ABET
Self-Study Report
for the
BS in Computer Engineering Technology
at
Indiana State University
College of Technology
Terre Haute, Indiana

June 30, 2015

CONFIDENTIAL

The information supplied in this Self-Study Report is for the confidential use of ABET and its authorized agents, and will not be disclosed without authorization of the institution concerned, except for summary data not identifiable to a specific institution.
BACKGROUND INFORMATION

A. Contact Information

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B. Program History

The Computer Engineering Technology (CET) major was originally named the Computer Hardware major; originally offered in fall of 1984. The program was restructured and renamed Computer Engineering Technology with the first courses in the new CET major offered fall of 2009.

The CET major was reviewed by ABET during the fall of 2012. Since the fall 2012 review, no significant course curriculum changes in the major have been made. Additionally, no requirements have been changed in the Foundational Studies curriculum.

C. Options

No options, tracks or concentrations exist in the CET program. A minor in Computer Engineering Technology is offered.

D. Program Delivery Modes

Generally, all CET major courses are offered during days on campus. Courses with multiple sections may include evening class meeting times. The classes are a mix of lecture/in-class activity based classes or a mix lecture/lab/in-class activity based classes. Blackboard is used as a supplemental tool in all courses.
E. Program Locations
The CET BS degree program is housed in the Department of Electronics and Computer Engineering Technology in the Myers Technology Center, College of Technology. All major courses are delivered in the Myers Technology Center facility. Mathematics, science, computer science and Foundational Studies courses are offered at a number of locations on the ISU Terre Haute campus.

F. Public Disclosure
The CET program educational objectives, student outcomes, annual enrollment and graduation data can be found:

1. On the ISU 2015-2016 Undergraduate Catalog, in the section detailing the CET major, on-line at:
2. On the College of Technology web site, in the section detailing the CET major, on-line at: http://technology.indstate.edu/cet/ or http://cms.indstate.edu/academics#accordion-undergrad_programsAccordion=0.

G. Deficiencies, Weaknesses or Concerns from Previous Evaluation(s) and the Actions Taken to Address Them
The most recent (first for the CET program) ABET accreditation site visit occurred on October 14 -16, 2012. The CET program, per the ABET report dated November 21, 2012, was found to be “well organized” and delivered “well-designed curricula” that currently met industry and government needs. It was noted that the CET faculty members were “well qualified, experienced and dedicated to student instruction and advising.”

No deficiencies or weaknesses were cited. One program concern was delineated, stating that “Several faculty members are at, or near, retirement age. This could place the program in a vulnerable position. It is recommended that the program consider developing a plan that will ensure program continuity…”

This concern was and continues to be recognized by the CET program faculty, the ECET department, the College of Technology and university administration. Mitigating this issue is a difficult challenge given the current climate of university budget shortfalls, pressure from FTE budgets and compounded by continued growth over the past five years in department and CET program enrollment. The department faculty, together with the COT dean, has developed and is executing a stop-gap strategy for increasing faculty numbers in this difficult climate. The strategy involves bringing non-tenure track instructors on-board who are currently working on their PhD degree programs in technology related fields. As they gain teaching experience as well as progress toward their terminal degrees, we will be in position to offer tenure-track positions to instructors who are well aligned with our department practices and programs, furnishing continuity
in the face of losing more experienced faculty to retirement. To date, this represents our best strategy to resolve the issue.

Note that we have included two Personnel tables in section D, one showing FTEs for the Computer Engineering Technology Lead Faculty and the other showing FTEs for the ECET department as a whole.
GENERAL CRITERIA

CRITERION 1. STUDENTS

A. Student Admissions
To qualify for general admission to the university, applicants must complete the Indiana Core 40 high school curriculum (or equivalent for non-Indiana graduates) with a grade point average of 2.5 on a 4.0 scale. Indiana high school graduates must have passed both the mathematics and English sections of the Indiana Statewide Testing for Educational Progress (ISTEP) or receive a waiver from their high school. Transfer hours are restricted to courses in which the applicant earned a grade of “C” or higher from 100 level or higher courses from a regionally accredited college or university. In addition, some block transfer credit may be accepted via articulation agreements.

International students must demonstrate a TOEFL score of 61 (500) minimum or an IELTS of 6 or an ELS level of 112 (successful completion).

Admittance to ISU at the undergraduate level is handled by the Admissions Office. Outside of assisting Admissions with recruiting (Sycamore Preview, Experience State & arranged visits) and participation in new student orientation and initial freshman advising and registration for classes, the program has no other involvement with the admission process. A CET major freshman has the same eligibility requirements as freshmen in other majors at ISU.

B. Evaluating Student Performance
To earn a bachelor’s degree in computer engineering technology, students must complete all required courses listed in the curriculum and have a minimum GPA of 2.0/4.0 in all course work completed. A total of 120 credit hours are required for graduation. Other requirements include a minimum of 45 hours of 300/400 level courses, and 30 hours of residency (for transfer students).

Prerequisites for CET major courses, and all other courses, are enforced. Passing the prerequisite is necessary for the student to proceed with course registration for the following semester, enforced by the ISU course registration software-based process. An ‘F’ grade in courses that are pre-requisites for other courses in the curriculum requires the course to be repeated.

C. Transfer Students and Transfer Courses
Transfer students constitute an increasing portion in our undergraduate population. Most transfers come from neighboring community colleges. The main factor contributing to this scenario is the expansion of the two-year junior college system in Indiana, which has been a priority for the Indiana Commission of Higher Education Commission to
offer more affordable college education to Indiana residents. This continues to pose serious competition for enrollment at lower levels for our program. The state is also pressing for an increase in the rate of two-year graduates continuing to pursue a four-year bachelor degree. We therefore consider this state goal to be an opportunity for future program growth, and with a strategically crafted transfer plan in place we expect transfers to remain strong in the coming years.

The CET program has established articulation agreements with like programs at several community colleges that allow students to complete an associate degree to apply credits towards a bachelor degree at ISU. These institutions include: Ivy Tech Community College and Vincennes University in Indiana, and Lakeland Community College in Illinois. Each articulation agreement stipulates the ISU courses that the transfer students need to complete, along with the requirements or guidelines that govern the agreement. An associate degree holder from these institutions takes the so-called “block transfer”, i.e., courses with an acceptable grade would directly substitute ISU equivalents without repeated scrutiny. These agreements help pre-establish course equivalence and ease the transition to ISU. They are also reviewed and revised if necessary every two-to-four years to assure the courses are well-aligned. The block transfer often, however, is not used since community college students typically bring electives or courses outside of the articulated block. Thus the course-by-course transfer analysis is typically used.

The transfer process, at times, begins by students requesting unofficial transfer advising while they are still enrolled at a community college and/or while they are registering for their last one or two semesters at the community college. A department faculty advisor or the department chair handles this pre-transfer advising. Transfer students first apply and are admitted to the university through the regular admissions process via the ISU website. Their records are evaluated first by the ISU Registrar, assigning major course credit per the Transferology web source, a CollegeSource Incorporated product. Foundational Studies transfer credit is also assigned based on Transferology and with consultation with the ISU Foundational Studies administration. Foundational Studies transfer credit can also be achieved through the Statewide Transfer General Education Care (STGEC) process. The STGEC was developed by the public institutions of higher education in Indiana in response to Senate Enrolled Act 182 (2012). It enables a student who satisfactorily completes an approved program of general education in any one of those institutions to transfer that course work to any other state educational institution as a block of 30 credit hours towards the general education core requirements. The STGEC applies to all students matriculating at a public institution of higher education in Indiana in the fall of 2013 and after.

The CET program is then responsible for reviewing the major transfer courses to determine whether they have the rigor and coverage equivalent to the courses in our curriculum. The decisions are made based on the syllabi, course descriptions, and other supplemental material. If a course is not judged to be suitable for substitution, a transfer-equivalence will not be granted. The department chair usually performs the major course transfer analysis and credit assignment. There is no limit on the maximum number of hours of transfer credit which may be assigned towards a bachelor’s degree, however a minimum of 30 credits must be completed at ISU; the residency requirement. In August 2005 the department
unanimously passed a motion to require all transfer students to complete a minimum 15 credits of major courses while enrolled at ISU. We recognize that transfer credits may originate from a wide variety of educational institutions. To maintain the curriculum integrity the program, and ISU as a general policy, does not “grandfather” credits accepted by other institutions and reserves the right to evaluate according to CET requirements.

D. Advising and Career Guidance

Academic advising is an integral part of the educational process in the CET program and the College of Technology. The primary purpose of advising is to assist students in the development of meaningful educational plans compatible with the attainment of their life goals.

Advisor and Student Role. Academic advising is an interactive process in which both students and advisors share the responsibility. Academic advisors should foster a good working relationship with students, and adapt to their experiences and changing needs to assure the effectiveness of advising. By having faculty members serving in university and college level academic affairs committees, the CET program is able to enhance understanding, affirming, and respecting the individual differences within the University community to assure quality advising. The department and program expect advisors to develop the knowledge, experience, and interest for successfully communicating with students in a genuine, sincere, accurate, and confidential manner. Students are expected to understand University and program requirements and accept the responsibility for fulfilling them. Together advisors and students are expected to maintain a professional and mutually respectful relationship as they review students’ progress toward the attainment of educational objectives.

Advising Units. Advising in the CET major starts from the freshman year and will continue through the senior year. Students have a variety of advising resources provided by units at the college and department level. Non-transfer freshmen are co-advised by the University College and CET program advisors. The University College provides an intrusive advising experience. Upon completion of 30 credits, students matriculate from the University College co-advising program, then receiving all academic and career advising from CET program and department faculty. As a student progresses through the academic program, each advising unit will play a different role, depending on the status and concern of the student. Key advisement personnel include:

1. Associate Dean’s office. The Associate Dean is the chief administrator in the College of Technology for undergraduate academics. This office oversees and adds consistency to advising and curriculum issues across the College of Technology. Support staff work in this office, available to help students with advising, scheduling and registration, serving as a backup when department faculty are not available.

2. The College of Technology central records coordinator. This role is to assist the Associate Dean in organizing and coordinating the review of degree requirements at the time of graduation, review and ensure proper course transfer documentation, coordinate requests for course substitutions and oversee the academic records of students in the College of Technology.
3. Academic advisor. When a student enrolls as a CET major, he/she is assigned an academic advisor who is a full-time member of the faculty. The student will retain this advisor as long as he/she feels advising has been productive, thereby enabling the development of a closer, more interactive relationship between the two parties. Students may request a change in their assigned advisor at any time by contacting the department chair. The role of the faculty advisor is to provide general guidance regarding CET curriculum and career paths. Each faculty advisor has a crucial role in monitoring and advising students and in catching academic problems before they become serious.

Advising Tools. Student progress is tracked by advisors with the Ellucian Degree Works™ (implemented fall 2012) academic advising and tracking tool, named MySAM by the university. Students also have full access to the tool. This software application holds academic records including progress toward the degree, course grades, remaining coursework to be completed, class registration tools, what-if functions for degree major or minor additions or changes and a note area for academic advisor notes and recommendations. Prior to Degree Works/MySAM the Ellucian Degree Audit Reporting System (DARS) software package was used. Students who entered the program before Fall 2012 are still using the DARS tool. An excerpt of a Degree Works (MySAM) report is shown in Figure 1.1. The upgrade to Degree Works has been well received, giving students and advisors additional and more flexible academic review tools.

Additional advising tools include the curriculum guide sheet, an exemplary four-year plan and a degree map updated by academic advisors each semester. The guide sheet is a one-page curriculum form that itemizes all the courses required to obtain the CET BS degree, as shown in Figure 1.2. For the student’s program of study, this is a one-page form that many students find to be the most useful means for tracking progress toward degree completion. A flow/prerequisite map in shown in Figure 1.3. The four-year plan, shown in Figure 1.4, arranges the curriculum in a suggested semester-by-semester track. This document also recommends which semesters classes are guaranteed to be offered.

General Advising Policy. It is mandatory for students to arrange advisement meeting with their advisor at least once per semester to review their academic progress and discuss plans for subsequent semesters during the first two years of study. The advisor will evaluate the student’s up-to-date information in MySAM (Degree Works) (ISU previously used DARS) and grades from the previous semester to see student data to help with advising. The meeting is to take place prior to registering for classes each semester. All freshman and sophomore students (60 credits or less) are required to obtain advisor approval via a PIN registration permission number before they can register on-line for courses. Students at the junior and senior rank may register for class without advisor permission, but are strongly encouraged to meet with their academic advisor prior to registration for each upcoming semester. A PIN number which changes each semester for each student is used to control the registration permission process. The advisor issues the PIN number upon meeting with the student for advising. The approval is also indispensable when students decide to add or drop courses from their schedule.
Besides advisement meetings, advisors routinely monitor each student’s progress towards the degree and work carefully to identify any deficiencies. Any issues identified are communicated to students through emails and, meetings if necessary. Students may also request more frequent meetings depending on their needs. In addition to academic advising, students who are experiencing emotional, personal or family issues are referred to departments on campus who can best assist in these matters. For students with documented physical and learning disabilities, advisors will help accommodate their special needs following university guidelines. The Office of Student Success at ISU exists as a central resource for a number of programs and tools to assist students with special needs or support.

**New Student Orientation.** All new first-time, full-time freshmen, transfer, and international students are required to attend New Student Orientation coordinated by the Office of New Student Transition Programs to register for their first semester of coursework. Any freshman who fails to attend this program will not be allowed to register for classes before attending the orientation program and completing a consultation with Student Financial Aid. During this orientation program the freshmen will have the first experience of academic advising. Incoming freshmen meet with University College staff and advisors, College of Technology staff including the Associate Dean and have a one-on-one session with an academic advisor to introduce important advising tools such as the university catalog, program guide sheet, and the Degree Works™ (MySAM) academic report. Advisors will assist in developing a first
semester schedule, based on their ACT/SAT score and placement results. Additionally
students learn to search, add or drop courses online.

**Mentoring.** It has been part of the department’s culture for faculty to have an “open-door”
policy for student visits. The primary role of mentoring encompasses general non-curriculum
related guidance to student concerns on transition to college, employment perspective, and
professional development, etc. Although there is no structured system for these activities, our
department prides itself in creating an informal and comfortable social atmosphere in which
students can routinely communicate with faculty outside classrooms. Survey results continue

![Figure 1.2 CET Major - Plan of Study Guide](image-url)
## Computer Engineering Technology BS Degree

### Prerequisite path

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Freshman</strong></td>
<td></td>
</tr>
<tr>
<td>ECT130</td>
<td>None</td>
</tr>
<tr>
<td>ECT165</td>
<td>MATH115 or higher</td>
</tr>
<tr>
<td>ECT167</td>
<td>ECT165</td>
</tr>
<tr>
<td>ECT168</td>
<td>None</td>
</tr>
<tr>
<td>MATH115</td>
<td>Math placement score &gt; 11/30</td>
</tr>
<tr>
<td>ENG105</td>
<td>ENG101</td>
</tr>
<tr>
<td><strong>Sophomore</strong></td>
<td></td>
</tr>
<tr>
<td>ECT231</td>
<td>None</td>
</tr>
<tr>
<td>ECT232</td>
<td>ECT231</td>
</tr>
<tr>
<td>ECT281</td>
<td>MATH115 or higher</td>
</tr>
<tr>
<td>CS256</td>
<td>None</td>
</tr>
<tr>
<td><strong>Junior</strong></td>
<td></td>
</tr>
<tr>
<td>ECT301</td>
<td>ECT232 &amp; Jr standing</td>
</tr>
<tr>
<td>ECT303</td>
<td>ECT232</td>
</tr>
<tr>
<td>ECT306</td>
<td>ECT301</td>
</tr>
<tr>
<td>ECT308</td>
<td>ECT303</td>
</tr>
<tr>
<td>MATH129</td>
<td>MATH115 or placement score &gt; 20/30</td>
</tr>
<tr>
<td>ENG305T</td>
<td>ENG105 &amp; &gt; 64 credits</td>
</tr>
<tr>
<td><strong>Senior</strong></td>
<td></td>
</tr>
<tr>
<td>ECT401</td>
<td>ECT306</td>
</tr>
<tr>
<td>ECT403</td>
<td>ECT303</td>
</tr>
<tr>
<td>ECT406</td>
<td>Senior standing</td>
</tr>
<tr>
<td>ECT437</td>
<td>Junior or senior standing</td>
</tr>
<tr>
<td>ECT430</td>
<td>Final school year</td>
</tr>
</tbody>
</table>

Figure 1.3 CET Major Prerequisite Paths
Figure 1.4 CET Major – Four Year Plan

to show students are satisfied with department faculty’s availability and willingness to serve the mentoring responsibility.
Student Awards. A number of awards sponsored by professional societies and individual donors recognize outstanding student academics and services. Among these awards are:

1. Kenneth and Zorah (Atkins) Syphax-Rapid Reproduction, Inc. Scholarship - Student must be a full-time student in the College of Technology and possess a minimum GPA of 2.5.

2. Thelma F. Mills Scholarship - Students must have completed the freshman year and have demonstrated outstanding academic performance, must be an undergraduate student engaged in a meaningful work experience related to their vocational/professional objectives which does not average more than 20 hours per week during the academic year.

3. ECT Alumni Endowed Scholarship - This scholarship is awarded to a student who has declared a major in electronics and computer technology. The student must be in good standing with the University and the Department of Electronics and Computer Engineering Technology.

4. Pamela and Earl Godt Scholarship - The award is presented once every two years to a full-time student in the Department of Electronics and Computer Engineering.

5. Dr. Leland B. & Ruth Trask Moore Scholarship - Given annually, the award is presented to a full-time junior level student majoring in electronics engineering technology (EET) or CET major with the highest GPA.

6. Electronics and Computer Technology Alumni Endowed Scholarship - The recipient must be in good standing in EET or CET. The International Society of Automation (ISA) recently committed financial support for this scholarship. ISA is a leading global organization that is setting the standard for automation.

The nominations for award recipients are done annually by a selected faculty member. The faculty nominates the students in accordance with the award guidelines and makes the final decision through comprehensive evaluation.

Tutoring. The rigorous nature of collegiate level study requires tutoring as an indispensable part of the learning process. Tutoring services for CET students are available through three avenues.

1. Through the Office of Student Success at ISU - Students have access for free tutoring for most Foundational Studies courses. Sessions may be arranged on one-to-one or small study group basis for either long or short term periods each semester. Some problems can even be handled on a “drop-in” basis. These services are accessible Monday through Thursday from 9:00 AM to 9:00 PM and until 4:30 PM on Fridays. Sunday evening tutoring is available 6:00 PM to 9:00 PM.

2. The College of Technology has a centralized tutoring service coordinated by the Associate Dean’s office - The tutors are of junior/senior standing and have excellent grades and classroom performance. The hours are flexible and occur on weekdays. The COT tutors are responsible for assisting students on introductory circuit analysis, digital logic, computer science and math.

3. In-class tutors – The Office of Student Success supports the inclusion of tutors to reside during class meeting in 100 level courses. CET majors benefit from this assistance in 100 level electronics, freshman orientation and introduction to automation courses.
Career Guidance. The ISU Career Center offers services to prepare, educate and assist students throughout their career development, to prepare them for a competitive work environment and to pro-actively develop and maintain effective relationships among students, employers and other relevant constituencies. The Career Center is responsible for hosting two career fairs a year on campus. Other services benefiting CET student careers include:

1. MyPlan - a Career Center on-line service to help students plan their career.
2. CAREERLINK - a national recruiting network and suite of web based recruiting and career services automation tools serving the needs of colleges, employers and job candidates.
3. Networking and etiquette workshops - workshops that allows students to learn about and practice important networking and dining skills including conversation, interviewing tips and proper dress.
4. Speed interview review workshops - workshops that offer students practice in interviewing skills in group setting alongside their peers.

E. Work in Lieu of Courses
For the CET major, credit towards graduation is awarded upon successful completion of coursework at ISU, transfer of equivalent credit as described previously, Advanced Placement (AP) credit from high schools, College Level Examination Program (CLEP) credit or Dantes Standardized Subject Tests (DSST). Any dual credit awarded by high schools must have college credit awarded and a transcript received by the ISU Registrar from that accredited university. This policy also applies to military credit for Joint Service Transcripts or CCAF transcripts, awarded by the American Council on Education (ACE).

