Assessment: Course Four Column

SPRING/SUMMER 2015

El Camino: Course SLOs (IND) - Automation, Robotics, and Manufacturing (ETEC, MTEC, MTT)

ECC: ETEC 10B:Principles of Engineering Technology II

Course SLO	*Assessment Method Description*	*Assessment Data & Analysis*	*Actions*
SLO #3 Bridge Construction & Testing - Students will build a bridge from popsicle sticks and load test their design to failure. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/29/2013	**Project -** Students worked in teams to build a truss bridge from a maximum of 200 Popsicle Sticks. The bridge was required to span a minimum of 14" with a load of 20 pounds minimum. A stress analyzer (where available) or calibrated weights were used to load the bridge until it failed. The failure point was reported for evaluation. **Standard and Target for Success:** Based on Mastery. This is a pass-fail outcome. All students are expected to master the concept. Some students will accomplish the objective on the first try, others may require multiple attempts. This outcome is foundational and required for students to progress in the course.	**Semester and Year Assessment Conducted:** 2014-15 (Spring 2015) **Standard Met? :** Standard Met 243 students enrolled in 15 sections mastered the outcome in the Spring 2015 semester. The teams that excelled in a first attempt spent the time needed designing the span in advance to include the location, size and number of trusses. Teams that built the span on intuition needed multiple attempts to satisfy the design constraints, demonstrating the value and importance of the engineering design process. (06/03/2015) **Faculty Assessment Leader:** Ron Way **Faculty Contributing to Assessment:** Nancy Brown, Jason Takamoto, Charles Klimcack, Dana Hagen, Hassan Twiet	**null.courseAction:** The instructors feel that the Truss Bridge is foundational and should remain as a key SLO for the course. Continue to reinforce concepts relating to design, strength of materials and destructive testing. (06/03/2016) **Action Category:** Teaching Strategies

ECC: ETEC 12B:Introduction to Engineering Design II

Course SLO	*Assessment Method Description*	*Assessment Data & Analysis*	*Actions*
SLO #2 Design Project - Upon completion of the course, the student shall be able to take a design project from problem statement to final production drawings. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/29/2013	**Presentation/Skill Demonstration -** This is a traditional end of course assignment for a design student to assess their comprehension of the course materials. Each of the essential elements of the process must be completed in order consistently (define problem, brainstorm, research, explore possibilities, select an approach, develop design proposal, create 3D model and production drawings). In this assignment, the student is provided with the problem and will work independently to complete the process as specified. **Standard and Target for Success:** Based on Mastery. This is a pass-fail outcome. All students are expected to master the concept. Some students will accomplish the objective on the first try, others may require multiple attempts. This outcome is foundational and required for students to progress in the course.	**Semester and Year Assessment Conducted:** 2014-15 (Spring 2015) **Standard Met? :** Standard Met 221 students enrolled in 15 sections mastered the outcome in the Spring 2015 semester. The length of time varied greatly from 10 lab periods to 16 lab periods. There was no distinction or grade based on the time needed to complete the project. The effectiveness of the design was judged by a jury of peers as the project was presented. (06/04/2015) **Faculty Assessment Leader:** Ron Way **Faculty Contributing to Assessment:** Joe Carpenter, Jose Rivas, Hassan Twiet, Mike McClendon, Jason Takamoto, Dana Hagen	**null.courseAction:** Continue to emphasize demonstration of the process from start to finish on a simple object. The instructors felt that this SLO was a good indicator of student comprehension of the course content and should remain as a key SLO for the course. (06/04/2016) **Action Category:** Teaching Strategies

ECC: ETEC 14B:Electronics for Engineering Technologists II

Course SLO	*Assessment Method Description*	*Assessment Data & Analysis*	*Actions*
SLO #2 Base 10 Conversion - Given a negative two's complement binary number, convert this to a base 10 number. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/29/2013	**Laboratory Project/Report -** Two's complement is a mathematical operation on binary numbers, as well as a binary signed number representation based on this operation. Its wide use in computing makes it a most important concept in digital electronics. There is only one answer to this problem and success will be demonstrated and documented in a laboratory report. **Standard and Target for Success:** Based on Mastery. This is a pass-fail outcome. All students are expected to master the concept. Some students will accomplish the objective on the first try, others may require multiple attempts. This outcome is foundational and required for students to progress in the course.	**Semester and Year Assessment Conducted:** 2014-15 (Spring 2015) **Standard Met? :** Standard Met 48 students enrolled in 3 sections mastered the outcome in the spring 2015 semester. Student success of the outcome was demonstrated by completing a laboratory report which graphically represented the solution. (06/09/2015) **Faculty Assessment Leader:** Ron Way **Faculty Contributing to Assessment:** Ted Harder, Ryan Bucher, Jose Rivas	**null.courseAction:** This system is the most common method of representing signed integers on computers. Continue to reinforce concepts through practice and simulation. The instructors felt that this SLO was foundational to an understanding of digital logic and should remain as a key SLO for the course. (06/09/2016) **Action Category:** Teaching Strategies

