

**DEPARTMENT**  
**OF**  
**ELECTRICAL AND COMPUTER ENGINEERING TECHNOLOGY**  
**COLLEGE OF ENGINEERING, TECHNOLOGY, AND COMPUTER SCIENCE**  
**INDIANA UNIVERSITY-PURDUE UNIVERSITY**  
**FORT WAYNE**  
[www.ipfw.edu](http://www.ipfw.edu)

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Admissions Office	<a href="http://www.ipfw.edu">www.ipfw.edu</a>	(260) 481-6812
IPFW Academic Advising	<a href="http://www.ipfw.edu">www.ipfw.edu</a>	(260) 481-5710
Counseling, Testing and Placement		(260) 481-6599
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## TABLE OF CONTENTS

The Department of ECET – An Introduction.....	3
Cooperative Education.....	4
Graduate Programs.....	5
Industrial Advisory Committee.....	6
EET Plan of Study.....	9
EET (Computer Option) Plan of Study.....	12
CPET Plan of Study.....	15
EET Course Flowchart.....	16
EET (Computer Option) Course Flowchart.....	17
CPET Course Flowchart.....	18
Approved ECET/CPET Electives.....	19
Advanced Microprocessor Certificate .....	20
Certificate in Electronics Communications .....	21
Computer Controlled Systems Certificate.....	21
Certificate in Computer Networking.....	22
CPET Description of Courses.....	24
EET Description of Courses.....	26
Other Required Courses in the Curriculum.....	32
ECET Faculty & Staff.....	35

## **The Department of Electrical and Computer Engineering Technology – An Introduction**

The department of Electrical and Computer Engineering Technology (ECET) in the College of Engineering, Technology, and Computer Science (ETCS), serves the needs of students, industry, and government in northeastern Indiana. The department offers the B.S. in Computer Engineering Technology (CPET), the Bachelor of Science (B.S.) in Electrical Engineering Technology (EET) and the Associate of Science (A.S.) in Electrical Engineering Technology degree programs. The EET programs are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET<sup>1</sup>) and the CPET program is preparing for accreditation.

The two-year A.S. EET program is a combination of courses in electricity, electronics, computers, mathematics, science, and general academic areas. The program helps students prepare for employment as electrical/electronic or computer technicians, and provides knowledge in fields such as computer electronics, local area networking, industrial electronics, communication electronics, military electronics, automation, electronics servicing, and electrical power.

The four-year B.S. EET program prepares students for careers in many fields related to engineering, in electronics or computer related industries, manufacturing, engineering sales, or any industry that uses electric power, electronic communications, computer networks, or computer-controlled equipment. The program provides students with advanced study in specialized fields of electronics and computer networking and provides other courses to build a foundation of technical and non-technical knowledge that is essential in modern industry.

The B.S. in CPET program is focuses on applications and application packages in areas of information technology. This can be contrasted with Computer Engineering programs where the focus is on the theory and design of computer-based systems and Computer Science with a focus on computer program design. A graduate of this program will have the training and skills encompassed by a combination of CPET, ECET, CS, and supporting science, mathematics, general education, and other technical areas. CPET courses generally focus on software strongly related to hardware, while ECET courses focus on hardware and related software. A strong feature of the CPET program is the adaptability of the curriculum to concentrate on technical applications similar to those being developed and implemented for use in industry such as: industrial networking, web-based control, electronic devices, web services, and other aspects of enterprise networking. During the latter portion of the B.S. in CPET program, the student also qualifies for an A.S. in EET.

Laboratory experience is an essential part of all three curricula. All programs and options integrate hands-on laboratories with lectures. Distance learning courses, including TV and Internet courses are also integrated into the curriculum.

Over 90% of students continue for the B.S. degree and the ECET department has more than 1100 alumni who hold technical and managerial positions nationwide. The most common job titles are engineer, technician, technologist, and engineering manager. Some companies with many employed graduates are ITT Industries, United Technologies (Carrier Division), BAE, General Electric Industrial Systems, Raytheon, American Electric Power, General Motors, and International Truck and Engine (Navistar).

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<sup>1</sup> The ABET is located at 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, (410) 347-7700, [www.abet.org](http://www.abet.org).

If you are a regularly admitted first-year student, you must take the IPFW English, mathematics, and reading placement tests before registering for classes. It is recommended that you take the placement tests well in advance of your beginning semester. Testing dates and procedures can be obtained from the Counseling, Testing, and Placement staff, in Office KT 232B, phone 481-6599 or 481-6600.

You may enroll either as a full-time or as a part-time student. ECET and CPET courses are offered both during the day and in the evening.

As an ECET student, you are eligible and encouraged to join the student branch of the Institute of Electrical and Electronic Engineers (IEEE). Also, membership in the Pi Gamma chapter of the engineering technology honor society, Tau Alpha Pi, is available for those meeting the scholastic requirements. Details about these groups, the Society of Women Engineers (SWE) and the Society of Black Engineers (SBE) are available from your ECET advisor.

The Master of Science in Technology with principle technology areas

- Advanced Computer Applications
- Information Technology

is available to ECET and other B.S. degree graduates. Some details are provided later and please see your advisor for additional information

### **Mission of the ECET Department**

The mission of the department is to offer high quality undergraduate EET, CPET, and continuing education programs. These programs meet regional needs and include credit and non-credit training in electrical, electronics, computer applications, and computer networking. The department seeks to advance and share technical knowledge through teaching and creative endeavors, and to work with regional industries to develop and increase technically knowledgeable human resources.

### **ECET Strategic Goals**

- 1) Offer relevant and innovative degree and certificate programs to meet the needs of Northeast Indiana
- 2) Support the campus environment for a diverse community of learners
- 3) Promote the scholarly and creative achievements of faculty and students
- 4) Pursue the continuous quality improvement of the department

### **Cooperative Education**

The Department of Electrical and Computer Engineering Technology is a participant in the Cooperative Education Program at IPFW. Cooperative Education at IPFW is a formal plan that allows you to alternate academic study with study related work. The work experience is considered vital to the learning process. Not only must the employment be related to your field of study, but must increase in responsibility and difficulty as you advance. You receive credit and pay for the co-op experience.

You gain work experience in your chosen field of study, pretest your career choice, finance your education, expand your placement options, and develop your human relations skills in the work place. Neither you nor your employer are obligated to make or accept an offer for permanent employment after co-op ends. You typically enter the co-op program after your freshman year and alternate full time semesters of study with full time semester of work. Generally two co-op students share one position and

alternate semesters. Additional information is available through the Co-op Education office in room NF 337 (481-6918) or the department coordinator (Prof. Laverghetta 481-6423).

### **Graduate Programs (IPFW/Purdue)**

If you are considering enrollment in the Master of Technology program you should visit the website at: [http://www.etc.ipfw.edu/ms\\_technology.php](http://www.etc.ipfw.edu/ms_technology.php) and see your advisor.

### **Master of Science in Technology**

The M.S. in Technology is designed for students with both technical and non-technical backgrounds and will provide the knowledge and skills required for its graduates to function effectively in a technical environment and to accept increasing responsibility in technical leadership positions. The program permits specialization in an area of modern technology applicable to each student's working environment or area of interest. Emphasis is placed on preparing students for technical leadership positions in business and industry, faculty positions in technology and engineering technology programs at the community college and university levels, or to continue for a Ph.D. in Technology or a closely related field at Purdue or another university.

A total of 33 semester credit hours are required for the degree with course work shown below:

**Technical Core** (9 credit hours)

Measurement and Evaluation in Industry and Technology **OR** Statistical Methods  
Quality and Productivity in Industry and Technology  
Analysis of Research in Industry and Technology

**Principal Technology Area** (12 credit hours)

Information Technology and Advanced Computer Applications

**Technical Electives** (9 credit hours)

Students choose three technical electives from a list of approved graduate level courses that include courses from Applied Computer Science, Business, Communication, English, Mathematics, Organizational Leadership and Supervision, Statistics, Technology, and other graduate courses offered at IPFW.

**Directed Project** (3 credit hours)

This requirement consists of a one-credit hour project proposal course followed by a two-credit hour course during which the project is completed and the results defended.

Information on all IPFW graduate programs can be found at <http://www.ipfw.edu/academics/gradstudies/>

## ECET Industrial Advisory Committee

The ECET Industrial Advisory Committee (IAC) represents organizations that employ graduates, acts in a leadership role in the future direction of Electrical and Computer Engineering Technology education, and advises the department in establishing, achieving, and assessing its goals. The committee reviews program curricula, and provides advice on current and future needs in the technical fields in which graduates are employed.

### Board Members

Tom Allyn, Senior Engineer  
General Motors Corporation

Dave Altizer, Director  
American Electric Power

Jon Beasley, Section Manager  
Verizon

Joseph Bender, Staff Engineer  
ITT Industries Space Systems

Matt Bishop, Manager of Biomedical Department  
Parkview Hospital

Randy Brock, Manager,  
FTW Engineering, BAE

Cynthia Charbonneau, IT Manager  
ITT Industries

Thomas Groves, Director of Biomedical  
Svcs., Lutheran Hospital

Paul deMond, Manager  
Undersea Sensor Systems, Inc

Rick Malecki, Director, Plant Resident,  
Mexico & Export Engr, International  
Truck & Engine Co

Medrick McClain, Manager  
Raytheon

Mike Mourey, Manager of Technical  
Support, IPFW

Mike Newell, Engineering Manager  
ITT Aerospace

Jerry Ryan, Senior Staff Engineer,  
United Technologies Electronic Controls

### Grade Definitions

“A” Reflects superior performance far in excess of minimum academic requirements. This grade will be awarded for truly exceptional performance.

“B” Reflects performance consistently and significantly exceeding the course requirements. The student frequently exceeds expectations and has a comprehensive knowledge of course material.

“C” Performance is satisfactory, acceptable, meets and occasionally exceeds the course requirements. This grade is a performance standard expected of students.

“D” Performance is below the standard of the course, but not failing. Improvement would be needed in subsequent courses for graduation. **A GRADE OF “D” IN AN ECET COURSE IS A SIGN OF SCHOLASTIC DIFFICULTY. IT IS STRONGLY RECOMMENDED THAT ANYONE RECEIVING A “D” RETAKE THE COURSE**

“F” Performance is deficient and must be improved substantially to meet the satisfactory grade requirements. The student has not demonstrated the ability to proceed with the academic program.