F. Graduation Requirements
A Bachelor of Science in Computer Engineering Technology (CET) is awarded upon completion of the following requirements:

1. The student earns a minimum of 120 credits, excluding any duplicate course credits and remedial coursework.
2. The student has no incomplete courses on their record when the incomplete was assigned for any semester or term after spring 2007.
3. The student has completed at least 30 credits enrolled at Indiana State University, of which at least nine must be at the 300-400 level.
4. The student has completed a minimum of 45 credit hours of course work in 300 and 400-level courses.
5. The student has completed the Foundational Studies Program (see Figure 1.5).
6. The CET student has completed or transferred credit for all required courses in the major.
7. The student has earned a minimum cumulative grade point average of 2.0.

A student who desires a second or additional bachelor’s degree must complete a minimum of 30 credit hours at ISU after the awarding of the first degree and must fulfill all requirements.
for the degree being pursued. Two baccalaureate degrees may be granted simultaneously provided all requirements for both degrees have been completed and a minimum of 150 credit hours has been earned.

**FOUNDATIONAL STUDIES REQUIREMENTS**

I. COMPOSITION

*Freshman Composition*

ENG 101 and ENG 105 (ACT < 20; SAT < 510), or
ENG 107 or ENG 108 (ACT 20 or higher; SAT 510 or higher), or
GH 101 and GH 201 (SAT verbal score of 650 or higher (or an ACT verbal score of 29 or higher) and completion of the University Honors curriculum)

*Junior Composition* (must have completed 48 credit hours to enroll in a junior level composition course)
Select one upper-division course from the following:
BEIT 336, ENG 305, ENG 305T, ENG 307 or ENG 308

II. COMMUNICATION

Select one course from the following:
COMM 101, COMM 202, COMM 215, or COMM 302

IIIA. QUANTITATIVE LITERACY

a. One Quantitative Literacy course, select from one of the following choices:
ECON 101, FIN 108, or MATH 102; or
b. SAT Math score of 650 or above (or an ACT Math score of 27 or above)

IIIB. MATHEMATICS

a. One Mathematics course, select from one of the following choices:
MATH 115, MATH 123, MATH 131, MATH 132, or MET 215; or
b. SAT Math score of 650 or above (or an ACT Math score of 27 or above)

IV. NON-NATIVE LANGUAGE

Select one of the following:
a. Four courses in high school in a single or multiple non-native language, including American Sign Language, with a grade of C or better, or
b. Two courses at ISU in a single or multiple non-native language, or
c. Two courses from an accredited college or university, in a single or multiple non-native language, including American Sign Language, or
d. Completion of English as a Second Language requirements

V. HEALTH AND WELLNESS

a. Select one course with an activity component from the following choices:
AHS 111 or PE 101 and PE 101L; or
b. Completion of U.S. armed military services basic training (reserves or enlisted – does not include ROTC training).

VI. SCIENCE AND LABORATORY

a. One Foundational Studies designated laboratory science course, select one pair from the following:
BIO 112 and BIO 112L, CHEM 100 and CHEM 100L, ENVI 110 and ENVI 110L, or PHYS 101 and PHYS 101L; or
b. Any two laboratory science courses from two different science disciplines.

**VII. SOCIAL AND BEHAVIORAL SCIENCES**
Select one course from the following:
AET 461, ECON 100, ECON 346, EPSY 202, EPSY 221, PSCI 130, PSCI 305, PSY 101, or SOC 101

**VII. LITERARY STUDIES**
Select one course from the following:
ENG 239, ENG 338, ENG 339, ENG 346, LAT 215, or PHIL 321

**IX. FINE AND PERFORMING ARTS**
Select one course from the following:
ART 151, ARTE 390, COMM 240, COMM 336, ENG 219, MUS 150, MUS 233, MUS 236, MUS 333, THTR 150, or THTR 174

**X. HISTORICAL STUDIES**
Select one course from the following:
HIST 102, HIST 113, HIST 201, HIST 202, or MUS 351

**XI. GLOBAL PERSPECTIVE AND CULTURAL DIVERSITY**
Select one course from the following:
AFRI 113, AFRI 212, AFRI 222, ECON 446, ENG 340, ENVI 130, EPSY 341, HIST 101, HRD 335, PSCI 105, SOC 110, SOC 465, or GNDR 301

**XII. ETHICS AND SOCIAL RESPONSIBILITY**
Select one course from the following:
AFRI 323, ATTR 413, BUS 204, CIMT 475, CRIM 100, ECON 103, ENVI 442, ENVI 462, MUS 418, PHIL 190, PHIL 201, PHIL 303, PKG 381, PSCI 107, or GNDR 200

**XIII. UPPER DIVISION INTEGRATIVE ELECTIVES**
Select from one of the options listed below:

a. Select two upper-division, integrative electives from the following:
AET 330, AFRI 312, AFRI 329, BUS 401, CRIM 355/ECON 355, ECON 302, ECON 331, ECON 353, , ECON 355 , ENG 335, ENG 484, , ENG 486, ENG 487, ENVI 310, ENVI 360/PHYS 360, ENVI 361, ENVI 376, ENVI 419, ENVI 423, ENVI 460, HIST 320, HIST 336, HIST 345, HIST 350, LLL 350, MATH 492, MUS 329, MUS 350, NURS 486, PHIL 313, PHYS 360, PSY 350, PSY 485, SOC 302, SOWK 450, SOWK 494, TMGT 421, or GNDR 450 ; or

b. One upper-division, integrative elective and a one-course equivalent study abroad experience; or
c. One upper-division, integrative elective and completion of a second major, a minor, a certificate, or an education degree where the content is taken outside of the Bayh College of Education.

Figure 1.5 Foundational Studies Program Requirements

Those candidates who are free of all University obligations and who are designated as having completed degree requirements are issued the corresponding diploma and the transcript through the Office of Registration and Records. After graduation, if the student desires to pursue a second degree, he/she must be readmitted.
G. Transcripts of Recent Graduates

The program will provide transcripts of the most recent graduates to the visiting team along with any needed explanation of how the transcripts are to be interpreted, upon request.
CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES

Educational objectives for the computer engineering technology program have been developed in conjunction with our constituents based on, and are consistent with, the mission statements of parent units. This section contains the mission statements of the university and College of Technology, and elaborates the process by which these objectives were determined, how the program ensures these objectives are achieved, and the systematic assessment to assure continuous improvement of the program.

A. Mission Statement

The ISU mission, vision and value statements can be found at: http://www.indstate.edu/academicaffairs/mission.htm.

Indiana State University Mission Statement. Indiana State University combines a tradition of strong undergraduate and graduate education with a focus on community and public service. We integrate teaching, research, and creative activity in an engaging, challenging, and supportive learning environment to prepare productive citizens for Indiana and the world.

Indiana State University Vision Statement. Inspired by a shared commitment to improving our communities, Indiana State University will be known nationally for academic, cultural, and research opportunities designed to ensure the success of its people and their work.

Indiana State University Value Statement.

1. We demonstrate integrity through honesty, civility, and fairness.
2. We value high standards for learning, teaching, and inquiry.
3. We foster personal growth within an environment in which every individual matters.
4. We uphold the responsibility of university citizenship.
5. We provide a well-rounded education that integrates professional preparation and study in the arts and sciences with co-curricular involvement.
6. We embrace the diversity of individuals, ideas, and expressions.
7. We exercise stewardship of our global community.

The core values, mission statement and goals statements for the College of Technology can be found at: http://technology.indstate.edu/about/values.htm.

The College of Technology Core Values.

1. The study of technology is an essential part of our cultural heritage and of a university education.
2. High quality, state-of-the-art programs and the embracing of future technologies are highly valued.
3. The College of Technology faculty value experiential instruction using modern laboratories to develop knowledge and skill.
4. The College of Technology is a student-centered academic unit (i.e., high quality teaching and advising as well as meeting individual needs of students is central for all).

5. The College of Technology is dedicated to identifying, enhancing, and rewarding faculty and student excellence in scholarship (all forms) and service, and is committed to excellence, in general.

6. Based upon these core values, the College of Technology commits itself to fulfilling the mission and goals.

The College of Technology Mission Statement. The College of Technology will provide exemplary undergraduate and graduate programs, generate solutions and knowledge through research, and serve the technology needs of the State, the nation, and the international community.

Goals of the College of Technology.

1. Be recognized as a global leader in the preparation of future professionals for careers in technology, teachers/trainers for industry and education.

2. Continue to increase participation of underrepresented groups in technology careers.

3. Develop critical thinking, problem solving, and communication skills through the use of practical experiences.

4. Provide the knowledge and skills to prepare people to create, understand, apply, manage, and evaluate technology ethically and responsibly.

5. Contribute to the areas of state economic development, technology transfer professional development and community service.

6. Extend partnerships with schools, businesses, industry, and other agencies through co-op programs, internships, research and development projects to expand access to higher education and better prepare our future workforce.

7. Evaluate, refine, and enhance all academic programs to assure a sound basis for lifelong learning and living in a multi-cultural and interdependent world.

8. Maintain a concern for future developments; be known for innovativeness; and participate in the search and application of new technologies.

B. Program Educational Objectives

Computer Engineering Technology (CET) graduates are expected to demonstrate:

1. Technical proficiency by applying disciplinary reasoning and critical thinking to identify, analyze and solve problems in computers, systems integration, automation, digital systems, data communications, computer networks, and electronics (Technical Competency).

2. Effective communication skills in both oral and written form to articulate technical knowledge, ideas, and proposals (Communication Competency).

3. Organizational and increasing levels of managerial skills in their chosen field (Managerial Competency).

4. The awareness of professional, ethical and social responsibility and impact of engineering technology practices in Indiana and a diversified world (Responsibility Awareness).
5. The ability to function effectively, think independently and work collaboratively in a team environment (Teamwork Competency).
6. Individual desire and commitment to remain technically current by engaging in continuous self-improvement and lifelong learning (Lifelong Learning Competency).

The CET program educational objectives can be found:
4. On the College of Technology web site, in the section detailing the CET major, on-line at: http://technology.indstate.edu/cet/.

C. Consistency of the Program Educational Objectives with the Mission of the Institution

The Indiana State University Mission Statement speaks to “prepare(ing) productive citizens for Indiana and the world.” The College of Technology Mission Statement declares that it will (through degree programs such as CET) “serve the technology needs of the State, the nation, and the international community.”

The CET program’s educational objectives correlate well with these mission statements. These statements share the common educational values - graduating professionally competent students who can serve both as leaders and competent team members under different circumstances, and understand the impact of their work both to themselves and society as a whole.

Our educational objectives incorporate these values in that:
1. Objectives 1 (Technical Competency) and 2 (Communication Competency) reflect the program’s commitment to providing quality undergraduate education in both technical and liberal (ISU foundational) studies.
2. Objectives 3 (Managerial Competency) and 5 (Teamwork Competency) address program’s emphasis on our students’ team-work mentality in professional, community and public service.
3. Objective 4 (Responsibility Awareness) fulfills program’s contribution to society and the state of Indiana in particular, by advancing students’ awareness on the social and environmental implications of their careers.
4. Objective 6 (Lifelong Learning Competency) represents the CET program’s commitment to our graduates’ long-term productivity in their future careers.

D. Program Constituencies

The following stake-holders are the constituencies with respect to the CET degree, the stated program educational objectives and expected student outcomes. Each group has unique perspectives and interests which relate accordingly:
Students of the CET program. The students expect themselves to become technically competent, professionally and socially responsible individuals after earning a bachelor degree from the program. Obviously they expect to possess competency in all 6 areas, namely technically, in communication, in managerial, in responsibility, in teamwork and in lifelong learning.

Alumni of the CET program. The alumni expect a continued high quality educational program as their career and reputation are associated with the quality of their alma mater; thus all 6 objectives apply here.

Faculty of the department. The faculty are expected to fulfill their educational responsibility in leading the students in the learning process, and periodically evaluating and adjusting if necessary the teaching pedagogy pertinent to achieving all stated educational objectives. For the long term health of the CET program, a key faculty concern, the objectives are important goals on which to focus.

The Industrial Advisory Board (IAB). This selective and involved group of individuals expects to see the program yield quality graduates that meet industry needs. While the IAB members have a large concern with objective 1, technical competency, during IAB discussions the importance of communication skills (objective 2), teaming (objective 5) and the ability to search out and assimilate new information (objective 6) are always discussed as being very important.

Employers of CET graduates. This group expects to hire new employees who are technically competent, productive, self-motivated learners, team members, and have excellent communication skills. Here again and in many cases the most demanding of the stakeholders, the mastery of all 6 objectives is important.

E. Review of the Program Educational Objectives

Reviewing or evaluating the educational objectives involves identifying areas that warrant improving; then develop practical strategies for achieving such improvement, and ultimately implementing and monitoring whether or not these strategies have successfully accomplished their intent. Changing educational objectives is a serious academic issue; it therefore needs to be approached in a prudent and proactive manner. We also understand given the limited resources we have in the program, i.e., active faculty, administrative support and the like, the evaluation should grow gradually in terms of complexity and completeness.

The process for evaluating the educational objectives begins with data collection by the program and individual faculty. The data are then assessed. The program coordinator is leads this effort, and is responsible for reporting the compiled results to the faculty and industrial advisory board. Currently we have a three-year review cycle to assure any change to be implemented is in response to a consistent trend and not an aberration. At the end of the second year, program faculty will identify the components that need to be strengthened, included, or removed from objectives based on the feedback from the three surveys. The key question that needs to be answered in the process is: are the objectives meeting the needs of our constituents? The third year will initiate the revision process if
necessary: program faculty will be responsible for developing a draft with proper language; advisory board’s opinions and suggested modifications will be solicited during annual board meeting. The approval of final language rests in the department faculty hands. The program will publish any changes to the program mission and educational objectives online, in the undergraduate catalog and any other outlets that directly interface with constituencies.

Figure 2.1 shows the feedback loops that lead to continuous refinement of educational objectives and curriculum improvement. Data sources and the respective individuals or units in charge of each link are highlighted. The loop that involves educational objectives review and update is executed every three years, it assures periodic evaluation and redefinition (if necessary) of the current educational objectives and outcomes. The student outcomes and curriculum review loop is executed annually, and focuses primarily on outcomes assessment and curricular improvements. The two cycles are linked together through student outcomes report.

![Figure 2.1 CET Program Evaluation Flow Chart](image-url)
CRITERION 3. STUDENT OUTCOMES

A. Process for the Establishment and Revision of the Student Outcomes

The student outcomes represent the foundation of knowledge and skills for CET graduates to maintain competence and achieve professional success upon graduation. These outcomes are developed and approved by CET faculty. The faculty is responsible for collecting, reviewing, and interpreting information drawn from the designated courses. The outcomes assessment results are discussed at the program faculty meetings, where issues regarding student outcomes are identified and viable strategies are developed. Any changes in the process are also discussed, changes proposed and a change process executed by the faculty.

B. Student Outcomes

The CET program student outcomes exist to fulfill program educational objectives, encompass ABET general criteria and address specific criteria for the computer engineering technology program. To this end, the following outcomes have been developed that represent the desired capabilities of students upon graduation:

1. the ability to apply principles of mathematics, science, engineering technology, and programming languages to solve technical problems in computers, digital systems, computer networks, data communications, electronics, and automation (Problem solving skills).
2. the ability to incorporate systematic methods and emerging technology to identify, formulate, and generate original solutions within the fields of computer engineering technology (Design skills).
3. the ability to conduct experiments competently in a laboratory setting (Hands-on skills).
4. the ability to apply fundamental management principles and techniques in business operations, and display leadership qualities in organizing teams and reconciling differences (Managerial skills).
5. the understanding of professional and ethical responsibility, and the impact of technology in a global and social context (Ethics awareness).
6. the ability to engage in life-long learning to pursue increasing knowledge of current and emerging technical and non-technical issues (Lifelong learning).
7. the ability to function effectively in a multi-disciplinary team and respect members of various background and personality (Teamwork skills).
8. the ability to communicate with clarity and conciseness both verbally and in writing with peers, clients and targeted audience (Communication skills).

The CET program student outcomes can be found:
1. On the ISU 2015-2016 Undergraduate Catalog, in the section detailing the CET major, on-line at:
2. On the College of Technology web site, in the section detailing the CET major, online at: http://technology.indstate.edu/cet/.

C. **Relationship of Student Outcomes to Program Educational Objectives**

The student outcomes are the measurable effects of our curriculum which delivers the content to satisfy, in the larger context, the program educational objectives developed for the CET major. As such, there is close correspondence between the outcomes and the overarching educational objectives, illustrated in the matrix shown in Table 3.1.
Table 3.1 Educational Objectives, Student Outcomes and ABET General Criteria Matrix

<table>
<thead>
<tr>
<th>ABET Criteria</th>
<th>CET Educational Objectives</th>
<th>CET Student Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a, b &amp; f</td>
<td>Technical competency</td>
<td>√</td>
</tr>
<tr>
<td>a &amp; c</td>
<td>Communication skills</td>
<td>√</td>
</tr>
<tr>
<td>a &amp; b &amp; d</td>
<td>Managerial skills</td>
<td>√</td>
</tr>
<tr>
<td>a &amp; c</td>
<td>Mature responsibility</td>
<td>√</td>
</tr>
<tr>
<td>e &amp; g</td>
<td>Teamwork mentality</td>
<td>√</td>
</tr>
<tr>
<td>l &amp; j</td>
<td>Lifelong learning</td>
<td>√</td>
</tr>
<tr>
<td>h &amp; k</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>g, i &amp; j</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>g</td>
<td></td>
<td>√</td>
</tr>
</tbody>
</table>

The CET curriculum is designed to support the eight outcomes with one or more technical or foundational studies courses. By mapping individual course learning objectives to the appropriate outcomes, we can use the results to identify the areas of strengths, and to develop strategies to address the weaknesses. Table 3.2 shows the connections between program curriculum and the outcomes.
<table>
<thead>
<tr>
<th>ABET Criteria (text listed in table 3.1)</th>
<th>CET Student Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a, b &amp; f</td>
</tr>
<tr>
<td>ECT 130</td>
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</tr>
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<td>ECT 165</td>
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<tr>
<td>ECT 167</td>
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<td>ECT 168</td>
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<td>ECT 231</td>
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<tr>
<td>MATH 115</td>
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<td>MATH 129</td>
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</tr>
<tr>
<td>English Composition</td>
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<tr>
<td>COMM 101</td>
<td></td>
</tr>
<tr>
<td>Foundational Studies</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 3.2 Program Curriculum, Outcomes and ABET General Criteria Matrix
CRITERION 4. CONTINUOUS IMPROVEMENT

A. Student Outcomes

Student outcomes are assessed using two major courses: ECT 406 Senior Project and ECT 130 Introduction to Electronics and Computer Technology as a direct measure, and senior exit surveys as the indirect measure. The feedback from IAB and alumni that concern the curriculum issues are also referenced.

ECT 406 Senior Project. The ECT 406 Senior Project course was instituted in the CET curriculum to fulfill the capstone requirement. The course is offered during the spring semester each year. The students are required to work in a group of two. The project titles, which indicate topical content of the student projects for the spring 2014 and spring 2015 course offering were:

Spring 2014
1. “Automated Humidity Sensing System” by Zach Lahee and Nehemiah Gillman
2. “Decentralized Home Automation System” by Blaine Bond and Krunal Darji
3. “Voice Controlled Robotic Arm” by James Gardner
4. “OBD-II Diagnostic Information at your Fingertips” by Steven Piotrowski
5. “Magnetic Card Reader” by Willian Santos
6. “Capture Cam” by Mustafa Alhababi
7. “Bluetooth Controlled Vehicle” by Jonathan Draughn and Conor Raypholtz
8. “Arduino Uno: Global Positioning via Short Message Service” by Jordan Gray
10. “Mindstorm NXT 2.0: Baseball Game” by Heavenly Goodrum-Mitchell

Spring 2015
1. “Electronic Lock” by Jacob Mills, Oscar Henriquez, Hussain Almusalami
4. “Motion-Detecting Security Camera” by Landon Tally, Norah Aljabi
5. “Bluetooth controlled Robotic car” by Jalen Foster, Alicia Shaw, Erik McDaniel
6. “WeMo Controlled Switch” by Terrence Strader, Husam Alshawki, Anas Tobiqi, Abdullah Almatrafi
7. “Home Automation” Brian Bailey

All senior projects are centered on microcontroller-based applications in the control and communication areas. Furthermore, every group’s work involves developing a project scope, designing a hardware and software solution, building the hardware or using off-the-shelf microcontroller boards in conjunction with trainer boards to connect to accessory circuits, developing and debugging the software and demonstrating the system.
The student performance in the senior project is graded through two phases. The instructor of record, who is the main advisor for all groups, performs the in-semester evaluation. Also CET and department faculty attend the final presentations session to do the end-of-semester evaluations.

