

ENGINEERING TECHNOLOGY

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Prefixes for the Engineering Technology Department Programs:

CMCET denotes Construction Engineering Technology courses.
 EET denotes Electronics Engineering Technology courses.
 MFGET denotes Manufacturing Engineering Technology courses.
 MECET denotes Mechanical Engineering Technology courses.
 PET denotes Plastics Engineering Technology courses.

Undergraduate Degree Programs

Bachelor of Science Degree in Engineering Technology

Pittsburg State University's Engineering Technology programs have been established as part of the overall engineering education spectrum and are committed to excellence in engineering education. The Engineering Technology programs at PSU are comprised of elements of the technological spectrum requiring scientific and engineering knowledge plus the operational methods and skills devoted to achieving practical purpose in support of product producing industries. Pittsburg State University offers an "Engineering Technology" program which is an alternative engineering program.

The purpose of the department is to provide education in engineering technology and to support industry and economic development in the state of Kansas and the four-state region. The technical areas within the department are Construction Engineering Technology, Construction Management, Electronics Engineering Technology, Manufacturing Engineering Technology, Mechanical Engineering Technology, and Plastics Engineering Technology. The five Engineering Technology programs are accredited by the Technology Accreditation Commission/Accreditation Board for Engineering and Technology (TAC/ABET). The Department of Engineering Technology also offers a multi-disciplinary Masters of Engineering Technology program.

The Department of Engineering Technology supports industry and economic development by providing technology transfer and consulting services related to engineering technology. It also provides training for industry in the areas of applied technology.

The faculty in the Department of Engineering Technology must have an earned baccalaureate and masters degree in engineering, engineering technology or a related field and a minimum of three years industrial experience in technical areas related to the subjects they are teaching. Each technical area in the Department of Engineering Technology has a minimum of

three full-time faculty. There are 19 full-time faculty in the department. The department has approximately 540 undergraduate and graduate majors.

The curriculums for engineering technology require considerable applied experience in various industrial processes. The technical areas are served by supporting laboratories. The curriculum elements for the programs in engineering technology provide an integrated educational experience directed toward development of the ability to apply pertinent knowledge through the solution of practical problems in the graduates' engineering technology specialty. This is supplemented by courses in the basic sciences (physics and chemistry) and basic mathematics through the concepts and applications of calculus. It is also supported by courses in oral and written communications, along with the humanities and social sciences.

Graduates of the program receive a Bachelor of Science in Engineering Technology. They usually enter into middle management/technical jobs in plastics, mechanical design, manufacturing, electronics and construction. Positions are usually in manufacturing or production, field engineering and maintenance, practice-oriented design and development of new products, resource management, quality control, and technical sales and service. Most graduates have several job offers upon graduation. There is nearly 100 percent placement of graduates. A high proportion of graduates eventually become executives of companies. Typical job titles of graduates are: field engineer, surveyor, planning engineer, production supervisor, systems engineer, manufacturing engineer, process engineer, plastics engineer, maintenance supervisor, quality control supervisor, estimator, N/C programmer, N/C coordinator, inspection supervisor, electronics/electrical engineer, project manager, project engineer.

Technology Minors

The technology minor consists of a minimum of 21 semester hours in one technical area. Minors are available in the following technical areas: construction management, construction technology, electronics technology, manufacturing management, manufacturing technology, mechanical technology, and plastics technology.

Minor in Construction Management

CMCET 234	Construction Materials and Methods I.....	3
CMCET 235	Construction Materials and Methods II.....	3
CMCET 334	Construction Materials and Methods III.....	3
CMCET 335	Construction Materials and Methods IV.....	3
CMCET 631	Construction Estimating I.....	3
CMCET 634	Construction Management.....	3
CMCET 635	Contract Administration	3
CMCET 639	Construction Estimating II or	3
EST 696	Construction Safety.....	3
		24

Minor in Construction Technology

CMCET 234	Construction Materials and Methods I.....	3
CMCET 235	Construction Materials and Methods II.....	3
CMCET 334	Construction Materials and Methods III.....	3
CMCET 335	Construction Materials and Methods IV.....	3
CMCET 434	Civil Construction or	
CMCET 332	Residential Design.....	3
CMCET 631	Construction Estimating I.....	3
CMCET 634	Construction Management.....	3
		21

Minor in Electronics Technology

EET 141	Introductory Electronics.....	3
EET 144	D.C. Circuit Analysis Methods.....	3
EET 244	Logic Circuits.....	3
EET 245	Electronic Devices and Circuits	3

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EET 246	A.C. Circuit Analysis Methods.....	3
EET 344	Microcomputer Systems.....	3
	Electronics Elective.....	3
		21

Minor in Manufacturing Management

MECET 121	Engineering Graphics I or	
MECET 226	Computer Aided Drafting.....	3
MFGET 263	Manufacturing Methods I.....	2
MFGET 267	Manufacturing Methods II.....	3
MFGET 268	Manufacturing Methods I Laboratory.....	1
MFGET 296	Materials in Industry.....	3
MFGET 405	Quality Control.....	3
MFGET 661	Computer Aided Manufacturing.....	3
MFGET 690	Manufacturing Production Control and Management.....	3
		21

Minor in Manufacturing Technology

MFGET 263	Manufacturing Methods I.....	2
MFGET 268	Manufacturing Methods I Laboratory.....	1
MFGET 564	Heat Treatment and Metallurgy I.....	3
MFGET 567	Principles of Metalcasting.....	3
MFGET 568	Metalcasting Processing Laboratory.....	2
MFGET 661	Computer Aided Manufacturing.....	3
	Other Manufacturing Courses.....	10
		24

Minor in Mechanical Technology

MECET 121	Engineering Graphics I.....	3
MECET 220	Statics or	
PHYS 220	Engineering Mechanics I-Statics.....	3
MECET 226	Computer Aided Drafting.....	3
MECET 323	Advanced Engineering Graphics.....	3
MECET 420	Kinematics.....	2
MECET 423	Mechanics of Materials.....	3
MECET 523	Mechanical Design I.....	3
MECET 623	Mechanical Design II.....	3
		23

Minor in Plastics Technology

PET 180,185	General Plastics and Laboratory.....	4
PET 281	Plastics Testing Technology.....	3
PET 380,385	Plastics Processing I and Laboratory I.....	4
PET 381,386	Plastics Processing II and Laboratory II.....	4
PET 383,388	Thermoset Resins and Laboratory.....	4
PET 387,389	Thermoplastic Resins and Laboratory.....	4
PET 585	Mold Design.....	3
		26

Changes in Requirements

Baccalaureate degree curriculums offered by the Department of Engineering Technology are periodically revised and updated. Such revisions will be communicated by the department to currently enrolled students majoring in its programs. Each student is required to graduate under the most recent curriculum in effect at the time of that student's graduation unless those revisions would extend the student's graduation date. Requests for exceptions to such curriculum revisions should be filed in writing with the department chairperson.

Bachelor of Science in Engineering Technology Curricula

Construction Engineering Technology

Degree Requirements for Bachelor of Science in Engineering Technology

GENERAL EDUCATION*

Basic Skills		Hours
		16
ENGL 101	English Composition.....	3
ENGL 103	English Composition or	
ENGL 299	Introduction to Research Writing.....	3
COMM 207	Speech Communication.....	3
MATH 113	College Algebra.....	3
HPER 150	Lifetime Fitness Concepts.....	1
CSIS 121	Programming in BASIC or	
CSIS 240	C++ Programming.....	3
Core Courses		9
CMCET 234	Construction Materials and Methods I.....	3
	Choose two.....	6

HIST 201	American History.....	3
PSYCH 155	General Psychology.....	3
SOSCI 100	Introduction to Sociology.....	3
SOSCI 101	American Government.....	3

Natural Sciences.....

BIOL 113	Environmental Life Science.....	3
PHYS 100	College Physics I or	
PHYS 104	Engineering Physics I (preferred).....	4
PHYS 130	Elementary Physics Laboratory I.....	1

Languages and Cultures/Fine Arts (choose one).....

ENGL 113	General Literature.....	3
FLANG 124	French I.....	3
FLANG 134	German I.....	3
FLANG 154	Spanish I.....	3
SOSCI 103	Basic Philosophy.....	3
SOSCI 105	Ethics.....	3
SOSCI 106	World Regional Geography I.....	3
SOSCI 107	World Regional Geography II.....	3
WOMEN 200	Introduction to Women in Society.....	3
WOMEN 299	Issues in Women's Studies.....	3
ART 102	Introduction to Art Concepts ().....	3
ART 103	Introduction to Art Studio ().....	3
COMM 105	Performance Appreciation.....	3
COMM 205	Performance Studies I.....	3
MUSIC 120	Music Appreciation ().....	3

Economy and Society.....