ECC: ETEC 16B:Computer Integrated Manufacturing II

Course SLO	*Assessment Method Description*	*Assessment Data & Analysis*	*Actions*
SLO #2 Robotic Arm: Tool Frame - Students will program a tool frame (tool coordinates) for a robot arm. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/29/2013	**Project -** The student must be aware of and control a number of parameters when programming a robotic arm, including force calculations, motion planning, velocity, sensing and workspace envelope. Working within the given parameters, the student will utilize teach mode and offline programming to accomplish the specified task. **Standard and Target for Success:** Based on Mastery. This is a pass-fail outcome. All students are expected to master the concept. Some students will accomplish the objective on the first try, others may require multiple attempts. This outcome is foundational and required for students to progress in the course.	**Semester and Year Assessment Conducted:** 2014-15 (Spring 2015) **Standard Met? :** Standard Met 32 students enrolled in 3 sections successfully completed the assigned task to move a workpiece from a staging area to a machine envelope. In teach mode, most students completed the task in the first try in teach mode and averaged three tries in programming mode which was well within acceptable limits. (06/09/2015) **Faculty Assessment Leader:** Ron Way **Faculty Contributing to Assessment:** Harold Hofmann, Lucas Pacheco	**null.courseAction:** This outcome is fundamental in setting up a Flexible Manufacturing System (FMS). At the beginning of the instructional unit, emphasize and provide demonstrations to enable students to observe the individual components of the FMS, such as the robotic arm. The instructors felt that this SLO was a good indicator of student comprehension of the course content and should remain as a key SLO for the course. (06/09/2016) **Action Category:** Teaching Strategies

ECC: ETEC 18B:Engineering Design and Development II

Course SLO	*Assessment Method Description*	*Assessment Data & Analysis*	*Actions*
SLO #2 Project Tracking - The student will employ industrial scheduling techniques to demonstrate project tracking. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/29/2013	**Project -** One of the challenges in working in teams on a capstone project over many months is scheduling the various tasks to be completed. In industry, the scheduling process is documented by a Gantt chart. Gantt charts illustrate the start and finish dates of the terminal elements and summary elements of a project. Upon completion of the project, a report is generated providing narrative for each milestone and if the task was completed as planned. Where the performance varied from plan a justification for the variance is provided in a final report. **Standard and Target for Success:** Based on Mastery. This is a pass-fail outcome. All students are expected to master the concept. Some students will accomplish the objective on the first try, others may require multiple attempts. This outcome is foundational and required for students to progress in the course.	**Semester and Year Assessment Conducted:** 2014-15 (Spring 2015) **Standard Met? :** Standard Met 42 students (10 teams) enrolled in 3 sections developed industry standard Gantt charts. Initial charts were prepared at the end of the project brainstorming phase when schedules for the tasks are projected. Upon completion of the project, each team developed a narrative justifying schedule variations and provided recommendations for future project scheduling. (06/08/2015) **Faculty Assessment Leader:** Ron Way **Faculty Contributing to Assessment:** Ted Harder, Ryan Bucher, Jose Rivas	**null.courseAction:** This outcome is fundamental in the engineering design and development process and appropriately positioned in this course. Continue to use course reference materials to provide numerous examples of Gantt charts for students to learn from. The instructors felt that this SLO was a good indicator of student comprehension of the course content and should remain as a key SLO for the course. (06/08/2015) **Action Category:** Teaching Strategies

ECC: MTT 10J:Numerical Control Graphics Programming

Course SLO	*Assessment Method Description*	*Assessment Data & Analysis*	*Actions*
SLO #2 File Manipulation - Students will be able to utilize computer operating systems to manipulate files, convert geometry from CAD databases to numerical control part geometry, and obtain listings and graphic plots. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/29/2013	**Laboratory Project/Report -** Starting with a CAD produced cad file, students convert to native file geometry, then apply tool-paths to create G-code. **Standard and Target for Success:** An exam is used to measure success for this SLO. Based on percentage: It is expected that 90-95% of students will score 75% or higher for this SLO.	**Semester and Year Assessment Conducted:** 2014-15 (Spring 2015) **Standard Met? :** Standard Met 40% appeared to have a mastery of the information, level 4, 90% or higher. 30% showed a strong understanding; level 3, 80% - 89% 30% had an basic understanding; level 2, 75% - 79% none fell short of understanding; level 1, below 70% (10/15/2016) **Faculty Assessment Leader:** Ed Hoffman **Faculty Contributing to Assessment:** **Reviewer's Comments:**	**null.courseAction:** Acquiring an updated CAD file would assist the students that did not exceed the 75% score (10/15/2016) **Action Category:** Program/College Support

ECC: MTT 40:Machine Shop Calculations

Course SLO	*Assessment Method Description*	*Assessment Data & Analysis*	*Actions*
SLO #2 Screw Threading - The student will be able to compute and perform screw threading operations to include 60 degree thread formulas, acme thread formulas and calculations of the parts of a screw thread to industry standard tolerances. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015), 2017-18 (Spring 2018) **Input Date:** 11/29/2013	**Performance -** Through a check list of computations the student will perform screw threading operations to include 60 degree thread formulas, acme thread formulas and calculations of the parts of a screw thread to industry standard tolerances. **Standard and Target for Success:** I estimate the 70% of the class should be able to do this at Mastery Level 3. Mastery Level 3: Students could do the assignment without asking for help. Partial Mastery Level 2: Students could almost do this assignment, but required a minor amount of help to set-up or solve the problem. Non-Mastery Level 1: Students required a major amount of help to do the assignment.	**Semester and Year Assessment Conducted:** 2014-15 (Spring 2015) **Standard Met? :** Standard Met 86% were able to complete the task without any help; level (3) 14% required a minor amount of help; level (2) (10/15/2016) **Faculty Assessment Leader:** Tim Monzello **Faculty Contributing to Assessment:** **Reviewer's Comments:**	**null.courseAction:** Review checklist and have a Q & A session before practical exam (10/15/2016) **Action Category:** Teaching Strategies