The following summarizes the outcome assessment conclusions for the spring 2014, ECT 406 Senior Project coursework, based on the eight outcomes.

1. Problem solving skills
   - The students, in general, demonstrated good math and circuit analysis skills in building and testing the circuits involved in their projects. Two of the groups required some assistance in organizing their troubleshooting approaches.
   - The projects required programming in high-level languages. Each team or individual in the case of the one-person projects, demonstrated competence in debugging their control programs.

2. Design skills
   - The teams or individuals demonstrated good conceptual design practices in the initial definition of the scope of their project.
   - Four of the ten total teams required some assistance in refining and limiting the scope of their project to a manageable level.
   - Microcontroller I/O interfacing continued to appear as an area of design difficulty for the majority of the teams. A weakness of the concepts involved in the design considerations of electrical current capacity for digital and analog outputs was observed.

3. Hands-on skills
   - A very limited amount of simulation or prototype testing was performed. In most cases final hardware configurations were built from the designs.
   - The signal conditioning issues involving I/O again was observed here.
   - Two of the teams had some difficulty moving from the design to the circuit build process, requiring some discussions and guidance.
   - Much of the build work was accomplished outside of the classroom lab.

4. Managerial skills
   - Each team or individuals completed and demonstrated their project on the assigned date and time in class.
   - The projected timelines were generally followed, however eight of the ten teams were not accurate in estimating the time required for the various milestones in their project timelines.
   - All ten projects were completed without significant additions to their design bills of material.

5. Ethics awareness
   - The students demonstrated awareness of the ethical issues involved in design engineering and the technology profession, demonstrating ethical behaviors in the analysis of their projects.

6. Lifelong learning
• The project participants all indicated that web resources, product manuals, developer’s online forums and discussion boards were used to seek potential solutions to for their technical issues.
• This project, for some, brought the concept of continuous learning into better focus as they moved through the design, build and debug processes.

7. Teamwork skills
• The four actual teams of two members each obviously gained experience in a teamwork environment. Each of the four teams worked well together.
• Informal teamwork was also observed between essentially all of the project participants. Sharing of knowledge, particularly during the build and debug process was observed. At some level the entire class constituted a team as a whole, save one student who did work primarily alone.

8. Communication skills
• The overall quality of the project documents was good. Some improvement in grammar, content organization and technical writing was noted.
• In general every group was able to follow the format requirement and show understanding of technical report structure.
• A majority of the students communicated well during the project presentations, presented themselves professionally and were able to answer questions with confidence.

Student project reports will be organized as exhibit evidence for the visiting team to review.

ECT 130 Introduction to Electronics and Computer Technology. ECT 130 is the CET student’s first major course. It was originally designed to satisfy the university learning community requirement that help students’ transition to college life. The course content has been supplemented to offer the freshman, in addition to broad overview of the electronics and computer field, the first exposure to non-technical issues such as professional ethics, technology impact on environment and society, and life-long learning awareness. Students are required to research and study on the given subjects and develop reports and presentations.

The student performance in ECT 130 is graded by the instructor, based on work which includes in-class presentations. The ECT130 course is offered every semester.

The following summarizes the outcome assessment conclusions for the fall 2014, ECT 130 Introduction to Electronics and Computer Technology coursework, based on three outcomes.

1. Ethics awareness
• The students were asked to perform literature research and deliver a summary paper on their findings involving the impact technical advancement can have on society, both from a positive and a negative perspective.
• A portion of the grading rubric (10 of the 20 points total) involved the quality of their analysis.
- Of the 21 CET majors involved in the assignment, 16/21 or 76% scored an 8/10 or better on this assignment.

2. Lifelong learning and teamwork skills

- The students were asked to perform literature research and deliver a summary PowerPoint on their findings involving “How do engineers solve problems – what are the steps involved in the process?”
- The 21 CET majors were assigned two-person teams for the assignment.
- A portion of the grading rubric (5 of the 20 points total) involved the quality of their analysis of solving engineering problems, looking for comments that implied learning outside of school.
- Of the 21 CET majors involved, 13/21 or 62% received the 5 points for mentioning that engineers gain knowledge after leaving school.
- Of the 10 teams of CET majors participating in the assignment, 15/21 or 71% assessed the participation of their teammate as satisfactory.

Student grade exhibits for the 2013-14 and 2014-15 school years will be organized as exhibit evidence for the visiting team to review.

Senior survey. The senior exit survey was developed and incorporated as an assessment tools in the spring of 2012. The online questionnaire asks graduating seniors to reflect on their education in both technical and non-technical preparation for their professional careers.

The senior survey results for the 2013-14 and 2014-15 school years will be organized as exhibit evidence for the visiting team to review.

**B. Continuous Improvement**

As detailed previously concerning the educational objectives and student outcomes, continuous improvement involves first identifying areas that warrant improvement, then developing practical strategies for achieving such improvement. Then the improvements are implemented and monitored.

The program coordinator leads the continuous improvement process and is responsible for reporting the compiled results to the faculty and industrial advisory board. Currently we have a three-year review cycle to assure any change to be implemented is in response to a consistent trend and not an aberration. At the end of the second year, program faculty will identify the components that need to be strengthened, included, or removed based on a review of the quality of the three student outcome areas; namely the senior project, the work from the Introductory ECT course and the results of the exit surveys.

Issues and recommended actions resulting from the review process are discussed with the department chair, the department faculty as a whole and the Industrial Advisory Board. Upon consensus appropriate action is commenced and the cycle is repeated.
A summary of the continuous improvement activities will be made available for the visiting team to review.

C. Additional Information

Copies of the assessment materials, the results and summary documentation from the ECT 406 Senior Project course, the ECT130 Introduction to Electronics and Computer Technology course, the senior exit surveys and a summary of the continuous improvement activities involved will be available for review by the site visit team.
CRITERION 5. CURRICULUM

A. Program Curriculum

Table 5-1 describes the plan of study for students in the CET major, along with average section enrollments over the two years. All course work in the CET major is delivered in the semester format. There are no options in the program.

Figure 1.4 details the CET major 4 year plan of recommended courses per semester.

Table 5.2 shows how the CET curriculum aligns with the program educational objectives.

Tables 3.1 and 3.2 detail how the CET curriculum aligns with the student outcomes. As shown, each major course contributes to the development of learning toward the desired student learning outcomes. Most CET major courses contain a lab component which drives educational achievement toward the upper levels of Bloom’s Taxonomy, namely application, analysis and synthesis. The Industrial Advisory Board has made it clear many times that they expect our graduates to be not only technically competent and effective in communication skills, but to be able to perform problem solving at these higher levels.

The CET major courses, along with certain foundational studies courses, have a prerequisite structure. It is important that the learning of fundamentals must be sound before more advanced educational topics can be presented. In CET major courses that have prerequisites, some component of review and reinforcement of previous course fundamentals is delivered at the beginning of the course. The prerequisite structure path diagram for CET major courses is detailed in Figure 1.3

Tables 3.2 and 5.2 detail how each course in the CET major aligns with the defined educational objectives and student learning outcomes. Note that all major and foundational studies courses are 3 credit hour courses, with the exception of ECT130 (Introduction to Electronics & Computer Technology) and ECT430 (Senior Seminar). Of the 16 CET major courses (ECT prefix), 12 or 75% have a lab component. A review of the ISU class schedule will reveal that the class meeting time for these courses that include a lab component is doubled, thus meeting for 330 minutes per week as opposed to non-lab classes which meet for 150 minutes per week. Each major course also requires homework and has multiple exams and quizzes, as detailed in the syllabi in Appendix A.

The capstone course for the CET major is ECT406. As described in Section 4A of this report and as indicated in Table 3.2, the ECT406 project course aligns at some level with every educational objective and learning outcomes measure we have defined as important. The course requires the CET student to conceptualize, design, build, debug, analyze, document and present a technical project that must align to the technology and the defined outcomes for the program.
An internship or cooperative experience is highly encouraged but not a requirement of the CET major. The College of Technology has a staff person assigned to the development of internship opportunities for COT majors. Also the ISU Career Center is fully engaged in developing and overseeing internship opportunities for all majors, including those in CET. A three credit course, ECT351 allows students with internships to gain credit. In the case of the CET major, ECT351 credit can apply to the 120 total credits required for graduation, as well as to the 45 hour 300/400 level course requirement.

All requested materials will be made available to the on-site evaluation team. Most of the material will be referenced to course numbers and titles. The data in Tables 3.2 and 5.2 show the relationship of each course to the defined objectives and learning outcomes. Every attempt will be made to assist in the on-site review process.

**B. Course Syllabi**

The syllabi are displayed in Appendix A.

**C. Advisory Committee**

Currently, one industrial board serves for the four BS degree programs and one MS degree program in the ECET department. The board members are listed, along with the industrial affiliation and contact information.

Mr. David Adler  
Project/Process Engineer (Retired)  
Eli Lilly and Company  
Brownsburg, IN 46112-1733  
davidadler@comcast.net

Mr. John Brasker  
Manager-Engineering-IAPI  
Eli Lilly and Company  
Indianapolis, IN 46285  
JDB@lilly.com

Mr. Brian Bridgewater  
Manager Process Control Capitol Projects  
Eli Lilly and Company  
Indianapolis, IN 46135  
bbridgeh2o@lilly.com

Mr. Leslie King  
Lead Information Technology Engineer  
Hoosier Energy  
Bloomington, IN 47403  
LKing@Hepn.com
Each board member represents an industrial or business interest that has or can employ CET graduates. Sixty percent of the board members are graduates of ECET department programs, thirty percent of those are CET majors (formerly the Computer Hardware major). Three are also graduates of MS degree programs from the College of Technology.

Feedback from the IAB is always relevant and candid. As described in sections 2D, 2E, 4B, 5A and 6E of this report, the advisory board members are consulted on curriculum
changes, program changes, objective and outcome changes, and asked to review (in detail at times) results of assessments and evaluations.
## Table 5-1 Curriculum

Computer Engineering Technology

<table>
<thead>
<tr>
<th>Course (Department, Number, Title)</th>
<th>Indicate Whether Course is Required, Elective, or a Selective Elective by an R, an E or an SE2</th>
<th>Curricular Area (Credit Hours)</th>
<th>Last Two Terms the Course was Offered: Year and, Semester, or Quarter</th>
<th>Average Section Enrollment for the Last Two Terms the Course was Offered1</th>
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</thead>
<tbody>
<tr>
<td>ECT 130 Introduction to Electronics &amp; Computer Technology</td>
<td>R</td>
<td>2</td>
<td>F14, Sp 15 (S)</td>
<td>45</td>
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<tr>
<td>ECT 165 DC Circuits and Design</td>
<td>R</td>
<td>3</td>
<td>F14, Sp 15 (S)</td>
<td>18</td>
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<tr>
<td>ENG 101 Fundamental of Writing I</td>
<td>R</td>
<td>3</td>
<td>F14, Sp 15 (S)</td>
<td>18</td>
</tr>
<tr>
<td>MATH 115 College Algebra</td>
<td>R</td>
<td>3</td>
<td>F14, Sp 15 (S)</td>
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<tr>
<td>COMM 101 Introduction to Speech</td>
<td>R</td>
<td>3</td>
<td>F14, Sp 15 (S)</td>
<td>20</td>
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<tr>
<td>PE101 &amp; 101L Fitness for Life</td>
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<td>3</td>
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<td>ENG 105 Fundamentals of Writing II</td>
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<td>Foundational Studies - Social &amp; Behavioral Studies</td>
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<td>3</td>
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<td>CS 256 C++ Programming</td>
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<td>3</td>
<td>F14, Sp 15 (S)</td>
<td>32</td>
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<tr>
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<td>3</td>
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<tr>
<td>Foundational Studies - Fine &amp; Performing Arts</td>
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<td>Foundational Studies - Ethics &amp; Social Responsibility</td>
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<td>OVERALL TOTAL CREDIT HOURS FOR THE DEGREE</td>
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<td>PERCENT OF TOTAL</td>
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<td>CET Major Course Listing</td>
<td>CET Program Educational Objectives</td>
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<td>Communication Competency</td>
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</tbody>
</table>

Table 5.2 Curriculum alignment with the CET program educational objectives
CRITERION 6. FACULTY

A. Faculty Qualifications
The faculty in the ECET department shares diversity in background, race, ethnicity and experience. The regular full-time workload includes teaching, scholarly activities, and service. All tenured faculty members have terminal degrees in fields that relate to the four BS degree programs delivered in the ECET department, namely Electronics Engineering Technology, Computer Engineering Technology, Automation & Control Engineering Technology and Information Technology. Likewise, the instructors and adjunct faculty possess degrees that align with the degree programs. The teaching of the faculty as a whole is well received by our students as evidenced by the students’ evaluations each semester. Faculty resumes can be found in Appendix B. The credentials for the faculty directly associated with the delivery of CET program course content are detailed in Table 6-1.

B. Workload
Table 6-2 shows the Faculty Workload Summary. The teaching assignments are designed to accommodate individual interests and skills, while maintaining accountability and a reasonable level of balance. This flexibility in the teaching load distribution is possible because our faculty can teach comfortably several of the courses in our curriculum, across multiple majors in our curriculum in some cases.

C. Faculty Size
There are three (4) full-time faculty members (tenured or tenure-track) directly associated with CET program, among whom one is a full professor and three are assistant professors. Dr. Joe Ashby is currently the coordinator who represents the program to external entities. Three full-time ECET faculty members and one adjunct instructor also teach technical core or elective courses. All department faculty members share the responsibility of teaching, advising and service pertinent to the program.

The number of full-time faculty is sufficient to accommodate the current level of teaching, student-faculty interaction, service activities, professional development and communications with industrial partners. Table 8.1 shows the rank and educational background of CET program faculty, where full C. V’s are included in Appendix H.

Each student in the CET major has an assigned advisor, in most cases the assignment is made for one of the three full-time faculty members directly associated with the CET program. Advising is ultimately the responsibility of all department faculty members, thus depending on availability and scheduling, CET majors may meet with other than their assigned advisor.

D. Professional Development
The highlights of the professional development activities for the key CET faculty and all other ECET department faculty can be found in the Appendix B in the resumes. CET faculty
members provide significant service to the administrative, research, and educational objectives of the university, as well as the community. The CET faculty members are involved in a number of professional development activities, including: organizing and serving as key-note speakers in domestic and International professional conferences, serving as technical society program committee members, serving as peer-reviewers for professional journals, and serving in appointed or elected leaders in professional societies.

E. Authority and Responsibility of Faculty

The CET program faculty has the primary authority and responsibility for developing, revising, and implementing curriculum issues. However the program educational objectives, outcomes, and curriculum have to satisfy the needs of industry, students/parents, college/university administration, accreditation bodies and the State of Indiana Higher Education guidelines. Before proposing a new development or revision, program faculty seek and consider input from the students, graduates, employers, Industry Advisory Board (IAB) members and accreditation bodies. The college dean also advises on program educational objectives, outcomes, and curriculum issues, with an eye to state government and university administration requirements.
### Table 6.1. Faculty Qualifications

#### Computer Engineering Technology

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Highest Degree Earned- Field and Year</th>
<th>Rank¹</th>
<th>Type of Academic Appointment²</th>
<th>Years of Experience</th>
<th>Level of Activity⁴</th>
<th>Professional Registration/ Certification</th>
<th>Consulting/summer work in Industry</th>
</tr>
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<tr>
<td>Dr. William Croft</td>
<td>PhD-Mathematics Education 1997</td>
<td>P</td>
<td>T</td>
<td>FT</td>
<td>6</td>
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<td>mod</td>
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<tr>
<td>Dr. Joe Ashby</td>
<td>PhD-Computing Technology in Education 2009</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>28</td>
<td>ISA CAP</td>
<td>low</td>
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<tr>
<td>Dr. Yuetong Lin</td>
<td>PhD-Systems and Industrial Engineering 2005</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>1</td>
<td>hi</td>
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<tr>
<td>Dr. Xiaolong Li</td>
<td>PhD-Electrical &amp; Computer Engineering 2002</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>0</td>
<td>mod</td>
<td>low</td>
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</tbody>
</table>

1. Code:  P = Professor  ASC = Associate Professor  AST = Assistant Professor  I = Instructor  A = Adjunct  O = Other
2. Code:  TT = Tenure Track  T = Tenured  NTT = Non Tenure Track
3. At the institution
4. The level of activity, high, medium or low, should reflect an average over the year prior to the visit plus the two previous years.
### Table 6-2. Faculty Workload Summary

**Computer Engineering Technology**

<table>
<thead>
<tr>
<th>Faculty Member (name)</th>
<th>PT or FT</th>
<th>Classes Taught (Course No./Credit Hrs.) Term and Year</th>
<th>Program Activity Distribution</th>
<th>% of Time Devoted to the Program</th>
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<tbody>
<tr>
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<td>(ECT 174/3hrs) Fall 2014</td>
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<td>(ECT 490A/3hrs) Fall 2014</td>
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1. FT = Full Time Faculty or PT = Part Time Faculty, at the institution
2. For the academic year for which the Self-Study is being prepared.
3. Program activity distribution should be in percent of effort in the program and should total 100%.
4. Indicate sabbatical leave, etc., under "Other."
5. Out of the total time employed at the institution.
CRITERION 7. FACILITIES

A. Offices, Classrooms and Laboratories

1. Offices
The CET program together with ECET Department is housed in the John T. Myers Technology Center. The Collage of Technology building infrastructure consists of the Myers Technology Center (TC) and the Technology Annex (TA) building. The TC building was erected in 1997 and has received regular hardware upgrades to incorporate state-of-the-art instructional facilities as well as student work and lounge areas.

The Department office complex is located on the third floor of the Myers Technology Center. Most of the classrooms on this floor are used by the department and CET program. A research lab and graduate assistants’ office also take some space on the same floor. The central location of these facilities offers students the convenience to further enhance encounters with faculty, fellow students and graduate assistants.

All CET faculty members have offices in Suite TC301, close to the classrooms, labs, and meeting rooms. The suite also has office space for undergraduate/graduate student workers and adjunct faculty.

2. Classrooms
The College of Technology has an auditorium or theater-like classroom that seats 100 students on the first floor of the Myers Technology Building. There is also an atrium to hold large social gatherings. The ECET Department has one meeting/conference room. In addition, the College of Technology has three meeting rooms and two breakout rooms.

The ECET department primary classrooms also function as laboratories, which allow students to continue on lab experiments in the same room when the lecture session of the class is delivered. All classrooms are equipped with PC’s with network access, educational software required for courses taught in the room, and teaching apparatus including an audio/visual cabinet with master control, VCR/DVD player, and audio amplifier. The rooms have installed overhead projectors, and powered projector screens. Each room also has multiple equipment/documentation cabinets to store lab tools and manuals, motherboards, oscilloscopes, multi-meters, function generators and related lab test equipment and materials.

Classroom physical dimensions are sufficient to accommodate up to 24 seats, which is the nominal capacity for class size. The layout is designed to facilitate student interaction and collaboration on labs.
Room TC306 is the primary teaching room for core CET courses. The room has two types of Motorola microcontroller development boards and Xilinx Spartan-3 development boards. Integrated development application software is installed on PCs in the room.

Room TC304 is equipped with a Smart™ Symposium in this room operates identically to a Smart Board, for display of a PC desktop on the overhead. The system allows inputs to easily switch from desktop, laptop, and other visual sources. Writing on the touch screen can also be saved through special software.