**TYPICAL PLAN OF STUDY  
ELECTRICAL ENGINEERING TECHNOLOGY (EET)  
ASSOCIATE OF SCIENCE DEGREE  
EFFECTIVE FALL SEMESTER 2005**

**FRESHMAN YEAR**

**FIRST SEMESTER**

Credits	Course	
(4)	ECET 107	Introduction to Circuit Analysis
(4)	ECET 111	Digital Circuits
(3)	ECET 114	Introduction to Microcomputers
(3)	MA 153	Algebra and Trigonometry I
(MA 151-5 Credit Hours may be substituted for the MA 153, MA 154 sequence)		
(3)		General Education Elective (Area IV)
(17)	Total	

**SECOND SEMESTER**

(4)	ECET 157	Electronics Circuits Analysis
(3)	ECET 146	Digital Circuits II
(3)	MA 154	Algebra and Trigonometry II
(4)	PHYS 218	General Physics I
(3)	CPET 190	Problem Solving with MATLAB
(17)	Total	

**SOPHOMORE YEAR**

**THIRD SEMESTER**

(4)	ECET 207	AC Electronics Circuit Analysis
(4)	ECET 205	Introduction to Microprocessors
(3)	ECET 264	C Programming Language Applications
(4)	MA 227	Calculus for Technology I
(3)	COM 114	Fundamentals of Speech Communication
(18)	Total	

**FOURTH SEMESTER**

(4)	ECET 231	Electrical Power and Controls
(4)	ECET 303	Communications I OR
	ECET 302	Introduction to Control Systems
(3)	ECET 296	Electronic System Fabrication
(3)	*MA 228	Calculus for Technology II
(3)	ENG W131	Elementary Composition I
(17)	Total	

**TOTAL CREDITS: 69**

\*Terminal A.S. may substitute CHEM 111 or STAT 301

**TYPICAL PLAN OF STUDY  
ELECTRICAL ENGINEERING TECHNOLOGY (EET)  
BACHELOR OF SCIENCE DEGREE  
EFFECTIVE FALL SEMESTER 2005**

**JUNIOR YEAR**

**FIFTH SEMESTER**

Credit	Course	
(4)	ECET 307	Analog Network Signal Processing
(4)	ECET 302	Introduction to Control Systems   OR
	ECET 303	Communications I
(3)	MA 321	Advanced Technical Mathematics
(3)	CHM 111	General Chemistry
(14)	Total	

**SIXTH SEMESTER**

(3)		General Education Elective (Area IV)
(4)	ECET 357	Real-Time Digital Signal Processing
(3)	IET 105	Industrial Management
(3)	STAT 301	Elementary Statistical Methods I
(3)	ENG W234	Technical Report Writing
(16)	Total	

**SENIOR YEAR**

**SEVENTH SEMESTER**

(3)	ECET 470	Technology Project Management
(4)		ECET/CPET Elective (Junior or Senior Level)
(1)	ECET 490	Senior Design Project Phase I
(3)		General Education Elective (Area III)
(4)		ECET/CPET Elective (Junior or Senior Level)
(15)	Total	

**EIGHTH SEMESTER**

(4)		ECET/CPET Elective (Junior or Senior Level)
(2)	ECET 491	Senior Design Project Phase II
(3)	ENG W421	Technical Writing Projects
(3)		Non-ECET Elective (Junior or Senior Level)
(3)		General Education Elective (Area V)
(15)	Total	

**TOTAL CREDITS:** 60 (Junior and Senior Year)

**GRAND TOTAL:** 129 Credits for Bachelor of Science Degree



**PLAN OF STUDY** (AS OF FALL, 2005)  
 DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING TECHNOLOGY  
 SCHOOL OF ENGINEERING TECHNOLOGY AND COMPUTER SCIENCE  
 INDIANA-PURDUE UNIVERSITY FORT WAYNE, INDIANA

Name _____
Date Entered _____
Advisor _____

**Associate of Science Degree... Electrical Engineering Technology**

Semester 1	Cr	<sup>1</sup> Gr	Date	Semester 2	Cr	<sup>1</sup> Gr	Date	Semester 3	Cr	<sup>1</sup> Gr	Date	Semester 4	Cr	<sup>1</sup> Gr	Date
ECET 107	4	—	—	ECET 157	4	—	—	ECET 207	4	—	—	ECET 231	4	—	—
ECET 111	4	—	—	ECET 146	3	—	—	ECET 205	4	—	—	ECET 302 or ECET 303	4	—	—
ECET 114	3	—	—	MA 154	3	—	—	ECET 264	3	—	—	ECET 296	3	—	—
MA 153	3	—	—	PHYS 218	4	—	—	MA 227	4	—	—	MA 228*	3	—	—
<sup>1</sup> Gen Ed Elect (Area IV)	3	—	—	CPET 190	3	—	—	COM 114	3	—	—	ENG W131	3	—	—
(MA 151 may be subst. for MA 153/154)	—	—	—		—	—	—		—	—	—		—	—	—
	<u>17</u>				<u>17</u>				<u>18</u>				<u>17</u>		

\*Terminal A.S. May be subst. CHEM 111 or STAT 301

Associate of Science Degree Awarded \_\_\_\_\_

**Bachelor of Science Degree... Electrical Engineering Technology**

Semester 5	Cr	<sup>1</sup> Gr	Date	Semester 6	Cr	<sup>1</sup> Gr	Date	Semester 7	Cr	<sup>1</sup> Gr	Date	Semester 8	Cr	<sup>1</sup> Gr	Date
ECET 307 ECET 302 or ECET 303	4	—	—	<sup>1</sup> Gen Ed Elect (Area IV)	3	—	—	ECET 470	3	—	—	<sup>2</sup> ECET/CPET Elect	4	—	—
MA 321	4	—	—	ECET 357	4	—	—	<sup>2</sup> ECET/CPET Elect	4	—	—	ECET 491	2	—	—
CHM 111	3	—	—	IET 105	3	—	—	ECET 490	1	—	—	ENG W 421	3	—	—
	—	—	—	STAT 301	3	—	—	<sup>1</sup> Gen Ed Elect (Area III)	3	—	—	<sup>2,3</sup> Non ECET Elect	3	—	—
	—	—	—	ENG W234	3	—	—	<sup>1</sup> Gen Ed Elect (Area V)	3	—	—		3	—	—
	<u>14</u>				<u>16</u>				<u>4</u>				<u>3</u>		

NOTE 1: Write in course number  
 NOTE 2: Junior/Senior level

NOTE 3: Coop or Mil. Service may be used here

Bachelor of Science Degree Awarded \_\_\_\_\_

**TYPICAL PLAN OF STUDY  
ELECTRICAL ENGINEERING TECHNOLOGY (COMPUTER OPTION)  
ASSOCIATE OF SCIENCE DEGREE  
EFFECTIVE FALL SEMESTER 2005**

**FIRST SEMESTER**

Credit	Course	
(4)	CPET 101	Electrical Circuits
(4)	ECET 111	Digital Circuits
(3)	ECET 114	Introduction to Microcomputers
(3)	MA 153	Algebra and Trigonometry I
(MA 151-5 Credit Hours may be substituted for the MA 153, MA 154 sequence)		
(3)	ENG W131	Elementary Composition I
(17)	Total	

**SECOND SEMESTER**

(4)	ECET 157	Electronics Circuit Analysis
(3)	ECET 146	Digital Circuits II
(3)	CPET 181 or ECET 234	Computer Operating Systems Basics PC Systems I
(3)	MA 154	Algebra and Trigonometry I
(3)	CPET 190	Problem Solving with MATLAB
(16)	Total	

**THIRD SEMESTER**

(4)	ECET 207	AC Electronics Circuit Analysis
(4)	ECET 205	Introduction to Microprocessors
(3)	ECET 264	C Programming Language Applications
(4)	MA 227	Calculus for Technology I
(3)		General Education Elective (Area IV)
(18)	Total	

**FOURTH SEMESTER**

(3)	ECET 296	Electronic System Fabrication
(3)	CPET 281 or CPET 213	Local Area Networks and Management Web-based Analysis and Design
(4)	PHYS 218	General Physics I
(3)	*MA 228	Calculus for Technology II
(3)	COM 114	Fundamentals of Speech Communication
(16)	Total	

TOTAL CREDITS: 67

\*Terminal A.S. may substitute CHEM 111 or STAT 301

**TYPICAL PLAN OF STUDY  
ELECTRICAL ENGINEERING TECHNOLOGY (COMPUTER OPTION)  
BACHELOR OF SCIENCE DEGREE  
EFFECTIVE FALL SEMESTER 2005**

**FIFTH SEMESTER**

Credit	Course	
(4)	ECET 307	Analog Network Signal Processing
(4)	CPET 355	Data Communications and Networking
(3)	CHM 111	General Chemistry
(3)	MA 175	Introductory Discrete Mathematics
(14)	Total	

**SIXTH SEMESTER**

(4)	ECET 357	Real-Time Digital Signal Processing
(3)	STAT 301	Elementary Statistical Methods I
(3)	IET 105	Industrial Management
(3)	ENG W234	Technical Report Writing
(3)		General Education Elective (Area IV)
(16)	Total	

**SEVENTH SEMESTER**

(3)	CPET 470	Technology Project Management
(1)	ECET 490	Senior Design Project Phase I
(4)		CPET/ECET Elective
(4)		ECET/CPET Elective (Junior or Senior Level)
(3)		General Education Elective (Area III)
(15)	Total	

**EIGHTH SEMESTER**

(2)	ECET 491	Senior Design Project Phase II
(4)		ECET/CPET Elective (Junior or Senior Level)
(3)	ENG W421	Technical Writing Projects
(3)		Non-ECET Elective (Junior or Senior Level)
(3)		General Education Elective (Area V)
(15)	Total	

**TOTAL CREDITS:** 60  
**GRAND TOTAL:** 127 for Bachelor of Science Degree



**PLAN OF STUDY** (AS OF FALL, 2005)  
 DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING TECHNOLOGY  
 SCHOOL OF ENGINEERING TECHNOLOGY AND COMPUTER SCIENCE  
 INDIANA-PURDUE UNIVERSITY FORT WAYNE, INDIANA

Name _____
Date Entered _____
Advisor _____

**Associate of Science Degree... Electrical Engineering Technology (Computer Option)**

Semester 1	Cr	<sup>1</sup> Gr	Date	Semester 2	Cr	<sup>1</sup> Gr	Date	Semester 3	Cr	<sup>1</sup> Gr	Date	Semester 4	Cr	<sup>1</sup> Gr	Date
CPET 101	4	—	—	ECET 157	4	—	—	ECET 207	4	—	—	ECET 296	3	—	—
ECET 111	4	—	—	ECET 146	3	—	—	ECET 205	4	—	—	CPET 281 or CPET 213	3	—	—
ECET 114	3	—	—	CPET 181 or ECET 234	3	—	—	ECET 264	3	—	—	PHYS 218	4	—	—
MA 153	3	—	—	MA 154	3	—	—	MA 227	4	—	—	MA 228*	3	—	—
ENG W131	3	—	—	CPET 190	3	—	—	<sup>1</sup> Gen Ed Elect (Area IV)	3	—	—	COM 114	3	—	—
(MA 151 may be subst. for MA 153/154)															
	<u>17</u>				<u>16</u>				<u>18</u>				<u>16</u>		