ECON 200	Economics or	
ECON 201	Economics.....	3

TOTAL GENERAL EDUCATION REQUIREMENTS **39**

MAJOR REQUIREMENTS

Technical Sciences		Hours
MECET 220	Statics or	
PHYS 220	Engineering Mechanics I-Statics.....	3
MECET 423	Mechanics of Materials.....	6

Technical Specialties.....

CMCET 133	Construction Graphics.....	3
CMCET 234	Construction Materials and Methods I (satisfied by general education above).....	0
CMCET 235	Construction Materials and Methods II.....	3
CMCET 330	Mechanical Systems.....	5
CMCET 331	Electrical Systems.....	3
CMCET 334	Construction Materials and Methods III.....	3
CMCET 335	Construction Materials and Methods IV.....	3
CMCET 431	Structural Design-Loads.....	1
CMCET 434	Civil Construction.....	3
CMCET 533	Construction Materials Testing and Inspection.....	3
CMCET 536	Structural Design-Wood.....	2
CMCET 537	Construction Surveying I.....	3
CMCET 631	Construction Estimating I.....	3
CMCET 632	Structural Design-Steel.....	3
CMCET 633	Structural Design-Concrete.....	3
CMCET 634	Construction Management.....	3
CMCET 635	Contract Administration.....	3
CMCET 638	Foundation and Soil Mechanics.....	3
CMCET 639	Construction Estimating II.....	3
CMCET 691	Senior Project.....	2
ETECH 502	Engineering Economy.....	2
		57

Support Courses.....

PHYS 101	College Physics II or	
PHYS 105	Engineering Physics II (preferred).....	4
PHYS 131	Elementary Physics Laboratory II.....	1
CHEM 105/106	Introductory Chemistry/Laboratory.....	4
MATH 122	Plane Trigonometry.....	3
MATH 143	Elementary Statistics.....	3
MATH 150	Calculus I.....	5
ENGL 301	Technical/Professional Writing.....	3
ACCTG 201	Financial Accounting.....	3
		26

TOTAL..... **128**

*In order to meet the requirements of the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology, partial waivers for the PSU general education requirements have been allowed.

Bachelor of Science in Engineering Technology Curricula

Electronics Engineering Technology

Degree Requirements for Bachelor of Science in Engineering Technology

GENERAL EDUCATION*

Basic Skills		Hours
		16
ENGL 101	English Composition.....	3
ENGL 103	English Composition or	
ENGL 299	Introduction to Research Writing.....	3
COMM 207	Speech Communication.....	3
MATH 113	College Algebra.....	3
HPER 150	Lifetime Fitness Concepts.....	1

CSIS 240	C++ Programming.....	3
Core Courses.....		8
MFGET 263	Manufacturing Methods I	2
Choose two		6
HIST 201	American History	3
PSYCH 155	General Psychology	3
SOSCI 100	Introduction to Sociology.....	3
SOSCI 101	American Government	3
Natural Sciences.....		8
BIOL 113	Environmental Life Science.....	3
PHYS 100	College Physics I or	3
PHYS 104	Engineering Physics I**	4
PHYS 130	Elementary Physics Laboratory I.....	1
Languages and Cultures/Fine Arts (choose one)		3
ENGL 113	General Literature.....	3
FLANG 124	French I.....	3
FLANG 134	German I.....	3
FLANG 154	Spanish I.....	3
SOSCI 103	Basic Philosophy.....	3
SOSCI 105	Ethics.....	3
SOSCI 106	World Regional Geography I.....	3
SOSCI 107	World Regional Geography II.....	3
WOMEN 200	Introduction to Women in Society	3
WOMEN 299	Issues in Women's Studies	3
ART 102	Introduction to Art Concepts (____)	3
ART 103	Introduction to Art Studio (____)	3
COMM 105	Performance Appreciation	3
COMM 205	Performance Studies I	3
MUSIC 120	Music Appreciation.....	3
Economy and Society (choose one)		3
ACCTG 201	Financial Accounting.....	3
ECON 191	Issues in Today's Economy.....	3
ECON 200	Economics	3
ECON 201	Economics.....	3
FCS 230	Consumer Education.....	3
MGMKT 101	Introduction to Business.....	3
TOTAL GENERAL EDUCATION REQUIREMENTS.....		38

MAJOR REQUIREMENTS

Technical Sciences	Hours	
EET 141	Introductory Electronics.....	3
EET 144	D.C. Circuit Analysis Methods.....	3
EET 245	Electronic Devices and Circuits.....	3
EET 246	A.C. Circuit Analysis Methods.....	3
EET 349	Linear Integrated Circuits.....	3
EET 546	Electronic Controls.....	4
	19	
Technical Specialties		
EET 244	Logic Circuits.....	3
EET 344	Microcomputer Systems.....	3
EET 345	Instrumentation.....	3
EET 447	Communication Theory and Circuits	3
EET 540	Electronic Design Proposal.....	1
EET 640	Application Design Problems.....	2
EET 642	Electronic Technology Seminar.....	1
	16	
Support Courses		
MECET 121	Engineering Graphics I.....	3
MATH 122	Plane Trigonometry.....	3
MATH 143	Elementary Statistics.....	3
MATH 150	Calculus I.....	5
MATH 155	Calculus II.....	5
MECET 220	Statics or	3
PHYS 220	Engineering Mechanics I-Statics or	3
PHYS 514	Applied Thermodynamics.....	3
MFGET 263	Manufacturing Methods I (satisfied by general	0
	education core course).....	
MFGET 268	Manufacturing Methods I Laboratory	1
ENGL 301	Technical/Professional Writing	3
ETECH 502	Engineering Economy.....	3
ETECH 694	Engineering Technology Laboratory Internship (____).....	1
Choose one pair.....		4-5
PHYS 101/131	College Physics II/Elementary Physics Labora-	5
	tory II	
PHYS 105/131	Engineering Physics II/Elementary Physics Labora-	5
	tory II**	
CHEM 105/106	Introductory Chemistry/Laboratory.....	4
	34-35	
One Required Emphasis		9
Communication Emphasis - 9 hours		
EET 547	Electronic Communication Systems.....	3
EET 613	Network Systems.....	3
EET 648	Data Communications Systems	3
Computers Emphasis - 9 hours		
EET 610	Advanced Logic Design.....	3
EET 643	Data Acquisitions Systems.....	3
EET 648	Data Communications Systems	3
Controls Emphasis - 9 hours		
EET 549	Microcontrollers.....	3
EET 646	Control Systems.....	3
EET 649	Advanced Programmable Controllers	3
Custom Emphasis - 9 hours		
6 hours chosen from other options.....		6
3 hours electives with advisor's consent.....		3

Approved Electives Selected From.....	7-8	
MFGET 405	Quality Control.....	3
MFGET 661	Computer Aided Manufacturing	3
CMCET 331	Electrical Systems.....	3
MECET 420	Kinematics.....	2
MECET 423	Mechanics of Materials.....	3
MECET 424	Mechanics of Materials Laboratory.....	1
MECET 524	Fluid Mechanics.....	3
MECET 525	Fluid Mechanics Laboratory.....	1
ETECH 300	Cooperative Education (____)	3-6
ETECH 400	Cooperative Education (____)	3-6
ETECH 694	Engineering Technology Laboratory Internship (____).....	1-4
MGMKT 444	Legal and Social Environment of Business.....	3
Or		
Courses from the following with the advisors approval:		
Computer Science, Business, Mathematics and Physics.		
TOTAL	124	

*In order to meet the requirements of the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology, partial waivers for the PSU general education requirements have been allowed.
**Preferred courses.