Table 7.1 shows the department room numbers and typical course assignments to each.

<table>
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<th>Room</th>
<th>Lab Specialization</th>
<th>CET Major Courses Taught</th>
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<td>TC 304</td>
<td>ECT Classroom &amp; Lab</td>
<td>ECT 130, ECT 168, ECT 306, ECT 430, ECT 437</td>
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<td>TC 305</td>
<td>IT and Electronics Lab</td>
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<td>TC 306</td>
<td>Microcontroller Lab</td>
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<td>TC 307</td>
<td>Transistor Lab</td>
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<td>Solid State Lab</td>
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<td>TC 312</td>
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</tr>
<tr>
<td>TC 315</td>
<td>Electronics Lab</td>
<td>ECT 165, ECT 167</td>
</tr>
<tr>
<td>TC 108</td>
<td>Automation Lab</td>
<td>ECT 281</td>
</tr>
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</table>

Table 7.1 ECET Department Classrooms

3. Laboratories
The lab equipment specific to the CET program is housed in the classrooms as listed in the preceding section of this document. Again a number of the digital system trainers used in the CET major 300 and 400 level courses are present in room TC306 along with the integrated development application software. There are 12 stations accommodating normally only 12 students per class section. This allows for extensive availability and individual focus of the instructor in the courses delivered in TC306.

Other dedicated laboratory facilities in which the CET major may have an elective or minor course includes the automation lab (3600 sq ft), which has been developed to represent modern automation lab experiences. The lab has seven Mitsubishi industrial robots, ten programmable logic controller trainers, four Adept robots with vision systems, a Fanuc robot and a number of automated systems on which students redesign, develop and implement automation application scenarios.

In addition, the College has a lab dedicated to the study of programmable logic controllers (PLC) (2400 sq ft), a wet process control lab (2400 sq ft) that affords lab experiences with automation used in the chemical and plastics industries.
Besides commonly used software such as Microsoft Office Suite, most of the classroom PCs have application specific software installed including MultiSim, LabVIEW, and Microsoft Visual Studio installed.

**B. Computing Resources**

ISU maintains approximately 130 technology enhanced classrooms, 6 public labs and 49 discipline specific computer labs. An increasing number of the technology enhanced classrooms serve also distance-learning classrooms. Campus infrastructure currently supports over 100 servers and high performance computing facilities. The campus is a notebook institution beginning with freshmen in fall 2007. The campus is served by an extensive fiber optic cable system, and uses a gigabit backbone to deliver data and interactive video connections to every building. Wireless network access is available in all academic areas. High speed connection to both the commercial Internet and Internet2 is provided for faculty and student use.

A number of application, operating system and support software applications are available to students and faculty at no cost. The list detailing this software and its availability can be found at http://prodinteract.indstate.edu/pls/prod/hwzkswdl.P_DisplaySW.

The computers in each classroom receive regular upgrades and maintenance support from the Office of Information Technology (OIT) which serves as the central resource for the computing infrastructure at ISU. One major OIT program currently being implemented is the transition to the Windows 7 operating system, to abate the security issues involved with Windows XP. OIT also supports a 24/7 help line and extended hours help desk, where students and faculty can receive laptop or other PC troubleshooting and repair assistance with hardware and software issues.

The computers located in the course specific labs are generally available during normal class times, when faculty or staff is available. With the advent of laptop computer for every student, the need for off hour computer labs has been eliminated.

The laptops furnished to students who are on the laptop scholarship come loaded with a variety of software tools, including the Microsoft Office suite. For the CET major, any required special application software is made available on PCs in the specific classrooms. For unique application software or other computing infrastructure needs, the ECET department and the College of Technology have budget lines for such, as well as the support of OIT in special cases.

**C. Guidance**

There exist a number of resources to assist students in the CET major regarding the use of the tools, equipment, computing resources, and laboratories. Incoming freshmen receive seminar information on the availability of computing resources and the OIT help desk, provided as
part of new student orientation. The availability, location and policies related to computer use and associated resources are also discussed in the CET major’s freshman orientation course, ECT130.

Detailed and specific guidance on the use of electronics and electrical tools and equipment is provided in each course in the CET major. Many of the CET courses have student lab assistants to supplement the presence of the course instructor during lab exercises. The use of multi-meters, signal generators, oscilloscopes, digital probes and equipment related to the basic electronics components of the CET is treated in the lecture component of the course and exercised in the lab component.

D. Maintenance and Upgrading of Facilities
The allocation of general computing resources is managed by the Office of Information Technology. This includes lab PC hardware and general software. The management of application software specific to the CET major is handled by the department. Department budget line items exist for equipment which can include computer software.

Department faculty members as a whole (coordinated by the department chair) manage the specific needs for maintaining and upgrading of CET major class tools, equipment and laboratory facilities. A path exists to request specific funds for such activity from the College of Technology and the university. For issues related to computer software, OIT also has paths for funding requests.

E. Library Services
The university library has a faculty liaison for the College of Technology who serves as a direct interface between the library and the COT. An annual budget line item is allocated from which the ECET department can request specific books, databases and other library resources. Most ISU library functions, including access to research databases are available on-line to ISU students and faculty.

F. Overall Comments on Facilities
All major courses in the CET program are delivered in the Myers Technology Center as described previously. The required mathematics, science and foundational studies courses are delivered on the ISU campus. Overall the quantity of space available to the program, for both teaching and administrative needs, is adequate. With the steady increasing enrollment in the CET program and the department as a whole, classroom seats and lab space is becoming a concern.
CRITERION 8. INSTITUTIONAL SUPPORT

A. Leadership
The university administration has and continues to encourage growth in enrollment the CET program and the ECET department. Likewise, support exists for accreditation and the assessment and continuous improvement processes.

B. Program Budget and Financial Support
1. The CET program budget requirements are developed by faculty and the department chair, then reviewed and prioritized in terms of the total department needs by the department faculty as a whole. The annual College of Technology budget available is allocated by the university administration and the Dean of the College of Technology along with department chairs distributes some recurring and most all one-time fund allocations. Each department receives an annual equipment budget. During the past four years this has been supplemented by one-time allocations to the college by the university administration.

Additionally the college, via the efforts of the dean and the university foundation, works to procure outside funding from business, industry and alumni donors. These funds often come earmarked to special projects or needs, but some are more general and made available for critical needs in departments and programs.

2. Faculty teaching support is made available from graduate teaching assistants, student workers and tutors. Funding for graduate assistants is made available from the College of Graduate studies. Graduate teaching assistant numbers are included in the department and college FTE budget, thus are limited. An annual student worker budget is allocated to the department. An annual one-time allocation for additional student worker funds is made available at the beginning of each school year.

3. A process exists for requesting one-time or special budget allocations for equipment and facilities. The request originates in the department and requires review and approval by the college, the administration and the board. This process/policy also applies to requesting student lab or class fees for individual courses.

4. To date the students in the CET program have been able to achieve the outcomes set forth in the assessment process. As budgets continue to be reduced, new sources of funding by the university, the college and the department must be found if the quality of the CET and all other degree programs is to be maintained. Overall quality is tied to budgets to some degree that is difficult to define. Certainly the past and continuing budget cuts are impacting the potential for increased quality and our ability to maintain current levels.
**C. Staffing**

The level (numbers) of administrative, instructional, and technical staff continues to see the pressure of budget constraints. Department staffing is controlled by an FTE budget that is assigned by the administration. There is some means for mitigation at the college level, based on the overall college FTE budget allocation.

The university has instituted salary increases for faculty and staff in recent years toward achieving compensation parity with similar sized institution across the country.

**D. Faculty Hiring and Retention**

1. Need determination and requests new faculty originates in the department. The granting of permission for faculty hires is awarded by the administration, with input from the college Dean, based on department FTE results.

2. As described previously, salary increases have in recent history been granted across the faculty and staff in the university. The retention of new tenure-track faculty is supported by a new faculty orientation program that includes start-up funds for research and travel.

**E. Support of Faculty Professional Development**

Professional development support predominately comes in the format of travel funds. Faculty members are encouraged to make presentations at professional meetings and/or attend professional workshops. The travel funds for the department are very limited. In instances of International travel, limited travel grants are available from the Center for Global Engagement at ISU.

The university’s Faculty Center for Teaching Excellence organizes teaching and faculty workshops aimed at faculty development.

Each tenured/tenure-track faculty member is evaluated in terms of teaching, scholarship, and service. Tenure-track faculty, instructors and part-time faculty are evaluated by the department and the college annually. Tenured faculty members are evaluated by department peers every two years.

**PROGRAM CRITERIA**

Please refer to the information detailed in Criterion 2 and 3 of this report.
APPENDICES

Appendix A – Course Syllabi

The course syllabi for the CET major courses are listed here.
Indiana State University
Department of Electronics and Computer Engineering Technology
Fall 2014
ECT 130-002 – Introduction to Electronics and Computer Technology

Instructor: Joshua Perry
Class Time: TR 12:30-1:45pm
Classroom: TC105
Office: Room 301O
E-mail: Joshua.perry@indstate.edu

Course Description
ECT 130 Electronics & Computer Technology is a two (2) credit hour course that targets the interests and needs of freshman Electronics & Computer Engineering Technology program students.

Issues involving new student orientation, academic issues, university policy, academic advising and careers will also be discussed.

Required Text and Course Materials
No textbook is required for this course.

All supporting course materials, including the latest revision of the syllabus will be posted in Blackboard. The syllabus may be modified to best incorporate the diversity of topics and resources we have in this class. Thus you are responsible to follow the latest syllabus.

Assignments
ECT130 – Attendance, Class Schedule, 4-year plan, 10 research assignments

Assessment

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<th>85 - 89%</th>
<th>80 - 84%</th>
<th>75 - 79%</th>
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<td>B</td>
<td>C+</td>
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ECT130 Assessments

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<tr>
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<td>Course 4-year plan</td>
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<td>Career Center Workshop</td>
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<td>10 research assignments (20pts ea)</td>
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<tr>
<td></td>
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</table>

Late work
Every deliverable will have a published due date. You can turn in assignments late, but your score will be reduced by 50%.
Attendance Policy
Attendance is extremely important. Therefore, for each class attended in its entirety, students will receive attendance points. The only exception will be if you are absent having received prior approval from the instructor. NOTE: Any time you are absent, it is your responsibility to find out what took place during your absence and make up all missed work.

ECT130 Research Assignments
These assignments will be available in Blackboard and you can post your deliverable to the assignment in Blackboard. The specific instructions for each will be with the posting. The assignment topics and due dates are:
1. Blackboard assignment
2. Email assignment
3. Career center assignment
4. Job search assignment
5. Micro-controller assignment
6. PLC assignment
7. Financial assignment
8. Automation assignment
9. Nano-robotics assignment
10. Project management assignment
ECT 165 – DC Circuit and Design

General Information

Course Instructor: Joshua Perry  
Electronics and Computer Engineering  
Technology  
Indiana State University

Instructor’s Office: TC 301N  
Instructor’s Email Address: Joshua.perry@indstate.edu

Classroom: TC 305  
Class Meeting: MWF 9:00 – 10:50 AM  
Class Hours: 3 Credit Hours  

Required Materials: ECT 165 lab components will be provided for the class

Course Description
Elementary empirical design and practical laboratory exercises involving DC circuits, digital measuring equipment, and time measurements. The course involves the study of measuring and monitoring devices used in electronic and computer circuits. Focused study on the performance of discrete electronic components within a variety of application circuits.

Course Objectives
By the end of the course, students will:

• The learner will develop an understanding of the fundamental concepts, mathematics, and design of DC circuits using basic electronic components.

• The Student will develop the ability to identify and use electronics components, with 100% accuracy, in building DC circuits in the laboratory environment and producing will written lab reports.

• The student will gain experience in the safe and proper use of electronic measuring and monitoring equipment in the lab environment

Course Requirements
This course is performance-based and a combination of labs and examinations. Participation in all activities is considered to be essential in order to be successful. All labs and exams must be completed to pass the course. Specific requirements for each performance are detailed below:

• Attendance – Attendance will be taken every class meeting, either by roll call (at the beginning or the end of the class), or through the submission of that day’s assignment or pop quiz. Class activities will include lectures covering unit topics, review of
assignments, class discussions, lab work and time for questions and answers. Prior permission is required for not attending class.

- **Labs** – Lab exercises will be issued. The deliverable will be defined in the lab handout.
- **Exams** – Exams will accompany each unit. To receive full credit, formulas, equations, and all work must be shown. It is understood that some algebraic manipulations may not appear in the work, however use caution when not showing all. There may also be hands on portions to the test that have to be completed.
- **Due Dates** – All due dates refer to the end of the class period on that date. **No assignments will be accepted after the end of the class.** The only exception is that the student emails that instructor with a valid reason for why he is not going to be in class before the beginning of the class that you are missing. It is up to the discretion of the Instructor to allow that student an extension on the assignment. If the Instructor allows the extension, it will only be until the next class meeting.
- **Be Prepared** – The student is responsible for being prepared for lecture and lab sessions. This means reading Grob and Schultz prior to the lecture and/or lab.

**Course Grading**

Each student will be evaluated, in a nondiscriminatory manner, their work based on contribution to class activities, ability to complete lesson assignments, and tests. A total of 700 possible points may be earned. The breakout will be as follows:

- Six (6) Exams (100 pts each) 600 pts 57%
- Two (2) Quizzes (25 pts each) 50 pts 4.7%
- Six (6) lab deliverables (20 pts each) 120 pts 11.4%
- One (1) Comprehensive Final (200 pts) 200 pts 19%
- Attendance 80 pts 7.6%

Total 1050 pts 100%

**No extra credit will be offered during the course.** Missed exams may not be made up. Homework submitted after the due date will not be accepted (you may submit early to the Instructor or the T.A. if you know that you cannot make it to the class). Only exception was stated above and at the discretion of the Instructor. Missed or uncompleted laboratory assignments must be arranged with the Instructor or the T.A. at his discretion.

**Grading Scale**

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<th>Grade</th>
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<td>C</td>
<td>72 – 70</td>
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<td>88 – 82</td>
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<td>98 – 88</td>
<td>D-</td>
<td>88 – 82</td>
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56
ECT 167-001 AC Circuits and Design

Course Instructor
Anand Richard
Electronics and Computer Engineering Technology, Indiana State University

Prerequisite
ECT165

Instructor’s Office
315 (Please note that this is the classroom where the ECT167 classes are normally held)

Instructor Office Hours
TW 8:00 AM – 9:00 AM

Instructor Email Address
arichard5@sycamores.indstate.edu

Classroom
315 John T Meyers Technology Building

Class Meeting Times
MW 9:00 AM – 10:50 AM

Class Hours
3 Credit Hours

Textbook

Required Materials
ECT 167 lab components will be provided for the labs.

Calculator
REQUIRED. Must do Polar to Rectangular conversions. TI 83 Plus or higher. Casio is also fine.

Computer
You will need a PC/Laptop with access to Internet and email

Course Objectives
By the end of the course, students will:

- Develop an understanding of the fundamental concepts, mathematics, and design of AC circuits using basic electronic components.
- Develop the ability to identify and use electronic components with 100% accuracy, in building AC circuits in the laboratory environment.
- Understand the fundamentals of how AC circuits operate with respect to: voltage, current, impedance, frequency, phase and power.
• Understand operation of resistors, capacitors and inductors in AC circuits, as well as their combined effects on circuit operations.
• Know how to perform basic circuit analysis on complex AC circuits.
• Know how to use electronic test equipment for AC circuit analysis.
• Understand the operation of AC resonant and filter circuits.
• Understand the interaction of AC systems with semiconductor components.

Course Requirements
This course is performance-based and a combination of labs, homework assignments and examinations. Participation in all activities is considered to be essential for success. All labs, homework and exams must be completed to pass the course. Specific requirements for each activity are detailed below:

- **Attendance** – Attendance will be taken every class meeting either by roll call (at the start or end of the class) or through the submission of that day’s assignment or pop quiz. Class activities will include lectures covering unit topics, review of assignments, class discussions, lab work and time for questions and answers. Prior permission is required for not attending class.
- **Labs** – Lab exercises will be issued. The deliverable will be defined in the lab handout.
- **Homework Assignments** - Homework Assignments accompany each unit. To receive full credit, formulas, equations and all work must be shown. Homework must be submitted in the following format:
  - Homework will be posted on Blackboard and must be printed out and answers must be written or typed in the space provided after each question/problem.
  - Homework submissions MUST BE STAPLED. Folded over corners, clips, pins etc. WILL NOT BE ACCEPTED.
  - Every page of the homework must have the student’s name on it.
- **Due Dates** – All due dates refer to the START of the class period on that date. No assignments will be accepted after the lecture starts. The only exception is that the student emails the instructor with a valid reason for why he or she is not going to be in class before the start of the class being missed. The discretion of the instructor is final in granting extensions. All extensions are only until the next class meeting.
- **Be Prepared** – The student is responsible for being prepared for the lecture and lab sessions. This means reading the text book (Boylestad) prior to the lecture and/or lab.

Attendance Policy
Attendance will be taken every class meeting either by roll call (at the start or end of the class), or through the submission of that days assignment, lab or pop quiz. Students who incur excessive absences (two weeks’ worth of scheduled class meetings) will have their final course.
ECT 231 Digital Computer Logic
Syllabus – Fall 2014
Department of Electronics and Computer Engineering Technology

Class Schedule: MWF 11:00 am – 11:50 am, John T Myers Technology Center 304
Instructor: Dr. Xiaolong Li
E-mail: xiaolong.li@instate.edu
Phone: (812) 237-3451
Office: John T Myers Technology Center 301J
Office hour: MWF 3:00 pm - 4:00pm, T 1:00pm-2:00pm or by appointment

Text book:

Prerequisite
Consent of instructor

Course Description
Combination logic utilizing Boolean Algebra and the binary numbering system. The course includes Karnaugh maps, truth tables, coding, switching circuits, converters, and the logic circuit elements, Latches, Flip-Flops, Timers, counters and registers.

Course Objectives
Upon completion of this course, the student will be able to:
• Work with a variety of number systems and numeric representations, including signed and unsigned binary, hexadecimal, 2’s complement.
• Apply fundamental analysis skills to correctly describe the behavior of a given digital logic circuit.
• Translate system requirements into a practiced digital design.

Course Schedule (subject to change)

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<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Textbook ref.</th>
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<td>8/20</td>
<td>Syllabus and Introduction</td>
<td>Ch 1a</td>
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<td>8/22</td>
<td>Introduction</td>
<td>Ch 1b</td>
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<td>8/25</td>
<td>Binary number system</td>
<td>Ch 2a</td>
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<td>8/27</td>
<td>Binary Arithmetic</td>
<td>Ch 2b</td>
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<td>8/29</td>
<td>Signed Numbers</td>
<td>Ch 2c</td>
<td>HW #2 (due 9/5)</td>
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<td>3</td>
<td>9/1</td>
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<td>9/3</td>
<td>Signed floating point number</td>
<td>Ch 2d</td>
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<td>Arithmetic operation with signed number</td>
<td>Ch 2e</td>
<td>HW #3 (due 9/15)</td>
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<td>4</td>
<td>Hexadecimal &amp; octal number</td>
<td>Ch 2f</td>
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<td>BCD and digital codes &amp; Error detection codes</td>
<td>Ch 2g</td>
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<td>Logic gates and truth tables: AND, OR, NOT, NAND, NOR</td>
<td>Ch 3a</td>
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<td>Logic Gates and truth tables: XOR, XNOR</td>
<td>Ch 3b</td>
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<td>The Laws and Rules of Boolean Algebra</td>
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<td>9/26</td>
<td>De’Morgan’s Theorems</td>
<td>Ch 4c</td>
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<td>Exam #1 Review</td>
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<td>Simplification of Boolean Expressions</td>
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<td>Sum of Product (SOP) Expression</td>
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<td>Product of Sums (POS) Expression</td>
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<td>Karnaugh map minimization</td>
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<td>HW#8 (due 10/22)</td>
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<td>9</td>
<td>Combinational Logic</td>
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<td>The universal property of NAND and NOR gates</td>
<td>Ch 5b</td>
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<td>Ch 5c</td>
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<td>Further standard combinatorial logic</td>
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<td>Exercise #2</td>
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<tr>
<td>10/29</td>
<td>Review of Exercise #2</td>
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<td>12</td>
<td>Exam #2</td>
<td>Ch 4-6</td>
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<tr>
<td>11/3</td>
<td>Latch and Flip-Flops</td>
<td>Ch 7a</td>
<td></td>
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<tr>
<td>11/5</td>
<td>D Flip-Flops</td>
<td>Ch 7b</td>
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ECT 232 Digital Computer Circuits

Instructor: Mr. Harold L Seifers
Class Times: TC 307; MWF 1-2:50pm
& Location
Office Hour: TC 301N; MW 12-1pm
E-mail: HSeifers@Indstate.edu

COURSE DESCRIPTION
ECT 232 builds upon the basic knowledge of digital logic developed in ECT 231 and provides an advanced look at digital logic circuitry including design and operation of pulse circuits, memory devices, and sequential logic circuitry.