\*Terminal A.S. May be subst. CHEM 111 or STAT 301

Associate of Science Degree Awarded \_\_\_\_\_

**Bachelor of Science Degree... Electrical Engineering Technology (Computer Option)**

Semester 5	Cr	<sup>1</sup> Gr	Date	Semester 6	Cr	<sup>1</sup> Gr	Date	Semester 7	Cr	<sup>1</sup> Gr	Date	Semester 8	Cr	<sup>1</sup> Gr	Date
ECET 307	4	—	—	ECET 357	4	—	—	CPET 470	3	—	—	ECET 491	2	—	—
CPET 355	4	—	—	STAT 301	3	—	—	ECET 490	1	—	—	<sup>2</sup> ECET/CPET Elect	4	—	—
CHM 111	3	—	—	IET 105	3	—	—	CPET/ECET Elect	4	—	—	ENG W 421	3	—	—
<sup>2,3</sup> Non ECET Elect	3	—	—	ENG W234	3	—	—	<sup>2</sup> ECET/CPET Elect	4	—	—	MA 175	3	—	—
				<sup>1</sup> Gen Ed Elect (Area IV)	3	—	—	<sup>1</sup> Gen Ed Elect (Area III)	3	—	—	<sup>1</sup> Gen Ed Elect (Area V)	3	—	—
	<u>14</u>				<u>16</u>				<u>15</u>				<u>15</u>		

NOTE 1: Write in course number

NOTE 2: Junior/Senior level

NOTE 3: Coop or Mil. Service may be used here

Bachelor of Science Degree Awarded \_\_\_\_\_

**TYPICAL PLAN OF STUDY  
COMPUTER ENGINEERING TECHNOLOGY (CPET)  
BACHELOR OF SCIENCE DEGREE  
EFFECTIVE FALL SEMESTER 2005**

**FIRST SEMESTER**

Credit	Course	
(4)	CPET 101	Electrical Circuits
(4)	ECET 111	Digital Circuits
(3)	ECET 114	Introduction to Microcomputers
(3)	MA 153	Algebra and Trigonometry I
(MA 151-5 Credit Hours may be substituted for the MA 153, MA 154 sequence)		
(3)	ENG W131	Elementary Composition I
(17)	Total	

**SECOND SEMESTER**

(4)	ECET 157	Electronics Circuits Analysis
(3)	ECET 146	Digital Circuits II
(3)	CPET 181 or ECET 234	Computer Operating Systems Basics PC Systems I
(3)	MA 154	Algebra and Trigonometry II
(3)	CPET 190	Problem Solving with MATLAB
(16)	Total	

**THIRD SEMESTER**

(4)	ECET 207	AC Electronics Circuit Analysis
(4)	ECET 205	Introduction to Microprocessors
(3)	ECET 264	C Programming Language Applications
(4)	PHYS 218	General Physics I
(3)		General Education Elective (Area IV)
(18)	Total	

**FOURTH SEMESTER**

(3)	ECET 296	Electronic System Fabrication
(3)	CPET 281 or CPET 213	Local Area Networks and Management Web-based Analysis and Design
(4)	MA 227	Calculus for Technology I
(4)	CS 160	Introduction to Computer Science I
(3)	COM 114	Fundamentals of Speech Communication
(17)	Total	

**TOTAL CREDITS: 67**

**TYPICAL PLAN OF STUDY  
COMPUTER ENGINEERING TECHNOLOGY (CPET)  
BACHELOR OF SCIENCE DEGREE  
EFFECTIVE FALL SEMESTER 2004**

**FIFTH SEMESTER**

Credit	Course	
(4)	CPET 355	Data Communication and Networking
(3)		CPET/ECET Elective
(4)	CS 161	Introduction to Computer Science II
(3)	MA 228	Calculus for Technology II
(14)	Total	

**SIXTH SEMESTER**

(3)	CPET 364	Networking Security
(3)		CPET Elective
(3)	IET 105	Industrial Management
(3)	STAT 301	Elementary Statistical Methods I
(3)	ENG W234	Technical Report Writing
(15)	Total	

**SEVENTH SEMESTER**

(3)	CPET 470	Technology Project Management
(1)	CPET 490	Senior Design Project Phase I
(3)		CPET/ECET/CS Elective (See Advisor/Junior or Senior Level)
(3)	CHM 111	General Chemistry I
(3)		General Education Elective (Area III)
(3)		General Education Elective (Area IV)
(16)	Total	

**EIGHTH SEMESTER**

(3)		CPET/ECET/CS Elective (See Advisor/Junior or Senior Level)
(2)	CPET 491	Senior Design Project Phase II
(3)	MA 175	Introductory Discrete Mathematics
(3)	ENG W421	Technical Writing Projects
(3)		General Education Elective (Area V)
(14)	Total	

**TOTAL CREDITS:** 61 (Junior and Senior year)

**GRAND TOTAL:** 128 Credits for Bachelor of Science Degree



**PLAN OF STUDY** (AS OF FALL, 2005)  
 DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING TECHNOLOGY  
 SCHOOL OF ENGINEERING TECHNOLOGY AND COMPUTER SCIENCE  
 INDIANA-PURDUE UNIVERSITY FORT WAYNE, INDIANA

**Bachelor of Science Degree  
 Computer Engineering Technology (CPET)**

**Freshman/Sophomore Year**

Semester 1	Cr	Gr	Date	Semester 2	Cr	Gr	Date	Semester 3	Cr	Gr	Date	Semester 4	Cr	Gr	Date
CPET 101	4	—	—	ECET 157	4	—	—	ECET 205	4	—	—	ECET 296	3	—	—
ECET 111	4	—	—	ECET 146	3	—	—	ECET 264	3	—	—	CPET 281 or CPET 213	3	—	—
ECET 114	3	—	—	CPET 181 or ECET 234	3	—	—	PHYS 218	4	—	—	MA 227	4	—	—
MA 153	3	—	—	MA 154	3	—	—	ECET 207	4	—	—	CS 160	4	—	—
ENG W131	3	—	—	CPET 190	3	—	—	Gen Ed Elect (Area IV)	3	—	—	COM 114	3	—	—
	<u>17</u>				<u>16</u>				<u>18</u>				<u>17</u>		

**Junior/Senior Year**

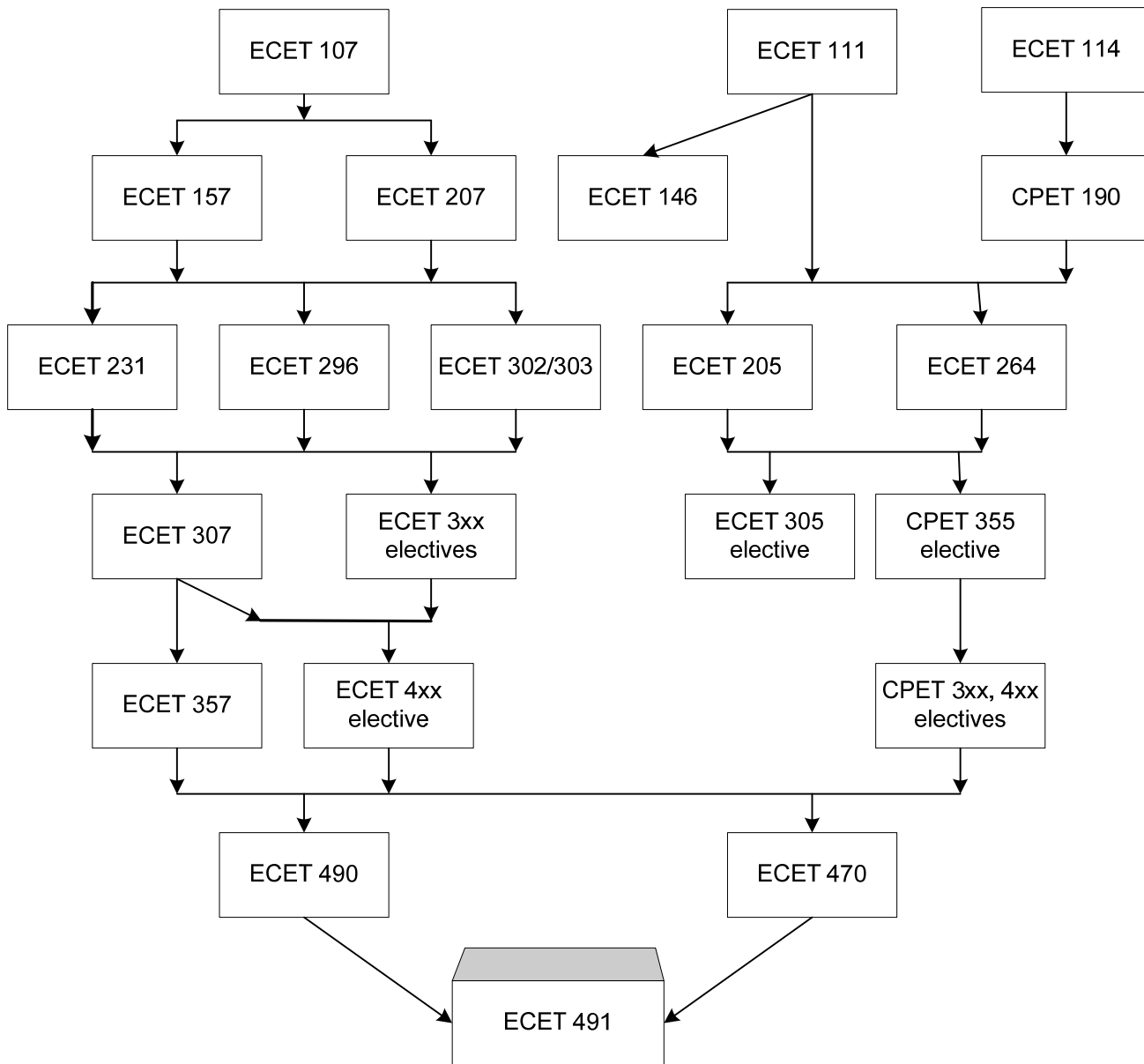
Semester 5	Cr	Gr	Date	Semester 6	Cr	Gr	Date	Semester 7	Cr	Gr	Date	Semester 8	Cr	Gr	Date
CPET 355	4	—	—	CPET 364	3	—	—	CPET 470	3	—	—	<sup>1</sup> CPET/ECET/ CS Elect	3	—	—
<sup>1</sup> CPET/ECET	3	—	—	CPET Elect	3	—	—	CPET 490	1	—	—	CPET 491	2	—	—
CS 161	4	—	—	IET 105	3	—	—	<sup>1</sup> CPET/ECET/ CS Elect	3	—	—	MA 175	3	—	—
MA 228	3	—	—	STAT 301	3	—	—	CHM 111	3	—	—	ENG W 421	3	—	—
				ENG W234	3	—	—	Gen Ed Elect (Area III)	3	—	—	Gen Ed Elect (Area V)	3	—	—
								Gen Ed Elect (Area IV)	3	—	—				
	<u>14</u>				<u>15</u>				<u>16</u>				<u>14</u>		

