ee3176
class30 )and (ee3376 class38)
if ( $row3[class46] == "ee3354" ) { //if pre2
//check for class ee2372 class28
    if (((($row3[classgrade28] == "blank") && ($row3[classterm28] == "blank")) ||
(($row3[classgrade28] != "A") && ($row3[classgrade28] != "B") && ($row3[classgrade28] !=
"C") && ($row3[classgrade28] != "TA")&&($row3[classgrade28] !=

```

```

"TB")&&($row3[classgrade28] != "TC")&&($row3[classgrade28] !=
"TCR")&&($row3[classgrade28] != "P")    ){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
}
//check for ee3176 class30
    if ((( $row3[classgrade30] == "blank") && ($row3[classterm30] == "blank")) ||
(($row3[classgrade30] != "A") && ($row3[classgrade30] != "B") && ($row3[classgrade30] !=
"C") && ($row3[classgrade30] != "TA")&&($row3[classgrade30] !=
"TB")&&($row3[classgrade30] != "TC")&&($row3[classgrade30] !=
"TCR")&&($row3[classgrade30] != "P")    )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
}
//check for ee3376 class38
    if ((( $row3[classgrade38] == "blank") && ($row3[classterm38] == "blank")) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C") && ($row3[classgrade38] != "TA")&&($row3[classgrade38] !=
"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P")    )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3372
}
} // close if pre2

//if pre3 prerequisites check for prerequisites for ee3385 which are (ee3321 class32) and
(phys2420 class4 )
if ( $row3[class46] == "ee3385" ){ //if pre3
//check for class ee3321 class32
    if ((( $row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA")&&($row3[classgrade32] !=
"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")    )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3385
}
//check for phys2420 class4
    if ((( $row3[classgrade4] == "blank") && ($row3[classterm4] == "blank")) ||
(($row3[classgrade4] != "A") && ($row3[classgrade4] != "B") && ($row3[classgrade4] != "C")
&&($row3[classgrade4] != "TA")&&($row3[classgrade4] != "TB")&&($row3[classgrade4] !=
"TC")&&($row3[classgrade4] != "TCR")&&($row3[classgrade4] != "P")    )){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee3385
}
} // close if pre3

```

```

//if pre4 prerequisites check for prerequisites for ee4341, ee4365, ee4366, ee4388, which are
(ee3353 class37) and (ee3384 class39 )
if ( ($row3[class46] == "ee4341") || ($row3[class46] == "ee4365") || ($row3[class46] ==
"ee4366") || ($row3[class46] == "ee4388") ){ //if pre4
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank"))) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
//check for ee3384 class39
    if (((($row3[classgrade39] == "blank") && ($row3[classterm39] == "blank"))) ||
(($row3[classgrade39] != "A") && ($row3[classgrade39] != "B") && ($row3[classgrade39] !=
"C") && ($row3[classgrade39] != "TA")&&($row3[classgrade39] !=
"TB")&&($row3[classgrade39] != "TC")&&($row3[classgrade39] !=
"TCR")&&($row3[classgrade39] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
} // close if pre4

//if pre5 prerequisites check for prerequisites for ee4342, ee4372, ee4378, ee4379 which are
(ee3376 class38)
if ( ($row3[class46] == "ee4342") || ($row3[class46] == "ee4372") || ($row3[class46] ==
"ee4378") || ($row3[class46] == "ee4379") ){ //if pre5
//check for class ee3376 class38
    if (((($row3[classgrade38] == "blank") && ($row3[classterm38] == "blank"))) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C") && ($row3[classgrade38] != "TA")&&($row3[classgrade38] !=
"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4342, ee4372, ee4378, ee4379
    }
} // close if pre5

//if pre6 prerequisites check for prerequisites for ee4347, ee4380, ee4382, ee4386 which are
(ee3321 class32)
if ( ($row3[class46] == "ee4347") || ($row3[class46] == "ee4380") || ($row3[class46] ==
"ee4382") || ($row3[class46] == "ee4386") ){ //if pre6
//check for class ee3321 class32

```

```

        if ((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA")&&($row3[classgrade32] !=
"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")    )){
            $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4347, ee4380, ee4382, ee4386
        }
    } // close if pre6

//if pre7 prerequisites check for prerequisites for ee4350, ee4353, ee4375, ee4376 which are
(ee3329 class34)
if ( ($row3[class46] == "ee4350") || ($row3[class46] == "ee4353") || ($row3[class46] ==
"ee4375") || ($row3[class46] == "ee4376") ){ //if pre7
//check for class ee3329 class34
    if ((($row3[classgrade34] == "blank") && ($row3[classterm34] == "blank")) ||
(($row3[classgrade34] != "A") && ($row3[classgrade34] != "B") && ($row3[classgrade34] !=
"C") && ($row3[classgrade34] != "TA")&&($row3[classgrade34] !=
"TB")&&($row3[classgrade34] != "TC")&&($row3[classgrade34] !=
"TCR")&&($row3[classgrade34] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4350, ee4353, ee4375, ee4376
    }
} // close if pre7

//if pre8 prerequisites check for being junior, this is prerequisite for prerequisites for ee4351,
ee4357, ee4360, ee4371
if ( ($row3[class46] == "ee4351") || ($row3[class46] == "ee4357") || ($row3[class46] ==
"ee4360") || ($row3[class46] == "ee4371") ){ //if pre8
    if ( $creditspassed<60 ){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4351, ee4357, ee4360, ee4371
    }
} // close if pre8

//if pre9 prerequisites check for prerequisites for ee4352 which is (ee3338 class35 )
if ( $row3[class46] == "ee4352" ){ //if pre9
//check for class ee3338 class35
    if ((($row3[classgrade35] == "blank") && ($row3[classterm35] == "blank")) ||
(($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") && ($row3[classgrade35] !=
"C") && ($row3[classgrade35] != "TA")&&($row3[classgrade35] !=
"TB")&&($row3[classgrade35] != "TC")&&($row3[classgrade35] !=
"TCR")&&($row3[classgrade35] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4352
    }
}

```

```

} // close if pre9

//if pre10 prerequisites for ee4354 SOLUTION to check prerequisite ee4383 that may be an
elective having another elective as prerequisite (first check that ee4354 was selected, then look
for the prerequisite in all of the elective options)
if ( ($row3[class43] == "ee4354") || ($row3[class44] == "ee4354") || ($row3[class45] ==
"ee4354") || ($row3[class46] == "ee4354") || ($row3[class43] == "ee4359") || ($row3[class44] ==
"ee4359") || ($row3[class45] == "ee4359") || ($row3[class46] == "ee4359") ) { //if pre10
//check for class ee4383
    if ((($row3[class43] == "ee4383") && ($row3[classterm43] == "blank")) &&
(($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
($row3[classgrade43] != "TA") || ($row3[classgrade43] != "TB") || ($row3[classgrade43] !=
"TC") || ($row3[classgrade43] != "TCR") || ($row3[classgrade43] != "P") )) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if ((($row3[class44] == "ee4383") && ($row3[classterm44] == "blank")) &&
(($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||
($row3[classgrade44] != "TA") || ($row3[classgrade44] != "TB") || ($row3[classgrade44] !=
"TC") || ($row3[classgrade44] != "TCR") || ($row3[classgrade44] != "P") )) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if ((($row3[class45] == "ee4383") && ($row3[classterm45] == "blank")) &&
(($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
($row3[classgrade45] != "TA") || ($row3[classgrade45] != "TB") || ($row3[classgrade45] !=
"TC") || ($row3[classgrade45] != "TCR") || ($row3[classgrade45] != "P") )) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if ((($row3[class46] == "ee4383") && ($row3[classterm46] == "blank")) &&
(($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
($row3[classgrade46] != "TA") || ($row3[classgrade46] != "TB") || ($row3[classgrade46] !=
"TC") || ($row3[classgrade46] != "TCR") || ($row3[classgrade46] != "P") )) {
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    //check that the prerequisite ee4383 was among the 4 possible options
    if (($row3[class43] != "ee4383") || ($row3[class44] != "ee4383") ||
($row3[class45] != "ee4383") || ($row3[class46] != "ee4383") ) {
        $color="gray"; //have not taken prerequisite class therefore not ready for ee4354
    }
} // close if pre10

//if pre11 prerequisites check for prerequisites for ee4356 which are (ee3353 class37) and
(ee3376 class38 )

```



```

if ( ($row3[class46] == "ee4356") ){ //if pre4
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
    }
//check for ee3376 class38
    if (((($row3[classgrade38] == "blank") && ($row3[classterm38] == "blank")) ||
(($row3[classgrade38] != "A") && ($row3[classgrade38] != "B") && ($row3[classgrade38] !=
"C") && ($row3[classgrade38] != "TA")&&($row3[classgrade38] !=
"TB")&&($row3[classgrade38] != "TC")&&($row3[classgrade38] !=
"TCR")&&($row3[classgrade38] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4356
    }
} // close if pre11

```

```

//if pre12 prerequisites for ee4358 SOLUTION to check prerequisite 4385 that may be an
elective having another elective as prerequisite (first check that ee4358 was selected, then look
for the prerequisite in all of the elective options)
if ( ($row3[class43] == "ee4358") || ($row3[class44] == "ee4358") || ($row3[class45] ==
"ee4358") || ($row3[class46] == "ee4358") ){ //if pre10
//check for class ee3338 class35
    if (((($row3[class43] == "ee4385") && ($row3[classterm43] == "blank")) &&
(($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
($row3[classgrade43] != "TA") || ($row3[classgrade43] != "TB") || ($row3[classgrade43] !=
"TC") || ($row3[classgrade43] != "TCR") || ($row3[classgrade43] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if (((($row3[class44] == "ee4385") && ($row3[classterm44] == "blank")) &&
(($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||
($row3[classgrade44] != "TA") || ($row3[classgrade44] != "TB") || ($row3[classgrade44] !=
"TC") || ($row3[classgrade44] != "TCR") || ($row3[classgrade44] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if (((($row3[class45] == "ee4385") && ($row3[classterm45] == "blank")) &&
(($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
($row3[classgrade45] != "TA") || ($row3[classgrade45] != "TB") || ($row3[classgrade45] !=
"TC") || ($row3[classgrade45] != "TCR") || ($row3[classgrade45] != "P")    )){