PREREQUISITE
Successful completion of ECT 231 is required before taking ECT 232. It is expected that all students are familiar with computer number systems, logic gate operation, truth table development, Boolean Algebra expressions, and simplification.

REQUIRED COURSE MATERIALS
1. Suggested text - Digital Fundamentals by Floyd. Prentice-Hall (Same as ECT 231) (Not Mandatory)
2. ECT 232 Lab Kit

COURSE OBJECTIVES
Upon successful completion of this course the student should know or be able to do the following:
1. Understand the operating parameters of digital logic components used in computer systems, and the effective design of computer circuits using Boolean algebra and other standard mathematical modeling techniques.
2. Understand the operation and design of combinational digital logic circuits used in computer systems. (i.e. Arithmetic Logic Units, comparator, parity, multiplexers, etc.)
3. Understand the operation and design of sequential digital logic circuits used in computer systems. (i.e. Flip-flops, latches, counters, registers, memory.)
4. Understand the operation and design of control circuitry in computer systems. (i.e. bus systems & control, pulse circuitry, input/output systems, and data manipulation.)
5. Have a basic understanding of how combinational and sequential digital circuits are combined with control systems in the operation of microprocessors.
**Outcomes Assessment Methods & Scale:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Examination</td>
<td>20%</td>
</tr>
<tr>
<td>Second Examination</td>
<td>20%</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>20%</td>
</tr>
<tr>
<td>Laboratory Projects</td>
<td>40%</td>
</tr>
</tbody>
</table>

No extra credit work will be offered during the course. Unsigned lab forms will not be accepted; lab forms submitted after due date will not be accepted.

**ATTENDANCE POLICY**

All students are expected to attend every class meeting. Attendance is an important part of successfully completing any university course, it is especially important in this course as the new materials covered build on the preceding materials. High absenteeism will almost invariably lead to a lower grade than the student could have achieved with regular attendance, or failure of the course.

If you are absent, it is your responsibility to find out what took place during your absence and be prepared for the next class meeting. “I wasn’t here on ‘whenever,’” is not an excuse.

If you missed a lab assignment then you must arrange with the T.A. to see if you can make up the lab before the due date for that lab, if possible. Missed exams are inexcusable. If you know you will be unable to attend an exam, plans should be made with the instructor as soon as possible.

**BLACKBOARD WEB SITE**

Necessary course materials will be available on Blackboard. Students should access the web before the start of class and navigate to blackboard.indstate.edu & login to the site. Copies of the laboratory manual are available in the “Content” section of the site for printout. Copies of the syllabus and other materials will be available on the site as well.

**SUPPLEMENTAL LEARNING MATERIALS**

There are many resources available on the World Wide Web which provide study materials on digital logic circuits. If any student desires additional study material it recommended that a search of the web may prove very useful. Feel free to contact your instructor if you need additional information or help in doing this.

Also, Prentice-Hall, the publisher of the text, maintains a support site on the web for the text that covers the important points of each chapter and provides sample questions that can be used as a study guide.

**LABORATORY POLICY**

The purpose of laboratory experiments is to provide students with experiential learning activities, and to reinforce concepts presented in the lecture. As there may not be enough equipment available for every student to work independently, students usually work in groups of two. Groups larger than two are not allowed, and will not receive credit for the assignment even if turned in using multiple lab forms.

If there is a shortage of equipment or materials the student should immediately bring this to the attention of the Instructor or the T.A.. Additional equipment is usually available in other classrooms and can be brought in to make up the shortfall. If equipment is available, then a student may perform labs individually if they desire to.
ECT 281 Introduction to Robotics & Automation

Instructor: Prof. Oscar Rodríguez, EdS.
Class Times: Section 001: Mo/We/Fr 10am-11:50am
             Section 002: MW-3:30pm-6:15pm
             Section 003: Tu/Th 9:30a-12:15pm
Class Rooms: Lecture - TC 312; Lab- TC 108
Office: TC 301F
E-mail: Oscar.Rodriguez@Indstate.edu

Course Description:
ECT 281 provides an introduction to the principles of industrial robotics and automation. Subject areas covered are: (a) the program design, control, operation, and programming of robots with an emphasis in industrial situations and applications; (b) the program design and programming of embedded microprocessor controllers used to interface equipment and systems with robots, and (c) the development of networked Human-Machine Interfaces to link human operators to automated control systems.

Required Texts & Materials:
Note: There are NO texts that must be purchased through the Bookstore.

1. Robotics Lab Manuals:
   Robotics Training Manual for RV-M Series Mitsubishi Robots (3 parts)
   Robotics Training Manual for RV-1A/2AJ Series Mitsubishi Robots (3 parts)

2. Controls Lab Manuals:
   RSLogix 500 – Getting Results Guide: Rockwell Automation.
   RSVview32 - Getting Results Guide: Rockwell Automation.
   RSLynx – Getting Results Guide: Rockwell Software.

3. Lecture notes and Lab assignments in PDF will be posted on Blackboard in the “TABS” sections of the site. Students may follow along on their laptops during lecture, or print out a hard copy of the notes and bring to class. MOST of the questions for the Midterm and Final examination will be drawn from the lecture notes, though some questions will be drawn from the other materials and lab experiences as well.
4. USB compatible storage device to save laboratory programs in progress.

**Course Objectives:**
Upon successful completion of ECT 281 students will know, or be able to do, the following:
6. Know the fundamental principles of an automated manufacturing process
7. Understand the design, operation, and utilization of robots in industry.
8. Understanding of terminology associated with industrial robotic systems.
9. Have a basic knowledge of robotic system components, end of arm tooling, and sensors.
10. Develop the ability to program industrial robots using teach pendants and personal computer software.
11. Have a basic understanding of how robots are interfaced with automated systems by use of programmable logic controllers and human-machine interfaces.
12. Be able to plan, program, load and debug basic programmable logic controller programs.
13. Be able to configure a PC/peripheral device network to allow a computer using a Human-machine interface to independently operate an automated system.
14. Be able to plan, program, load and debug a Human-machine interface program.
15. Understand how network communications are used to link controls in an automated system.

**Outcomes Assessment Methods & Scale:**

<table>
<thead>
<tr>
<th>Assessment Method</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Examination</td>
<td>25%</td>
</tr>
<tr>
<td>Final Examination</td>
<td>25%</td>
</tr>
<tr>
<td>Laboratory Projects</td>
<td>50%</td>
</tr>
</tbody>
</table>

No extra credit work will be offered during the course. Completed & signed Lab forms submitted after the final due date will not be accepted (you may submit early to me or the G.A. if you know you can not make class).

Grade scale will follow University standard.

**Attendance Policy:**
Attendance will be taken every class meeting, either by roll call, or a sign-up sheet. Students who incur excessive absences (20% of scheduled class meetings) will have their final course grade reduced by one grade scale in addition to any penalties from missed assignments or quizzes.

The ONLY exception is you were absent while officially representing University, and documentation is provided.

If you are absent, it is your responsibility to find out what took place during your absence and be prepared for the next class meeting. “I wasn’t here on ‘whenever,’ is not an excuse.

If you missed a lab assignment then you must arrange with the T.A. to see if you can make up the lab. Missed pop quizzes may not be made up. Labs may not be submitted after the due date has passed for that lab.
ECT301-001 – Technical Data Management and Applications
Syllabus – Fall 2014
Department of Electronics and Computer Engineering Technology
College of Technology
Indiana State University

Class Schedule: MWF 9:00 – 9:50AM
Location: TC304

Instructor: Dr. Patrick Appiah-Kubi
E-mail: patrick.appiah-kubi@indstate.edu
Phone: (812) 237-3400
Office: John T Myers Technology Center 301K
Office hour: MW 2:00 pm -3:00pm, T 10:30am – 11:30am or by appointment

Course Objectives
This course introduces database architectures, capabilities, data structures, and typical
applications at the factory and enterprise levels. Factory information systems, data filtering, data
for quality analysis, and summary report generation are studied.

You can also expect to read between several pages of varied text each week, from online blogs to
research papers to textbook chapters. You will also have a lot of tasks to complete that will help
you apply the learned concepts. All of the reading and activities have been carefully selected to
help ensure your growth as student in this course. (Please see the Course Schedule for more
details on deadlines and deliverables.)

Text books
Used books are fine. The CD in the database book is not needed. The bookstore might not be the
best source. Let me know if you have trouble finding a book.
*Database Design for Mere Mortals 2nd ed; Hernandez, M.J.; Addison Wesley; ISBN 0-201-
75284-0.*

Deliverables
The deliverables listed below are expected from each student to successfully complete the
course.

Project: Students will work on an assigned project. Project details will be provided.

Weekly Reflective Reports: Students will submit reflective reports that highlight key learning
outcomes. Issues related to the activities of the week should be pointed out in the reports.

Assignments: A couple of assignments are expected to be completed by each student.

Exams: There will be 2 major exams in the course, a midterm and a final. However there will
several pop quizzes during the semester to test students understanding on concepts covered in
Deadlines: There will be due dates for deliverables in Blackboard and their availability will close on published dates. Details of due dates is also available in the class schedule. Please take careful note of the due dates. Unless you notify me otherwise, if you miss a due date you will lose 50% of the possible credit for that assignment. You will however receive a grade of zero for any assignment that is not submitted three weeks after the due date.

<table>
<thead>
<tr>
<th>Outcomes Assessment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester Project</td>
<td>100</td>
</tr>
<tr>
<td>Attendance</td>
<td>200</td>
</tr>
<tr>
<td>Weekly reflective reports</td>
<td>140</td>
</tr>
<tr>
<td>Midterm</td>
<td>100</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
</tr>
<tr>
<td>Assignments</td>
<td>200</td>
</tr>
<tr>
<td>TOTAL</td>
<td>840</td>
</tr>
</tbody>
</table>

Final letter grades will be distributed in the following arrangement:

- A: 91%-100%
- B: 81%-85%
- C: 71%-75%
- D: 60%-65%
- B+: 86%-90%
- C+: 76%-80%
- D+: 66%-70%
- F: 0%-59%

Blackboard web site
All course materials, class schedule and the syllabus will be posted on the course Blackboard web site.

Classroom Lectures
Lectures will be given during class time and the corresponding PowerPoints will be posted on Blackboard. There will also be assignments during the semester that will be performed during class or be of the take home format.

Attendance Policy
The class meets 9:00-9:50am, MWF. Follow the schedule on the syllabus closely to know when class meets. You will have some time or deferred classes in order to work on your exams and design project. When class meets, you are expected to be present. A role is taken during each class meeting. No unexcused absences will be tolerated. In order for an absence to count as an excused absence, appropriate documentation must be provided. This means that a phone-call or email before the class does not by itself make an absence excused. Any unexcused absence will count towards your attendance grade.

Etiquettes
This is a learning environment and I expect everyone to be civil in the contributions. All opinions are welcomed and no one will be allowed to undermine someone’s opinion during discussions.

Please observe the following etiquettes as well:
- Turn cell phones off.
ECT 303 Microcontroller Hardware and Software
Syllabus

Instructor: Dr. William Croft          Office: 301C TC
William.Croft@indstate.edu           Phone: 237-3453
Office Hrs: As announced or by appointment

Teaching Assistant:

Catalog Data: This course is about the microprocessor embedded system consisting of both software and hardware, and how you apply this knowledge in the laboratory. We will develop an in-depth understanding of the operation of the 68HC11 microcontroller as a learning vehicle and Assembly Language (the language used to instruct the microcontroller), including the use of register and memory concepts. The stored program concept, addressing mode, instruction formats, instruction set, and stack and subroutine manipulation will be discussed. Concepts are reinforced through practical laboratory assignments.

ISBN: 0-7668-1600-1

Prerequisite: A Passing grade in ECT 232

Course Info:

This course will cover the Motorola 68HC11 microprocessor family and its associated peripheral components including memory, input/output, and control devices. An intense study of this system will include hardware and software topics such as; CPU data flow, timing and control, and assembler language programming. ECT 303 will provide a sound basis for successful completion of subsequent courses. It is expected that the student will expend a fair amount of effort to the mastery of the topics and theories presented in this course. It is assumed that the student possesses a basic understanding of digital logic including number systems and combinational/sequential logic circuit design.
Course Objectives:

- Students will be introduced to the concepts of microcontroller and its hardware and software organization
- Students will learn the architecture, programming and application of a commercially used microprocessor and microcontroller
- Students will learn to use assembler
- Students will learn to debug in their laboratory their microcontroller hardware and software and how to cooperate in teams and also document their results

Course Outline:

- General computer organization
- Microcontroller Architecture and Instruction Set
- Assembly language programming and simulation of programs
- Data Structures and Subroutine calls
- Memory Address Decoding

Topics:

- Microprocessor/Microcontroller Fundamentals
- Introduction to the Motorola Microcontroller
- Introduction to the Address, Data and Control Bus
- Fundamental Computing System Devices
- The Instruction Set
- Assembly Programming
- Utilizing the MC68HC11 protoboard
- Utilizing Hyperterminal
- Understanding the Buffalo Monitor program
- Subroutines and the Stack
- Memory
- Input/Output and Parallel Ports

Lab:

Students are expected to work on the lab beyond the allocated lab time. Each lab must be demonstrated to and approved by the instructor or designated lab assistant to receive points. The due date of the lab is typically one week after the instructor declares a finish date for the laboratory exercise. A 10% deduction of the lab will be taken for each class period beyond the due date, weekends will count as another late period.

Your lab will be graded approximately as follows:

- Functionalities....................................70%
- Hardware appearance and Reliability........10%
- Program Comments and Reliability.........10%
ECT 306 Computer Network Management Technology  
Syllabus – Spring 2015  
Department of Electronics and Computer Engineering Technology  
College of Technology  
Indiana State University  

Class Schedule: MW 3:30pm -6:15pm TC308

Instructor: Dr. Xiaolong Li  
E-mail: xiaolong.li@indstate.edu  
Phone: (812) 237-3451  
Office: TC301J  
Office Hours: MW 9:30am -10:50am, TR 1:00pm – 2:00pm or by appointment

Prerequisite  
ECT 232

Text book:  

Course Description  
Introduces and defines concepts involving network topology, network devices, protocols, and the  
Open System Interconnect Reference Model (OSIRM). The elements of a LAN, current issues  
and products, and system administration are emphasized.

Course Objectives  
Upon completion of this course, the student will be able to:

1. Identify the Hardware and Software components of a Computer Network System.
2. Describe the purpose of each hardware component in a communication system and how they relate to every other component in the system.
3. Discuss the Open Systems Interconnection (OSI) model and TCP/IP model.
4. Describe the format of data transmission and explain the operation (algorithms) for each layer in the OSI and TCP/IP Protocol Suite.
5. Simulate a variety of network.
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>HW &amp; LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/14</td>
<td>Syllabus and Introduction</td>
<td>1.1-1.3</td>
</tr>
<tr>
<td>2</td>
<td>1/19</td>
<td>Martin Luther King Day, No class</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/21</td>
<td>Introduction of Computer Networking</td>
<td>1.4-1.7, HW#1 Due 1/28</td>
</tr>
<tr>
<td>3</td>
<td>1/26</td>
<td>Application Layer</td>
<td>2.1-2.2, Lab #1 Getting Started Due 2/4</td>
</tr>
<tr>
<td></td>
<td>1/28</td>
<td>Application Layer</td>
<td>2.3-2.4</td>
</tr>
<tr>
<td>4</td>
<td>2/2</td>
<td>Application Layer</td>
<td>2.5-2.6, Lab #2 DNS Due 2/9</td>
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<td></td>
<td>2/4</td>
<td>Transport Layer</td>
<td>3.1-3.3</td>
</tr>
<tr>
<td>5</td>
<td>2/9</td>
<td>Transport Layer</td>
<td>3.4, Lab #3 UDP Due 2/16</td>
</tr>
<tr>
<td></td>
<td>2/11</td>
<td>Transport Layer</td>
<td>3.5, HW#3 Due 2/18</td>
</tr>
<tr>
<td>6</td>
<td>2/16</td>
<td>Transport Layer</td>
<td>3.6-3.7</td>
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<td></td>
<td>2/18</td>
<td>Exam #1</td>
<td>Ch 1-3</td>
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<tr>
<td>7</td>
<td>2/23</td>
<td>The Network Layer</td>
<td>4.1-4.2</td>
</tr>
<tr>
<td></td>
<td>2/25</td>
<td>The Network Layer</td>
<td>4.3-4.4</td>
</tr>
<tr>
<td>8</td>
<td>3/2</td>
<td>The Network Layer</td>
<td>Lab #4 IP (Due 3/9)</td>
</tr>
<tr>
<td></td>
<td>3/4</td>
<td>The Network Layer</td>
<td>HW#4 Due 3/11</td>
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<tr>
<td>9</td>
<td>3/9</td>
<td>The Network Layer</td>
<td>4.5</td>
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<td></td>
<td>3/11</td>
<td>The Network Layer</td>
<td></td>
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<tr>
<td>10</td>
<td>3/16-20</td>
<td>Spring Break, no class</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>3/23</td>
<td>The Network Layer</td>
<td>4.6, HW#5 Due 3/30</td>
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<td></td>
<td>3/25</td>
<td>The Link Layer and LAN</td>
<td>5.1-5.2</td>
</tr>
<tr>
<td>12</td>
<td>3/30</td>
<td>The Link Layer and LAN</td>
<td>5.35.4, HW#6 Due 4/6</td>
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<td></td>
<td></td>
<td></td>
<td>5.6, Lab #5 Ethernet</td>
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<tr>
<td></td>
<td>4/1</td>
<td>Wireless and Mobile Networks</td>
<td>6.1-6.3</td>
</tr>
<tr>
<td>13</td>
<td>4/6</td>
<td>Wireless and Mobile Networks</td>
<td>6.4-6.5, Lab #6 OPNET Tutorial</td>
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<tr>
<td></td>
<td>4/8</td>
<td>Multimedia Networking</td>
<td>HW#7 Due 4/9</td>
</tr>
<tr>
<td>14</td>
<td>4/13</td>
<td>Multimedia Networking</td>
<td>7.1-7.3, HW#8 Due 4/16</td>
</tr>
</tbody>
</table>
ECT 308  Microcontroller Applications and Interfacing
Syllabus

Instructor: Dr. William Croft
Office: 301C TC
William.Croft@indstate.edu
Phone: 237-3453
Office Hrs: As announced or by appointment

Catalog Data: This course is intended to solidify and build upon your previous knowledge of the 68HC11 microcontroller. In this course we will deal with microprocessor architecture and organization and its associated peripheral subsystems. Subsystem interfacing Concepts, Program-controlled I/O subsystem, Timer subsystem, Parallel and Serial I/O subsystems, A/D subsystem interfacing, and interrupt-based solutions will be applied to microcontroller-based applications. The basic software techniques to use these subsytems and some common hardware designs used for interfacing to real world problems will be learned. Concepts are reinforced through practical laboratory projects.