NOTE 1: See Advisor/Junior or Senior Level  
 NOTE 2: Coop or Mil. Service may be used here

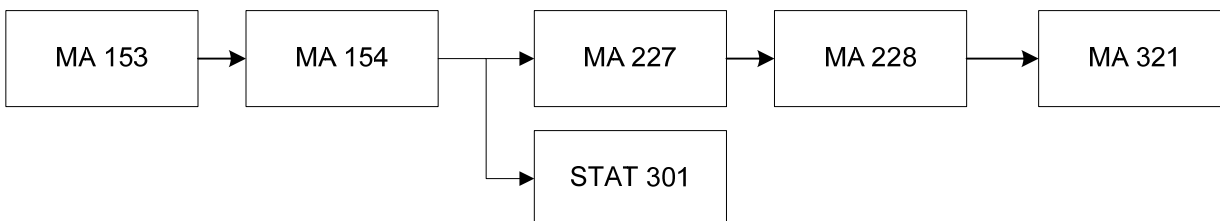
Bachelor or Science Degree Awarded \_\_\_\_\_

Name _____
Date Entered _____
Advisor _____

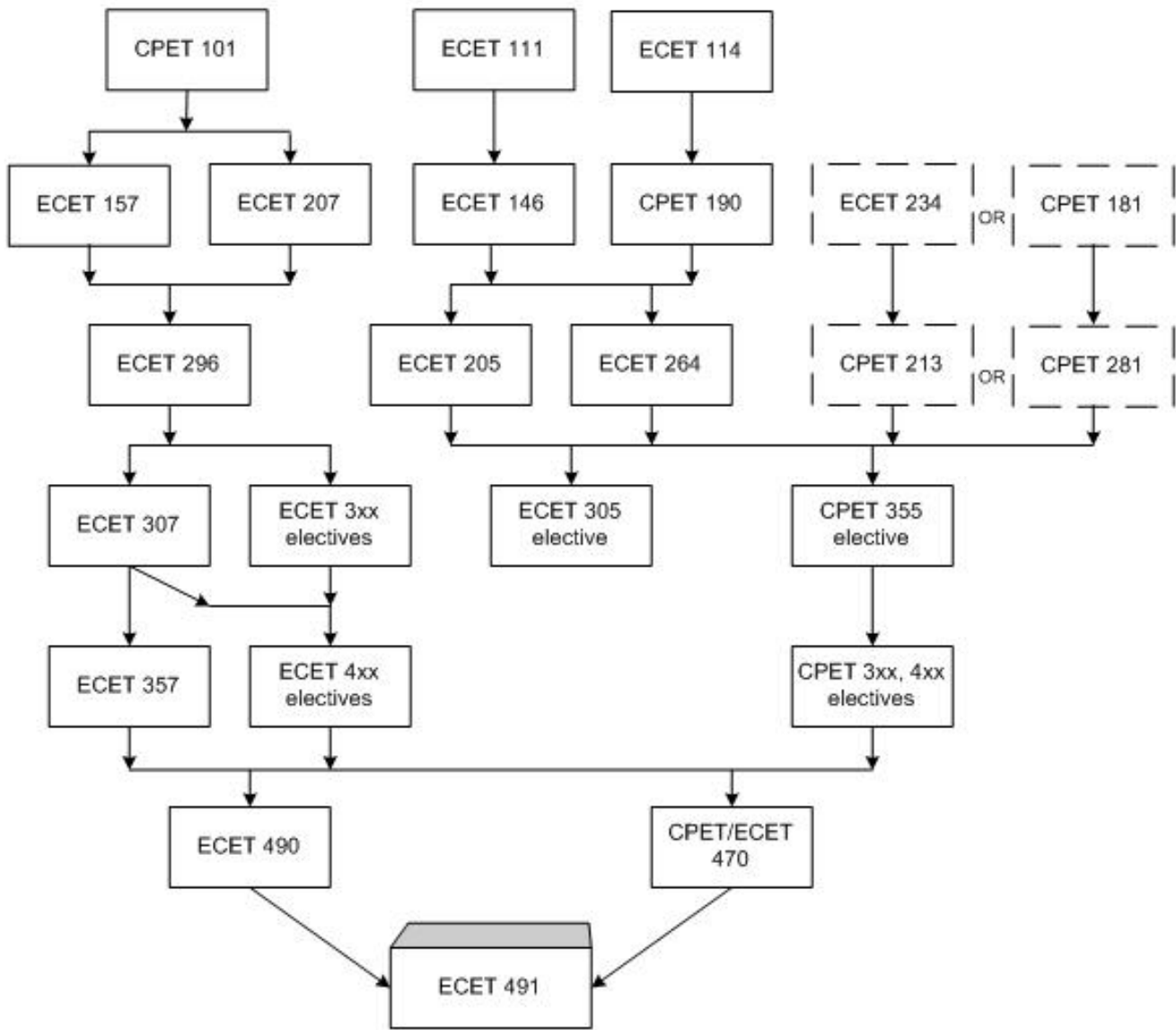
## EET Course Flowchart



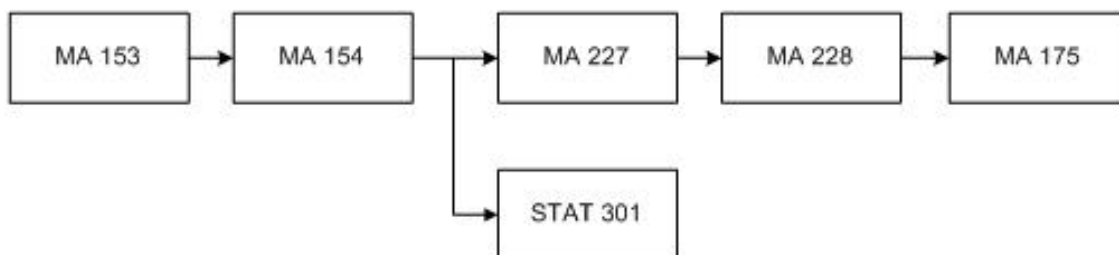
## Math Course Flowchart



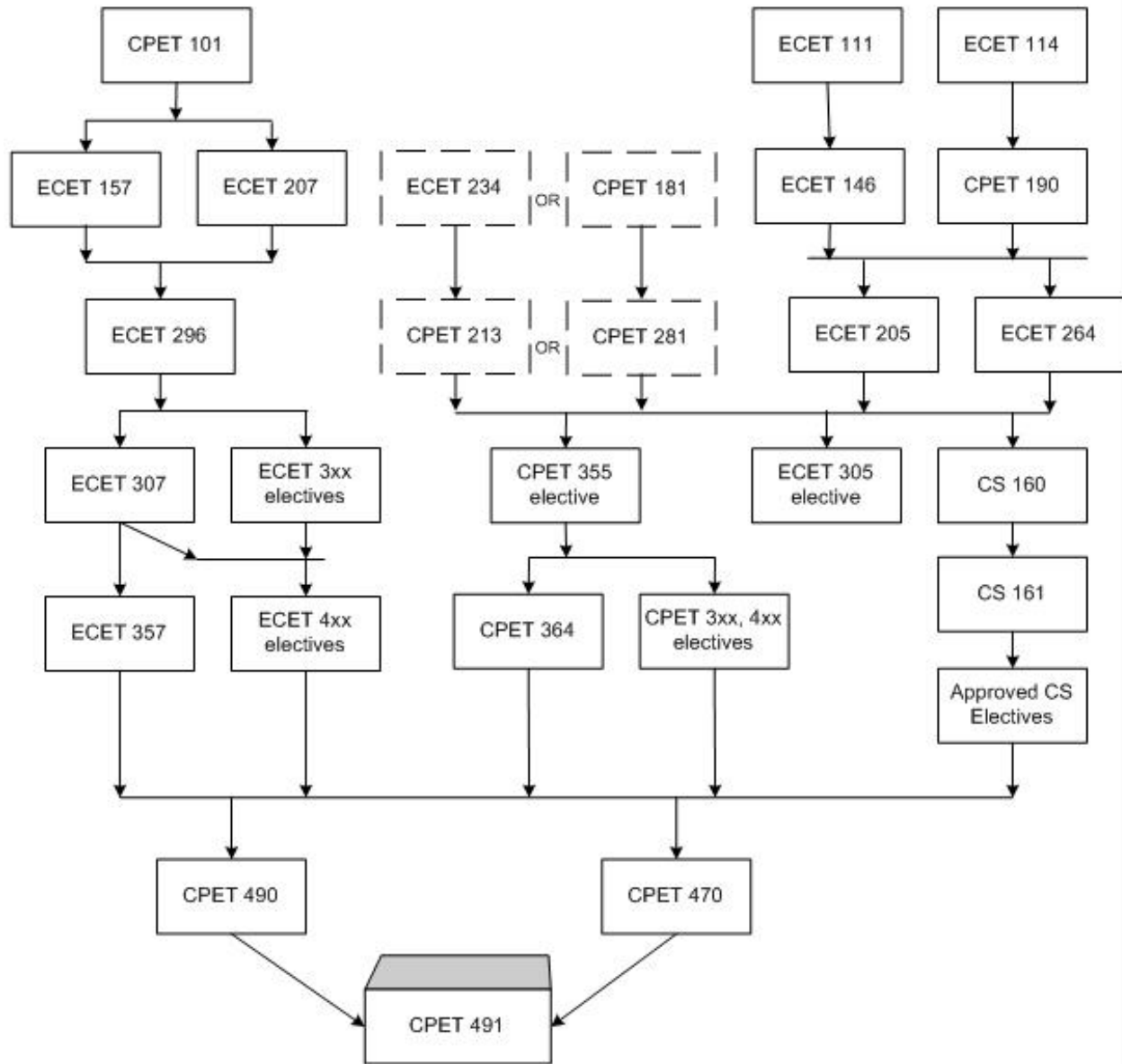
**EET (Computer Option) Course Flowchart**



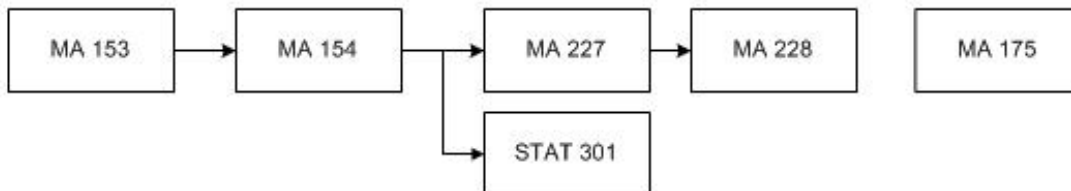
**Math Course Flowchart**



**BS Computer Engineering Technology Course Flowchart**



**Math Course Flowchart**



## APPROVED ECET/CPET ELECTIVES

The options shown below are available and designed to provide you with in-depth study in a specific area. The professors responsible for each area are also listed.