Bachelor of Science in Engineering Technology Curricula

Manufacturing Engineering Technology
Degree Requirements for Bachelor of Science in Engineering Technology

GENERAL EDUCATION*

Basic Skills	Hours	
ENGL 101	English Composition.....	3
ENGL 103	English Composition or	3
ENGL 299	Introduction to Research Writing.....	3
COMM 207	Speech Communication.....	3
MATH 113	College Algebra.....	3
HPER 150	Lifetime Fitness Concepts.....	1
CSIS 121	Programming in BASIC or	3
CSIS 240	C++ Programming.....	3

Core Courses	Hours	
MFGET 263	Manufacturing Methods I	2
PSYCH 155	General Psychology.....	3
Choose two		6
HIST 201	American History	3
SOSCI 100	Introduction to Sociology	3
SOSCI 101	American Government.....	3

Natural Sciences	Hours	
BIOL 113	Environmental Life Science.....	3
PHYS 100	College Physics I or	3
PHYS 104	Engineering Physics I**.....	4
PHYS 130	Elementary Physics Laboratory I.....	1

Languages and Cultures/Fine Arts (choose one).....	3	
ENGL 113	General Literature.....	3
FLANG 124	French I.....	3
FLANG 134	German I.....	3
FLANG 154	Spanish I.....	3
SOSCI 103	Basic Philosophy.....	3
SOSCI 105	Ethics.....	3
SOSCI 106	World Regional Geography I.....	3
SOSCI 107	World Regional Geography II.....	3
WOMEN 200	Introduction to Women in Society.....	3
WOMEN 299	Issues in Women's Studies	3
ART 102	Introduction to Art Concepts (____).....	3
ART 103	Introduction to Art Studio (____).....	3
COMM 105	Performance Appreciation.....	3
COMM 205	Performance Studies I.....	3
MUSIC 120	Music Appreciation (____)	3

Economy and Society (choose one).....	3	
ACCTG 201	Financial Accounting.....	3
ECON 191	Issues in Today's Economy.....	3
ECON 200	Economics	3
ECON 201	Economics.....	3
FCS 230	Consumer Education.....	3
MGMKT 101	Introduction to Business.....	3
TOTAL GENERAL EDUCATION REQUIREMENTS	41	

MAJOR REQUIREMENTS

Technical Sciences	Hours	
MECET 220	Statics or	3
PHYS 220	Engineering Mechanics I-Statics.....	3
MECET 420	Kinematics.....	2
MECET 423	Mechanics of Materials	3
MECET 424	Mechanics of Materials Laboratory	1
MECET 524	Fluid Mechanics.....	3
MECET 525	Fluid Mechanics Laboratory.....	1
MFGET 564	Heat Treatment and Metallurgy I.....	3
	16	

Technical Specialties (Planned Sequences)

ENGINEERING TECHNOLOGY

<i>Tool Design</i>		
MECET 121	Engineering Graphics I.....	3
MECET 226	Computer Aided Drafting.....	3
MFGET 363	Principles of Tool Design.....	3
<i>Manufacturing Processes</i>		
MFGET 263	Manufacturing Methods I (satisfied by general education core course).....	0
MFGET 267	Manufacturing Methods II.....	3
MFGET 268	Manufacturing Methods I Laboratory.....	1
MFGET 690	Manufacturing Production Control and Management.....	3
<i>Metalcasting</i>		
MFGET 567	Principles of Metalcasting.....	3
MFGET 568	Metalcasting Processing Laboratory.....	3
MFGET 569	Casting Design and Simulation.....	3
<i>Capstone Experience</i>		
MFGET 666	Manufacturing and Design Project I.....	1
MFGET 669	Manufacturing and Design Project II.....	2
<i>Technical Specialties</i>		
MFGET 405	Quality Control.....	3
MFGET 660	Dimensional Metrology.....	3
MFGET 661	Computer Aided Manufacturing.....	3
ETECH 502	Engineering Economy.....	3
EET 141	Introductory Electronics.....	3
EET 340	Programmable Logic Controllers.....	3
<i>Support Courses</i>		
CHEM 105	Introductory Chemistry.....	3
CHEM 106	Introductory Chemistry Laboratory.....	1
MATH 122	Plane Trigonometry.....	3
MATH 143	Elementary Statistics.....	3
MATH 150	Calculus I.....	5
ENGL 301	Technical/Professional Writing.....	3
	Technical Electives.....	7
TOTAL		127

*In order to meet the accreditation requirements of the Technology Accreditation Commission of the Accreditation Board for Engineering Technology, partial waivers from the PSU general education requirements have been allowed.

**Preferred course

Bachelor of Science in Engineering Technology Curricula

Mechanical Engineering Technology

Degree Requirements for Bachelor of Science in Engineering Technology

GENERAL EDUCATION*

		<i>Hours</i>
Basic Skills		16
ENGL 101	English Composition.....	3
ENGL 103	English Composition or	
ENGL 299	Introduction to Research Writing.....	3
COMM 207	Speech Communication.....	3
MATH 113	College Algebra.....	3
HPER 150	Lifetime Fitness Concepts.....	1
CSIS 121	Programming in BASIC or	
CSIS 240	C++ Programming.....	3
Core Courses		8
MFGET 263	Manufacturing Methods I.....	2
	Choose two.....	6
HIST 201	American History.....	3
PSYCH 155	General Psychology.....	3
SOSCI 100	Introduction to Sociology.....	3
SOSCI 101	American Government.....	3
Natural Sciences		8
BIOL 113	Environmental Life Science.....	3
PHYS 100	College Physics I or	
PHYS 104	Engineering Physics I**.....	4
PHYS 130	Elementary Physics Laboratory I.....	1
Languages and Cultures/Fine Arts (choose one)		3
ENGL 113	General Literature.....	3
FLANG 124	French I.....	5
FLANG 134	German I.....	5
FLANG 154	Spanish I.....	5
SOSCI 103	Basic Philosophy.....	3
SOSCI 105	Ethics.....	3
SOSCI 106	World Regional Geography I.....	3
SOSCI 107	World Regional Geography II.....	3
WOMEN 200	Introduction to Women in Society.....	3
WOMEN 299	Issues in Women's Studies.....	3
ART 102	Introduction to Art Concepts (____).....	3
ART 103	Introduction to Art Studio (____).....	3
COMM 105	Performance Appreciation.....	3
COMM 205	Performance Studies I.....	3

MUSIC 120	Music Appreciation (____).....	3
Economy and Society (choose one)		3
ACCTG 201	Financial Accounting.....	3
ECON 191	Issues in Today's Economy.....	3
ECON 200	Economics.....	3
ECON 201	Economics.....	3
FCS 230	Consumer Education.....	3
MGMKT 101	Introduction to Business.....	3
TOTAL GENERAL EDUCATION REQUIREMENTS		38

MAJOR REQUIREMENTS

<i>Technical Sciences</i>		<i>Hours</i>
MECET 121	Engineering Graphics I.....	3
MECET 220	Statics or	
PHYS 220	Engineering Mechanics I-Statics.....	3
MECET 226	Computer Aided Drafting.....	3
MFGET 263	Manufacturing Methods I (satisfied by general education core course).....	0
MFGET 268	Manufacturing Methods I Laboratory.....	1
MFGET 296	Materials in Industry.....	3
MECET 323	Advanced Engineering Graphics.....	3
MECET 423	Mechanics of Materials.....	3
MECET 424	Mechanics of Materials Laboratory.....	1
ETECH 502	Engineering Economy.....	3
PHYS 514	Applied Thermodynamics.....	3
MECET 524	Fluid Mechanics.....	3
MECET 525	Fluid Mechanics Laboratory.....	1
EET 340	Programmable Logic Controllers.....	3
MFGET 666	Manufacturing and Design Project I.....	1
MFGET 669	Manufacturing and Design Project II.....	2
		36

Technical Specialties (Choose one option)***

Option I--Design

MECET 420	Kinematics.....	2
PHYS 522	Engineering Mechanics II-Dynamics.....	3
MECET 523	Mechanical Design I.....	3
MECET 623	Mechanical Design II.....	3
MECET 624	Geometric Dimensioning and Tolerancing.....	3
MECET 682	Heat Transfer.....	3
		17

Option II--Manufacturing

MFGET 267	Manufacturing Methods II.....	3
MFGET 363	Principles of Tool Design.....	3
MFGET 564	Heat Treatment and Metallurgy I.....	3
MFGET 660	Dimensional Metrology.....	3

MFGET 661	Computer Aided Manufacturing.....	3
MFGET 690	Manufacturing Production Control and Management.....	3
		18

Support Courses

PHYS 101	College Physics II or	
PHYS 105	Engineering Physics II**.....	4
PHYS 131	Elementary Physics Laboratory II.....	1
MATH 122	Plane Trigonometry.....	3
CHEM 215	General Chemistry.....	3
CHEM 216	General Chemistry Laboratory.....	2
MATH 150	Calculus I.....	5
MATH 155	Calculus II.....	5
ENGL 301	Technical/Professional Writing.....	3
		26

Approved Technical Electives (requires advisor's approval)..... 9-10

TOTAL.....**127**

*In order to meet the requirements of the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology, partial waivers for the PSU general education requirements have been allowed.