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        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
    if ((($row3[class46] == "ee4385") && ($row3[classterm46] == "blank"))) &&
(($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
($row3[classgrade46] != "TA") || ($row3[classgrade46] != "TB") || ($row3[classgrade46] !=
"TC") || ($row3[classgrade46] != "TCR") || ($row3[classgrade46] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
    }
//check that the prerequisite ee4385 was among the 4 possible options in EE electives
    if (($row3[class43] != "ee4385") || ($row3[class44] != "ee4385") || ($row3[class45] !=
"ee4385") || ($row3[class46] != "ee4385") ){
        $color="gray"; //have not taken prerequisite class 4385 therefore not ready for
ee4358
    }
} // close if pre12

//if pre13 prerequisites check for prerequisites for ee4361 which are (ee3338 class35) and
(ee3321 class32 )
if ( ($row3[class46] == "ee4361") ){ //if pre13
//check for class ee3338 class35
    if (((($row3[classgrade35] == "blank") && ($row3[classterm35] == "blank"))) ||
(($row3[classgrade35] != "A") && ($row3[classgrade35] != "B") && ($row3[classgrade35] !=
"C") && ($row3[classgrade35] != "TA") && ($row3[classgrade35] !=
"TB") && ($row3[classgrade35] != "TC") && ($row3[classgrade35] !=
"TCR") && ($row3[classgrade35] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4361
    }
//check for ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank"))) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA") && ($row3[classgrade32] !=
"TB") && ($row3[classgrade32] != "TC") && ($row3[classgrade32] !=
"TCR") && ($row3[classgrade32] != "P") )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4361
    }
} // close if pre13

//if pre14 prerequisites check for prerequisites for ee4364, ee4383 which are (ee3353 class37)
if ( ($row3[class46] == "ee4364") || ($row3[class46] == "ee4383") ){ //if pre14
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank"))) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=

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"C") &&($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    ){
    $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4341, ee4365, ee4366, ee4388
}
} // close if pre14

//if pre15 prerequisites for ee4374 check prerequisite ee3372 that may be an elective having
another elective as prerequisite (first check that ee4374 was selected, then look for the
prerequisite in all of the elective options)
//if ( ($row3[class43] == "ee4374") || (($row3[class44] == "ee4374") || (($row3[class45] ==
"ee4374") || (($row3[class46] == "ee4374") )){ //if pre10
//check for class ee3372 in electives
//    if (((($row3[class43] == "ee3372") && ($row3[classterm43] == "blank")) &&
(($row3[classgrade43] != "A") || ($row3[classgrade43] != "B") || ($row3[classgrade43] != "C") ||
($row3[classgrade43] != "TA") || ($row3[classgrade43] != "TB") || ($row3[classgrade43] !=
"TC") || ($row3[classgrade43] != "TCR") || ($row3[classgrade43] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//    }
//    if (((($row3[class44] == "ee3372") && ($row3[classterm44] == "blank")) &&
(($row3[classgrade44] != "A") || ($row3[classgrade44] != "B") || ($row3[classgrade44] != "C") ||
($row3[classgrade44] != "TA") || ($row3[classgrade44] != "TB") || ($row3[classgrade44] !=
"TC") || ($row3[classgrade44] != "TCR") || ($row3[classgrade44] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//    }
//    if (((($row3[class45] == "ee3372") && ($row3[classterm45] == "blank")) &&
(($row3[classgrade45] != "A") || ($row3[classgrade45] != "B") || ($row3[classgrade45] != "C") ||
($row3[classgrade45] != "TA") || ($row3[classgrade45] != "TB") || ($row3[classgrade45] !=
"TC") || ($row3[classgrade45] != "TCR") || ($row3[classgrade45] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//    }
//    if (((($row3[class46] == "ee3372") && ($row3[classterm46] == "blank")) &&
(($row3[classgrade46] != "A") || ($row3[classgrade46] != "B") || ($row3[classgrade46] != "C") ||
($row3[classgrade46] != "TA") || ($row3[classgrade46] != "TB") || ($row3[classgrade46] !=
"TC") || ($row3[classgrade46] != "TCR") || ($row3[classgrade46] != "P")    ))){
//        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4383
//    }
//check that the prerequisite ee4385 was among the 4 possible options in EE electives
//    if ( ($row3[class43] != "ee3372") || ($row3[class44] != "ee3372") || ($row3[class45] !=
"ee3372") || ($row3[class46] != "ee3372") ){

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//          $color="gray"; //have not taken prerequisite class ee3372 therefore not ready for
ee4374
//          }
//} // close if pre15

//if pre16 prerequisites check for prerequisites for ee4385, which are (ee3340 class36)
if ( ($row3[class46] == "ee4385") ){ //if pre16
//check for class ee3340 class36
    if (((($row3[classgrade36] == "blank") && ($row3[classterm36] == "blank")) ||
(($row3[classgrade36] != "A") && ($row3[classgrade36] != "B") && ($row3[classgrade36] !=
"C") && ($row3[classgrade36] != "TA")&&($row3[classgrade36] !=
"TB")&&($row3[classgrade36] != "TC")&&($row3[classgrade36] !=
"TCR")&&($row3[classgrade36] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4385
    }
} // close if pre16

//if pre17 prerequisites check for prerequisites for ee4389 which are (ee3321 class32) and
(ee3353 class37 )
if ( ($row3[class46] == "ee4389") ){ //if pre17
//check for ee3321 class32
    if (((($row3[classgrade32] == "blank") && ($row3[classterm32] == "blank")) ||
(($row3[classgrade32] != "A") && ($row3[classgrade32] != "B") && ($row3[classgrade32] !=
"C") && ($row3[classgrade32] != "TA")&&($row3[classgrade32] !=
"TB")&&($row3[classgrade32] != "TC")&&($row3[classgrade32] !=
"TCR")&&($row3[classgrade32] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4361
    }
//check for class ee3353 class37
    if (((($row3[classgrade37] == "blank") && ($row3[classterm37] == "blank")) ||
(($row3[classgrade37] != "A") && ($row3[classgrade37] != "B") && ($row3[classgrade37] !=
"C") && ($row3[classgrade37] != "TA")&&($row3[classgrade37] !=
"TB")&&($row3[classgrade37] != "TC")&&($row3[classgrade37] !=
"TCR")&&($row3[classgrade37] != "P")    )){
        $color="gray"; //have not passed the class and check for prerequisite not passed
not ready for ee4389
    }
} // close if pre17

//if pre18 prerequisites check for being senior, this is prerequisite for prerequisites for ee4395,
ee5118,ee5300,ee5301,ee5302, ee5306,ee5311,ee5313,ee5315,ee5318,ee5323,ee5324, ee5325,
ee5330,ee5332, ee5333,ee 5336, ee5341, ee5351, ee5352, ee5353, ee5354, ee5356, ee5357,

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ee5360, ee5366, ee5369, ee5370, ee5371, ee5372, ee5374, ee5375, ee5376, ee5378, ee5379, ee5390, ee5392

//missing "other ee" form the possible classes

```
if ( ($row3[class46] == "ee4395") || ($row3[class46] == "ee5118") || ($row3[class46] ==  
"ee5300") || ($row3[class46] == "ee5301") || ($row3[class46] == "ee5302") || ($row3[class46] ==  
"ee5306") || ($row3[class46] == "ee5311") || ($row3[class46] == "ee5313") || ($row3[class46] ==  
"ee5315") || ($row3[class46] == "ee5318") || ($row3[class46] == "ee5323") || ($row3[class46] ==  
"ee5324") || ($row3[class46] == "ee5325") || ($row3[class46] == "ee5330") || ($row3[class46] ==  
"ee5332") || ($row3[class46] == "ee5333") || ($row3[class46] == "ee5336") || ($row3[class46] ==  
"ee5341") || ($row3[class46] == "ee5351") || ($row3[class46] == "ee5352") || ($row3[class46] ==  
"ee5353") || ($row3[class46] == "ee5354") || ($row3[class46] == "ee5356") || ($row3[class46] ==  
"ee5357") || ($row3[class46] == "ee5360") || ($row3[class46] == "ee5366") || ($row3[class46] ==  
"ee5369") || ($row3[class46] == "ee5370") || ($row3[class46] == "ee5371") || ($row3[class46] ==  
"ee5372") || ($row3[class46] == "ee5374") || ($row3[class46] == "ee5375") || ($row3[class46] ==  
"ee5376") || ($row3[class46] == "ee5378") || ($row3[class46] == "ee5379") || ($row3[class46] ==  
"ee5390") || ($row3[class46] == "ee5392")) { //if pre18  
    if ( $creditspassed<90 ) {  
        $color="gray"; //have not passed the class and check for prerequisite not passed  
        not ready for ee4351, ee4357, ee4360, ee4371  
    }  
} // close if pre18
```