### COMMUNICATIONS

(4)	ECET 303	Communications I (Analog Communications)
(4)	CPET 355	Data Communications and Networking
(4)	ECET 377	Introduction to Fiber Optics
(4)	ECET 403	Communications II (Digital Communications)
(3)	ECET 414	Wireless Communications
(4)	ECET 468	Microwave Solid State Devices
(4)	ECET 473	Microwaves
(3)	CPET 493	Wireless Networking

### CONTROLS INSTRUMENTATION

(4)	ECET 302	Introduction to Control Systems
(4)	ECET 361	Introduction to PLC & Pneumatic Systems
(4)	ECET 365	Electrical Measurements
(4)	ECET 472	Automatic Control Systems

### COMPUTER/LOGIC

(4)	ECET 305	Advanced Microprocessors
(4)	ECET 346	Advanced Digital Circuits
(4)	ECET 375	Computer Controlled System Design
(4)	ECET 382	C++ Object Oriented Programming for Industrial Applications
(4)	ECET 434	PC Systems II
(4)	ECET 466	Windows Programming for Industrial Applications
(4)	ECET 486	Robotics and Control Electronics with Microcomputers

### COMPUTER NETWORKING/ENTERPRISE APPLICATIONS

(3)	CPET 181	Computer Operating Systems Basics
(3)	CPET 213	Web-based Analysis and Design
(3)	CPET 281	Local Area Networks and Management
(4)	CPET 355	Data Communications and Networking
(3)	CPET 364	Networking Security
(3)	CPET 384	Wide Area Networks Design
(3)	CPET 470	Technology Project Management
(3)	CPET 493	Wireless Networking
(4)	CPET 494	Java Programming Applications
(4)	CPET 495	Web Engineering and Design
(1-9)	CPET 499	Special Topics in Computer Engineering Technology

## POWER

- (4) ECET 312 Power Electronics
- (4) ECET 331 Generation and Transmission of Electrical Power

## OTHER:

- (1-9) ECET 499 Special topics in Electrical Engineering Technology

## NON-ECET ELECTIVES

These electives must be chosen from a technical discipline and approved by your advisor. Three credits may be approved as basis for military service. Co-op credits may also be approved to meet this requirement.

**BACCALAUREATE GRADUATES MUST FULFILL THE IPFW GENERAL EDUCATION REQUIREMENTS.** These requirements are fulfilled by courses in each curriculum as shown in each Plan of Study.

## MATH/SCIENCE ELECTIVE

This elective must be approved by your advisor.

CS Electives must be approved by the CS department for a Minor in CS.

## **CERTIFICATE PROGRAMS**

### ADVANCED MICROPROCESSORS CERTIFICATE

The certificate program in advanced microprocessors provides the theoretical and practical knowledge necessary to enable you to use microprocessors in industrial applications. Some highlights of the course sequence include introduction to and use of Visual Basic in electronic simulations and calculations; theoretical and laboratory applications of digital logic circuits, operational amplifiers, D/A and A/D converters, computer memory circuits; microprocessor assembly language programming; EEPROM and EPROM programming; 16/32-bit microprocessor theory and applications; I/O using both 8- and 16/32-bit microprocessors; experimental applications; and applied, practical projects.

Upon satisfactory completion of the program, you will understand the operation of microprocessors; be able to design and construct a microprocessor-based circuit; be able to program a microprocessor in assembly language, Visual Basic, or C; and be able to use your designed circuit to control or monitor the operation of an industrial process.

To earn the certificate in advanced microprocessors, you must satisfy the requirements of IPFW (see Part 7), fulfill all course prerequisites, and satisfactorily complete the following courses. This certificate is not available to the student with a major in EET (A.S. and/or B.S.) or CPET (B.S.).

<b>Course Number and Title</b>	<b>Credits</b>
ECET 111 Digital Circuits	4
ECET 264 C Programming Language Applications	3
ECET 205 Introduction to Microprocessors	4
ECET 305 Advanced Microprocessors	4
ECET 499 Advanced Microprocessor Project	1
<b>Total: 16</b>	

#### CERTIFICATE IN ELECTRONIC COMMUNICATIONS

This certificate program provides theory and experiments for electronic communications topics ranging from low-frequency applications to fiber optics. It includes courses in analog communications (AM and FM), digital communications (satellite communications and digital TV), microwaves (high-frequency communications), and fiber optics. Computer programs such as SPICE, ACOLADE (digital communications), SYSCAD (analog communications), TOUCHSTONE (RF and microwave systems), and Microwave Office are incorporated into the curriculum.

Upon satisfactory completion of this certificate program, you will be familiar with all aspects of electronic communication and will have a technical background for work in any of the areas.

To earn the certificate in electronics communications, you must satisfy the requirements of IPFW (see Part 7), fulfill all course prerequisites, and satisfactorily complete the following courses. This certificate is not available to the student with a major in EET (A.S. and/or B.S.).

<b>Course Number and Title</b>	<b>Credits</b>
ECET 303 Communications I	4
ECET 377 Introduction to Fiber Optics	4
ECET 403 Communications II	4
ECET 473 Microwaves	4
or	
ECET 414 Wireless Communications	4
ECET 499 Electronic Communications Project	1
<b>Total: 17</b>	

#### COMPUTER CONTROLLED SYSTEMS CERTIFICATE

This certificate program provides theory and experiments on computer-controlled system design and implementation. Three methods of computer control—programmable logic controller (PLC); General Purpose Interface Bus system (GPIB, HPIB, or IEEE 488); and microcontroller-based systems—are studied. Highlights of the course sequence include data acquisition using low- and high-level languages, control-variable measurement using sensors, D/A and A/D conversions, ladder diagrams, design of pneumatic- and hydraulic-controlled systems, sampling and reconstruction, z transform, stability-analysis techniques, comparisons of continuous and discrete time-controlled systems, and open- and closed-loop controlled systems.

Upon satisfactory completion of this certificate program, you will be able to build your own computer-controlled system using a PLC, a GPIB, or a microcontroller.

To earn the certificate in computer-controlled systems, you must satisfy the requirements of IPFW (see Part 7), fulfill all course prerequisites, and satisfactorily complete the following courses. This certificate is not available to the student with a major in EET (A.S. and/or B.S.).

<b>Course Number and Title</b>	<b>Credits</b>
ECET 205    Microprocessor Fundamentals	4
ECET 302    Introduction to Control Systems	4
One of the following:	
CPET/ECET 355 Data Communications and Networking	4
ECET 375    Computer Controlled System Design	4
One of the following:	
ECET 361    Introduction to PLC & Pneumatic Systems	4
ECET 365    Electrical Measurements	4
And	
ECET 499    Computer Controlled Systems Project	1
<b>Total: 17</b>	

#### CERTIFICATE IN COMPUTER NETWORKING

This certificate program in computer networking provides the theoretical and practical knowledge necessary to enable you to work with computer operating systems, data communication and network equipments, networking protocols, network system administration, local area networks, wide area networks, and network security.

To earn the certificate in computer networking, you must satisfy the requirements of IPFW (see Part 7), fulfill all course prerequisites, and successfully complete the following courses with a grade C or better grade in each course. This certificate is not available to the student with a major in CPET (B.S.).

<b>Course Number and Title</b>	<b>Credits</b>
CPET 181    Computer Operating Systems Basics	3
CPET 281    Local Area Networks	3
CPET 364    Networking Security	3
One of the following:	
ECET 264    C Programming Language Applications	3
CS 170    C and Data Structures or equivalent	
One of the following:	
ECET/CPET 355 Data Communications and Networking	4
CS 274    Data Communications plus one hour CPET lab	
One of the following	
CPET 384    Wide Area Network Design	3
CS 374    Computer Networks	
CPET 499    Industrial Applications of Networking	
CPET 493    Wireless Networking	
CPET 495    Web Engineering and Design	
And	
CPET 499    Computer Networking Project	1
<b>Total: 20</b>	

## ECET EVENING COURSE OFFERINGS

The following courses are generally offered in the evening (4:30 or later) or on the Internet during the indicated semesters. All courses for A.S. and B.S. programs have evening or distance learning sections so that all degrees and certificates can be completed with evening courses. If you work 2<sup>nd</sup> shift, please see the department chair to discuss how to complete a degree.

### Freshman & Sophomore CPET/ECET Evening or Distance Learning Courses

<u>Fall</u>	<u>Summer (Occasional)</u>	<u>Spring</u>
CPET 181	CPET 181	CPET 101
CPET 190	ECET 111	CPET 281
CPET 281	ECET 114	ECET 107
ECET 114 (Internet)	ECET 264	ECET 111
ECET 146	ECET 234	ECET 114 (Internet)
ECET 157	ECET 213	ECET 207
ECET 205 (Internet)		ECET 231
ECET 296		ECET 264
ECET 303 (TV/Video)		ECET 296
		ECET 302 (Internet)

Junior & Senior courses are generally offered in the evening.

Times for non-ECET courses are controlled by the departments offering the courses, but are generally offered at the same time each year so check the bulletins for Fall/Spring to plan your schedules in advance.

## **COMPUTER ENGINEERING TECHNOLOGY DESCRIPTION OF COURSES**

### **CPET 101 - ELECTRICAL CIRCUITS**

Class 3, Lab 2 or 3, Cr. 4; Co-requisite: MA 153.

A study of DC electrical circuits and AC electrical circuits. Topics include circuit components (R, L, C), voltages, currents, power, Ohm's Law, Kirchhoff's Laws, series and parallel circuits, circuit theorems, electrical measurements, sinusoidal AC voltages, currents, impedance.