**Preferred course
**Student must declare either manufacturing or design option and follow option sequence.

Bachelor of Science in Engineering Technology Curricula

Plastics Engineering Technology

Degree Requirements for Bachelor of Science in Engineering Technology.

GENERAL EDUCATION*

		<i>Hours</i>
Basic Skills		16
ENGL 101	English Composition.....	3
ENGL 103	English Composition or	
ENGL 299	Introduction to Research Writing.....	3
COMM 207	Speech Communication.....	3
MATH 113	College Algebra (MATH 150 Calculus I will also satisfy this requirement).....	3
HPER 150	Lifetime Fitness Concepts.....	1
CSIS 121	Programming in BASIC or	
CSIS 240	C++ Programming.....	3

Core Courses.....	8
MFGET 263 Manufacturing Methods I.....	2
Choose two.....	6
HIST 201 American History.....	3
PSYCH 155 General Psychology.....	3
SOSCI 100 Introduction to Sociology.....	3
SOSCI 101 American Government.....	3

Natural Sciences.....	8
BIOL 113 Environmental Life Science.....	3
PHYS 100 College Physics I or	
PHYS 104 Engineering Physics I**.....	4
PHYS 130 Elementary Physics Laboratory I.....	1

Languages and Cultures/Fine Arts (choose one).....	3
ENGL 113 General Literature.....	3
FLANG 124 French I.....	5
FLANG 134 German I.....	5
FLANG 154 Spanish I.....	5
SOSCI 103 Basic Philosophy.....	3
SOSCI 105 Ethics.....	3
SOSCI 106 World Regional Geography I.....	3
SOSCI 107 World Regional Geography II.....	3
WOMEN 200 Introduction to Women in Society.....	3
WOMEN 299 Issues in Women's Studies.....	3
ART 102 Introduction to Art Concepts (____).....	3
ART 103 Introduction to Art Studio (____).....	3
COMM 105 Performance Appreciation.....	3
COMM 205 Performance Studies I.....	3
MUSIC 120 Music Appreciation (____).....	3

Economy and Society (choose one).....	3
ACCTG 201 Financial Accounting.....	3
ECON 191 Issues in Today's Economy.....	3
ECON 200 Economics.....	3
ECON 201 Economics.....	3
FCS 230 Consumer Education.....	3
MGMKT 101 Introduction to Business.....	3

TOTAL GENERAL EDUCATION REQUIREMENTS.....38

MAJOR REQUIREMENTS

<i>Technical Sciences</i>	<i>Hours</i>
MECET 121 Engineering Graphics I.....	3
MECET 226 Computer Aided Drafting.....	3
EET 141 Introductory Electronics.....	3
ETECH 502 Engineering Economy.....	3
MECET 524 Fluid Mechanics.....	3
MECET 525 Fluid Mechanics Laboratory.....	1
	16

<i>Technical Specialties</i>	
PET 180 General Plastics Laboratory.....	1
PET 185 General Plastics.....	3
PET 281 Plastics Testing Technology.....	3
PET 380 Plastics Processing I Laboratory.....	1
PET 381 Plastics Processing II Laboratory.....	1
PET 383 Thermoset Resins Laboratory.....	1
PET 385 Plastics Processing I.....	3
PET 386 Plastics Processing II.....	3
PET 387 Thermoplastic Resins.....	3
PET 388 Thermoset Resins.....	3
PET 389 Thermoplastic Resins Laboratory.....	1
PET 585 Mold Design.....	3
PET 684 Plastics Part Design.....	3
ETECH 400 Cooperative Education (____).....	3
MFGET 263 Manufacturing Methods I (satisfied by general education	0
core course).....	
MFGET 268 Manufacturing Methods I Laboratory.....	1
	33

*Choose One Support Option****

<i>Option I--Manufacturing</i>	
MATH 122 Plane Trigonometry.....	3
MATH 143 Elementary Statistics.....	3
MFGET 296 Materials in Industry.....	3
MFGET 405 Quality Control.....	3
EST 593 Introduction to Industrial Safety or	
EST 603 Industrial Safety.....	3
EET 340 Programmable Logic Controls.....	3
	18

<i>Option II--Design</i>	
MATH 155 Calculus II.....	5
MECET 220 Statics or	
PHYS 220 Engineering Mechanics I-Statics.....	3
MATH 253 Calculus III.....	3
MECET 420 Kinematics.....	3
MECET 423 Mechanics of Materials.....	3
MECET 424 Mechanics of Materials Laboratory.....	1
PHYS 514 Applied Thermodynamics.....	3
MATH 553 Differential Equations.....	3
	23

<i>Support Courses</i>	
ENGL 301 Technical/Professional Writing.....	3
MATH 150 Calculus I.....	5
CHEM 215 General Chemistry.....	3
CHEM 216 General Chemistry Laboratory.....	2
CHEM 320 Introductory Organic Chemistry.....	3
CHEM 326 Organic Chemistry Laboratory.....	2
CHEM 620 Polymer Chemistry.....	3
CHEM 621 Polymer Chemistry Laboratory.....	2
	23

Total - Manufacturing Option.....128
Total - Design Option.....133

*In order to meet the accreditation requirements of the Technology Accreditation Commission of the Accreditation Board for Engineering Technology, partial waivers for the PSU general education requirements have been allowed.

**Preferred course.
***Student must declare either manufacturing or design option and follow option sequence.

Bachelor of Science in Technology Curriculum

This curriculum leads to a Bachelor of Science in Technology degree and is designed to prepare individuals for employment in industry. Graduates find employment in administrative, supervisory or technical positions in industrial organizations and assume responsibilities in areas of construction management, estimating, project management and field supervision.

Construction Management

Degree Requirements for Bachelor of Science in Technology

GENERAL EDUCATION*

<i>Basic Skills</i>	<i>Hours</i>
ENGL 101 English Composition.....	3
ENGL 103 English Composition or	
ENGL 299 Introduction to Research Writing.....	3
COMM 207 Speech Communication.....	3
MATH 113 College Algebra.....	3
HPER 150 Lifetime Fitness Concepts.....	1
CSIS 130 Computer Information Systems.....	3

<i>Core Courses</i>	<i>Hours</i>
ENGL 113 General Literature.....	3
HIST 201 American History.....	3
PSYCH 155 General Psychology.....	3
SOSCI 100 Introduction to Sociology.....	3
SOSCI 101 American Government.....	3
GT 190 Introduction to Technology Systems.....	2

<i>Natural Sciences</i>	<i>Hours</i>
BIOL 113 Environmental Life Science.....	3
PHYS 171 Physical Science.....	3
AND	
BIOL 114 Environmental Life Science Laboratory or	
PHYS 172 Physical Science Laboratory.....	2

<i>Languages and Cultures (choose one).....</i>	<i>Hours</i>
FLANG 124 French I.....	5
FLANG 134 German I.....	5
FLANG 154 Spanish I.....	5
SOSCI 103 Basic Philosophy.....	3
SOSCI 105 Ethics.....	3
SOSCI 106 World Regional Geography I.....	3
SOSCI 107 World Regional Geography II.....	3
WOMEN 200 Introduction to Women in Society.....	3
WOMEN 299 Issues in Women's Studies.....	3

<i>Fine Arts (choose one).....</i>	<i>Hours</i>
ART 102 Introduction to Art Concepts (____).....	3
ART 103 Introduction to Art Studio (____).....	3
COMM 105 Performance Appreciation.....	3
COMM 205 Performance Studies I.....	3
MUSIC 120 Music Appreciation (____).....	3