//check if taken and successfully passed

```
if ( ( ($row3[class46] == "ee3354") || ($row3[class46] == "ee3372") || ($row3[class46] ==  
"ee3385") || ($row3[class46] == "ee4341") || ($row3[class46] == "ee4342") || ($row3[class46] ==  
"ee4347") || ($row3[class46] == "ee4350") || ($row3[class46] == "ee4351") || ($row3[class46] ==  
"ee4352") || ($row3[class46] == "ee4353") || ($row3[class46] == "ee4354") || ($row3[class46] ==  
"ee4356") || ($row3[class46] == "ee4357") || ($row3[class46] == "ee4358") || ($row3[class46] ==  
"ee4359") || ($row3[class46] == "ee4360") || ($row3[class46] == "ee4361") || ($row3[class46] ==  
"ee4364") || ($row3[class46] == "ee4365") || ($row3[class46] == "ee4366") || ($row3[class46] ==  
"ee4371") || ($row3[class46] == "ee4372") || ($row3[class46] == "ee4374") || ($row3[class46] ==  
"ee4375") || ($row3[class46] == "ee4376") || ($row3[class46] == "ee4378") || ($row3[class46] ==  
"ee4379") || ($row3[class46] == "ee4380") || ($row3[class46] == "ee4382") || ($row3[class46] ==  
"ee4383") || ($row3[class46] == "ee4385") || ($row3[class46] == "ee4386") || ($row3[class46] ==  
"ee4388") || ($row3[class46] == "ee4389") || ($row3[class46] == "ee4395") || ($row3[class46] ==  
"other ee") || ($row3[class46] == "ee5118") || ($row3[class46] == "ee5300") || ($row3[class46]  
== "ee5301") || ($row3[class46] == "ee5302") || ($row3[class46] == "ee5306") || ($row3[class46]  
== "ee5311") || ($row3[class46] == "ee5313") || ($row3[class46] == "ee5315") || ($row3[class46]  
== "ee5318") || ($row3[class46] == "ee5323") || ($row3[class46] == "ee5324") || ($row3[class46]  
== "ee5325") || ($row3[class46] == "ee5330") || ($row3[class46] == "ee5332") || ($row3[class46]  
== "ee5333") || ($row3[class46] == "ee5336") || ($row3[class46] == "ee5341") || ($row3[class46]  
== "ee5351") || ($row3[class46] == "ee5352") || ($row3[class46] == "ee5353") || ($row3[class46]  
== "ee5354") || ($row3[class46] == "ee5356") || ($row3[class46] == "ee5357") || ($row3[class46]  
== "ee5360") || ($row3[class46] == "ee5366") || ($row3[class46] == "ee5369") || ($row3[class46]  
== "ee5370") || ($row3[class46] == "ee5371") || ($row3[class46] == "ee5372") || ($row3[class46]  
== "ee5374") || ($row3[class46] == "ee5375") || ($row3[class46] == "ee5376") || ($row3[class46]
```

```

== "ee5378") || ($row3[class46] == "ee5379") || ($row3[class46] == "ee5390") || ($row3[class46]
== "ee5392")) ) && ($row3[classterm46] != "blank") ){
    if (($row3[classgrade46] == "A") || ($row3[classgrade46] == "B") || ($row3[classgrade46]
== "C") || ($row3[classgrade46] == "TA") || ($row3[classgrade46] == "TB") || ($row3[classgrade46]
== "TC") || ($row3[classgrade46] == "TCR") || ($row3[classgrade46] == "P") ){
        $color="green"; //credit at UTEP already? if taken, second check
passing grade ABC
                                $creditspassed=$creditspassed+3;
                                $credits42=$credits42+3;
                                }
        }
    }

} //close the while
if ($varclass46=="blank"){ // in case no class was choosen paint cell gray
    $color="gray";
}

print $color;
$color="gray"; //back to default gray color
print ">"; //finish picking the color of the cell

//display the class picked if none was picked then print if there is a corequisite
if ($varclass46=="blank"){
    print "EE XXXX* class46";
    $color="gray";
}
else {
    echo $varclass46;
}

print "<br>";

$sql4 = "SELECT * FROM `bsee` WHERE `classcode`='$varclass46' "; //select record of
current user on Mysql
$result4 = $conn->query($sql4);
while ($row4 = $result4->fetch_assoc()) {
echo $row4[classname]; //display brief class description
echo "<br>";
//to print the corequisite class due to the fact that this will be a class chosen as an Elective class
in either class 43, 44, 45, 46 uncomment to display
//if ($varclass43co != ""){
//print " coreq. ";
//}
//echo $varclass40co;
} //close the while $row4

```

```

//If left blank in the class history page print elective on the second line of the cell
if ($varclass46=="blank"){
    print "Elective";
}

else {
    echo $varclass46;
}

print "<u> dB </u>";
print "</td>\n";
//*****
*****

print " <td>106-blank</td> \n";

//*****
*****

print " <td style=background-color:"; //***** pols2311 --class11 db
//check status of hist1302 taken?, in progress or not taken ***this needs to be check again
$result3 = $conn->query($sql3);
while ($row3 = $result3->fetch_assoc()) {
    //pols2311 has (0 prerequisites: ) and (0 corequisites: )
    $color="white"; //Since there is no prerequisite
    //pols2310 has not been TAKEN or taken and or taken and not passed CHECK
    if ((( $row3[class11] == "pols2311") && ( $row3[classterm11] == "blank")) ||
    ( $row3[classgrade11] == "blank")) {
        if (( $row3[classgrade11] != "A") && ( $row3[classgrade11] !=
        "B") && ( $row3[classgrade11] != "C") && ( $row3[classgrade11] !=
        "TA") && ( $row3[classgrade11] != "TB") && ( $row3[classgrade11] !=
        "TC") && ( $row3[classgrade11] != "TCR") && ( $row3[classgrade11] != "P")) {
            $color="white"; //this means the class has not been taken, or if intended
            and student got something different than ABC TA TB TC TCR P
        }
    }
}

//check if taken and successfully passed
if (( $row3[class11] == "pols2311") && ( $row3[classterm11] != "blank")) {
    if (( $row3[classgrade11] == "A") || ( $row3[classgrade11] == "B") || ( $row3[classgrade11]
    == "C") || ( $row3[classgrade11] == "TA") || ( $row3[classgrade11] == "TB") || ( $row3[classgrade11]
    == "TC") || ( $row3[classgrade11] == "TCR") || ( $row3[classgrade11] == "P")) {
        $color="green"; //credit at UTEP already? if taken, second check
        passing grade ABC TA TB TC TCR P
        $creditspassed=$creditspassed+3;
        $credits42=$credits42+3;
    }
}

```

```

    }
//COrequisite check section
// passed check needed ready to register to ee2151 1 corequisites: ee2351 class25
//if ( ($color=="white") && (($row3[classgrade25] == "blank") && ($row3[classterm25] ==
"blank")) || (($row3[classgrade25] != "A") && ($row3[classgrade25] != "B") &&
($row3[classgrade25] != "C"))) {
//          $color="yellow";
//          }
//PRErequisites check section
// ee2353 has (3 prerequisites: ee2350 class24, math1312 class15, math2326 class17) passed
check needed ready to register ee2353
//if (((($row3[classgrade24] == "blank") && ($row3[classterm24] == "blank")) ||
(($row3[classgrade24] != "A") && ($row3[classgrade24] != "B") && ($row3[classgrade24] !=
"C")))) {
//          $color="gray"; //have not passed the class ee2350 class24 and check for
prerequisite not passed not ready for ee2353
//          }
                                                    } //close the while

print $color;
$color="gray"; //back to default gray color
print " >POLS 2311* <br> Am Gov</td>\n";
//*****
*****

```

```

print " <td>";
print "<font color=blue>";
print $credits42;
print "</font>";
print "<font color=black>";
print " of 14</td>\n";

```

```

print " <td>109</td>\n";
print " </tr>\n";
print " <tr>\n";
print " <td>110</td>\n";
print " <td>111</td>\n";
print " <td>112</td> \n";
print " <td>113</td>\n";
print " <td>114</td>\n";
print " <td>115</td>\n";
print " <td>116</td> \n";
print " <td>Total cr=</td>\n";

```



```

print "  <td>";
print "  <b>";
print $creditspassed;
print "  </b>";
print "</td>\n";
print "  <td>119</td>\n";
print " </tr>\n";
print "</table>\n";
print "<br>";
echo "<font color=orange><b><u>Note 2: Do not forget to save and print this page for your
advising appointment.</u></b></font>";
echo "<br>";
echo "<br>";

```

//section of future analysis to graduation. Below are the variables used for the analysis declared at the top of the file

```

// $creditslefttofinish=0; $semesterstograduate16=0; $semesterstograduate15=0;; $semesterstograduate14=0;; $semesterstograduate12=0;

```

// the average number of credits per semester to take is 16

```

//function in php to get reminder $lastsemester12=gmp_div_r($creditslefttofinish, 12);

```

```

$degreepercentage=($creditspassed/128)*100; //calculation of percentage of degree completed
$creditslefttofinish=128-$creditspassed; //calculation of credits needed to graduate

```

```

$dynsemesterstograduate=$creditslefttofinish/$dyncredits; //calculation of semesters needed to graduate taking the selected number on the DB per semester

```

```

$semesterstograduate16=$creditslefttofinish/16; //calculation of semesters needed to graduate taking 16 credits per semester

```

```

$semesterstograduate15=$creditslefttofinish/15; //calculation of semesters needed to graduate taking 15 credits per semester

```

```

$semesterstograduate14=$creditslefttofinish/14; //calculation of semesters needed to graduate taking 14 credits per semester

```

```

$semesterstograduate12=$creditslefttofinish/12; //calculation of semesters needed to graduate taking 12 credits per semester

```

```

$semesterstograduate6=$creditslefttofinish/6; //calculation of semesters needed to graduate taking 12 credits per semester

```

```

$dynlastsemester=$creditslefttofinish%$dyncredits; //calculation of credits during the last semester taking 12 credits

```

```

$lastsemester6=$creditslefttofinish%6; //calculation of credits during the last semester taking 12 credits

```

```

$lastsemester12=$creditslefttofinish%12; //calculation of credits during the last semester taking 12 credits