### **CPET 161 - ANALOG ELECTRONICS**

Class 3, Lab 2 or 3, Cr. 4; Prerequisites: CPET 101, MA 153.

A study of solid state devices and circuits. Topics include diodes, LED's, photo-sensitive devices, Zener diodes, bipolar transistors, MOS devices, linear integrated circuits, and related application circuits such as rectifiers, sensing circuits, various transistor amplifiers, transistor switches, linear and nonlinear op-amp circuits.

### **CPET 181 - COMPUTER OPERATING SYSTEMS BASICS**

Class 2-3, Lab 0-2, Cr. 3.

Introduction to computer operating systems, organization and functions of hardware components, and system software. Topics include system commands, operating system interface, system utilities, shells programming, files systems and management, introduction to concepts, graphical user interface, device drivers, memory management, processes, concurrency, scheduling, multi-tasking and multi processing. Laboratory experiences includes Microsoft Windows and UNIX.

### **CPET 190 - PROBLEM SOLVING WITH MATLAB**

Cr. 3; Prerequisites: ECET 114 or CS 114 and MA 153.

The course is designed to provide a study of principles and practice in problem solving using MATLAB. Topics include MATLAB basics, functions and variables, file input and output, user-defined functions and program design, complex data manipulation, graphical user interface, and technical problem solving applications, etc. The students shall gain hands on experience through several programming assignments, and practice strategies for collaborative problem solving such as creating specifications, brainstorming, sketching an idea, solution evaluation, and solution testing.

### **CPET 281 - LOCAL AREA NETWORKS AND MANAGEMENT**

Cr. 3; Prerequisite: CPET 181 or equivalent

A study of issues in local area network (LAN) planning, design, installation, and management. Topics include LAN components and protocols, topologies and network architecture, network system hardware consideration, LAN design and network layout, wiring and installation, network operating systems, network servers, connection and servers, connection and services for clients, network system administration and management. Other topics may include LAN applications, performance tuning, disaster recovery, hybrid networking environment and integration, network monitoring tools, and network management tools. Laboratory experiences include Microsoft Windows 2003 and UNIX.

### **CPET 355 - DATA COMMUNICATIONS AND NETWORKING**

Class 3, Lab 2 or 3, Cr.4; Prerequisite: ECET 205 or CS 271 or Equivalent.

A survey of data communication and networking techniques, protocols, and standards. Topics include OSI model, TCP/IP protocols and applications, signals, encoding and modulating, transmission of data and interfaces, transmission media, multiplexing, error detection and correction, data link controls and protocols, switching techniques, local area networks, wide area networks, and other well-known networks services including integrated services digital network (ISDN), X.25 (packet switching), frame relay (virtual circuit), asynchronous transfer mode (ATM), and synchronous optical network (SDONET).

### **CPET 364 - NETWORKING SECURITY**

Cr. 3; Prerequisite: CPET 281 or 355, or 384, or CS 374 or equivalent.

This course examines the analysis, design, implementation, and management issues surrounding effective network security. The business, conceptual, and technological aspects of network security for computer networks. Topics include virus protection, firewalls, authentication, encryption, wireless security, security protocols, and network security policy development and fraud protection.

### **CPET 384 - WIDE AREA NETWORK DESIGN**

Cr. 3; Prerequisite: CPET 281, CPET 355, CS 274 or equivalent.

This course explores wide area network (WAN) planning and design issues. Emphasis on WAN switching methods and technologies, protocols, and services, traffic engineering and capacity planning design and tradeoffs. Representative case studies will be used. Other topics may include remote access technologies, access networks, backbone networks, enterprise WAN networks, remote monitoring tools and protocol analyzer, trends in WAN design and WAN integration.

### **CPET 470 - TECHNOLOGY PROJECT MANAGEMENT**

Cr. 3; Prerequisites: B.S. CPET senior class standing.

Topics include project management concepts, project life cycle; project initiation, team building, planning, review, execution, tracking and control; project related issues, resource, cost, subcontractor control, and risk management; Web-based project management and collaboration, project management and integration tools. A portion of the course is devoted to case studies. Written reports and oral presentations required.

### **CPET 490 - SENIOR DESIGN PROJECT, PHASE I**

Cr. 1; Prerequisites: Junior or senior status.

An extensive individual design and/or analytical project performed in consultation with one or more faculty advisors. Collaboration with representatives of industry, government agencies, or community, institutions is encouraged. Evidence of extensive and thorough laboratory performance is required. Phase I includes, but is not limited to: (1) faculty acceptance of project proposal, (2) defining and limiting project objectives, (3) initial research and source contacts, (4) project proposal management, (5) procurement of materials, and (6) periodic progress reports.

### **CPET 491 - SENIOR DESIGN PROJECT, PHASE II**

Cr. 2; Prerequisite: CPET 490.

Phase II includes, but is not limited to: (1) continued research and finalized design, (2) project management process, (3) project analysis, design, modeling and prototyping, and testing, (4) oral presentation to faculty and other interested parties, (5) standard-format written technical report.

### **CPET 493 - WIRELESS NETWORKING**

Cr. 3; Prerequisite: CPET 355.

This course covers both theoretical issues related to wireless networking and practical system for both wireless data networks and cellular wireless telecommunications systems. Students will also work on a project that addresses some recent issues in wireless and mobile networking.

### **CPET 494 - JAVA PROGRAMMING APPLICATIONS**

Cr. 4; Prerequisites: ECET 264, CS 160, CS 331, or equivalent, and junior standing.

This course covers design and implementation of modern embedded, stand-alone, Web-based, and distributed Java applications. Topics include definition of classes and objects; Java basics, array and string classes; exceptions and debugging; graphics user interface; file I/O streams; Java multi-threading; Java applets and Servlets; Java database connectivity; Java RMI (remote method invocation); Java native interface through C/C++; Java industrial and enterprise applications. Students develop application-oriented final projects.

### **CPET 495 - WEB ENGINEERING AND DESIGN**

Cr. 4; Prerequisites: ECET 264, CS 161, and junior standing, or CPET 494.

An introduction to problems involved in analyzing and designing Web applications from small-scale, short-lived services, to large-scale enterprise applications distributed across the Internet and corporate intranets and extranets. Major topics include Web standard protocols and interfaces, Web security, Web engineering methodology, Web architectures and Web components (Web server, application servers or environments, the client, and persistent server), E-commerce infrastructures, database and Web integration, Web services standards and technologies and Web-based application development.

### **CPET 499 - COMPUTER ENGINEERING TECHNOLOGY**

Cr. 1-4; Prerequisites: Approved by instructor.

An extensive individual design, research and/or analytical project in any one of the following areas: networking operating systems, computer networking, distributed computing, client/server applications, wireless communications, wide area network design, network system management, computer and network security. Internet system programming and industrial applications or networking, control, and monitoring. Collaboration with representatives of industry, government agencies, or community institutions is encouraged.

## **ELECTRICAL ENGINEERING TECHNOLOGY DESCRIPTION OF COURSES**

### **ECET 101 - ELECTRICAL CIRCUITS**

Class 3, Lab 2-3, Cr.4; Co-requisite: MA 153.

A study of DC electrical circuits and AC electrical circuits. Topics include circuit components (R,L,C), voltages, currents, power, Ohm's Law, Kirchhoff's laws, series and parallel circuits, circuit theorems, electrical measurements, sinusoidal AC voltages, currents, impedance, RL circuits, RC circuits, and RLC circuits. (Not open to EET Majors)

### **ECET 107 - INTRODUCTION TO CIRCUIT ANALYSIS**

Class 3, Lab 2-3, Cr. 4; Co-requisite: MA 153.

Voltage, current, resistance, Ohm's Law, Kirchhoff's current and voltage laws, resistance combinations, and Thevenin's, Norton's, and superposition theorems are studied and applied. DC and AC sources are studied and utilized with basic AC terminology described. Ideal RC coupling and filter circuits and RC switching circuits are introduced. Fundamental analog circuits with ideal or near-ideal electronic devices are utilized in the lecture and laboratory to enhance the understanding of basic circuit laws and theorems.

### **ECET 111 - DIGITAL CIRCUITS**

Class 3, Lab 2 or 3, Cr. 4.

A study of switching circuits, waveshaping, logic gates, arithmetic codes, Boolean algebra, mapping and other simplification techniques. Discrete devices and small-scale (SSI) and medium-scale (MSI) integrated circuits are used in combinational and introductory sequential logic circuits.

### **ECET 114 - INTRODUCTION TO MICROCOMPUTERS**

Class 2-3, Lab 0-2, Cr. 3.

Programming in BASIC with emphasis upon electrical circuit problems. Includes pokes, peeks, string manipulation, arrays, sequential file creation and manipulation, sorts, searches, graphics, external files, and compiling.

### **ECET 146 - DIGITAL CIRCUITS II**

Class 2, Lab 2, Credit 3; Prerequisites: ECET 111, Co-requisites: ECET 114 or CS 114.

Basic digital system techniques with emphasis on programmable logic and ASIC theory. Computer-aided design is strongly emphasized along with system considerations such as criteria for device selection, testability and vendor selection.

### **ECET 157 - ELECTRONICS CIRCUIT ANALYSIS**

Class 3, Lab 2-3, Cr. 4; Prerequisites: ECET 107, MA 153.

Capacitors, inductors, switching circuits, transformers, rectifiers, linear regulators, dependent sources, operational amplifiers, BJT & MOSFET based small signal amplifiers, waveform generation, and programmable analog devices are studied. Circuit fundamentals such as Kirchhoff's laws are utilized in analysis and design of circuits. Computer simulation is used.

### **ECET 205 - INTRODUCTION TO MICROPROCESSORS**

Class 3, Lab 2-3, Cr. 4; Prerequisite: ECET 111 or equivalent.

An introduction to microprocessor and microcontroller hardware and software. Assembly language instructions and programming, troubleshooting, and input/output techniques are studied. Computer-based program editing and assembly techniques are used.

### **ECET 207 - AC ELECTRONICS CIRCUIT ANALYSIS**

Class 3, Lab 2-3, Cr. 4; Prerequisites: ECET 157 and MA 154.

AC circuits including the  $j$  operator, phasors, reactance and impedance are studied. Circuit laws, network theorems, and the fundamental concepts of Fourier analysis are applied and used in the study of topics such as passive filters, IC filters, amplifiers, resonant circuits, single phase and three phase circuits. Computer aided analysis of circuits is used.

### **ECET 211 - ELECTRICAL MACHINES AND CONTROLS**

Class 2-3, Lab 0-2, Credit 3; Prerequisite: MA 154.

Course not open to EET students. Lecture, demonstration, and laboratory experiments are combined to acquaint the student with the elements of electrical power circuits and machines.