<i>Economy and Society</i>	<i>Hours</i>
ACCTG 201 Financial Accounting.....	3

TOTAL GENERAL EDUCATION REQUIREMENTS50

<i>Technical Courses</i>	<i>Hours</i>
CMCET 133 Construction Graphics.....	3
CMCET 234 Construction Materials and Methods I.....	3
CMCET 235 Construction Materials and Methods II.....	3
CMCET 330 Mechanical Systems.....	5
CMCET 331 Electrical Systems.....	3
CMCET 333 Theory of Structures.....	3
CMCET 334 Construction Materials and Methods III.....	3
CMCET 335 Construction Materials and Methods IV.....	3
CMCET 434 Civil Construction.....	3
CMCET 533 Construction Materials Testing and Inspection.....	3
CMCET 537 Construction Surveying I.....	3
CMCET 631 Construction Estimating I.....	3
CMCET 634 Construction Management.....	3
CMCET 635 Contract Administration.....	3
CMCET 639 Construction Estimating II.....	3
CMCET 691 Senior Project.....	2
EST 696 Construction Safety.....	3
ETECH 502 Engineering Economy.....	2
	54

ENGINEERING TECHNOLOGY

<i>Support Courses</i>	
ETECH 200/300/400 Cooperative Education (____)	3
MATH 122 Plane Trigonometry	3
ENGL 301 Technical/Professional Writing	3
<i>Emphases (choose one - 12 hours)</i>	
<i>Company Management Emphasis</i>	
MGMKT 101 Introduction to Business	3
MGMKT 444 Legal and Social Environment of Business	3
ACCTG 202 Managerial Accounting	3
MECET 226 Computer Aided Drafting	3
<i>Environmental Management Emphasis</i>	
BIOL 513 Resource Conservation	3
BIOL 615 Environmental Protection	3
EST 514 Controlling the Industrial Environment	3
TTED 606 Industrial Supervision	3
<i>Field Management Emphasis</i>	
MFGET 162 Welding Processes and Procedures	3
MECET 226 Computer Aided Drafting	3
TTED 606 Industrial Supervision	3
CMCET 637 Construction Surveying II	3
<i>Residential Construction Emphasis</i>	
CMCET 332 Residential Design	3
TTED 606 Industrial Supervision	3
ETECH 694 Engineering Technology Laboratory Internship (____)	3
WT 382 Construction Methods and Materials	3
<i>Construction Safety Management Emphasis</i>	
EST 514 Controlling the Industrial Environment	3
EST 516 Handling of Products and Hazardous Materials	3
EST 603 Industrial Safety	3
TTED 606 Industrial Supervision	3
TOTAL	125

Graduate Degree Program

Master of Engineering Technology

The Department of Engineering Technology offers courses leading to a Master of Engineering Technology degree with a specialization in research, construction, electronics, manufacturing, mechanical or plastics. This graduate program is a professional multi-disciplinary team and project oriented approach to graduate education. Emphasis is placed on "real-world" activities, projects and interactions.

Admission to this graduate program requires an undergraduate degree in engineering, engineering technology or closely related area. Students must meet the university graduate admission requirements detailed in the University Catalog. International students must have a TOEFL of 540 or higher. All applicants must submit a one page letter and resume relating their background, specific interests and outlining their expectations. A minimum undergraduate grade point average of 2.7000 is required unless applicant has significant industrial experience. All transcripts will be evaluated prior to admission into program.

<i>Core Courses: (Group 1 - Required)</i>	
ETECH 804 Quality: Management and Control	3
ETECH 805 Current Issues in Engineering Technology	3
ETECH 807 Systems Engineering and Analysis	3
ETECH 809 Engineering Management	3
ETECH 810 Collaborative Projects for Engineering Technology	3
ETECH 831 Value Engineering	3
<i>Core Courses: (Group 2 - Select one course)</i>	
GRT 888 Product Design and Management	3
GRT 899 Quantitative Decision Making in Industry	3
MGMKT 811 Production Management	3
<i>Emphasis Options: (minimum of 12 hours)</i>	
Option A - Research/Development Option	12
GRT 890 Reserach and Thesis	3-6

GRT 891 Methods of Research	3
ETECH 795 Special Topics in Engineering Technology (____)	1-3
<i>Option B - Technical Specialty Option</i>	
A minimum of 12 hours of selected graduate coursework in construction, electronics, manufacturing, mechanical, plastics or approved areas.	
TOTAL (minimum)	33

CONSTRUCTION ENGINEERING TECHNOLOGY

CMCET 133. Construction Graphics. 3 hours. (1 hour lecture, 4 hours laboratory). Graphic representation as used in the construction industry including blueprint reading, structural drafting, mechanical and electrical systems diagrams.

CMCET 234. Construction Materials and Methods I. (3 hours lecture; Laboratory experience required). Light framing, thermal and moisture protection, doors and windows, and finishes. Materials and methods of construction. Review of drawings and specifications. Identification and quantification of labor and material units for productivity and cost determination.

CMCET 235. Construction Materials and Methods II. 3 hours (3 hours lecture; Laboratory experience required). Earthwork, sitework and foundations. Earth structures, equipment for earth construction, foundation systems, and sitework. Materials, methods, and equipment of construction, productivity of equipment and unit quantity and cost determination.

CMCET 330. Mechanical Systems. 5 hours. Design, installation and operation of materials and equipment in HVAC (heating, ventilating, air conditioning) and plumbing (sanitary sewer, domestic water) systems in residential and commercial construction. Includes design projects, computer aided design, blueprint reading and estimating. Prerequisites: CMCET 133 Construction Graphics and a "C" or better in MATH 113 College Algebra or MATH 110 College Algebra with Review or MATH 126 Pre-Calculus.

CMCET 331. Electrical Systems. 3 hours. Design, installation and operation of materials and equipment in electrical power and lighting systems in residential and commercial construction. Includes design projects, blueprint reading and estimating. Prerequisites: CMCET 133 Construction Graphics and a "C" or better in MATH 113 College Algebra or MATH 110 College Algebra with Review or MATH 126 Pre-Calculus.

CMCET 332. Residential Design. 3 hours. (1 hour lecture, 4 hours laboratory). Space utilization, circulation, structural design, energy efficient design, building costs, architect-owner-contractor relationship, exterior design, electrical/mechanical considerations and techniques for preparing architectural residential drawings. Computer aided drafting may be used. Prerequisite: CMCET 133 Construction Graphics.

CMCET 333. Theory of Structures. 3 hours. (2 hours lecture, 2 hours laboratory). Fundamentals of static design, forces acting on structural systems and components, stresses in members. Not open to Engineering Technology majors. Prerequisites: MATH 122 Plane Trigonometry and a "C" or better in MATH 113 College Algebra or MATH 110 College Algebra with Review or MATH 126 Pre-Calculus.

CMCET 334. Construction Materials and Methods III. 3 hours (3 hours lecture; Laboratory experience required). Steel and masonry construction. Materials, methods, and equipment used. Reading of drawings and specifications. Identification and quantification of labor and material units for productivity and cost determination. Prerequisite: MATH 113 College Algebra or MATH 110 College Algebra with Review or MATH 126 Pre-Calculus.

CMCET 335. Construction Materials and Methods IV. 3 hours (3 hours lecture; Laboratory experience required). Concrete construction. Materials, methods, and equipment used including mix design, formwork design, placing, and finishing. Reading of drawings and specifications. Identification and quantification of labor and material units for productivity and cost determination. Prerequisite: MATH 113 College Algebra or MATH 110 College Algebra with Review or MATH 126 Pre-Calculus.

CMCET 431. Structural Design-Loads. 1 hour. Code requirements for structural loading, vertical loads and lateral forces, in addition to other codes used in the construction industry. Prerequisite or Corequisite: MECET 220 Statics or equivalent.

CMCET 434. Civil Construction. 3 hours. (3 hours lecture). Terminology, processes, equipment, materials, construction, and testing in the construction of water and waste water plants, utilities, highways, and bridges. Prerequisites: CMCET 133 Construction Graphics, CMCET 234 Construction Materials and Methods I, and a "C" or better in MATH 113 College Algebra or MATH 110 College Algebra with Review or MATH 126 Pre-Calculus, and permission of instructor.

CMCET 533. Construction Materials Testing and Inspection. 3 hours. (2 hours lecture, 2 hours laboratory). Construction materials testing and inspection procedures in laboratory and field situations using standard testing equipment, methods and field inspection techniques. Testing concrete, steel, wood, soils, aggregate, asphalt and masonry materials and samples relative to ASTM testing standards, laboratory reports, computer analysis, data collection and simulated field inspections. Prerequisites: CMCET 234 Construction Materials and Methods I, CMCET 235 Construction Materials and Methods II, and a "C" or better in MATH 113 College Algebra or MATH 110 College Algebra with Review or MATH 126 Pre-Calculus.