Text Book: MC68HC11 An Introduction Software and Hardware Interfacing
Author: Huang, Han-Way
ISBN-13: 978-0-7668-1600-8 (make sure you get the current ed. used in class)

Prerequisite: ECT 303

Course Objective:

- Students will learn to develop code for application of microprocessors/microcontrollers peripherals devices to real world problems.
- For example, we may develop code for serial and parallel communication systems such as timing systems, A/D conversion, SCI and SPI.
- Students will learn to apply microcontroller systems to solve real-time and interrupt-based problems.
Course Outline: (various topics from the following may be covered)

- Describe advanced microcontroller architecture and programming.
- Increase assembly language programming proficiency and simulation.
- Parallel Input/Output Ports
- Interrupt and interrupt programming to control real-time embedded systems.
- Describe the operations, functions and applications of microcontroller internal timer
- Keyboard/Keypad interfaces
- 7-segment Display interfaces
- LCD interfaces
- Analog-to-Digital Converter
- Describe the operation and application of serial communication and serial peripheral interfaces
- Design and validate laboratory experiments for interface to I/O devices incorporating serial/Parallel communication Analog Digital Conversion and the internal timer functions

Assessments: Homework, quizzes, laboratory experiments, presentation/project, one midterm and one final exam

Lab:

Students are expected to work on the lab beyond the allocated lab time. Each lab must be demonstrated to and approved by the instructor or designated lab assistant to receive points. The due date of the lab will be assigned after the instructor declares a finish date for the laboratory exercise. A 10% deduction of the lab will be taken for each class period beyond the due date, weekends will count as another late period.

Your lab will be graded approximately as follows:

- Functionalities........................................70%
- Hardware appearance and Reliability........10%
- Program Comments and Reliability.........10%
- Report.................................................10%
ECT 401 Data Communications and Internet Technology

Syllabus – Fall 2014

Department of Electronics and Computer Engineering Technology
College of Technology
Indiana State University

Class Schedule: MWF 9:00am -10:50am @TC308
Instructor: Dr. Xiaolong Li
E-mail: xiaolong.li@indstate.edu
Phone: (812) 237-3451
Office: TC301J
Office Hours: MWF 3:00 pm - 4:00pm, T 1:00pm-2:00pm or by appointment

Prerequisite
ECT 306

Text book:
Cisco Networking Academy Program

Course Description
This three credit hour course designed to introduce the fundamentals for delivering information from a source through a medium to a destination. Students will gain knowledge of various data communications hardware and methodologies employed in networking and the Internet, the concepts of packet switching for transporting data through a telecommunication network, protocols, and they will examine the basic hardware and software components that make up the Internet in particular and computer networks in general.

Course Objectives
Upon completion of this course, the student will be able to:
6.Identify the Hardware and Software components of a Computer Network System.
7.Describe the purpose of each hardware component in a communication system and how they relate to every other component in the system.
8.Discuss the Open Systems Interconnection (OSI) model and TCP/IP model.
9.Describe the format of data transmission and explain the operation (algorithms) for each layer in the OSI and TCP/IP Protocol Suite.
10.Simulate a variety of network.
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/20</td>
<td>Syllabus and Introduction of Networking &amp; Media</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8/22</td>
<td>Web Assignment #1</td>
<td></td>
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<tr>
<td>2</td>
<td>8/25</td>
<td>Lab #1 Making Cables</td>
<td></td>
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<tr>
<td></td>
<td>8/27</td>
<td>Cabling LAN and WAN</td>
<td>Lab #2 P2P Network</td>
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<tr>
<td></td>
<td>8/29</td>
<td>Web Assignment #2</td>
<td></td>
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<tr>
<td>3</td>
<td>9/1</td>
<td>Labor Day; No class</td>
<td></td>
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<tr>
<td></td>
<td>9/3</td>
<td>Switching Concepts</td>
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<td></td>
<td>9/5</td>
<td>Web Assignment #3</td>
<td></td>
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<tr>
<td>4</td>
<td>9/8</td>
<td>Lab #3 Basic Switch Configuration</td>
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<td></td>
<td>9/10</td>
<td>Lab #4 Switch MAC address</td>
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<td></td>
<td>9/12</td>
<td>Web Assignment #4</td>
<td></td>
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<tr>
<td>5</td>
<td>9/15</td>
<td>Lab #5 Port security</td>
<td></td>
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<td>9/17</td>
<td>VLANs</td>
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<td></td>
<td>9/19</td>
<td>Web Assignment #5</td>
<td></td>
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<tr>
<td>6</td>
<td>9/22</td>
<td>Lab #6 Basic VLAN configuration</td>
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<td></td>
<td>9/24</td>
<td>Lab #7 Trunking</td>
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<td></td>
<td>9/26</td>
<td>Web Assignment #6</td>
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<tr>
<td>7</td>
<td>9/29</td>
<td>Exam #1 (Lab Test)</td>
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<tr>
<td></td>
<td>10/1</td>
<td>WANs and Routers</td>
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<td>10/3</td>
<td>Web Assignment #7</td>
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<tr>
<td>8</td>
<td>10/6</td>
<td>Lab #8 Router Configuration</td>
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<td></td>
<td>10/8</td>
<td>Lab #9 Basic router configuration</td>
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<tr>
<td></td>
<td>10/10</td>
<td>Web Assignment #8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>10/13</td>
<td>Static Routing Lab #10 Static routing</td>
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<tr>
<td></td>
<td>10/15</td>
<td>Lab #10 Static routing</td>
<td></td>
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<tr>
<td></td>
<td>10/17</td>
<td>Web Assignment #9</td>
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<tr>
<td>10</td>
<td>10/20</td>
<td>RIP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10/22</td>
<td>Lab #11 Basic RIP1 configuration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10/24</td>
<td>Web Assignment #10</td>
<td></td>
</tr>
</tbody>
</table>
ECT 406 Senior Projects
Syllabus – Spring 2015
Department of Electronics and Computer Engineering Technology
College of Technology
Indiana State University

Class Schedule: R 2:00 pm – 4:45 pm, John T Myers Technology Center 305

Instructor: Dr. Xiaolong Li
E-mail: xiaolong.li@instate.edu
Phone: (812) 237-3451
Office: John T Myers Technology Center 301J
Office hour: MW 9:30 am -10:50am, TR 1:00pm – 2:00pm or by appointment

Course Description
Students work in group on a design/research problem. The project can be developed through industry collaboration, faculty research, or at the students’ own initiative through a literature search. The project requires computer engineering technology faculty approval, formal oral presentation, and written report.

Course Description
Senior Standing

Course Objectives
The overall objective of this course is to provide the Computer Engineering Technology student with an integrative experience, which ties the skills and knowledge obtained from the curriculum to the professional world. Specific objectives of the course include:

1. an appreciation of the importance of using notebooks to document engineering research and development work (ABET: g);
2. an ability to develop a needs analysis (ABET: a,c,e,h,j);
3. a working knowledge of the sources of engineering design specifications (e.g. consumers, companies, groups having authority) (ABET: c,e);
4. an ability to develop a comprehensive set of quantitative and qualitative engineering design specifications based on a needs analysis (ABET: a,c,e,h,j);
5. an ability to apply and understand the advantages and disadvantages of the three primary methods of engineering design: synthesis, repeated analysis, and device evolution (ABET: a,c,e,k);
6. an ability to conduct a physical and economic feasibility study for a proposed device or system (ABET: a,b,c,e,k);
7. an ability to conduct a literature and patent search to support an engineering design project (ABET: a,b,c,e,k);
8. an ability to design a device or system to meet a specified need using knowledge of mathematics, science, and engineering, while considering (as listed by ABET Engineering Criteria 2000) “economic; environmental; sustainability; manufacturability; ethical; health and safety; social; and political” issues (ABET: a,b,c,e,h,j,k);
9. an ability to effectively function as a member of a design team (ABET: c,d,g);
10. an ability to develop a strategy for designing a device or system based on a precedence matrix (ABET: a,b,c,e,k);
11. an ability to use physical and/or mathematical models to verify that a designed device or system satisfies the design specifications (ABET: a,b,c,e,k);
12. an ability to provide effective documentation for an engineering design project (ABET: g);
13. an ability to estimate time needed to complete an engineering project using the critical math method and the program evaluation and review technique (ABET: c,k);
14. a knowledge of the role that human factors engineering has in engineering design (ABET: a,c);
15. an ability to determine the tolerance on a device or system based on the tolerances of the individual components comprising that device or system (ABET: a,c,e,k);
16. a basic understanding of mechanisms to protect intellectual property, including patents, copyrights, trademarks, semiconductor masks, and trade secrets (ABET: c,e,k);
17. an understanding and appreciation of engineering ethics, including an ability to cite examples where engineering ethics were compromised with disastrous consequences (ABET: f);
18. a knowledge of the IEEE and the NSPE Code of Ethics (ABET: f);
19. an understanding of the importance of, and how to obtain, a professional engineering license (ABET: f);
20. an appreciation for the role engineers play in society (ABET: f,h,i,j);
21. an awareness of basic electronic system prototyping techniques (ABET: k);
22. and an ability to correctly and effectively communicate via the written word (ABET: d,g,k).

**Instructional Approach**

There is less direct supervision in this course than in other undergraduate courses and you will be responsible for your own time management. I won't nag you but will expect you to meet the deadlines. I am available for help but the primary responsibility for successful completion rests with you.

**Course Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignment and Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/13</td>
<td>Course introduction; syllabus review</td>
<td>Project Ideas (Due 1/22)</td>
</tr>
<tr>
<td>2</td>
<td>1/22</td>
<td>Project Proposal</td>
<td>Project proposal (Due 2/5)</td>
</tr>
<tr>
<td>4</td>
<td>1/29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2/5</td>
<td>Project Analysis</td>
<td>Project Analysis (2/3)</td>
</tr>
<tr>
<td>5</td>
<td>2/12</td>
<td>Project Implementation</td>
<td>Project Implementation (2/24)</td>
</tr>
<tr>
<td>6</td>
<td>2/19</td>
<td>Project Test Plan</td>
<td>Project Test Plan (2/17)</td>
</tr>
<tr>
<td>7</td>
<td>2/26</td>
<td>Implementation Status Report</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----</td>
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<td>---------------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>3/5</td>
<td>Milestone 1 Report</td>
<td>Milestone 1 Presentation</td>
</tr>
<tr>
<td>9</td>
<td>3/12</td>
<td>Implementation Status Report</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>3/19</td>
<td><strong>Spring Break, no Class</strong></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>3/17</td>
<td>Implementation Status Report</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>3/24</td>
<td>Implementation Status Report</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>3/31</td>
<td>Milestone 2 Report;</td>
<td>Milestone 2 Presentation</td>
</tr>
<tr>
<td>14</td>
<td>4/7</td>
<td>Implementation Status Report</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>4/14</td>
<td>Implementation Status Report</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>4/21</td>
<td>Implementation Status Report</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Final Report</td>
<td>Final Presentations</td>
</tr>
</tbody>
</table>

**Grading Policy**

Your final grade will be weighted as follows.

<table>
<thead>
<tr>
<th>Component</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Notebook</td>
<td>40%</td>
</tr>
<tr>
<td>Project Idea</td>
<td></td>
</tr>
<tr>
<td>Project Proposal</td>
<td>5%</td>
</tr>
<tr>
<td>Project Analysis</td>
<td>10%</td>
</tr>
<tr>
<td>Project Implementation</td>
<td>10%</td>
</tr>
<tr>
<td>Project Test Plans</td>
<td></td>
</tr>
<tr>
<td>Status Reports</td>
<td>5%</td>
</tr>
<tr>
<td>Milestone 1</td>
<td>10%</td>
</tr>
<tr>
<td>Milestone 2</td>
<td></td>
</tr>
<tr>
<td>Project Operation</td>
<td>5%</td>
</tr>
<tr>
<td>Final Project Report</td>
<td>25%</td>
</tr>
<tr>
<td>Oral Presentation</td>
<td>10%</td>
</tr>
</tbody>
</table>

100-97 = A+;  97-92 = A;  92-90 = A-
89-87 = B+;  87-82 = B;  82-80 = B-
79-77 = C+;  77-72 =C;  72-70 = C-
69-67 = D+;  67-62 =D;  62-60 = D-
59-0 = F.

**Course Policies**

Assignment is due on the dates above. You will *not* be reminded to turn it in; **you are expected to keep track of your deadlines.** Late homework will not be accepted.

All submitted work, when turned in must be **typed and proofed.** The ability to communicate your ideas clearly and effectively is a critical aspect of your work now and later in industry. As such, assignments with misspellings and bad grammar will be returned ungraded. You are encouraged to make use of your peers and it is my assumption that any writing assignment you turn in has been proofed by at least one other person.
Indiana State University  
College of Technology  
Department of Applied Engineering & Technology Management  

MET, CNST, ECT, TMGT 430 - 301 = Senior Seminar (1 credit hour) Spring 2015

Instructor: Alexander J. Hagedorn 
Alexander.hagedorn@indstate.edu

Class Times: Web based course managed via Blackboard.

Course Description: Senior seminar involves issues of industrial technologists related to career planning, job obtainment, and personnel matters in the development/management of your professional career. The main objective of this class is to put the finishing touches on a students current level of professionalism, refocus the nature and definition of the field of industrial technology, help the student start/advance their professional career, and prepare for life after this stage of their education.

Textbook: No formal is textbook required. Internet, university, and library sources will be utilized. Any additional resources will be provided by the instructor of this class.

Objectives: The course will help prepare students, who (upon graduation) can:

1. Remain technically current and adapt to rapidly changing technologies through self improvement with continuous learning or post-graduate education. [EO:2]
2. Demonstrate independent thinking, self-management, and functioning effectively in team-oriented and open-ended activities in an industrial environment. [EO:3]
3. Communicate effectively in oral, written, and graphical forms. [EO:4]

Outcomes: Upon completion of this course, the students will have:

1. an appropriate mastery of the knowledge, techniques, skills, and modern tools of the MET discipline
2. an ability to function effectively on teams
3. an ability to communicate effectively through engineering drawings, written reports, or oral presentations.
4. a recognition of the need for, and an ability to engage in lifelong learning
5. an ability to understand professional, ethical and social responsibilities
6. a commitment to quality, timeliness, and continuous improvement

Course Outline: Upon completion of this course the student will be able to:

1. Explain the students’ major career field and what it prepares the students to do
2. Define, compare, and contrast industry, technology, industrial technology and related terms
3. Dress, behave, and live for success
4. Function properly in a formal dining situation
5. Demonstrate interviewing skills through practice interviews
6. Understand the procedures employers use for indirect hiring, as well as direct hiring
7. Register with the ISU Career Center and possibly other recruiting services
8. Write an effective and accurate resume and cover letter
9. Make professional quality presentations
10. Plan career goals and potential paths of advancement
11. Set academic, personal, social, and professional goals
12. Locate, identify, describe, and evaluate a range of career resources
13. Employ strategies for developing career contacts
14. Develop a professional portfolio of skills, abilities, and accomplishments
15. Display conscientious personal and professional choices

Grading:

435 points possible

Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum Score</th>
<th>Maximum Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>403</td>
<td>435</td>
</tr>
<tr>
<td>A</td>
<td>390</td>
<td>402</td>
</tr>
<tr>
<td>B+</td>
<td>377</td>
<td>401</td>
</tr>
<tr>
<td>B</td>
<td>359</td>
<td>400</td>
</tr>
<tr>
<td>B-</td>
<td>346</td>
<td>358</td>
</tr>
<tr>
<td>C+</td>
<td>333</td>
<td>345</td>
</tr>
<tr>
<td>C</td>
<td>316</td>
<td>332</td>
</tr>
<tr>
<td>C-</td>
<td>300</td>
<td>315</td>
</tr>
<tr>
<td>D+</td>
<td>290</td>
<td>314</td>
</tr>
<tr>
<td>D</td>
<td>272</td>
<td>289</td>
</tr>
<tr>
<td>D-</td>
<td>259</td>
<td>271</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
<td>59.9%</td>
</tr>
</tbody>
</table>

Assignments:

All assignments are due according to the posted class documents in Blackboard, unless otherwise specified. NO LATE WORK WILL BE ACCEPTED UNLESS AN EXCUSABLE REASON IS GIVEN PRIOR TO THE DUE DATE.

Each assignment must be submitted in electronic format (MS Word, Excel, PPT, etc.) to the proper discussion board location with your name, class & section number, date, and assignment description placed in the subject header.

Class Etiquette: While this is an internet base course, all normal issues of participation, courtesy, professionalism, and ethics apply just as if you were in the classroom. Participation in discussion boards will be assessed toward your grade. The reading and replying to discussion board postings allows you to benchmark the work of others to find new ideas or help other students in the development of their portfolio items. While the instructors’ inclusion in the discussion boards will vary, you should read, review, and reply in a short nature to at least 2 other students’ postings each week. Don’t go overboard, just give each other some feedback and help generate creative ideas that everyone can utilize.

Disability and Special Needs

Indiana State University provides services and accommodations for qualified individuals with documented disabilities. If you require any accommodation, you must register with the Disability Support Services at the beginning of the semester. You may contact them at 237-2301 or see them in person on the 2nd floor of Gillum Hall. Any other types of needs required for you (undocumented) to successfully complete this class, feel free to contact me so arrangements can be made to help you in any way possible.

There is NO comprehensive written final exam for this class however the FINAL PROJECT is due during study week and the Portfolio is DUE during EXAM WEEK

*NOTE: The information and subject matter included in this syllabus is subject to change at the discretion of the course instructor and/or department officials. All changes will be communicated in full to the class.
Text Book

1. The text book for the class is Managing Projects: A Team-based Approach (with Student CD); K. A. Brown & N. L. Hyer; 2010; McGraw-Hill; ISBN 978-0-07-735645-3; Available at Amazon (Click Here)

2. The class lectures will expand on the major themes in the text. As this is a 400 level class, it is expected that the learners will read the text on their own volition. Thus, after March 5th, each student is expected to have read the text (Chapter 1 – 5) and be familiar with the project management material found there-in. Chapter 6 – 10 should be read by the student by April 16th. The text book content will be "fair game" for midterm and final exam questions.

Class Format

1. Blackboard will be the location for all course documents, announcements, and schedules. Everyone in the class has been registered into the ECT437 Blackboard. Access it from http://blackboard.indstate.edu . Use your MYISU (your Sycamore log-in) and select: Spring 2015 ECT-437 ….. Indust Comput Sys Mgt.

2. At least one lecture session (Tuesday) each week will be dedicated to the delivery of instructional material to the class. All students, registered for ECT-437 are expected to attend class (Tuesday and Thursday).

3. After week 3, Thursday are team meetings and will be relegated to project team meetings. Follow the General Outline for Semester listing at the end of this document to see scheduled activities. At the end of the semester we will be meeting to view team project summary presentations. Thus you are expected to attend class as dictated by the syllabus and needs of your team activities. This syllabus will be revised to reflect changes in class
meeting plans, so when you are in Content, check the “rev” number of the syllabus in its file name.

First Assignment - Resume

1. The professor will assign teams for the course project based on areas of multi-disciplined expertise of students, as indicated in part by their resumes. Also, your resume will be posted in a discussion thread in Blackboard so your team members can know something about you. Your resume is a document that outlines your education and work experience and serves as a professional introduction tool. If your resume has spelling or grammar errors or does not present the information of a typical resume, your grade for this deliverable will be deducted. Otherwise, this assignment is an easy grade.

2. Per the semester outline, the resume is due in the Blackboard discussion thread area by 11:59pm on Friday January 23rd. In class by January 15th.

Team Deliverable

1. The professor will assign teams for the course project, based on areas of multi-disciplined expertise of students, as indicated by their resumes.

2. ECT437 students will be team members. Full participation in the project is required. If you feel you can not participate for any reason, see the instructor before the team activities launch. If you do not actively participate in the team activity and have not made prior arrangements with the instructor, you will fail this class.

3. During the class meeting on January 29th teams will be given the “Project in a Box” along with details on the scope of the project will be posted and discussed. Team member assignments will also be posted at that time. Teams may then start having organizational meetings, working towards developing and selecting a project topic. The title and scope of the team project will be developed by the team and approved by the instructor.

4. In-class Q&A sessions will be held on February 5 Thursday to help with project planning. A project in the box topic is to be submitted by the team and an abstract developed by Thursday, February 12th at 11:59pm. Submission in “typed” format to Blackboard assignment “TURNITIN” link.