### **ECET 215 - INTRODUCTION TO INDUSTRIAL ELECTRONICS**

Cr. 3; Prerequisite: ECET 101 or ECET 107.

Not open to EET majors. A study of power transformers, single and polyphase circuits, and an introduction to the National Electric Code. The study of DC machines (motors and generators), and AC single and polyphase synchronous and induction machines. Programmable controllers and other control devices will be introduced in the course.

### **ECET 231 - ELECTRICAL POWER AND CONTROLS**

Class 3, Lab 2-3, Cr. 4; Prerequisites: ECET 152 or ECET 207 and MA 227.

This course introduces magnetic materials and properties followed by analysis of transformers and power conditioning equipment, induction motors, and single-phase and three-phase power systems. Motor control devices, programmable logic controllers, PLC input and output devices, and power systems communications and monitoring are introduced.

### **ECET 234 - PC SYSTEMS I**

Class 3, Lab 2, Cr. 4; Prerequisites: ECET 114 or CS 160 and ECET 111.

Personal computer hardware and software. Components of the computer including CPU, memory, ports, drives and cards. Setup, operation and troubleshooting. Labs include topics within A+ certification and hardware/software interfacing using Visual Basic.

### **ECET 264 - PROGRAMMING LANGUAGE APPLICATIONS**

Cr. 3; Prerequisite: MA 154.

Examination of fundamental principles and issues in embedded applications: instrumentation, data acquisition, robots, and real time systems. Overview of the C programming environment. Introduction to C language syntax, basic data types, complex data types (pointer, array, structure, bit fields, union, enum) storage classes, operators, preprocessor directives, macros, functions, flow control, and file I/O. Programming using a structured approach. Emphasis on use of mathematical functions (routines) libraries and numerical algorithms needed in embedded applications.

### **ECET 291 - INDUSTRIAL PRACTICE I**

Cr. 1-5; Prerequisite: admission to the cooperative education program.

Practice in industry and written reports of this practice for co-op students.

### **ECET 292 - INDUSTRIAL PRACTICE II**

Cr. 1-5; Prerequisite: ECET 291.

Practice in industry, with written reports of this practice by the co-op student.

### **ECET 295 - INDUSTRIAL PRACTICUM**

Cr. 1-5; Enrollment restricted to full-time students who have completed one year's study. Students will work 10-15 hours per week solving technical problems under the supervision of professional employees of local industries. Students will receive some remuneration. Course may be repeated for up to four (4) credits.

### **ECET 296 - ELECTRONIC SYSTEM FABRICATION**

Class 2, Lab 2-3, Cr. 2-3; Prerequisite: ECET 204.

This course introduces project planning and basic concepts in electronic design automation (EDA). The student develops the project from an engineering rough sketch to a finished and test printed circuit board by utilization of EDA. New construction and testing techniques are introduced. The final product is presented in an oral and written report.

### **ECET 302 - INTRODUCTION TO CONTROL SYSTEMS**

Class 3, Lab 2, Cr. 4; Prerequisites: ECET 157 and MA 154.

A study of the components in open-loop and closed-loop systems. Included are sensing devices, error detectors, potentiometers, synchros, resolvers, modulators, demodulators, amplifiers, motors, generators, and networks. An analysis course that stresses operation, time and frequency-response characteristics, and proper adjustment of the components.

### **ECET 303 - COMMUNICATIONS I (ANALOG COMMUNICATIONS)**

Class 3, Lab 2-3, Cr. 4; Prerequisites: ECET 204, MA 227 or consent of instructor.

A study of analog communications which includes transmission lines and propagation, signal spectra, elements of noise, RF amplifiers, oscillators, AM and FM systems, phase modulation, transmitter and receiver circuits. PSPICE and Electronic Workbench are incorporated in the course.

### **ECET 305 - ADVANCED MICROPROCESSORS**

Class 3, Lab 2-3, Cr. 4; Prerequisite: ECET 205 or equivalent, and 264 or equivalent.

A course emphasizing applications of microcomputers to dedicated hardware functions. A high-level language is used with an emphasis on programming hand-held computers. Some coverage of microprocessor architecture and troubleshooting is included.

### **ECET 307 - ANALOG NETWORK SIGNAL PROCESSING**

Class 3, Lab 2-3, Cr. 4; Prerequisites: (ECET 152 or ECET 207) and MA 228.

This is an advanced course in network analysis that stresses network theorems and solutions of time-domain and frequency-domain problems. Transform circuit and signal analysis using Laplace and Fourier techniques are developed culminating in active filter design applications. Software techniques, such as MATLAB and LabView are employed to solve mathematical problems.

### **ECET 312 - POWER ELECTRONICS**

Class 3, Lab 2, Cr. 4; Prerequisites: ECET 231.

Introduction to the characteristics of power semiconductor devices, diode rectifiers, thyristor, commutation techniques, controlled rectifiers, AC voltage controllers, choppers, inverters, and motor drives.

### **ECET 331 - GENERATION AND TRANSMISSION OF ELECTRICAL POWER**

Class 3, Lab 2, Cr. 4; Prerequisite: ECET 231.

A study of the generation and transmission of electrical energy. Includes techniques used by electric utilities for the protection of generating equipment and transmission lines, an introduction to the economic considerations of power plant operation, and three-winding transformers and methods of solving unbalanced three-phase systems.

**ECET 346 - ADVANCED DIGITAL CIRCUITS**

Class 3, Lab 0-2, Cr. 3-4; Co-requisites: ECET 205 and ECET 264.

Basic system techniques with emphasis on digital ASIC theory. Computer aided engineering is strongly emphasized along with system considerations such as criteria for device selection, testability and vendor selection.

**ECET 355 - DATA COMMUNICATION AND NETWORKING**

Class 3, Lab 2-3, Cr. 4; Prerequisite: ECET 205 or CS 271.

A survey of data communication and networking techniques, protocols, and standards. Topics include OSI model, TCP/IP protocols and applications, signals, encoding and modulating, transmission of data and interfaces, transmission media, multiplexing, error detection and correction, data link controls and protocols, switching techniques, local area networks, wide area networks, and other well-known networks services including integrated services digital network (ISDN), X.25 (packet switching), frame relay (virtual circuit), asynchronous transfer mode (ATM), and synchronous optical network (SDONET).

**ECET 357 - REAL-TIME DIGITAL SIGNAL PROCESSING**

Class 3, Lab 2-3, Cr. 4; Prerequisites: ECET 264 and ECET 307.

Architecture, instruction set, and hardware and software development tools associated with a fixed point general purpose DSP VLSI processor are studied. Fundamental principles associated with the processing of discrete time signals are introduced. Common applications such as waveform generation, FIR and IIR digital filtering and DFT and FFT based spectral analysis and filtering are implemented.

**ECET 361 - INTRODUCTION TO PLC & PNEUMATIC SYSTEMS**

Class 3, Lab 2-3, Cr. 4; Prerequisite: ECET 157 or ECET 204.

A study of the fundamentals of developing and implementing ladder logic diagrams for machine controls using industrial programmable logic controllers. The applications of hydraulic and pneumatic systems are also studied.

**ECET 365 - ELECTRICAL MEASUREMENTS**

Class 3, Lab 2, Cr. 4; Prerequisites: (ECET 152 or ECET 207) and ECET 205.

A study of instrumentation and automatic measurements. Individual instruments include DMM, counters, oscilloscopes, spectrum analyzers, and signal generators. The signals and operation of the general purpose interface bus are examined and applied to a measurements system.

**ECET 377 - INTRODUCTION TO FIBER OPTICS**

Class 3, Lab 2, Cr. 4; Prerequisites: ECET 303 & ECET 403 & MA 228.

An introductory course in fiber optics for junior or senior-level students. Topics include optical characteristics, optical fibers, cables, modulation techniques, optical receivers and transmitters, and measurements on optical systems. A lab is also included in the course resulting in a complete optical transmitter/receiver system modulated with various methods.

**ECET 382 - C++ OBJECT ORIENTED PROGRAMMING FOR INDUSTRIAL APPLICATIONS**

Class 3, Lab 2, Cr. 4; Prerequisite: ECET 264.

This course provides a comprehensive introduction to C++ for students to apply object oriented programming in industrial applications. A background in C or another high level language is a must, because all applications in this course involve C and C++. The course introduces the methodology of object identification and behavior, the syntax of C++, and industrial applications.

**ECET 393 - INDUSTRIAL PRACTICE III**

Cr. 1-5; Prerequisite: ECET 292.

Practice in industry, with written reports of this practice by the co-op student.

**ECET 394 - INDUSTRIAL PRACTICE IV**

Cr. 1-5; Prerequisite: ECET 393.

Practice in industry, with written reports of this practice by the co-op student.

**ECET 395 - INDUSTRIAL PRACTICE V**

Cr. 1-5; Prerequisite: ECET 394.

Practice in industry, with written reports of this practice by the co-op student.

**ECET 403 - COMMUNICATIONS II (DIGITAL COMMUNICATIONS)**

Class 3, Lab 2, Cr. 4; Prerequisite: ECET 303.

A study of digital communications which includes sideband systems, phase-locked loops, digital communications concepts, pulse and digital modulation, data communications, digital radio, space communications, and fiber optics. PSPICE, Acolade, and Electronic Workbench are incorporated in the course.

**ECET 414 – WIRELESS COMMUNICATIONS**

Class 3, Lab 2 or 3, Cr. 4; Prerequisite: ECET303.

Practical and theoretical aspects of wireless communication system design are studied; particular emphasis is on mobile communications. Frequency reuse, hand-off, cell splitting, indoor/outdoor propagation, cochannel interference, frequency management, channel assignment techniques, cell-site antennas, handset antenna/human body interaction, switching and traffic, AMPS, GSM, TDMA, and CDMA are studied.

**ECET 453 - TOPICS IN TELE-COMMUNICATIONS**

Class 3, Lab 2, Cr. 4; Prerequisite: ECET/CPET 355.

An advanced course in telecommunications that introduces and evaluates state-of-the-art systems, services and applications for current and emerging networking technologies.

**ECET 466 - WINDOWS PROGRAMMING FOR INDUSTRIAL APPLICATIONS**

Class 3, Lab 2, Cr. 4; Prerequisite: ECET 264.

This course provides an overview of Windows programming using visual software for industrial applications. The graphic user interface (GUI) in Windows programming allows operators to interact with computers by clicking a mouse on a graphical panel without understanding the program itself. The topics of the course include: introduction to the Windows operating system, text input and output, multiple window programs, creating dialog boxes and menus, dynamic data exchange, dynamic link library, and error handling, multimedia programming, designs of graphic control panels for industrial applications such as gages, meters, and setting devices.