```

```

$lastsemester14=$creditslefttofinish%14; //calculation of credits during the last semester taking 12 credits

```

```
$lastsemester15=$creditslefttofinish%15; //calculation of credits during the last semester taking
12 credits
$lastsemester16=$creditslefttofinish%16; //calculation of credits during the last semester taking
12 credits
```

```
echo "<font color=Blue><b><u>Future Analisys: Degree Progression and Expected Graduation
date </u></b></font>";
echo "<br>";
echo "<font color=Black><b><u>(assuming best case scenario: no class repeats, and only
enrolling on classes towards your degree)</u></b></font>";
```

```
print "<br>";
print "<br>";
echo "Credits Passed:";
print $creditspassed;
echo " out of 128 credits. <br>";
echo "This represents: <u><b>";
echo round($degreepercentage); //round percentage to an integer
echo "</b></u> % of completion of the degree plan.";
print "<br>";
print "<br>";
```

```
echo "If you take <u><b>";
echo $dyncredits;
echo " credits</u></b> as you previusly stated, you can expect to graduate in: <u><b>";
echo ceil($dynsemesterstograduate); //round semesters to graduation to the next interger
echo "</u></b> semesters.<br> The last semester credit load will need to be: <u><b>";
//if last semester you need a full load of classes
if ($dynlastsemester == 0){
echo $dyncredits;
}
else{
echo $dynlastsemester;
}
echo "</u></b> credits.";
echo " Expected Graduation date: <b><u>";
$dynoffset=(ceil($dynsemesterstograduate)*6);
$dyndate = date("m/d/Y", strtotime(" +$dynoffset months"));
$dynexpgraddate=date('m', strtotime( $dyndate ));
If (($dynexpgraddate>=1)&&($dynexpgraddate<=6)){
echo "Spring of ";
}
else {
```

```

    echo "Fall of ";
}
echo date('Y', strtotime( $dyndate ));
echo "</b></u><br>";

print "<br>";
echo "If you take <u><b>16 credits</u></b> starting next semester you can expect to graduate
in: <u><b>";
echo ceil($semesterstograduate16); //round semesters to graduation to the next interger
echo "</u></b> semesters.<br> The last semester credit load will need to be: <u><b>";
//if last semester you need a full load of classes
if ($lastsemester16 == 0){
echo " 16 ";
}
else{
echo $lastsemester16;
}
echo "</u></b> credits.";
echo " Expected Graduation date: <b><u>";
$offset16=(ceil($semesterstograduate16)*6);
$date16 = date("m/d/Y", strtotime(" +$offset16 months"));
$expgraddate16=date('m', strtotime( $date16 ));
If (($expgraddate16>=1)&&($expgraddate16<=6)){
echo "Spring of ";
}
else {
    echo "Fall of ";
}
echo date('Y', strtotime( $date16 ));
echo "</b></u><br>";

```

```

print "<br>";
echo "If you take <u><b>15 credits</u></b> starting next semester you can expect to graduate
in: <u><b>";
echo ceil($semesterstograduate15); //round semesters to graduation to the next interger
echo "</u></b> semesters.<br> The last semester credit load will need to be: <u><b>";
//if last semester you need a full load of classes
if ($lastsemester15 == 0){
echo " 15 ";
}
else{
echo $lastsemester15;
}
echo "</u></b> credits.";

```

```

echo " Expected Graduation date: <b><u>";
$offset15=(ceil($semesterstograduate15)*6);
$date15 = date("m/d/Y", strtotime(" +$offset15 months"));
$expgraddate15=date('m', strtotime( $date15 ));
If (($expgraddate15>=1)&&($expgraddate15<=6)){
echo "Spring of ";
}
else {
    echo "Fall of ";
}
echo date('Y', strtotime( $date15 ));
echo "</b></u><br>";
print "<br>";

```

```

echo "If you take <u><b>12 credits</u></b> starting next semester you can expect to graduate
in: <u><b>";
echo ceil($semesterstograduate12); //round semesters to graduation to the next interger
echo "</u></b> semesters.<br> The last semester credit load will need to be: <u><b>";
//if last semester you need a full load of classes
if ($lastsemester12 == 0){
echo " 12 ";
}
else{
echo $lastsemester12;
}
echo "</u></b> credits.";
echo " Expected Graduation date: <b><u>";
$offset12=(ceil($semesterstograduate12)*6);
$date12 = date("m/d/Y", strtotime(" +$offset12 months"));
$expgraddate12=date('m', strtotime( $date12 ));
If (($expgraddate12>=1)&&($expgraddate12<=6)){
echo "Spring of ";
}
else {
    echo "Fall of ";
}
echo date('Y', strtotime( $date12 ));
echo "</b></u><br>";
print "<br>";

```

```

echo "If you take <u><b>6 credits (<font color=red><b><u>part-
time</u></b></font></u></b> starting next semester you can expect to graduate in: <u><b>";
echo ceil($semesterstograduate6); //round semesters to graduation to the next interger
echo "</u></b> semesters.<br> The last semester credit load will need to be: <u><b>";
//if last semester you need a full load of classes

```

```

if ($lastsemester6 == 0){
echo " 6 ";
}
else{
echo $lastsemester6;
}
echo "</u></b> credits.";
echo " Expected Graduation date: <b><u>";
$offset6=(ceil($semesterstograduate6)*6);
$date6 = date("m/d/Y", strtotime(" +$offset6 months"));
$expgraddate6=date('m', strtotime( $date6 ));
If (($expgraddate6>=1)&&($expgraddate6<=6)){
echo "Spring of ";
}
else {
    echo "Fall of ";
}
echo date('Y', strtotime( $date6 ));
echo "</b></u><br>";
print "<br>";

//Overload / Under-load analysis
//“60 Hours Rule” developed by Dr. Mulinazzi.
//This rule assumes that a person can be productive for 60 hours a week
//for the length of a semester.
echo "<font color=blue><b><u>School, Work and Family load balance
Analisis</u></b></font><br>";
echo "<font color=black>Based on the extensive research of the <u>60 Hours Rule</u>
developed by Dr. Mulinazzi.</font><br>";
echo "<font color=black>This research shows that most students can be productive for up to 60
hours a week for the length of a semester.</font><br>";
echo "<font color=black>Overcommitting to these 60 hours a week may have a negative impact
on: School, Work and/or Family Grades/Commitments/Relationships.</font><br>";
echo "<font color=black>Remember that to be successfull in college you are supposed to devote
3 hours of study for each credit hour enrolled.</font><br>";
//echo $localworking; //debuging purposses
//print "<br>";
$totalcommittedhours= $localworking + (3*$dyncredits);
$schoolhours=3*$dyncredits;
//print "<br>";
//echo $schoolhours; //debuging purposses
//print "<br>";
//echo $totalcommittedhours; //debuging purposses
//print "<br>";

if ( $totalcommittedhours > 60){

```

```

echo "<font color=Red><b>According to your selection of Next semester credits ($dyncredits *3
= $schoolhours hrs), Work and Family commitments ($localworking hrs) you are
<u>overcommitted ($totalcommittedhours hrs).</u> you maybe at risk.</b></font><br>";
}
if (($totalcommittedhours > 55) && ($totalcommittedhours <= 60) ){
echo "<font color=Orange><b><u>According to your selection of Next semester credits
($dyncredits *3 = $schoolhours hrs), Work and Family commitments ($localworking hrs) you
have a <u>balanced load of commitments ($totalcommittedhours hrs)</u>, but you are close to
the limit and should be careful.</b></font><br>";
}

if (($totalcommittedhours >= 40) && ($totalcommittedhours <= 55) ){
echo "<font color=Green><b><u>According to your selection of Next semester credits
($dyncredits *3 = $schoolhours hrs), Work and Family commitments ($localworking hrs) you
have a <u>balanced load of commitments($totalcommittedhours hrs).</u></b></font><br>";
}

if ($totalcommittedhours < 40 ){
echo "<font color=Pink><b><u>According to your selection of Next semester credits
($dyncredits *3 = $schoolhours hrs), Work and Family commitments ($localworking hrs) you
are <u>Under-committed.($totalcommittedhours hrs)</u> you maybe wasting resources as you
may be able to enroll to another class to finish your degree faster</b></font><br>";
}

```

iAdvise code:nextsemester-Final.php

```

print "<br>";
echo "<font color=red><b><u>Note: this semesters to graduation only take into consideration
the fall and the spring semesters</u></b></font>";
echo "<br>";
echo "<br>";
echo "<br>";

print "<a href ='nextsemester-final.php'><b>Click here to Select classes for next
semester</b></a>";
echo "<br>";
echo "<a href ='recordexp.php'><b>Export Your Record for next semester</b></a>";
echo "<br>";

echo "<a href ='..\student\index.html'><b>Click here to go BACK to the Student Main
Menu</b></a>";
echo "<br>";
echo "<br>";
echo "<br>";

```

```

print "\n";
print "</body>\n";
print "</html>";

```

```
?>
```

```

<?php
// Start the session
session_start();
$localname = $_SESSION['name'];
$localutepemail = $_SESSION['email'];
$localutep800 = $_SESSION['utep800'];
$localworking = $_SESSION['workinghrs'];
?>

```

```

<html>

<head>Bachelor of Science-Electrical and Computer Engineering <b>-->Next semester intended
classes, double check the Workflow before filling it in<--</b></head><br>
<br>
<br>
<body>

```

```

<form action="nextsemester.php" method="post">
<?php
echo "Full Name: <input type='text' name='txtboxname' value='{$localname}'><br>";
echo "UTEP E-mail: <input type='text' name='txtboxemail' value='{$localutepemail}'><br>";
echo "UTEP 800: <input type='text' name='txtbox800number' value='{$localutep800}'><br>";
echo "<font color=red>Semester:</font> ";