5. The general objective of each team project is to develop a detailed project plan report. The steps involved in accomplishing this activity include, to: (a) learn about a technical need for a project; (b) define and delimit the scope; (c) research potential paths toward solution; (d) evaluate the potential paths and select the best approach; (e) develop a project plan which includes resources, equipment and materials, costs, and time schedule using standard project management tools and procedures; and (f) deliver the written project plan report to course instructor with a summary report delivered to the class.

6. The deliverable will be a detailed plan on how to accomplish your defined project. A hardcopy of the plan report and a CD will be due the last day of the semester. An in-class summary presentation will be delivered late in the semester. The activity does not include accomplishing the project – just fully planning the development and execution, using the tools discussed in the course lectures and text.
7. A set of documents including a PPT which details the project plan development deliverable in detail will be posted in Blackboard under the Content tab. The January 29 team meeting will cover the project plan requirements in detail.

8. Each team member will be assigned specific duties during the project, which result in deliverables. Team members will be evaluated on the deliverables by the course instructor, their ability to apply the project management tools presented in class, their attendance at team meetings and the peer review part of the project journals.

9. The professor will attend every team meeting and will be monitoring the team’s progress. Do not copy the instructor on every inter-team e-mail as the volume becomes overwhelming. Do e-mail when you have questions or issues.

10. **During the project team activities, participation and attendance at all team meetings is required.** The team leaders will work to schedule meeting that best fit all team members involved. If you cannot attend a meeting the team leader should be notified, along with the course instructor. Communication between team members can be accomplished by e-mail, postings in the team discussion thread area in Blackboard and your choice of web meeting technology to include in climate weather or use phone calls (your phone).

11. In order for me a fairly assess your participation in the project activities, you **MUST** keep a log book or journal. This can be hand written or entered in an MS Word or Excel document (preferred). Each time you work on the project, attend a meeting or do anything that moves the project forward, simply make a brief note of the date, what that action involved and names of those involved if it was a meeting. In most cases, one to three sentences are all that is required. If the team keeps and posts minutes for each meeting that includes those in attendance, this can serve as the journal for everyone on the team. Most who work on projects in business and industry keep some sort of journal. Your journal can be invaluable at times when questions about dates and activities arise after the fact.

12. As a final entry in the journal, I want you to evaluate each of your team member’s performance with a letter grade (A, B, C, D or F) and along with one or two sentences about their quality of work and performance on this project. A hard copy of your journal (or e-mail if it is an MSWord or .PDF document) will be due on April 23rd before the beginning of class. This represents $400 of your grade.

**Weekly assessments, midterm and the final exam**

1. Five questions, open book, open note quiz (reality check – i.e. are you understanding?) will be posted in Blackboard no later than Thursday of each week. You will need to post an answer in Blackboard by the following Thursday at 2pm. This will constitute $650 of your course grade. This will start on week 2 – due Thursday January 22 at 2pm. The quiz will CLOSE on each Thursday at 1:59PM; if you do NOT complete the quiz, there is NO make-up quiz! It is your responsibility to retrieve, complete and post on Blackboard by the required ‘CLOSE TIME’!
Course Title: MATH 115-College Algebra  
Instructor: Mr. Derrick Bowman  
Email: Derrick.Bowman@indstate.edu  
Phone: (812) 237-2138  
Office Location: A-125  
Office Hours: MTR 1:00 pm – 2:00 pm

Section: 012  
Class Meeting Times: TR at 9:30 am – 10:45 am  
Classroom: RO A005  
Semester: Spring 2015

Materials Needed:
- *College Algebra (6th edition)* by Stewart, Redlin and Watson (Brooks/Cole) with WebAssign
- *Scientific Calculator* (See the Calculator Usage section for more details)
- *Graph paper (optional).* You may also print off graph paper templates from the internet, as needed.

Catalog Description: Functions including polynomial, rational, exponential, and logarithmic and their graphs including translations, reflections and symmetry. Systems of equations.

Prerequisite: Appropriate placement test score or MATH 035 or MATH 099.

Course Grade: Your class grade is a weighted grade system. The following are the rates for each category.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Final Exam</th>
<th>Homework</th>
<th>Quizzes</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>110%</td>
<td>25%</td>
<td>10%</td>
<td>10%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Final grading scale:
- **A+: 98% – 100%**
- **A: 92% – 97%**
- **A-: 90% – 91%**
- **B+: 88% – 89%**
- **B: 82% – 87%**
- **B-: 80% – 81%**
- **C+: 78% – 79%**
- **C: 72% – 77%**
- **C-: 70% – 71%**
- **D+: 68% – 69%**
- **D: 62% – 67%**
- **D-: 55% – 61%**
- **F: Below 55%**

Final Exam Grade Policy: If the Final Exam grade is less than 45%, you will earn an F for the course, regardless of the overall grade earned as calculated according to this syllabus.

Final Course Grade Computation: Each assignment will be given a category: Exam 1 (*E₁*), Exam 2 (*E₂*), Exam 3 (*E₃*), Exam 4 (*E₄*), Exam 5 (*E₅*), Final Exam (*FE*), Homework (*HA*), Quizzes (*QA*), and Attendance (*A*). The homework will be averaged together to give a Homework Average (*HA*). The quizzes will be averaged together to give a Quiz Average (*QA*). Attendance (*A*) is computed as per the syllabus. The following equation will compute your final course grade.

\[ \text{Final Grade} = (E₁ + E₂ + E₃ + E₄ + E₅) \times 10\% + FE \times 25\% + HA \times 10\% + QA \times 10\% + A \]

Homework: Homework will be assigned through WebAssign. You can sign up but going to http://www.webassign.com/ and register for an account. The information needed to sign-up is included in your book. The Self Enrollment Code for the course is: indstate 1852 6686
**Quizzes:** Quizzes will be periodically given during the course. The quizzes may contain examples from the class, problems from the homework, or unique questions in the style of the others. The dates for the quizzes are indicated in the Course Calendar.

**Final Exam:** There will also be a mandatory, cumulative, common final exam. The exam will be proctored on Saturday, December 6. The time will be announced later on in the semester. There will be NO MAKE-UPS for the Final Exam.

**Last Date to Withdraw:** Tuesday, October 28, 2014

**Foundational Studies Requirement:** This course meets the mathematics requirement for Foundational Studies.

**Learning Objectives for Mathematics:**
1. Solve for multiple unknowns from available information using appropriate methods.
2. Represent and solve real-world problems employing appropriate mathematical models.
3. Answer questions using advanced* mathematical techniques, and
4. Interpret and explain the results of advanced mathematical analysis.
   * Courses at the level of college-level algebra and trigonometry or above

These objectives will be met through the coursework of the class. This includes the study of systems of equations, solving these systems in multiple ways, linking these systems to real world problems, and explaining the results. Homework, quizzes, and exams will assess your progress towards achieving these goals.

**Skill Applied Learning Requirements**
1. Explicitly demonstrate how the curriculum will develop critical thinking skills.
2. Explicitly demonstrate how the curriculum will develop information literacy skills.

**Academic Honesty:** It is imperative that you adhere to standard practices of academic honesty and integrity in this course. I encourage you to review the University’s Academic Dishonesty Policy found in the Student Code of Conduct (see http://www.indstate.edu/sjp/docs/code.pdf). A violation of this policy will result in a zero for the assignment or exam in which the violation occurred. Any subsequent violation will result in a grade of F for the course.
MATH 301.001 (Now MATH129)  
Fundamentals and Applications of Calculus  

Spring 2015

Instructor

Name: Henjin Chi
Office: Root Hall A122
Phone: 812-237-2157
Office Hours: 2:30 PM to 3:30 PM Monday, Wednesday or by appointments

Semester: Spring 2015  
Section: 001  
Email: Henjin.Chi@indstate.edu

Course Introduction

Catalog Description: Inequalities, polynomial functions, logs, and exponentials. Differential and integral calculus and applications. For students in social sciences, business, and other applied areas.

The purpose of the course is to introduce you to basic ideas in calculus and how to apply calculus to areas such as business, social science, and technology.

I have structured the course around modules. Each module will build on previous modules and your previous mathematics coursework. You will need to complete a module prior to beginning the subsequent module. Modules will be subdivided into lessons.

Prerequisites

Appropriate placement exam score, MATH 115, MATH 201, or equivalent.

Learning Objectives

By the end of this course, you will be able to:

- Interpret a function from an algebraic, numerical, graphical, and verbal perspective.
- Evaluate and interpret limits of functions from their graphs and/or equations.
• Analyze and apply the notions of continuity and differentiability to algebraic, exponential, and logarithmic functions.

• Compute and analyze definite and indefinite integrals.

• Solve applied problems with derivatives.

• Solve applied problems with integrals.

Textbooks

Required Text:


You can order your book from the Indiana State University Barnes and Noble bookstore. If you chose another route such as Amazon or Half.com, please be sure to check the ISBN carefully. It is imperative that you order the correct edition, as other editions may not have the same information and problem sets. Also, be sure that you order a text with the MyMathLab access code. It may be less expensive for you if you just get the access code because it comes with an online version of the textbook.

Technology Requirements

For this online course, you will need access to a reliable computer with high-speed internet access. To access the course, please log into http://blackboard.indstate.edu using your Sycamore ID and password. Do not access Blackboard through the MyISU Portal; if you do, your access may get timed out, and you will likely lose some of your work! You are expected to log in to Blackboard at least three times a week, and you must check your Sycamore email daily at http://webmail.indstate.edu in order to keep up with class updates.

Your computer should meet the following MINIMUM requirements:

• 2.0 GHz Processor or higher
• 4 GB Memory
• 120 GB Hard Drive or higher
• Wireless Connectivity (802.11 b/g minimum)
• Updated Windows or Mac Operating System
INDIANA STATE UNIVERSITY
Department of Chemistry and Physics
Fall 2014
PHYSICS 105 - 002
INSTRUCTOR: Dr. Valentina French
OFFICE: S-165F
OFFICE PHONE: (812) 237-2272
OFFICE HOURS: MW 3:15 – 4:15 p.m., TuF 12:00 – 12:50 p.m., and by appointment
EMAIL: Valentina.French@indstate.edu
CLASS TIME: MWF 11:00 – 11:50 a.m.
LOCATION: S- 138
CREDIT: 3 semester hours
LABORATORY: Concurrent enrollment in 105L is part of the course requirement (unless PHYS 105L has already been successfully completed)
You will need a Mastering Physics access code in order to do online homework. If you have a textbook without a code you can purchase an access code at the following web address: http://www.masteringphysics.com
Please be sure that you purchase a registration code for Giancoli: Physics-Principles with Applications, 7th edition.
The course ID is: PHYSICS105FRENCHFALL2014
Purpose and objectives: This course constitutes the first semester of General Physics, an algebra-based introductory Physics course. Proficiency in college algebra is an essential requirement for this course (successful completion of MATH 115 or MET 215 is required).
Each student needs to bring a scientific calculator to class every day.
The course will feature lectures, discussions, demonstrations, and problem solving. The objectives of this class are threefold: 1) to help students develop a conceptual understanding of physical principles, 2) to develop knowledge of how these principles fit together to describe the physical world, and 3) to develop deductive reasoning skills and to test the understanding of the physical principles and concepts through problem solving.
In the study of physics you will learn that concepts build upon one-another, and are related to each other like the links of a chain. It is therefore vital that you keep up with the material and not fall behind, because just as one weak link spoils a chain, so will superficially-learned concepts undermine your understanding of later course material.
Class Participation: It will be very important for you to participate in class discussions so that I can gauge your understanding of the concepts that we have covered. This is especially critical in view of the nature of physics knowledge as a system of interrelated concepts. It is an unfortunate
but common occurrence for students to come to me on the eve of an exam and express their lack of understanding of concepts or problem-solving skills that were covered in class long ago. This admission is often accompanied by considerable hand wringing and expressions of despair. Had they contributed to class discussions and asked a few choice questions in a timely manner, their problems would have been resolved much earlier and they would have been in a position to face the exam with much greater confidence. **It is also very important that you read and study the relevant chapters in the textbook.**

Grading will be based on the following:

1. **EXAMS: 300 points**

   **Two one-hour exams** worth 100 points each. The first exam will be during the week of September 15th, and the second during the week of October 20th (the exact dates will be announced in class). **Please note that Tuesday, October 28th is the last day to drop a class.**

   **Final exam: 100 points.** The final exam will be on Friday, December 12th, at 10:00 a.m., according to the University Final Exam Schedule.

   **Review sessions will be scheduled before each exam.**

2. **HOMEWORK: 130 points**

   There will be homework assignments for each chapter covered. The homework will be done online at the following address: http://www.masteringphysics.com

   The course ID is: PHYSICS105FRENCHFALL2014

   To access the homework you need to use the access code packaged with your textbook or purchase an access code online at the above address. The homework is graded online and you have access to your scores at all times. Each homework set will have a due date. Late homework will be penalized by 10% per day. While I cannot give out solutions to the homework assignments before the due date, students are invited to discuss questions about the homework in class.

   The number of homework assignments is open, but at the end of the semester the total homework points will be scaled to 130 points.

3. **QUIZZES: 100 points**

   There will be a number of unannounced quizzes. Each quiz is worth 10 points. Each quiz will cover material discussed since the previous quiz. At the end of the semester, the lowest two quiz scores will be dropped. Because of that, no make-up quizzes will be given.

   **MAKE-UP EXAMS:** In order to make up a missed exam you must present documented evidence that the reason for missing the exam was serious and beyond your control. **Sleeping-in and vacation travel are NOT acceptable reasons.**

   **FINAL GRADE** is indicated by the following scale: 99-100% = A+; 93-98% = A;

   90-92% = A-; 87-89% = B+; 83-86% = B; 80-82% = B-; 77-79% = C+; 73-76% = C;

   70-72% = C-; 67-69% = D+; 63-66% = D; 60-62% = D-.

   In addition to the regular classes, there will be a Physics Help Center in room S 115. The Help Center will open on Monday, August 25th.
Purpose and objectives: Physics 105 and its laboratory component, Physics 105L constitute the first semester of General Physics, an algebra-based introductory Physics course. The laboratory component is designed to complement the classroom lectures by giving hands-on experience for the concepts covered in the lectures.

Laboratory Work
You will perform one laboratory experiment/exercise each week and work in groups of two. Every student is required to write a report on each lab experiment/exercise performed (one report per group is also acceptable, provided both group members make equal contributions to the report). Only students who were present at the lab session and performed the lab experiment/exercise may submit a report. The report is due at the following lab session. No late reports will be accepted. Detailed instructions on writing the lab reports are given for each experiment in the report directions file on Blackboard. The reports will be graded and returned to you at the following lab session. The grading will be done on a zero to 50-point scale. 15% of your grade will be based on individual participation during the lab experiment/exercise. Failure to write and submit a report will result in a score of 7.5 points (i.e., 15% of the 50 points possible for the report), if your participation during the lab exercise was satisfactory.

Note: all comments and essay answers to questions in the lab report need to be typed. Failure to do so will result in zero credit for those questions. Only calculations, equations and diagrams may be written by hand.

Students are expected to prepare for each lab by reading that day’s lab exercise from the lab manual before coming to the lab. There will be a quiz at the beginning of each lab session. Each quiz is worth 10 points. The questions on the quiz will cover the exercise that you will perform that day as well as the previous lab report that is due that day. A maximum of ten minutes will be allocated to the quiz. Being late to the lab will result in missing the quiz. There will be no exceptions to this rule.

There will be no make-up labs. At the end of the semester the lowest lab and quiz scores will be dropped. Total course points: 720 points
Lab reports: 600 points (12 labs, 50 points each)
Quizzes: 120 points (12 quizzes, 10 points each)
The letter grades will be assigned according to the following scale:
99-100% = A+; 93-98% = A; 90-92% = A-; 87-89% = B+; 83-86% = B; 80-82% = B-; 77-79% = C+; 73-76% = C; 70-72% = C-; 67-69% = D+; 63-66% = D; 60-62% = D-.

Code of Student Conduct: All students are expected to comply with ISU Code of Student Conduct, which can be found online at the following address:
http://www.indstate.edu/sci/docs/CodeConduct.pdf

Physics 105 Lab Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Lab Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/26</td>
<td>Experiment 1: Introduction to the Physics Laboratory</td>
</tr>
<tr>
<td>9/2</td>
<td>Experiment 2: Data Collection and Analysis</td>
</tr>
<tr>
<td>9/9</td>
<td>Experiment 3: Motion Studies</td>
</tr>
<tr>
<td>9/16</td>
<td>Experiment 4: Vector Addition of Forces</td>
</tr>
<tr>
<td>9/23</td>
<td>Experiment 5: Projectile Motion</td>
</tr>
<tr>
<td>9/30</td>
<td>Experiment 6: Atwood’s Machine</td>
</tr>
<tr>
<td>10/7</td>
<td>Experiment 7: Friction</td>
</tr>
<tr>
<td>10/14</td>
<td>Experiment 8: Hooke’s Law</td>
</tr>
<tr>
<td>10/21</td>
<td>Experiment 9: Centripetal Force</td>
</tr>
<tr>
<td>10/28</td>
<td>Experiment 10: The Pendulum</td>
</tr>
<tr>
<td>11/4</td>
<td>Experiment 11: Conservation of Mechanical Energy</td>
</tr>
<tr>
<td>11/11</td>
<td>Experiment 12: Momentum and Collisions</td>
</tr>
<tr>
<td>11/18</td>
<td>Experiment 13: Torque</td>
</tr>
<tr>
<td>11/25</td>
<td>Thanksgiving Break</td>
</tr>
<tr>
<td>12/2</td>
<td>Study week – no labs</td>
</tr>
</tbody>
</table>
COURSE TITLE AND DESCRIPTION: TMGT 492 – Industrial Supervision (3 hours); The role of supervision functions in industry with emphasis upon principles and practices of human behavior and human relations within the industrial environment.

PREREQUISITES: The student must be senior class level (90+ earned credits).

REQUIRED TEXTBOOK/READING:

COURSE OBJECTIVES: During this course the student should be able to:
1. discuss the nature of the supervisor’s job.
2. discuss the basic nature of industrial organizations.
3. perform day to day supervisory activities of industrial management personnel.
4. demonstrate knowledge of styles and techniques in industrial supervision.

COURSE EVALUATION:
Quizzes/Exams 45%
Assignments 30%
Discussion Board Participation 15%
Misc. Activities 10%

GRADING SCALE:
100-98 A+
93-97 A
90-92 A-
87-89 B+
83-86 B
80-82 B-
77-79 C+
73-76 C
67-69 D+
63-66 D
59 & below = F

DETERMINING COURSE GRADES: Course grades will be determined by dividing the total number of points you receive (earn) in the course by the total number of possible points from all assessments.

OFFICE HOURS: Scheduled office hours will be posted on my office door. Other hours can be made available by appointment. I am willing to meet with you anytime it is convenient for both of us.