**ECET 468 - MICROWAVE SOLID STATE DEVICES**

Cr. 3; Prerequisite: ECET 473.

A project oriented course dealing with microwave solid state devices. Areas to be covered are solid-state materials, solid-state junctions (PN and Schottkey), diodes, transistors, and solid-state components. Microwave projects are assigned which involve designing and analyzing microwave solid state circuits using SPICE and Microwave Office.

### **ECET 470 - TECHNOLOGY PROJECT MANAGEMENT**

Cr. 3; Prerequisites: B.S. EET senior class standing.

Topics include project management concepts, project life cycle; project initiation, team building, planning, review, execution, tracking and control; project related issues, resource, cost, subcontractor control, and risk management; Web-based project management and collaboration, project management and integration tools. A portion of the course is devoted to case studies. Written reports and oral presentations required.

### **ECET 473 - MICROWAVES**

Class 3, Lab 2, Cr. 4; Prerequisite: ECET 303.

A study of microwave techniques, which includes definitions, microwave materials, microwave components, transmission lines, the Smith chart, S-parameters, microwave diodes and transistors, and microwave measurements. Microwave Office software is incorporated in the course.

### **ECET 490 - SENIOR DESIGN PROJECT, PHASE I**

Cr. 1-2; Prerequisites: Junior or senior status.

An extensive individual design and/or analytical project performed in consultation with one or more faculty advisors. Collaboration with representatives of industry, government agencies, or community institutions is encouraged. Evidence of extensive and thorough laboratory performance is required. Phase I includes, but is not limited to: (1) faculty acceptance of project proposal, (2) defining and limiting project objectives, (3) initial research and source contacts, (4) project proposal management, (5) procurement of materials, and (6) periodic progress reports.

### **ECET 491 - SENIOR DESIGN PROJECT, PHASE II**

Cr. 2-5; Prerequisite: ECET 490.

Phase II includes, but is not limited to: (1) continued research and finalized design, (2) project management process, (3) project analysis, design, modeling and prototyping, and testing, (4) oral presentation to faculty and other interested parties, (5) standard-format written technical report.

### **ECET 499 - ELECTRICAL ENGINEERING TECHNOLOGY**

Class 0-4, Lab 3-9, Cr. 1-9.

Hours and subject matter to be arranged by staff. Repeatable up to 9 credits.

## **OTHER REQUIRED COURSES IN THE CURRICULUM**

### **CHEMISTRY**

#### **CHM 111 – GENERAL CHEMISTRY**

Class 2, Lab 3, Cr. 3; Prerequisite: MA 109 with a grade of C or better or placement at the level of MA 113 or higher. A basic introduction to the principles of chemistry including matter and energy, nomenclature, measurement, atomic structure, nuclear chemistry, chemical bonding, stoichiometry, classification of chemical reactions, kinetics, equilibria, gas laws, liquids, and solids.

### **COMMUNICATION**

#### **COM 114 - FUNDAMENTALS OF SPEECH COMMUNICATION**

Cr. 3. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion, to informative and persuasive speaking in standard speaker-audience situations.

## **COMPUTER SCIENCE**

### **CS 160 – INTRODUCTION TO COMPUTER SCIENCE I**

Cr. 4; Prerequisite: CS 112 or equivalent experience and MA 153.

An introduction to computer concepts and the fundamentals of structured programming in a high-level language. Problem-solving techniques, specifications, stepwise refinement, programming style, structure charts, and program documentation. Programming topics include data types, assignments, input/output, subprograms, selection, iteration, arrays, records, text files, and simple searching and sorting.

### **CS 161 – INTRODUCTION TO COMPUTER SCIENCE II**

Cr. 4; Prerequisite: CS 160, Co-requisite: MA 175. Continuation of 160. Emphasis on program development including programming style, modularization, data abstraction, abstract data types, and selection and analysis of algorithms. Programming using a structured approach. Topics include recursion, pointers, files, and elementary data structures including stacks, queues, linked lists, and binary trees.

## **ENGLISH**

### **ENG W131 - ELEMENTARY COMPOSITION I**

Cr. 3; Prerequisite: Placement in W131 or completion of W130 with a grade of C or better, or completion of the ESL composition sequence and recommendation of the ESL instructor. Practice in writing organized, well-developed, research papers for a variety of purposes and audiences. Some analysis of prose style and structure

### **ENG W234 - TECHNICAL REPORT WRITING**

Cr. 3; Prerequisites: W131, W135, W140, with a grade of C or better with a recommended sophomore class standing. Instruction in preparing engineering and other technical proposals and reports, with an introduction to the use of graphics.

### **ENG W421 - TECHNICAL WRITING PROJECTS**

Cr. 1-3; Prerequisite: Junior or Senior class standing and (W234 or W331).

Application of the principles of technical reporting to a major piece of primary research and development, usually a senior project in the major. May be repeated for credit.

## **INDUSTRIAL ENGINEERING TECHNOLOGY**

### **IET 105 - INDUSTRIAL MANAGEMENT**

Cr. 3 An overview of industrial engineering technology including manufacturing organization and quality production.

## **MATHEMATICS**

### **MA 153 - ALGEBRA AND TRIGONOMETRY I**

Cr. 3; Prerequisite: MA 113 with a grade of C or higher or placement by departmental exam.

Review of algebraic operations, factoring, exponents, radicals, rational exponents, and fractional expressions. Linear and quadratic equations with modeling, problem solving, and inequalities. Graphs of functions and transformations, including polynomial, rational, exponential, and logarithmic functions with applications.

### **MA 154 - ALGEBRA AND TRIGONOMETRY II**

Cr. 3; Prerequisite: MA 149 or MA 153 with a grade of C or higher or placement by departmental exam. Trigonometric functions and graphs, vectors, complex numbers, conic sections, matrices, and sequences.

### MA 175 - INTRODUCTORY DISCRETE MATHEMATICS

Cr. 3; Prerequisite: (MA 165 or MA 153) and CS 160 with a grade of C or better; or MA 153 and ECET 264 with a grade of C or better in each.

Sets, logical inference, induction, recursion, counting principles, binary relations, vectors and matrices, graphs, algorithm analysis.

### MA 227 - CALCULUS FOR TECHNOLOGY I

Cr. 4; Prerequisite: MA 154 or MA 159 with a grade of C or better or placement by departmental exam. Functions, derivatives, integrals. Applications to problems in the engineering technologies.

### MA 228 - CALCULUS FOR TECHNOLOGY II

Cr. 3; Prerequisite: MA 227 with a grade of C or higher.

Continuation of MA 227. Further topics in differentiation and infinite series, integration. Introduction to infinite series, harmonic analysis, differential equations, and Laplace transforms. Applications to problems in the engineering technologies.

### MA 321 - ADVANCED TECHNICAL MATHEMATICS

Cr. 3; Prerequisite: MA 228 with a grade of C or better.

Designed primarily for EET majors. Ordinary differential equations with emphasis on linear equations and their applications. Laplace transforms. Fourier series, and an introduction to partial differential equations and their applications.

## **PHYSICS**

### PHYS 218 - GENERAL PHYSICS

Class 3, Lab 2 Cr. 4; Prerequisite: MA 150 or MA 151 or (MA 153 and MA 154)

Mechanics, heat, and sound, primarily for technology students.

## **STATISTICS**

### STAT 301 - ELEMENTARY STATISTICAL METHODS I

Cr. 3; Prerequisites: MA 149 or MA 153 or MA 168 with a grade of C or higher. Not open to majors in mathematics or engineering.

Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout.

## **GENERAL EDUCATION REQUIREMENTS FOR B.S.**

Area I	ENG W131, COM 114, MA 153
Area II	PHYS 218 & CHM 111
Area III	6 Hours IET 105 and one elective
Area IV	6 Hours Two electives
Area V	3 Hours One elective
Area VI	3 Hours ENG W421

## ECET FACULTY AND STAFF

KAREN WRIGLEY, Administrative Assistant and Office Manager

Joined the department in September 2001.

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HAROLD L. BROBERG, Associate Dean & Chair

Joined the department in 1985.

Degrees: B.A. Chemistry, Northwestern University, 1963; M.S.E.E., U.S. Naval Postgraduate School, 1969; Ph.D., Engineering Science (EE), University of Toledo, 1993.

Professional Registration: P.E. State of Indiana.

Technical Interest Areas: control systems, microcontrollers, student learning styles.

Memberships in Professional Organizations: Senior Member of IEEE, Member of ASEE,

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PETER GOODMANN, Assistant Professor

Joined the department in 2002.

Degrees: B.S.E.E., Rose-Hulman Institute of Technology, 1979; M.S.E.E., Purdue University, 1989.

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Technical Interest Areas: electronics, digital signal processing, and control systems.

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ISKANDAR HACK, Associate Professor

Joined the department in 1984.

Degrees: A.A.S., Purdue University Fort Wayne Campus, 1982; B.S., Purdue University Fort Wayne Campus, 1984; M.S.E., Purdue University, 1989.

Professional Registration: P.E. State of Indiana.

Technical Interest Areas: digital signal processing, embedded microprocessors, and digital systems.

Memberships in Professional Organizations: Tau Alpha PI National Honorary Society, IEEE, ASEE.

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Joined the department in 1986.

Degrees: A.A.S., Mohawk Valley Community College, 1965; B.S.E.E., Syracuse University, 1971; M.S.E.E., Purdue University, 1991.

Technical Interest Areas: microwave circuitry, electronic communications

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Joined the department in 1985.

Degrees: E.E. Diploma, National Taipei University of Science and Technology, 1971; M.S.E.E., Syracuse University, 1984; M.S.C.S., Marist College, 1985.

Professional Registration: P.E. State of Indiana, and P.E. (E.E.), State of California.

Technical Interest Areas: Internet technologies and applications, enterprise information Integration, wireless and mobile technologies and applications, smart sensors systems, Nano-technologies, and industrial control and automation.

Memberships in Professional Organizations: Senior Member of IEEE; Member of ASEE.

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HONGLI LUO, Assistant Professor

Joined the department in 2006

Degrees: B.S.,EE, Hunan University, 1993; M.S., EE, Hunan University, 1996; Ph.D., ECE, University of Miami, 2006.

Technical Interest Areas: computer networks, multimedia networking, networking security, Internet technologies and applications, and database.

Memberships in Professional Organizations: IEEE, ASEE

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GARY D. STEFFEN, Assistant Professor

Degrees: B.S., Purdue University, 1989; M.S.C.S., Ball State University, 2001.

Technical Interest Areas: computer operating systems, networking, data communications, and networking security.

Memberships in Professional Organizations: IEEE, ASEE

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