```

```

echo "<select name='dropdown1'>";

```

```

echo " <option value=A>blank</option>";
echo " <option value=spring2016>Spring 2016</option>";
echo " <option value=summer2016 >Summer 2016</option>";
echo " <option value=fall2016 selected=selected >Fall 2016</option>";
echo " <option value=spring2017>Spring 2017</option>";
echo " <option value=summer2017>Summer 2017</option>";
echo " <option value=fall2017>Fall 2017</option>";
echo " <option value=spring2018>Spring 2018</option>";
echo " <option value=summer2018>Summer 2018</option>";

```

```

echo " <option value=fall2018>Fall 2018</option>";
echo " <option value=spring2019>Spring 2019</option>";
echo " <option value=summer2019>Summer 2019</option>";
echo " <option value=fall2019>Fall 2019</option>";
echo " <option value=spring2020>Spring 2020</option>";
echo " <option value=summer2020>Summer 2020</option>";
echo " <option value=fall2020>Fall 2020</option>";
echo "</select>";
echo "<br>";

```

```

echo "<font color=red>hours committed to other activities other than school (Family, work,
religious, etc.) for the semester selected:</font>";
echo "<select name='dropdown2'>";
echo " <option value='{ $localworking }'>{ $localworking }</option>";
echo " <option value='1'>1</option>";
echo " <option value='2'>2</option>";
echo " <option value='3'>3</option>";
echo " <option value='4'>4</option>";
echo " <option value='5'>5</option>";
echo " <option value='6'>6</option>";
echo " <option value='7'>7</option>";
echo " <option value='8'>8</option>";
echo " <option value='9'>9</option>";
echo " <option value='10'>10</option>";
echo " <option value='11'>11</option>";
echo " <option value='12'>12</option>";
echo " <option value='13'>13</option>";
echo " <option value='14'>14</option>";
echo " <option value='15'>15</option>";
echo " <option value='16'>16</option>";
echo " <option value='17'>17</option>";
echo " <option value='18'>18</option>";
echo " <option value='19'>19</option>";
echo " <option value='20'>20</option>";
echo " <option value='21'>21</option>";
echo " <option value='22'>22</option>";
echo " <option value='23'>23</option>";
echo " <option value='24'>24</option>";
echo " <option value='25'>25</option>";
echo " <option value='26'>26</option>";
echo " <option value='27'>27</option>";
echo " <option value='28'>28</option>";
echo " <option value='29'>29</option>";
echo " <option value='30'>30</option>";
echo " <option value='31'>31</option>";
echo " <option value='32'>32</option>";

```



```

echo " <option value='33'>33</option>";
echo " <option value='34'>34</option>";
echo " <option value='35'>35</option>";
echo " <option value='36'>36</option>";
echo " <option value='37'>37</option>";
echo " <option value='38'>38</option>";
echo " <option value='39'>39</option>";
echo " <option value='40'>40</option>";
echo " <option value='41'>over 40</option>";
echo "</select>";

echo "<br>";
echo "<font color=blue>Please type the classes that you plan to take next semester in the
following format i.e. for </font>";
echo "<font color=red>Digital Systems 1 type EE2369 </font>(no spaces)</font><br>";

echo "UTEP class1: <input type='text' name='txtboxclass1'><br>";
echo "UTEP class2: <input type='text' name='txtboxclass2'><br>";
echo "UTEP class3: <input type='text' name='txtboxclass3'><br>";
echo "UTEP class4: <input type='text' name='txtboxclass4'><br>";
echo "UTEP class5: <input type='text' name='txtboxclass5'><br>";
echo "UTEP class6: <input type='text' name='txtboxclass6'><br>";
echo "UTEP class7: <input type='text' name='txtboxclass7'><br>";
echo "UTEP class8: <input type='text' name='txtboxclass8'><br>";
echo "UTEP class9: <input type='text' name='txtboxclass9'><br>";
echo "UTEP class10: <input type='text' name='txtboxclass10'><br>";

?>

<input type="submit">
</form>

</body>
</html>

```

iAdvise code:nextsemester.php

```

<html>
<!--  -->
<!-- <head>Bachelor of Science-Electrical and Computer Engineering <b> Academic Advising
Form </b></head><br> -->

```

```

<body>

<?php
session_start();
$localworking = $_SESSION['workinghrs'];

//updating the classplaning table
$servername = "localhost";
$username = "iadviceuser";
$password = "smartadvice2016.";
$dbname = "iadvise";
//variable loading from the form fields values
$fullname=$_POST['txtboxname'];
$utepemail=$_POST['txtboxemail'];
$utep800=$_POST['txtbox800number'];
$semestertoenroll=$_POST['dropdown1'];
$class1=$_POST['txtboxclass1'];
$class2=$_POST['txtboxclass2'];
$class3=$_POST['txtboxclass3'];
$class4=$_POST['txtboxclass4'];
$class5=$_POST['txtboxclass5'];
$class6=$_POST['txtboxclass6'];
$class7=$_POST['txtboxclass7'];
$class8=$_POST['txtboxclass8'];
$class9=$_POST['txtboxclass9'];
$class10=$_POST['txtboxclass10'];
$otheractivities=$_POST['dropdown2'];
$load=0;

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

$sql = "INSERT INTO classplanning
(fullname,utepemail,utep800,semesterenrolling,utepclass1,utepclass2,utepclass3,utepclass4,utepc
lass5,utepclass6,utepclass7,utepclass8,utepclass9,utepclass10,otheractivities) VALUES

('$fullname','$utepemail','$utep800','$semestertoenroll','$class1','$class2','$class3','$class4','$class
5','$class6','$class7','$class8','$class9','$class10','$otheractivities')";

if ($conn->query($sql) === TRUE) {
    echo "<font size='4' face='verdana' color='#002147'> <center> THE UNIVERSITY OF
TEXAS AT EL PASO </center></font> <br>"; //Record created successfully

```



```

padding: 5px;
}
</style>
</head>
<body>

<table style="width:100%">
  <tr bgcolor="#DCDCDC">
    <th>Course</th>
    <th>CRN</th>
    <th>Course Title</th>
    <th>Notes</th>
  </tr>

  <!-- *****Class 1
  ***** -->
  <tr>
    <td><?php echo $_POST["txtboxclass1"]; ?></td>
    <td></td>
    <td align="center">
      <?php

if ($class1 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```

```

// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= black>";
        echo $row['classname'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font> <font size=2 color=black>
$.line.</font>";
} //Close else with error message


// Free the resources associated with the result set
// This is done automatically at the end of the script
mysql_free_result($result);
//close the connection to the database
mysql_close($link);
}

else {

    echo "<font color=gray> textbox was empty </font>";

}

?>
</td>
<td>
<?php

if ($class1 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```

```

// Perform Query
$result = mysql_query($query);
if (!$result) {
    $message = 'Invalid query: ' . mysql_error() . "\n";
    $message .= 'Whole query: ' . $query;
    die($message);
}

// Use result
// Attempting to print $result won't allow access to information in the resource
// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= orange>";
        echo "Prerequisites for this class: ";
        echo $row['prerequisite1'];
        if ($row['prerequisite1']) {echo ", ";}
        echo $row['prerequisite2'];
        if ($row['prerequisite2']) {echo ", ";}
        echo $row['prerequisite3'];
        if ($row['prerequisite3']) {echo ", ";}
        echo $row['prerequisite4'];
        if ($row['prerequisite4']) {echo ", ";}
        echo $row['prerequisite5'];
        if ($row['prerequisite5']) {echo ", ";}
        echo $row['prerequisite6'];
        if ($row['prerequisite6']) {echo ", ";}
        echo $row['prerequisite7'];
        if ($row['prerequisite7']) {echo ", ";}
        echo $row['prerequisite8'];
        if ($row['prerequisite8']) {echo ", ";}
        echo $row['prerequisite9'];
        if ($row['prerequisite9']) {echo ", ";}
        echo "</font>";
        echo "<br>";
        echo "<font size=2 color= green>";
        echo "Corequisites for this class: ";
        echo $row['corequisite1'];
        echo $row['corequisite2'];
        echo $row['corequisite3'];
        echo "</font>";
        echo "<br>";
    }
}

```

```

    } //close IF for empty set
    else{
        echo "<font size=2 color=red>Did not find Class.</font> <font size=2
color=black>NOTE: Check that the class follow this format EE1305 letters have to be Uppercase
<br> ".$line."</font><br></td></tr>";
    } //Close else with error message

    // Free the resources associated with the result set
    // This is done automatically at the end of the script
    mysql_free_result($result);
    //close the connection to the database
    mysql_close($link);
}

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>
</tr>

<!-- *****Class 2
***** -->
<tr>
<td><?php echo $_POST["txtboxclass2"]; ?></td>
<td></td>
<td align="center">
<?php
if ($class2 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```

```

$result = mysql_query($query);
if (!$result) {
    $message = 'Invalid query: ' . mysql_error() . "\n";
    $message .= 'Whole query: ' . $query;
    die($message);
}

// Use result
// Attempting to print $result won't allow access to information in the resource
// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= black>";
        echo $row['classname'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font> <font size=2 color=black>
".$line."</font>";
} //Close else with error message


// Free the resources associated with the result set
// This is done automatically at the end of the script
mysql_free_result($result);
//close the connection to the database
mysql_close($link);
}

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>
<td>
<?php

if ($class2 != "") {

    //Setup connection to mysql 5.5

```



```

$link = mysql_connect($servername, $username, $password);
if (!$link) {
    die('Could not connect: ' . mysql_error());
}
//echo 'Connected successfully <br>';
//connect to database
mysql_select_db($dbname) or die('Could not select database.');
```

mysql_real_escape_string(\$class2));