POLICY STATEMENTS:
1. ISU policies of student conduct and academic integrity apply to this course and can be found at the Student Conduct and Integrity web site: http://www.indstate.edu/sci/
<table>
<thead>
<tr>
<th>WEEK</th>
<th>Plan of Activities</th>
<th>READING (Chapter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intro &amp; the Role of a Supervisor</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Supervision Challenges</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Organizing</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Planning &amp; Goal Setting</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Controlling</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Problem Analysis &amp; Decision Making</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>Communicating Effectively</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>Motivation</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>Leadership</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>Supervising groups, work teams and projects</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>Staffing and Recruiting</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>Appraising Employee Performance</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>Workplace Health and Safety</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>Conflict, Politics, Discipline</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>Change Management</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>Labor Relations</td>
<td>16</td>
</tr>
</tbody>
</table>

**Final Exam – Consistent with the Final Exam Schedule**
Appendix B – Faculty Vitae

CET program primary faculty resumes are listed here.
Indiana State University
School of Technology
PERSONAL DATA SHEET
1983 – Present

NAME AND ADDRESS: William E. Croft, 3855 N. Dogwood St.
Terre Haute, IN 47803
(812) 877-1483 Home Phone
(812) 237-3457 Work Phone

DEPARTMENT AFFILIATION: Electronics & Computer Engineering
Technology

RANK AND TITLE:
Jan. 2003 – Aug. 2007 Professor and Chairperson ECT Department
Aug. 2003 – May 2004 Interim Asst. Dean, School of Technology
Aug. 2003 – May 2004 Acting Assistant Dean School of Technology
Aug. 1983 – Pres. Faculty member ECT Department

ACADEMIC PREPARATION:

<table>
<thead>
<tr>
<th>INSTITUTION</th>
<th>AREA OF SPECIALIZATION</th>
<th>YEAR</th>
<th>DEGREE</th>
<th>EARNED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indiana University</td>
<td>Mathematics Education</td>
<td>1997</td>
<td>Ph.D</td>
<td></td>
</tr>
<tr>
<td>Indiana State University</td>
<td>Mathematics</td>
<td>1990</td>
<td>M.S.</td>
<td></td>
</tr>
<tr>
<td>Indiana University</td>
<td>Vocational Education</td>
<td>1983</td>
<td>M.S.</td>
<td></td>
</tr>
<tr>
<td>Indiana State University</td>
<td>Electronics Technology</td>
<td>1975</td>
<td>B.S.</td>
<td></td>
</tr>
<tr>
<td>Indiana State University</td>
<td>Criminology</td>
<td>1973</td>
<td>B.S.</td>
<td></td>
</tr>
</tbody>
</table>

PREVIOUS PROFESSIONAL AND/OR INDUSTRIAL EXPERIENCE:

<table>
<thead>
<tr>
<th>FIRM/INSTITUTION</th>
<th>POSITION/TITLE</th>
<th>DATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Monitor Corp.</td>
<td>Sr. Design Engineer</td>
<td>1979-1983</td>
</tr>
<tr>
<td>Wang Laboratories, Inc.</td>
<td>Sr. Customer Engineer</td>
<td>1979-1979</td>
</tr>
<tr>
<td>Raytheon Service Corp.</td>
<td>Sr. Customer Engineer</td>
<td>1978-1979</td>
</tr>
<tr>
<td>Indiana State University</td>
<td>Instructor</td>
<td>1976-1978</td>
</tr>
</tbody>
</table>

PUBLICATIONS:

REVIEWED PUBLICATION:
Croft, William E. "Attitude of Electronics Technology Majors at Indiana State University Toward Electronics". Journal of...
UNPUBLISHED:

RESEARCH PROJECTS & GRANTS:
Motorola Corporation literature donation, approximate value $250. October 1997.

COMPUTER HARDWARE AND SOFTWARE EXPERTISE:
Professional software experience includes programming in: C, Assembler, Fortran, BASIC, Visual BASIC, Hypercard, Supercard and numerous other languages. I also have expertise with operating systems such as DOS, Windows, UNIX (Linux and Solaris 2.6, 2.7), Macintosh, etc. Recently, I have programmed in SaS and Perl. In the past, I have programmed in numerous other languages and have worked in database systems such as SQL and Oracle. I have used ProE extensively.
Professional hardware experience includes: 8048, 8049, 8051, 8085, 8086 and above Intel microprocessors. 6800, 6809, 68000 and 68HC11 Motorola microprocessors and others such as the 6502, etc.

Professional Certifications:
March 2001 - Cisco Certified Network Associate (CCNA).
May 2001 - I have completed two-thirds of the training taken and passed 3 of the 5 exams required for CCNP certification.

PROFESSIONAL ORGANIZATION ACTIVITIES:
Memberships:
Member, National Council of Teachers of Mathematics.
Member, National Association of Industrial Technology.
Senior Member, Mathematical Association of America.
Education

- Ph. D, Systems and Industrial Engineering with EE minor, University of Arizona. 05/2005
- M. S., Industrial Engineering, University of Arizona. 05/2003
- M. Eng., Computer Engineering, Northeastern University, China. 04/1998
- Bachelor of Engineering, Telecommunication Engineering, Northeastern University, China. 07/1995

Appointments

- Assistant Professor, Electronics and Computer Technology Department, Indiana State University, 08/2005 ~ Present
- Visiting Assistant Professor, Electrical and Computer Engineering Department, University of Louisiana, Spring 2003 – Spring 2004
- Software Engineer, Beijing Huakong Technology Co. Ltd, China, 1997 – 1998
- Software Engineer (Part-Time), Wuxi Xixing Iron and Steel Co. Ltd, China, 1995 – 1996

Selected Publications

Book Chapter:


Journal Articles:


Conference Papers:


- “Incorporating Multisim Simulation into Introductory Circuit Courses”, Information Technology Innovation Mini-grant, Indiana State University, 2006.
- “Implementing Neural Networks with FPGA”, Information Technology Research Mini-grant, Indiana State University, 2007.
- Student Activities Chair, 2007 IEEE International Conference on Vehicular Electronics and Safety, Beijing, China
- Finance Chair, 2005 IEEE International Conference on Networking, Sensing and Control, Tucson, Arizona
- Publication Chair, 2005 IEEE Intelligent Vehicles Symposium, Las Vegas, Nevada
- Publication Co-Chair, 2003 IEEE 6th International Conference on Intelligent Transportation Systems, Shanghai, China.
- “Vehicle with Intelligent Systems for Transportation Automation”, sponsored by Arizona Department of Transportation.
- “Web-based Audio Video Educational System: An Open and Integrated Platform for Online Laboratory Experiments, Computer Simulation, and Course Instruction using Internet”, sponsored by NSF.

Synergistic Activities

Professional Activities
Xiaolong Li, Ph.D.

Electronics & Computer Engineering Technology Department
College of Technology, Indiana State University
(812)-237-3451
Email: Xiaolong.Li@indstate.edu

Education

Ph D, University of Cincinnati, 2006.
   Major: Electrical and Computer Engineering
   Dissertation Title: Performance Analysis of Mobile Ad Hoc Networks

MS, Huazhong University of Science & Technology, 2002.
   Major: Electrical Engineering
   Dissertation Title: Study and Implementation of Streaming Media Transmission Technology over the Internet

BS, Huazhong University of Science & Technology, 1999.
   Major: Electrical Engineering
   Dissertation Title: Weak Target Detection based on Correlation Analysis

Professional Experience

- August, 13 – present, Associate Professor, Department of Electronics & Computer Engineering Technology, Indiana State University, IN

- August, 08 – August, 13, Assistant Professor, Department of Electronics, Computer & Mechanical Engineering Technology, Indiana State University, IN

- August, 06 – May, 08, Assistant Professor, Department of Industrial and Engineering Technology, Morehead State University, KY

- September, 03 – June, 06, Research Assistant, Department of Electrical and Computer Engineering, University of Cincinnati, OH

- September, 00 – June, 02, Research Assistant, Department of Electronics and Information Engineering, Huazhong University of Science & Technology, China

Publications

Journal Articles


Li, Xiaolong, Panja, Biswajit, and Zargari, Ahmad, “Modeling and Performance Analysis of Mobile Ad hoc Networks,” Journal of the Technology Interface, Fall Issue, 2007


**Conference Proceedings**


Thangaraj, Aruna, Zeng, Qing-An and Li, Xiaolong, “Performance Analysis of the IEEE 802.11e with TCP ACK Prioritization”, Proceedings of 17th International Conference on Computer, Communications and Networks (ICCCN 08), St. Thomas, US Virgin Islands, August 3-7, 2008.


Li, Xiaolong and Zeng, Qing-An, "Influence of Bit Error Rate on the Performance of IEEE 802.11 MAC Protocol", the proceedings of the IEEE Wireless Communications and Networking Conference 2007 (WCNC’07), Hong Kong, China, March 11-15, 2007.


Career Objectives

Continue work in higher education or related capacity in an engineering technology setting. Remain current in the fields of industrial automation, project management, manufacturing, mechatronics and process control technology. Variety and travel desired.

In Brief

Completing 12 years as a professor and including 5 years as department chair at Indiana State University, Electronics and Computer Engineering Technology (ECET) Department. Entered the education field after 26 years in the Industrial Automation and Control Systems Integration field. Specific experience in the Steel, Paper, Plastics, Power Generation, Machine Tool and Automotive power-train industries. Background includes work as a maintenance supervisor, plant project engineer, construction engineer, teacher, owner of a systems integration business, and automation project engineer for a major automation OEM.

Experience

Indiana State University, College of Technology
- Chair Electronics and Computer Engineering Technology department – 2010 to present
- Tenured Associate professor Electronics and Computer Technology department – 2010 to present
- Interim Director of Student Services, College of Technology – August 2012 to July 2014

Automotive Industry (Rockwell Automation, Allen-Bradley) - 6 years
- Working as Sr. Project Engineer on CNC machine tool and general motion control system retrofits in the automotive industry. Project activity represented $500K hardware, $600K engineering.
- Worked as consultant to OEM machine builders on a green-field automotive transmission plant design and start-up.
- Extensive experience with Allen-Bradley products including CNC, general motion control, AC drives, AC servo drives, PLC’s, MMI, DeviceNet, PC based soft logic control, PC based CNC and Rockwell Software.

Power Generation (JE Ashby Automation Consulting) - 2 years aggregate
- Accomplished control system and instrumentation upgrades on rail car dumping and coal handling systems, boiler soot blowers, Flue Gas De-sulfurization (FGD) control system upgrade ($85K engineering), boiler feedwater, and wastewater treatment plant systems at Hoosier Energy Merom.

Machine Tool Industry (JE Ashby Automation Consulting) - 3 years aggregate
- Worked on control system retrofit projects involving a wide variety of machine tools including vertical and horizontal lathes, machining centers, tool changers, large gantry type milling and turning machines, and grinders.
- Subcontracted electrical and controls portion of a $1.2M machine tool retrofit, carrying project from functional specification through start-up. Hired and supervised field electricians and mechanics (8 employees at peak).

Plastics Industry (Hercules, Inc. – now Taghleef Ind.) - 7 years
- Executed automation projects involving extrusion, co-extrusion, extrusion melt and web temperature control, web handling, winding, slitting, blown and tenter thin film. Projects ranged from $30K to $150K.

Paper Industry (Weston Paper, Terre Haute Mill Division) - 4 years
- Performed maintenance supervision and project work involving wood and recycled paper pulping, refining, Fourdrinier paper machine, web handling, slitting, rewinding and plant power distribution.

Steel Industry (US Steel - USX, Gary Works) - 4 years
- Worked in Hot Rolling, Pickling, Sheet Mill and Tin Mill divisions as turn supervisor and plant project engineer on maintenance and automation projects involving flat rolled steel products.

**Education**

Nova Southeastern University, Ft Lauderdale, Florida. Computer Science Department, PhD in Computing Technology in Education, December 2009.

Indiana State University, Terre Haute, Indiana. MS degree, Electronics and Computer Technology, December 2001.

Indiana State University, Terre Haute, Indiana. BS degree, Electronics and Computer Technology, December 1974.


**Professional**

ISA Certified Automation Professional (CAP) since November 2005 – Certification No. 40062

Senior member ISA, IEEE, ASEE & ATMAE

Member of American Council on Education (ACE) military college credit evaluation teams, 2009-present
Appendix C – Equipment

Major pieces and sets of laboratory equipment used in the delivery and support of the CET BS degree program include:

(12) Microcontroller and digital logic design stations with PCs to support; ECT 303 Microcontroller hardware and software, ECT 308 Microcontroller Applications & Interfacing and ECT 403 Practical Digital Logic Design coursework.

(12) Lot of digital routers, switches and associated hardware and software used in the delivery of ECT 306 Computer Network Management Technology and ECT 401 Data Communication and Internet Technology coursework.

(7) Mitsubishi Model AJ Industrial robots used for ECT281 Robotic Controls.

(10) Rockwell Automation uLogix 1200 PLC trainers used for ECT281 Robotic Controls.

(15) Lot of Fluke digital multi-meters, B&K Precision DC bench top power supplies, circuit prototype boards, resistors and connection materials and leads to support the lab work in ECT165 DC Circuits and Design.

(15) Lot of Fluke digital multi-meters, B&K Precision signal generators, Tektronix oscilloscopes, circuit prototype boards, resistors, capacitors and inductors and connection materials and leads to support the lab work in ECT167 AC Circuits and Design.

(15) Lot of digital logic integrated circuit devices, connecting wiring and Microtek digital logic prototype trainer systems to support lab work in ECT232 Digital Computer Circuits.
Appendix D – Institutional Summary

The following institutional summary information is listed.

1. **The Institution**
   a. Indiana State University  
      200 North 7th Street  
      Terre Haute, IN 47809

   b. Dr. Daniel J. Bradley  
      President

   c. Dr. Joe E. Ashby  
      Associate Professor  
      Electronics & Computer Engineering Technology Department  
      650 Cherry Street, Myers Technology Center TC101  
      Terre Haute, IN 47578  
      812.237.3456

   d. Indiana State University has been accredited by the Higher Learning Commission (HLC) of the North Central Association of Colleges and Schools (NCA) since 1915. The accreditation process has two primary goals: to ensure the quality of institutions of higher education and to promote continuous improvement. ISU was last reviewed in 2010. The next comprehensive evaluation will occur in 2020-2021.

2. **Type of Control**
   Indiana State University (ISU) is a state university.

3. **Educational Unit**
   There are six colleges and one school that comprise the educational units at Indiana State University, namely: The College of Arts and Sciences, Scott College of Business, Bayh College of Education, College of Nursing, Health and Human Services, College of Technology, University College and a school of Graduate Studies. The College of Technology (COT) offers accredited programs at the baccalaureate, master, and doctoral levels. Programs are accredited by the ABET, The Association of Technology, Management, and Applied Engineering (ATMAE, formerly NAIT), The American Council on Construction Education (ACCE) and the National Council for Accreditation of Teacher Education (NCATE/CTTE).

   The COT offers 22 undergraduate programs and 4 graduate programs, organized in five departments including: Applied Engineering & Technology Management, Aviation Technology, Built Environment, Electronics & Computer Engineering Technology (ECET) and Human Resource Development & Performance Technologies. At the fall
2014 reference point, the College of Technology had 75 faculty members, 14 staff members, 1752 undergraduate students, and 363 graduate students. The COT also houses the Air Force Reserve Officer Training Corps and the Technology Services Center that sponsors projects with businesses and industries throughout the region. The programs offered the ECET department has been listed in item 6A of this report.

4. Academic Support Units

- Major courses are delivered by the ECT department (Interim Chair: Dr. William Clyburn, Associate Professor): all ECT courses.
- Department of Mathematics and Computer Science (Chair: Dr. Liz Brown, Professor): CS 256, MATH 115, MATH 129
- Management electives are delivered by the AETM department (Chair: Dr. Randy Peters, Associate Professor): TMGT 471, 478,492, MET 404, 405
- Department of Chemistry and Physics (Chair: Dr. Eric Glendening, Professor): PHYS 105 & 105L, CHEM 100 & 100L
- Department of Biology (Interim Chair Dr. Diana Hews, Professor): BIO112 & 112L
- Department of Earth & Environmental Systems (Chair: Dr. C. Russell Stafford, Professor): ENVI110 & 110L
- Department of English (Chair: Dr. Robert Perrin, Professor): ENG 101, ENG 105, ENG 305T
- Department of Communication (Chair: Dr. Mary L. Kahl, Professor): COMM 101
- Department of Physical Education (Chair: Dr. Don Rogers, Professor): PE 101 & 101L
- College of Arts and Sciences (Dean: John Murray, Professor): All Foundational Studies courses

5. Non-academic Support Units

- COT Student Services (Director: Dr. Kara Harris, Associate Dean)
- ISU Career Center (Director: Ms. Darby Scism)
- Library Services (Dean: Ms. Robin A. Crumrin)
- Admissions (VP Enrollment Management: Mr. John E. Beacon, Dean)
- Office of Information Technology (AVP IT: Dr. Lisa Spence, CIO)

6. Credit Unit

One semester credit represents one class hour or three laboratory hours per week. One academic year normally represents 32 weeks of classes, exclusive of final examinations.

7. Tables

Details follow.
**Table D-1. Program Enrollment and Degree Data**

**Computer Engineering Technology**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Enrollment Year</th>
<th>Total Undergrad</th>
<th>Total Grad</th>
<th>Degrees Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>4th</td>
</tr>
<tr>
<td>Current Year</td>
<td>2014</td>
<td>FT</td>
<td>25</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>PT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2013</td>
<td>FT</td>
<td>30</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>PT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2012</td>
<td>FT</td>
<td>36</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>PT</td>
<td></td>
<td></td>
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<tr>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>2011</td>
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<td>27</td>
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</tr>
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<td></td>
<td>PT</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>4</td>
<td>2010</td>
<td>FT</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>PT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Give official fall term enrollment figures (head count) for the current and preceding four academic years and undergraduate and graduate degrees conferred during each of those years. The "current" year means the academic year preceding the on-site visit.

FT--full time
PT--part time
### Table D-2a. Personnel

**Computer Engineering Technology (Lead Faculty)**

**Year:** Fall 2014

<table>
<thead>
<tr>
<th>HEAD COUNT</th>
<th></th>
<th>FTE²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FT</td>
<td>PT</td>
</tr>
<tr>
<td>Administrative² (Department chair)</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>Faculty (tenure-track)³</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>Other Faculty (excluding student Assistants)</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>Student Teaching Assistants⁴</td>
<td>PT</td>
<td></td>
</tr>
<tr>
<td>Technicians/Specialists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office/Clerical Employees</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>Others⁵ (Adjuncts)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Report data for the program being evaluated.

1. Data on this table should be for the fall term immediately preceding the visit. Updated tables for the fall term when the ABET team is visiting are to be prepared and presented to the team when they arrive.

2. Persons holding joint administrative/faculty positions or other combined assignments should be allocated to each category according to the fraction of the appointment assigned to that category.

3. For faculty members, 1 FTE equals what your institution defines as a full-time load.

4. For student teaching assistants, 1 FTE equals 20 hours per week of work (or service). For undergraduate and graduate students, 1 FTE equals 15 semester credit-hours (or 24 quarter credit-hours) per term of institutional course work, meaning all courses — science, humanities and social sciences, etc.

5. Specify any other category considered appropriate, or leave blank.
### Table D-2b. Personnel

**ECET Department Faculty (Total)**

**Year¹: Fall 2014**

<table>
<thead>
<tr>
<th></th>
<th>HEAD COUNT</th>
<th>FTE²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FT</td>
<td>PT</td>
</tr>
<tr>
<td>Administrative² (Department chair)</td>
<td>FT</td>
<td>0.5</td>
</tr>
<tr>
<td>Faculty (tenure-track)³</td>
<td>FT</td>
<td>6.5</td>
</tr>
<tr>
<td>Other Faculty (excluding student Assistants)</td>
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<td>0.4</td>
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<tr>
<td>Technicians/Specialists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office/Clerical Employees</td>
<td>FT</td>
<td>0</td>
</tr>
<tr>
<td>Others⁵ (Adjuncts)</td>
<td></td>
<td>PT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.5</td>
</tr>
</tbody>
</table>

Report data for the program being evaluated.

1. Data on this table should be for the fall term immediately preceding the visit. Updated tables for the fall term when the ABET team is visiting are to be prepared and presented to the team when they arrive.

2. Persons holding joint administrative/faculty positions or other combined assignments should be allocated to each category according to the fraction of the appointment assigned to that category.

3. For faculty members, 1 FTE equals what your institution defines as a full-time load.

4. For student teaching assistants, 1 FTE equals 20 hours per week of work (or service). For undergraduate and graduate students, 1 FTE equals 15 semester credit-hours (or 24 quarter credit-hours) per term of institutional course work, meaning all courses — science, humanities and social sciences, etc.

5. Specify any other category considered appropriate, or leave blank.
Signature Attesting to Compliance

By signing below, I attest to the following:

That _______________________ (Name of the program(s)) has conducted an honest assessment of compliance and has provided a complete and accurate disclosure of timely information regarding compliance with ABET’s Criteria for Accrediting Engineering Technology Programs to include the General Criteria and any applicable Program Criteria, and the ABET Accreditation Policy and Procedure Manual.

________________________________________
Dean’s Name (As indicated on the RFE)

________________________________________  ________________
Signature                        Date