CMCET 536. Structural Design--Wood. 2 hours. (1 hour lecture, 2 hours laboratory). Analysis and design of wood structural members, connectors, reoriented and reconstituted wood. Written laboratory reports and computer

applications. Prerequisites or corequisites: MECET 423 Mechanics of Materials and CMCET 431 Structural Design-Loads. May be taken for honors.

CMCET 537. Construction Surveying I. 3 hours. (1 hour lecture, 4 hours laboratory). Theory, principles, practices of surveying applied to construction and engineering instrumentation, computations, and site layout. Prerequisite: MATH 122 Plane Trigonometry with grade of "C" or better.

CMCET 631. Construction Estimating I. 3 hours. (2 hours lecture, 2 hours laboratory). Estimating techniques and methods pertaining to residential, commercial, industrial, and civil construction. Quantity take offs, unit pricing, estimate development, blueprint reading, resource pricing, and bidding procedures. Introduction to computer estimating using Lotus 1,2,3 and estimating software. Prerequisites: CMCET 334 Construction Materials and Methods II, CMCET 434 Civil Construction, or written permission of instructor. May be taken for honors.

CMCET 632. Structural Design--Steel. 3 hours. (2 hours lecture, 2 hours laboratory). Analysis and design of steel structural members incorporating requirements of current specifications and codes with procedures of practical construction. Written and oral reports, computer applications. Prerequisites or corequisites: MECET 423 Mechanics of Materials and CMCET 431 Structural Design-Loads. May be taken for honors.

CMCET 633. Structural Design--Concrete. 3 hours. (3 hours lecture). Analysis and design of concrete structural members incorporating requirements of current specifications and codes with procedures of practical construction, form work and scaffolding. Written and oral reports. Computer applications. Prerequisites or corequisites: MECET 423 Mechanics of Materials and CMCET 431 Structural Design-Loads. May be taken for honors.

CMCET 634. Construction Management. 3 hours. (2 hours lecture, 2 hours laboratory). Construction management principles, practices and decisions relative to project and construction site management, project organization, project planning, scheduling, control, safety, resource allocation and quality control. Case studies and computer applications of scheduling. Prerequisites or corequisite: CMCET 631 Construction Estimating I. Senior standing. May be taken for honors.

CMCET 635. Contract Administration. 3 hours. (2 hours lecture, 2 hours laboratory). Administration of construction contracts, contract documents, contract law, contract negotiation, taxes, insurance and bonds, labor relations and case studies. Prerequisite: Senior standing. May be taken for honors.

CMCET 637. Construction Surveying II. 3 hours. (2 hours lecture, 2 hours laboratory). Theory and supervised field practice of field work in layout of engineering and construction projects, utilizing extensive surveying principles, applied science, mathematics, legal implications and computer applications. Prerequisite: CMCET 537 Construction Surveying I.

CMCET 638. Foundation and Soil Mechanics. 3 hours. (3 hours lecture). Classification and properties of soils. Subsurface soil exploration. Design of piling, caissons, spread footings, and walls. Prerequisites or corequisites: CMCET 633 Structural Design--Concrete and CMCET 533 Construction Materials Testing and Inspection. May be taken for honors.

CMCET 639. Construction Estimating II. 3 hours. (2 hours lecture, 2 hours laboratory). An advanced study of estimating and bidding procedures for building, civil, and industrial construction. Includes unit price estimating, conceptual estimating, detailed estimating, overhead allocation, profit determination, bidding strategies, and bid formulation. Extensive use of estimating software. Project oriented. Prerequisite: CMCET 330 Mechanical Systems, CMCET 331 Electrical Systems and CMCET 631 Construction Estimating I. May be taken for honors.

CMCET 691. Senior Project. 2 hours. (4 hours laboratory). Capstone experience utilizing construction design, methods, cost analysis, specifications, contracts and organization in a commercial project. Computer applications for design, drafting and control. Team approach. Prerequisites or corequisites: Senior standing and permission of instructor.

ELECTRONICS ENGINEERING TECHNOLOGY

EET 141. Introductory Electronics. 3 hours. (2 hours lecture, 2 hours laboratory). Principles of electricity, magnetism, and basic laws. Fundamentals of analog and digital electronic components and circuits, including applied areas. Laboratory involves experiments with basic circuits and test equipment. Recommended prerequisite: MATH 113 College Algebra or MATH 110 College Algebra with Review or MATH 126 Pre-Calculus.

EET 144. D.C. Circuit Analysis Methods. 3 hours. (2 hours lecture, 2 hours laboratory). Methods and mathematical techniques of analyzing DC circuits, Kirchoff's Laws, Thevenin, Norton, superposition and maximum power transfer theorems. Branch, mesh, and nodal analysis. Recommended Prerequisites: EET 141 Introductory Electronics and MATH 113 College Algebra or MATH 110 College Algebra with Review or MATH 126 Pre-Calculus.

EET 244. Logic Circuits. 3 hours. (2 hours lecture, 2 hours laboratory). Theory and experimentation with building block circuits in logic systems and computers including number systems, codes, Boolean Algebra, gates, flip-flops, registers, clocks and memories. Corequisite/Prerequisite: EET 144 D.C. Circuit Analysis Methods.

EET 245. Electronic Devices and Circuits. 3 hours. (2 hours lecture, 2 hours laboratory). Operation and characteristics of basic semi-conductor devices. Study of basic electronic circuits including wave-shaping circuits, power supplies, and amplifiers. Prerequisite: EET 144 D.C. Circuit Analysis Methods.

EET 246. A.C. Circuit Analysis Methods. 3 hours. (2 hours lecture, 2 hours laboratory). Methods and mathematical techniques of analyzing A.C. circuits. Kirchoff's Laws and phaser analysis. Apparent, reactive and real power calculations. Branch, mesh and nodal analysis. Prerequisites: EET 144 D.C. Circuit Analysis Methods and MATH 122 Plane Trigonometry. Recommended Corequisite: MATH 150 Calculus I.

EET 340. Programmable Logic Controllers. 3 hours. (2 hours lecture, 2 hours laboratory). Industry standard controller devices based on specialized microcomputers and relay I/O racks. Relay logic, ladder logic symbolism, hardware configuration, inputs (analog transducers and logic switching devices), outputs including D/A conversion and I/O panel to actuator connection, PLC programming and theory of hardware interfacing. Prerequisite: PHYS 131 Elementary Physics Laboratory II and GT 249 Fundamentals of Electricity/Electronics or EET 141 Introductory Electronics or PHYS 101 College Physics II or PHYS 105 Engineering Physics II.

EET 344. Microcomputer Systems. 3 hours. (2 hours lecture, 2 hours laboratory). Theory of computer and microcomputer architecture. Experimentation with and applications of MPU's, ROM's, RAM's, PROM's, and I/O devices, both hardware and programming. Prerequisite: EET 244 Logic Circuits.

EET 345. Instrumentation. 3 hours. (2 hours lecture, 2 hours laboratory). Principles of electronic instrumentation and measurement techniques including analog to digital and digital to analog conversion methods. Emphasis placed on virtual instrumentation and application towards specific systems. Prerequisite: EET 245 Electronic Devices and Circuits. Prerequisite or Corequisite: EET 344 Microcomputer Systems. May be taken for honors.

EET 349. Linear Integrated Circuits. 3 hours. (2 hours lecture, 2 hours laboratory). Theory of operation and applications of analog integrated circuits. Laboratory experience includes circuits using operational amplifiers, phase locked loops and timers. Prerequisite: EET 245 Electronic Devices and Circuits. May be taken for honors.

EET 447. Communications Theory and Circuits. 3 hours. (2 hours lecture, 2 hours laboratory). Theory of operation of basic circuits and equipment used in industrial and commercial communications applications with emphasis on F. M., multiplex, A.M., and sideband techniques. Prerequisites: EET 245 Electronic Devices and Circuits. May be taken for honors.

EET 540. Electronic Design Proposal. 1 hour. (Lecture/laboratory). Research culminating in a circuit or system design proposal. Prerequisites: EET 344 Microcomputer Systems, EET 349 Linear Integrated Circuits, and six upper division electronic hours.

EET 546. Electronic Controls. 4 hours. (3 hours lecture, 2 hours laboratory). Principles of electronic control theory and programming techniques applied to control systems. Applications of integrated circuits, discrete semiconductor devices and microprocessors. Laboratory includes experience with applied programming, control devices, and systems, and experimentation in virtual control. Prerequisite: EET 344 Microcomputer Systems, EET 349 Linear Integrated Circuits, MATH 155 Calculus II, and CSIS 240 C++ Programming. May be taken for honors.