```

//set the query to look for
$query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",
// Perform Query
$result = mysql_query($query);
if (!$result) {
    $message = 'Invalid query: ' . mysql_error() . "\n";
    $message .= 'Whole query: ' . $query;
    die($message);
}

// Use result
// Attempting to print $result won't allow access to information in the resource
// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= orange>";
        echo "Prerequisites for this class: ";
        echo $row['prerequisite1'];
        if ($row['prerequisite1']) {echo ", ";}
        echo $row['prerequisite2'];
        if ($row['prerequisite2']) {echo ", ";}
        echo $row['prerequisite3'];
        if ($row['prerequisite3']) {echo ", ";}
        echo $row['prerequisite4'];
        if ($row['prerequisite4']) {echo ", ";}
        echo $row['prerequisite5'];
        if ($row['prerequisite5']) {echo ", ";}
        echo $row['prerequisite6'];
        if ($row['prerequisite6']) {echo ", ";}
        echo $row['prerequisite7'];
        if ($row['prerequisite7']) {echo ", ";}
        echo $row['prerequisite8'];
        if ($row['prerequisite8']) {echo ", ";}
        echo $row['prerequisite9'];
        if ($row['prerequisite9']) {echo ", ";}
    }
}

```

```

        echo "</font>";
        echo "<br>";
        echo "<font size=2 color= green>";
        echo "Corequisites for this class: ";
        echo $row['corequisite1'];
        echo $row['corequisite2'];
        echo $row['corequisite3'];
        echo "</font>";
        echo "<br>";
    }

    } //close IF for empty set
    else{
        echo "<font size=2 color=red>Did not find Class.</font><font size=2 color=black>
NOTE: Check that the class follow this format EE1305 letters have to be Uppercase
<br>". $line."<br></td></tr></font>";
    } //Close else with error message

    // Free the resources associated with the result set
    // This is done automatically at the end of the script
    mysql_free_result($result);
    //close the connection to the database
    mysql_close($link);
    }

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>
</tr>

<!-- *****Class 3
***** -->

<tr>
<td><?php echo $_POST["textboxclass3"]; ?></td>
<td></td>

    <td align="center">
    <?php
if ($class3 != "") {

```

```

//Setup connection to mysql 5.5
$link = mysql_connect($servername, $username, $password);
if (!$link) {
    die('Could not connect: ' . mysql_error());
}
//echo 'Connected successfully <br>';
//connect to database
mysql_select_db($dbname) or die('Could not select database.');
```

mysql_real_escape_string(\$class3));

```

// Perform Query
$result = mysql_query($query);
if (!$result) {
    $message = 'Invalid query: ' . mysql_error() . "\n";
    $message .= 'Whole query: ' . $query;
    die($message);
}

// Use result
// Attempting to print $result won't allow access to information in the resource
// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= black>";
        echo $row['classname'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font> <font size=2 color=black>".
$.line."</font>";
} //Close else with error message

// Free the resources associated with the result set
// This is done automatically at the end of the script
mysql_free_result($result);
//close the connection to the database
mysql_close($link);
}

```



```

        if ($row['prerequisite2']) {echo ", ";}
        echo $row['prerequisite3'];
        if ($row['prerequisite3']) {echo ", ";}
        echo $row['prerequisite4'];
        if ($row['prerequisite4']) {echo ", ";}
        echo $row['prerequisite5'];
        if ($row['prerequisite5']) {echo ", ";}
        echo $row['prerequisite6'];
        if ($row['prerequisite6']) {echo ", ";}
        echo $row['prerequisite7'];
        if ($row['prerequisite7']) {echo ", ";}
        echo $row['prerequisite8'];
        if ($row['prerequisite8']) {echo ", ";}
        echo $row['prerequisite9'];
        if ($row['prerequisite9']) {echo ", ";}
        echo "</font>";
        echo "<br>";
        echo "<font size=2 color= green>";
        echo "Corequisites for this class: ";
        echo $row['corequisite1'];
        echo $row['corequisite2'];
        echo $row['corequisite3'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font><font size=2 color=black>
NOTE: Check that the class follow this format EE1305 letters have to be Uppercase
<br>".$line."<br></td></tr></font>";
    } //Close else with error message

    // Free the resources associated with the result set
    // This is done automatically at the end of the script
    mysql_free_result($result);
    //close the connection to the database
    mysql_close($link);
}

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>

```

</tr>

<!-- *****Class
4***** -->

<tr>

<td><?php echo \$_POST["txtboxclass4"]; ?></td>

<td></td>

<td align="center">

<?php

if (\$class4 != "") {

 //Setup connection to mysql 5.5

 \$link = mysql_connect(\$servername, \$username, \$password);

 if (!\$link) {

 die('Could not connect: ' . mysql_error());

 }

 //echo 'Connected successfully
';

 //connect to database

 mysql_select_db(\$dbname) or die('Could not select database.');

 //set the query to look for

 \$query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",

mysql_real_escape_string(\$class4));

 // Perform Query

 \$result = mysql_query(\$query);

 if (!\$result) {

 \$message = 'Invalid query: ' . mysql_error() . "\n";

 \$message .= 'Whole query: ' . \$query;

 die(\$message);

 }

 // Use result

 // Attempting to print \$result won't allow access to information in the resource

 // One of the mysql result functions must be used

 // See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

 if (mysql_num_rows(\$result) > 0){

 while (\$row = mysql_fetch_assoc(\$result)) {

 echo "";

 echo \$row['classname'];

 echo "";

 echo "
";

```

    }

    } //close IF for empty set
    else{
        echo "<font size=2 color=red>Did not find Class.</font> <font size=2 color=black>
$.line.'</font>';
    } //Close else with error message

    // Free the resources associated with the result set
    // This is done automatically at the end of the script
    mysql_free_result($result);
    //close the connection to the database
    mysql_close($link);
    }
else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>

```

```

<td>
<?php echo $_POST["txtboxclass4"]; ?><br>
<!--search for the prerequisite and coorequisites of class1-->
<?php

if ($class4 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```

mysql_real_escape_string(\$class4));

```

    // Perform Query
    $result = mysql_query($query);
    if (!$result) {
        $message = 'Invalid query: ' . mysql_error() . "\n";
    }
}

```

```

$message .= 'Whole query: ' . $query;
die($message);
}

// Use result
// Attempting to print $result won't allow access to information in the resource
// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= orange>";
        echo "Prerequisites for this class: ";
        echo $row['prerequisite1'];
        if ($row['prerequisite1']) {echo ", ";}
        echo $row['prerequisite2'];
        if ($row['prerequisite2']) {echo ", ";}
        echo $row['prerequisite3'];
        if ($row['prerequisite3']) {echo ", ";}
        echo $row['prerequisite4'];
        if ($row['prerequisite4']) {echo ", ";}
        echo $row['prerequisite5'];
        if ($row['prerequisite5']) {echo ", ";}
        echo $row['prerequisite6'];
        if ($row['prerequisite6']) {echo ", ";}
        echo $row['prerequisite7'];
        if ($row['prerequisite7']) {echo ", ";}
        echo $row['prerequisite8'];
        if ($row['prerequisite8']) {echo ", ";}
        echo $row['prerequisite9'];
        if ($row['prerequisite9']) {echo ", ";}
        echo "</font>";
        echo "<br>";
        echo "<font size=2 color= green>";
        echo "Corequisites for this class: ";
        echo $row['corequisite1'];
        echo $row['corequisite2'];
        echo $row['corequisite3'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{

```



```

        echo "<font size=2 color=red>Did not find Class.</font><font size=2 color=black>
NOTE: Check that the class follow this format EE1305 letters have to be Uppercase<br>
". $line.'<br></td></tr></font>';
    } //Close else with error message

```

```

        // Free the resources associated with the result set
        // This is done automatically at the end of the script
        mysql_free_result($result);
        //close the connection to the database
        mysql_close($link);
    }
else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>
</tr>

```

```

<!-- *****Class
5***** -->
<tr>
<td><?php echo $_POST["textboxclass5"]; ?></td>
<td></td>

```

```

        <td align="center">
        <?php
if ($class5 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database. ');
    //set the query to look for
    $query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",
mysql_real_escape_string($class5));
    // Perform Query
    $result = mysql_query($query);

```

```

if (!$result) {
    $message = 'Invalid query: ' . mysql_error() . "\n";
    $message .= 'Whole query: ' . $query;
    die($message);
}

// Use result
// Attempting to print $result won't allow access to information in the resource
// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= black>";
        echo $row['classname'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font> <font size=2 color=black>
$.line.</font>";
} //Close else with error message

// Free the resources associated with the result set
// This is done automatically at the end of the script
mysql_free_result($result);
//close the connection to the database
mysql_close($link);
}

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>

```

<td>

```

<?php echo $_POST["txtboxclass5"]; ?><br>
<!--search for the prerequisite and coorequisites of class1-->
<?php

if ($class5 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```

mysql_real_escape_string(\$class5));

```

    //set the query to look for
    $query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",
    // Perform Query
    $result = mysql_query($query);
    if (!$result) {
        $message = 'Invalid query: ' . mysql_error() . "\n";
        $message .= 'Whole query: ' . $query;
        die($message);
    }

    // Use result
    // Attempting to print $result won't allow access to information in the resource
    // One of the mysql result functions must be used
    // See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

    if (mysql_num_rows($result) > 0){

        while ($row = mysql_fetch_assoc($result)) {
            echo "<font size=2 color= orange>";
            echo "Prerequisites for this class: ";
            echo $row['prerequisite1'];
            if ($row['prerequisite1']) {echo ", ";}
            echo $row['prerequisite2'];
            if ($row['prerequisite2']) {echo ", ";}
            echo $row['prerequisite3'];
            if ($row['prerequisite3']) {echo ", ";}
            echo $row['prerequisite4'];
            if ($row['prerequisite4']) {echo ", ";}
            echo $row['prerequisite5'];
            if ($row['prerequisite5']) {echo ", ";}
            echo $row['prerequisite6'];
        }
    }
}

```

```

        if ($row['prerequisite6']) {echo ", ";}
        echo $row['prerequisite7'];
        if ($row['prerequisite7']) {echo ", ";}
        echo $row['prerequisite8'];
        if ($row['prerequisite8']) {echo ", ";}
        echo $row['prerequisite9'];
        if ($row['prerequisite9']) {echo ", ";}
        echo "</font>";
        echo "<br>";
        echo "<font size=2 color= green>";
        echo "Corequisites for this class: ";
        echo $row['corequisite1'];
        echo $row['corequisite2'];
        echo $row['corequisite3'];
        echo "</font>";
        echo "<br>";
    }

    } //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font><font size=2 color=black>
NOTE: Check that the class follow this format EE1305 letters have to be Uppercase
<br>".$line."<br></td></tr></font>";
    } //Close else with error message

    // Free the resources associated with the result set
    // This is done automatically at the end of the script
    mysql_free_result($result);
    //close the connection to the database
    mysql_close($link);
}

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>
</tr>

<!-- *****Class 6
***** -->
<tr>
<td><?php echo $_POST["txtboxclass6"]; ?></td>

```

```

<td></td>

<td align="center">
<?php

if ($class6 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```

mysql_real_escape_string(\$class6));

```

    //set the query to look for
    $query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",
    // Perform Query
    $result = mysql_query($query);
    if (!$result) {
        $message = 'Invalid query: ' . mysql_error() . "\n";
        $message .= 'Whole query: ' . $query;
        die($message);
    }

    // Use result
    // Attempting to print $result won't allow access to information in the resource
    // One of the mysql result functions must be used
    // See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

    if (mysql_num_rows($result) > 0){

        while ($row = mysql_fetch_assoc($result)) {
            echo "<font size=2 color= black>";
            echo $row['classname'];
            echo "</font>";
            echo "<br>";
        }

    } //close IF for empty set
    else{
        echo "<font size=2 color=red>Did not find Class.</font> <font size=2 color=black>
".$line."</font>";
    } //Close else with error message

```

```

        // Free the resources associated with the result set
        // This is done automatically at the end of the script
        mysql_free_result($result);
        //close the connection to the database
        mysql_close($link);
    }
else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>

<td>
    <?php echo $_POST["textboxclass6"]; ?><br>
    <!--search for the prerequisite and coorequisites of class1-->
    <?php

if ($class6 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```

mysql_real_escape_string(\$class6));

```

    // Perform Query
    $result = mysql_query($query);
    if (!$result) {
        $message = 'Invalid query: ' . mysql_error() . "\n";
        $message .= 'Whole query: ' . $query;
        die($message);
    }

    // Use result
    // Attempting to print $result won't allow access to information in the resource

```

```

// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= orange>";
        echo "Prerequisites for this class: ";
        echo $row['prerequisite1'];
        if ($row['prerequisite1']) {echo ", ";}
        echo $row['prerequisite2'];
        if ($row['prerequisite2']) {echo ", ";}
        echo $row['prerequisite3'];
        if ($row['prerequisite3']) {echo ", ";}
        echo $row['prerequisite4'];
        if ($row['prerequisite4']) {echo ", ";}
        echo $row['prerequisite5'];
        if ($row['prerequisite5']) {echo ", ";}
        echo $row['prerequisite6'];
        if ($row['prerequisite6']) {echo ", ";}
        echo $row['prerequisite7'];
        if ($row['prerequisite7']) {echo ", ";}
        echo $row['prerequisite8'];
        if ($row['prerequisite8']) {echo ", ";}
        echo $row['prerequisite9'];
        if ($row['prerequisite9']) {echo ", ";}
        echo "</font>";
        echo "<br>";
        echo "<font size=2 color= green>";
        echo "Corequisites for this class: ";
        echo $row['corequisite1'];
        echo $row['corequisite2'];
        echo $row['corequisite3'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font><font size=2 color=black>
NOTE: Check that the class follow this format EE1305 letters have to be Uppercase
<br>".$line."<br></td></tr></font>";
} //Close else with error message

// Free the resources associated with the result set

```

```

        // This is done automatically at the end of the script
        mysql_free_result($result);
        //close the connection to the database
        mysql_close($link);
    }
else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>
</tr>

<!-- *****Class
7***** -->
<tr>
<td><?php echo $_POST["textboxclass7"]; ?></td>
<td></td>

        <td align="center">
        <?php
if ($class7 != "") {

        //Setup connection to mysql 5.5
        $link = mysql_connect($servername, $username, $password);
        if (!$link) {
            die('Could not connect: ' . mysql_error());
        }
        //echo 'Connected successfully <br>';
        //connect to database
        mysql_select_db($dbname) or die('Could not select database. ');
        //set the query to look for
        $query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",
mysql_real_escape_string($class7));
        // Perform Query
        $result = mysql_query($query);
        if (!$result) {
            $message = 'Invalid query: ' . mysql_error() . "\n";
            $message .= 'Whole query: ' . $query;
            die($message);
        }

        // Use result

```



```

// Attempting to print $result won't allow access to information in the resource
// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= black>";
        echo $row['classname'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font> <font size=2 color=black>
". $line."</font>";
} //Close else with error message


// Free the resources associated with the result set
// This is done automatically at the end of the script
mysql_free_result($result);
//close the connection to the database
mysql_close($link);
}

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>


<td>
<?php echo $_POST["textboxclass7"]; ?><br>
<!--search for the prerequisite and coerequisites of class1-->
<?php

if ($class7 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {

```

```

        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```

mysql_real_escape_string(\$class7));

```

    // Perform Query
    $result = mysql_query($query);
    if (!$result) {
        $message = 'Invalid query: ' . mysql_error() . "\n";
        $message .= 'Whole query: ' . $query;
        die($message);
    }

    // Use result
    // Attempting to print $result won't allow access to information in the resource
    // One of the mysql result functions must be used
    // See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

    if (mysql_num_rows($result) > 0){

        while ($row = mysql_fetch_assoc($result)) {
            echo "<font size=2 color= orange>";
            echo "Prerequisites for this class: ";
            echo $row['prerequisite1'];
            if ($row['prerequisite1']) {echo ", ";}
            echo $row['prerequisite2'];
            if ($row['prerequisite2']) {echo ", ";}
            echo $row['prerequisite3'];
            if ($row['prerequisite3']) {echo ", ";}
            echo $row['prerequisite4'];
            if ($row['prerequisite4']) {echo ", ";}
            echo $row['prerequisite5'];
            if ($row['prerequisite5']) {echo ", ";}
            echo $row['prerequisite6'];
            if ($row['prerequisite6']) {echo ", ";}
            echo $row['prerequisite7'];
            if ($row['prerequisite7']) {echo ", ";}
            echo $row['prerequisite8'];
            if ($row['prerequisite8']) {echo ", ";}
            echo $row['prerequisite9'];
            if ($row['prerequisite9']) {echo ", ";}
            echo "</font>";
            echo "<br>";
        }
    }
}

```

```

        echo "<font size=2 color= green>";
        echo "Corequisites for this class: ";
        echo $row['corequisite1'];
        echo $row['corequisite2'];
        echo $row['corequisite3'];
        echo "</font>";
        echo "<br>";
    }

    } //close IF for empty set
    else{
        echo "<font size=2 color=red>Did not find Class.</font><font size=2 color=black>
NOTE: Check that the class follow this format EE1305 letters have to be Uppercase
<br>".$line."<br></td></tr></font>";
    } //Close else with error message

    // Free the resources associated with the result set
    // This is done automatically at the end of the script
    mysql_free_result($result);
    //close the connection to the database
    mysql_close($link);
    }

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>
</tr>

<!-- *****Class
8***** -->
<tr>
<td><?php echo $_POST["textboxclass8"]; ?></td>
<td></td>

<td align="center">
<?php
if ($class8 != "") {

    //Setup connection to mysql 5.5

```

```

$link = mysql_connect($servername, $username, $password);
if (!$link) {
    die('Could not connect: ' . mysql_error());
}
//echo 'Connected successfully <br>';
//connect to database
mysql_select_db($dbname) or die('Could not select database.');
```

mysql_real_escape_string(\$class8));

```

//set the query to look for
$query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",
// Perform Query
$result = mysql_query($query);
if (!$result) {
    $message = 'Invalid query: ' . mysql_error() . "\n";
    $message .= 'Whole query: ' . $query;
    die($message);
}

// Use result
// Attempting to print $result won't allow access to information in the resource
// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= black>";
        echo $row['classname'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font> <font size=2 color=black>
". $line."</font>";
} //Close else with error message

// Free the resources associated with the result set
// This is done automatically at the end of the script
mysql_free_result($result);
//close the connection to the database
mysql_close($link);
}

else {
```



```

        echo "Prerequisites for this class: ";
        echo $row['prerequisite1'];
        if ($row['prerequisite1']) {echo ", ";}
        echo $row['prerequisite2'];
        if ($row['prerequisite2']) {echo ", ";}
        echo $row['prerequisite3'];
        if ($row['prerequisite3']) {echo ", ";}
        echo $row['prerequisite4'];
        if ($row['prerequisite4']) {echo ", ";}
        echo $row['prerequisite5'];
        if ($row['prerequisite5']) {echo ", ";}
        echo $row['prerequisite6'];
        if ($row['prerequisite6']) {echo ", ";}
        echo $row['prerequisite7'];
        if ($row['prerequisite7']) {echo ", ";}
        echo $row['prerequisite8'];
        if ($row['prerequisite8']) {echo ", ";}
        echo $row['prerequisite9'];
        if ($row['prerequisite9']) {echo ", ";}
        echo "</font>";
        echo "<br>";
        echo "<font size=2 color= green>";
        echo "Corequisites for this class: ";
        echo $row['corequisite1'];
        echo $row['corequisite2'];
        echo $row['corequisite3'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font><font size=2 color=black>
NOTE: Check that the class follow this format EE1305 letters have to be Uppercase
<br>".$line."<br></td></tr></font>";
    } //Close else with error message

    // Free the resources associated with the result set
    // This is done automatically at the end of the script
    mysql_free_result($result);
    //close the connection to the database
    mysql_close($link);
}

else {
    echo "<font color=gray> textbox was empty </font>";