EET 547. Electronic Communications Systems. 3 hours. (2 hours lecture, 2 hours laboratory). Communication systems including antennas, transmission lines, microwave systems and fiber optics. Prerequisite: EET 349 Linear Integrated Circuits. May be taken for honors.

EET 549. Microcontrollers. 3 hours. (2 hours lecture, 2 hours laboratory). Microcontroller concepts and principles of operation. Architecture, instruction sets, programming, I/O, and peripheral systems with emphasis on individual laboratory experimentation and application of concepts. Prerequisite: EET 344 Microcomputer Systems and EET 349 Linear Integrated Circuits. Recommended prerequisite: EET 546 Electronic Controls. May be taken for honors.

EET 610. Advanced Logic Design. 3 hours. (2 hours lecture, 2 hours laboratory). Current technologies incorporated in logic design. Programmable logic devices (PLD), application specific integrated circuits (ASICs) and Fuzzy logic. Course will culminate in a design project based on a course topic. Prerequisite: EET 344 Microcomputer Systems. May be taken for honors.

EET 613. Network Systems. 3 hours. (2 hours lecture, 2 hours laboratory). Theory and experimentation with the basic components of local and wide area networking. Topics include cabling systems, protocols, operating systems, and interconnection strategies. Investigations into the use of personal computers in network systems will also be performed. Prerequisite: EET 344 Microcomputer Systems and EET 349 Linear Integrated Circuits. May be taken for honors.

EET 640. Application Design Problems. 2 hours. (1 hour lecture, 2 hours laboratory). Continuation of EET 540 Electronic Design Proposal. Capstone course resulting in a working electronic prototype of design proposal from EET 540 Electronic Design Proposal. Prerequisite: EET 540 Electronic Design Proposal.

EET 642. Electronic Technology Seminar. 1 hour. (1 hour lecture). Current development in electronics including linear, non-linear, digital and microprocessor circuits. Corequisite: EET 640 Application Design Problems.

EET 643. Data Acquisitions Systems. 3 hours. (2 hours lecture, 2 hours laboratory). Principles of data sampling and signal conditioning. Theory, operation, and circuit applications of analog multiplexers, digital to analog converters and analog to digital converters. Prerequisite: EET 344 Microcomputer Systems. May be taken for honors.

EET 646. Control Systems. 3 hours. (3 hours lecture). Control system analysis including terminology and principles, procedures and computations used to select, analyze, specify, design and maintain components of a control system. Investigation of electronic and non-electronic control systems including magnetic, mechanical, hydraulic, pneumatic, optical, and radiative. Automatic control concepts, process characteristics and methods of analysis and controller design. Prerequisite: EET 344 Microcomputer Systems and EET 349 Linear Integrated Circuits. Recommended prerequisite: EET 546 Electronic Controls. May be taken for honors.

EET 648. Data Communications Systems. 3 hours. (2 hours lecture, 2 hours laboratory). Theory of communications systems utilizing digital signals. Includes coding, multiplexing, digital modulation and networks. Prerequisite: EET 344 Microcomputer Systems. May be taken for honors.

EET 649. Advanced Programmable Controllers. 3 hours. (3 hours lecture). Principles of advanced programmable controller technology, advanced programming, and theoretical analysis. Transducers, digital and analog interfacing with emphasis on individual laboratory experimentation and implementation of interfacing modern devices and systems. Prerequisite: EET 344 Microcomputer Systems and EET 349 Linear Integrated Circuits. Recommended

prerequisite: EET 546 Electronic Controls. May be taken for honors.

EET 840. Networks and Systems. 3 hours. Theoretical and practical applications of networks and systems with major emphasis on electronic networks and systems. Steady state and transient response. Transform theory with computer applications. System description, simplification and optimization techniques. Prerequisites: 30 semester hours of undergraduate electronics, 5 semester hours of undergraduate physics, MATH 155 Calculus II.

EET 845. Advanced Microprocessor Systems and Applications. 3 hours. Microcomputer systems and applications including 16/32 Bit Microprocessors, digital signal processing (DSP) and microcontrollers. Assembly language programming using development systems. Prerequisite: 6 semester hours undergraduate work in microprocessor systems (hardware and software applications).

MANUFACTURING ENGINEERING TECHNOLOGY

MFGET 162. Welding Processes and Procedures. 3 hours. (1 hour lecture, 4 hours laboratory). This is an introductory course providing technical information on gas metal, flux core, plasma, and gas tungsten arc welding techniques employed by the welding industry. Techniques in robotic welding and weld inspection, applications of robotic, semi-automatic and manual welding and plasma and oxy-fuel cutting are included.

MFGET 263. Manufacturing Methods I. 2 hours. (2 hours lecture). Fundamental engineering manufacturing methods, practices, processes dealing with metals, plastics, composites, electronics and automation. Basic measuring tools and assembly practices. Corequisite: Concurrent enrollment in MFGET 268 Manufacturing Methods I Laboratory required.

MFGET 267. Manufacturing Methods II. 3 hours. (1 hour lecture, 42 hours laboratory). Emphasis on applied manufacturing methods found in industry. Measuring tools, hand tools, machine tools and computer numerical control will be used to construct projects from student drawings. Prerequisites: MFGET 263 Manufacturing Methods I and CAD class.

MFGET 268. Manufacturing Methods I Laboratory. 1 hour. (2 hours laboratory). Laboratory experiences in manufacturing methods. Disassembly and fabrication problems and discussion on the manufacturing process. Small team projects. Corequisite: MFGET 263 Manufacturing Methods I.

MFGET 296. Materials in Industry. 3 hours. Physical properties, structure and applications of materials used in manufacturing.

MFGET 304. Engineering Materials and Processes. 3 hours. Study of properties and applications of engineering material-metals, ceramics, and polymers used in production. Emphasis on primary and secondary processes used to produce standard stock material and finished products.

MFGET 363. Principles of Tool Design. 3 hours. (2 hours lecture, 2 hours laboratory). General methods of tool design with emphasis on jigs and fixtures. Enables the student to develop ideas into practical specifications for modern manufacturing methods. Prerequisites: MECET 226 Computer Aided Drafting, MFGET 263 Manufacturing Methods I or equivalent.

MFGET 364. Aircraft Tool Design. 3 hours. (3 hours lecture). Fundamentals of tool engineering; aircraft manufacturing processes/productions; tool fabrication processes; tooling materials; hardware variability control (HVC); design build teams. Prerequisites or Corequisites: MECET 323 Advanced Engineering Graphics or MECET 121 Engineering Graphics I and permission of instructor, and MECET 420 Kinematics or permission of instructor, and MECET 423 Mechanics of Materials or permission of instructor. Requires additional laboratory hours.

MFGET 405. Quality Control. 3 hours. (3 hours lecture). Dr. Edward Deming's concepts using statistical process control charts for variables and attributes. Topics include quality cost, gage repeatability and reproducibility, organization for quality, acceptance sampling techniques, product liability, and Hardware Variability Control (HVC). Prerequisite: A course in statistics.

MFGET 564. Heat Treatment and Metallurgy I. 3 hours. (2 hours lecture, 2 hours laboratory). Applied ferrous metallurgy dealing with the extraction of metal from ores, their physical properties, heat treatments, testing and industrial applications. May be taken for honors.

MFGET 567. Principles of Metalcasting. 3 hours. Basic principles, techniques and materials used in pattern construction. Theory and practice in techniques and principles of metalcasting operations, equipment, testing, and inspection methods related to quality and production control.

MFGET 568. Metalcasting Processing Laboratory. 2 hours. (4 hours laboratory). Laboratory experiences with various metalcasting processes: molding processes, coremaking techniques, ferrous and non-ferrous metallurgy, sand control and gating and risering techniques. Prerequisite: Concurrent enrollment required in MFGET 567 Principles of Metalcasting.

MFGET 569. Casting Design and Simulation. 3 hours. Design of components suitable for metalcasting processes. Emphasis placed on molding, fluid flow, heat transfer, gating, feeding, and subsequent machining as well as metallurgical properties, structural design and cost effectiveness. Computer assisted process simulation will be covered. Prerequisites: MFGET 567 Principles of Metalcasting and MFGET 568 Metalcasting Processing Laboratory.