```

```

}

?>
</td>
</tr>

<!-- *****Class
9***** -->
<tr>
<td><?php echo $_POST["txtboxclass9"]; ?></td>
<td></td>

<td align="center">
<?php
if ($class9 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```

mysql_real_escape_string(\$class9));

```

    //set the query to look for
    $query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",
    // Perform Query
    $result = mysql_query($query);
    if (!$result) {
        $message = 'Invalid query: ' . mysql_error() . "\n";
        $message .= 'Whole query: ' . $query;
        die($message);
    }

    // Use result
    // Attempting to print $result won't allow access to information in the resource
    // One of the mysql result functions must be used
    // See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

    if (mysql_num_rows($result) > 0){

```

```

        while ($row = mysql_fetch_assoc($result)) {
            echo "<font size=2 color= black>";
            echo $row['classname'];
            echo "</font>";
            echo "<br>";
        }

    } //close IF for empty set
    else{
        echo "<font size=2 color=red>Did not find Class.</font> <font size=2 color=black>
$.line.</font>";
    } //Close else with error message

    // Free the resources associated with the result set
    // This is done automatically at the end of the script
    mysql_free_result($result);
    //close the connection to the database
    mysql_close($link);
}

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>

```

```

<td>
<?php echo $_POST["txtboxclass9"]; ?><br>
<!--search for the prerequisite and coerequisites of class1-->
<?php

if ($class9 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```



```

//set the query to look for
$query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",
mysql_real_escape_string($class9));
// Perform Query
$result = mysql_query($query);
if (!$result) {
    $message = 'Invalid query: ' . mysql_error() . "\n";
    $message .= 'Whole query: ' . $query;
    die($message);
}

// Use result
// Attempting to print $result won't allow access to information in the resource
// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= orange>";
        echo "Prerequisites for this class: ";
        echo $row['prerequisite1'];
        if ($row['prerequisite1']) {echo ", ";}
        echo $row['prerequisite2'];
        if ($row['prerequisite2']) {echo ", ";}
        echo $row['prerequisite3'];
        if ($row['prerequisite3']) {echo ", ";}
        echo $row['prerequisite4'];
        if ($row['prerequisite4']) {echo ", ";}
        echo $row['prerequisite5'];
        if ($row['prerequisite5']) {echo ", ";}
        echo $row['prerequisite6'];
        if ($row['prerequisite6']) {echo ", ";}
        echo $row['prerequisite7'];
        if ($row['prerequisite7']) {echo ", ";}
        echo $row['prerequisite8'];
        if ($row['prerequisite8']) {echo ", ";}
        echo $row['prerequisite9'];
        if ($row['prerequisite9']) {echo ", ";}
        echo "</font>";
        echo "<br>";
        echo "<font size=2 color= green>";
        echo "Corequisites for this class: ";
        echo $row['corequisite1'];
        echo $row['corequisite2'];
        echo $row['corequisite3'];
    }
}

```

```

        echo "</font>";
        echo "<br>";
    }

    } //close IF for empty set
    else{
        echo "<font size=2 color=red>Did not find Class.</font> <font size=2
color=black>NOTE: Check that the class follow this format EE1305 letters have to be Uppercase
<br>".$line."<br></td></tr></font>";
    } //Close else with error message

        // Free the resources associated with the result set
        // This is done automatically at the end of the script
        mysql_free_result($result);
        //close the connection to the database
        mysql_close($link);
    }
else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>
</tr>

<!-- *****Class
10***** -->
<tr>
<td><?php echo $_POST["textboxclass10"]; ?></td>
<td></td>

<td align="center">
<?php
if ($class10 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database

```

```

mysql_select_db($dbname) or die('Could not select database.');
```

```

//set the query to look for
$query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",
mysql_real_escape_string($class10));
// Perform Query
$result = mysql_query($query);
if (!$result) {
    $message = 'Invalid query: ' . mysql_error() . "\n";
    $message .= 'Whole query: ' . $query;
    die($message);
}

// Use result
// Attempting to print $result won't allow access to information in the resource
// One of the mysql result functions must be used
// See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

if (mysql_num_rows($result) > 0){

    while ($row = mysql_fetch_assoc($result)) {
        echo "<font size=2 color= black>";
        echo $row['classname'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font> <font size=2 color=black>
". $line."</font>";
} //Close else with error message

// Free the resources associated with the result set
// This is done automatically at the end of the script
mysql_free_result($result);
//close the connection to the database
mysql_close($link);
}

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>

```

```

<td>
    <?php echo $_POST["txtboxclass10"]; ?><br>
<!--search for the prerequisite and coerequisites of class1-->
<?php

if ($class10 != "") {

    //Setup connection to mysql 5.5
    $link = mysql_connect($servername, $username, $password);
    if (!$link) {
        die('Could not connect: ' . mysql_error());
    }
    //echo 'Connected successfully <br>';
    //connect to database
    mysql_select_db($dbname) or die('Could not select database.');
```

mysql_real_escape_string(\$class10));

```

    //set the query to look for
    $query = sprintf("SELECT * FROM bsee WHERE classcode='%s'",
    // Perform Query
    $result = mysql_query($query);
    if (!$result) {
        $message = 'Invalid query: ' . mysql_error() . "\n";
        $message .= 'Whole query: ' . $query;
        die($message);
    }

    // Use result
    // Attempting to print $result won't allow access to information in the resource
    // One of the mysql result functions must be used
    // See also mysql_result(), mysql_fetch_array(), mysql_fetch_row(), etc.

    if (mysql_num_rows($result) > 0){

        while ($row = mysql_fetch_assoc($result)) {
            echo "<font size=2 color= orange>";
            echo "Prerequisites for this class: ";
            echo $row['prerequisite1'];
            if ($row['prerequisite1']) {echo ", ";}
            echo $row['prerequisite2'];
            if ($row['prerequisite2']) {echo ", ";}
            echo $row['prerequisite3'];
            if ($row['prerequisite3']) {echo ", ";}
            echo $row['prerequisite4'];
            if ($row['prerequisite4']) {echo ", ";}
        }
    }
}

```

```

        echo $row['prerequisite5'];
        if ($row['prerequisite5']) {echo ", ";}
        echo $row['prerequisite6'];
        if ($row['prerequisite6']) {echo ", ";}
            echo $row['prerequisite7'];
            if ($row['prerequisite7']) {echo ", ";}
        echo $row['prerequisite8'];
        if ($row['prerequisite8']) {echo ", ";}
        echo $row['prerequisite9'];
        if ($row['prerequisite9']) {echo ", ";}
        echo "</font>";
        echo "<br>";
        echo "<font size=2 color= green>";
        echo "Corequisites for this class: ";
        echo $row['corequisite1'];
        echo $row['corequisite2'];
        echo $row['corequisite3'];
        echo "</font>";
        echo "<br>";
    }

} //close IF for empty set
else{
    echo "<font size=2 color=red>Did not find Class.</font><font size=2 color=black>
NOTE: Check that the class follow this format EE1305 letters have to be Uppercase
<br>".$line."<br></td></tr></font>";
    } //Close else with error message

    // Free the resources associated with the result set
    // This is done automatically at the end of the script
    mysql_free_result($result);
    //close the connection to the database
    mysql_close($link);
}

else {
    echo "<font color=gray> textbox was empty </font>";
}

?>
</td>
</tr>
</table>

<br>

```


Appendix C

Previous publications

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Computers in Education Journal, 2016

Printed in U.S.A

Vita

Oscar Antonio Perez earned his Bachelor of Science in Electrical Engineering from The University of Texas at El Paso (UTEP) in 2002. In 2004 Oscar received his Master of Science in Electrical Engineering from UTEP. In 2010 Oscar joined the doctoral program in Electrical and Computer Engineering.

Dr. Perez' honors and awards include the Outstanding Teaching Award by a PhD student. Dr. Perez was also awarded the Academic Scholarship from The Society of Hispanic Professional Engineers Foundation and won the EmPower the Miner M Student Design Competition. Dr. Perez was awarded the prestigious Woody Everett award from the American Society for Engineering Education for best paper.

While pursuing his degree, Dr. Perez worked fulltime as an Instructional Technologist for the Academic Technologies department at UTEP. Dr. Perez worked on curriculum design for the Foundations of Engineering courses. Dr. Perez has taught Foundations of Engineering for the past 8 years and serves as Chief Proctor for the Principles and Practice engineering exam by the National Council of Examiners for Engineering and Surveying. Dr. Perez has lead numerous research projects presented at: ASEE Conference, International Conference on Design Principles & Practices, Annual Sloan-C International Conference on Online Learning and the V foro de Inovaciones Tecnologicas Ambientales ECO TECH. Dr. Perez's research has been cited in numerous research projects involving technologies in education and their effects on student learning.

Dr. Perez' dissertation research was the first article to be published in the Transactions on Techniques in STEM Education publication. Dr. Perez' academic technology

research has been published in the Computers in Education Journal by Northeast Consortium for Engineering Education.

Dr. Perez' dissertation entitled "Design and evaluation of the impact of a Multi-Agent Control System (framework) applied to a social setting" was supervised by Dr. Virgilio Gonzalez.

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