MFGET 660. Dimensional Metrology. 3 hours. Measurement and quality control systems from basic devices to complex electronic and air control systems. Inspection methods as applied to quality and production control. Requires open laboratory assignments. May be taken for honors.

MFGET 661. Computer Aided Manufacturing. 3 hours. (3 hours lecture). Interfacing computers and CAM software to develop Computer Numerical Control (CNC) programs for turning, milling, and other machines, (EDM and waterjet). Emphasis on manual programming, tooling considerations, post-

processing, speeds and feeds, and transferring data among CAD, CAM and CNC. Prerequisite: MATH 122 Plane Trigonometry. Requires open laboratory assignments. May be taken for honors.

MFGET 666. Manufacturing and Design Project I. 1 credit hour. (2 hours laboratory). A "capstone" experience incorporating design, design analysis and material selection based on design cost and quality. Projects will be assigned to teams or individuals to assure a professional experience in the major field. Prerequisite or corequisite: MECET 423 Mechanics of Materials or written permission of instructor required. Enrollment restricted to manufacturing or mechanical seniors.

MFGET 669. Manufacturing and Design Project II. 2 hours. (1 hour lecture, 2 hours laboratory). Part II of the "capstone" experience dealing with actual manufacturing, testing and evaluation of the project designed in MFGET 666 Manufacturing and Design Project I. Prerequisite: MFGET 666 Manufacturing and Design Project I or written permission of instructor. Enrollment limited to manufacturing and mechanical engineering technology majors only.

MFGET 690. Manufacturing Production Control and Management. 3 hours. Control of the production processing system with regard to plant layout material selection/utilization, human factors/management, and product marketing will be studied. The course utilizes a manufacturing enterprise approach to disseminate course content. Prerequisites: MFGET 263 Manufacturing Methods I and MFGET 268 Manufacturing Methods I Laboratory and MFGET 267 Manufacturing Methods II.

MFGET 761. Numerical Control in Manufacturing I. 3 hours. Numerical control of machine tools including management instructions, justification of numerical control, manuscript writing, control systems, computers and their role in numerical control, and manual programming. Prerequisites: MATH 122 Plane Trigonometry. Requires open laboratory assignments. May be taken for honors.

MECHANICAL ENGINEERING TECHNOLOGY

MECET 121. Engineering Graphics I. 3 hours. (1 hour lecture, 4 hours laboratory). Introduction to engineering graphic standards and the design process. Includes engineering lettering, line conventions, orthographic projection, sections, auxiliary views, dimensioning practices and pictorial drawings.

MECET 122. Engineering Graphics II. 3 hours. (1 hour lecture, 4 hours laboratory). Descriptive geometry with application of the spatial relationship between points, lines, planes, and solids. Advanced projection techniques including primary and secondary auxiliary views, revolutions, intersections, developments, and vector analysis. Prerequisite: MECET 121 Engineering Graphics I or equivalent.

MECET 220. Statics. 3 hours. (3 hours lecture). Study of forces acting on rigid bodies at rest. Vectors, couples, equilibrium, distributed forces, geometric properties, beam analysis, and friction. Prerequisites: MECET 121 Engineering Graphics I or MECET 133 Construction Graphics and PHYS 100 College Physics I and PHYS 130 Elementary Physics Laboratory I. Prerequisite or Corequisite: MATH 150 Calculus I or equivalent.

MECET 226. Computer Aided Drafting. 3 hours. (1 hour lecture, 4 hours laboratory). The application of computer hardware and software in the field of engineering graphics. Use of commercial computer hardware and software to prepare engineering drawings. Prerequisite: MECET 121 Engineering Graphics I or equivalent.

MECET 323. Advanced Engineering Graphics. 3 hours. (1 hour lecture, 4 hours laboratory). Manual and computer aided drafting techniques, standards and tolerancing methods to prepare design layouts, assembly, detail and installation drawings. Prerequisites: MECET 121 Engineering Graphics I and MECET 226 Computer Aided Drafting. May be taken for honors.

MECET 327. Advanced Computer Aided Drafting. 3 hours. (1 hour lecture, 4 hours laboratory). Advanced topics in computer aided design including hardware configuration, operating systems management, prototype drawings, and menu customization. Application of a computer system to prepare design layouts, assembly drawings, and detail drawings meeting ANSI and other industrial standards. Prerequisite: MECET 226 Computer Aided Drafting or equivalent. May be taken for honors.

MECET 420. Kinematics. 2 hours. (2 hours lecture). Motion, forces, and mechanisms that produce motion in a mechanical system. Calculation of displacement, velocity, and acceleration of machine elements using graphics, mathematical and computer assisted methods. Prerequisites: MECET 121 Engineering Graphics I and MECET 220 Statics or equivalent.

MECET 423. Mechanics of Materials. 3 hours. (3 hours lecture). Principles of mechanics as applied to the strength and stiffness of engineering materials. Topics include stress, strain, properties of areas, torsion, bending, compound stresses, and columns. Prerequisite: MECET 220 Statics or equivalent. Corequisite: MECET 424 Mechanics of Materials Laboratory.

MECET 424. Mechanics of Materials Laboratory. 1 hour. (2 hours laboratory). Laboratory activities designed to verify the properties of engineering materials using standard testing equipment and procedures. Testing of materials in tension, compression, shear, torsion, and bending in accordance with ASTM standards. Individual laboratory reports requiring the use of manual and computer assisted data collection and analysis techniques. Prerequisite or corequisite: MECET 423 Mechanics of Materials or equivalent.

MECET 523. Mechanical Design I. 3 hours. (3 hours lecture). Principles for selecting and interfacing standard mechanical system components. Topics include tolerance analysis, fasteners, shafts, couplings, brakes, clutches, gears, belt and chain drives, bearings, seals, cams, motors, and other power transmission components. Extensive use of engineering handbooks, vendor catalogs, and computer software. Prerequisite: MECET 423 Mechanics of Materials or equivalent.

MECET 524. Fluid Mechanics. 3 hours. (3 hours lecture). Elementary fluid mechanics. Manual and computer assisted calculation of viscosity, flow, pressure and pressure-velocity relationships of fluid to design fluid power systems or control manufacturing processes. Emphasis on the selection of valves, accumulators, actuators, seals, pumps, and motors. Prerequisite: PHYS 100 College Physics I or PHYS 104 Engineering Physics I and PHYS 130 Elementary Physics Laboratory I. Corequisite: MECET 525 Fluid Mechanics Laboratory.

MECET 525. Fluid Mechanics Laboratory. 1 hour. (2 hours laboratory). Laboratory activities designed to verify the principles of fluid mechanics. Topics include pressure and flow measurements, friction losses, pump performance, and use of computer software and laboratory equipment to gather data and write formal laboratory reports. Prerequisite or corequisite: MECET 524 Fluid Mechanics or equivalent.

MECET 528. Computer Aided Modeling. 3 hours (1 hour lecture, 4 hours laboratory). Study of special drafting methods including three-dimensional drawing, surface modeling, solid modeling, and other techniques used to prepare drawings for professional presentations. Prerequisite: MECET 226 Computer Aided Drafting. May be taken for honors.

MECET 623. Mechanical Design II. 3 hours. (3 hours lecture). Design of shafting, springs, fasteners, belts, clutches, brakes, chains, bearings, and gears. Emphasis is placed on the manual and computer aided design of individual machine elements in accordance with ASME codes and other industrial standards. Prerequisite: MECET 523 Mechanical Design I or equivalent.

MECET 624. Geometric Dimensioning and Tolerancing. 3 hours. Geometric dimensioning and tolerancing with an emphasis on the interpretation of ANSI Y 14.5 (Dimensioning and Tolerancing). Applications in product design, drafting, manufacturing, and inspection. Prerequisite: MECET 121 Engineering Graphics I or equivalent. May be taken for honors.

MECET 682. Heat Transfer. 3 hours. (3 hours lecture). Principles of heat transfer including conduction, convection, and radiation involved with materials and processing techniques. Manual and computer assisted calculations with applications in manufacturing. Closed to students with credit in MECET 682 Thermodynamics and Heat Transfer. Prerequisite: MATH 150 Calculus I. Prerequisite or corequisite: MECET 524 Fluid Mechanics.

PLASTICS ENGINEERING TECHNOLOGY

PET 180. General Plastics Laboratory. 1 hour. (2 hours laboratory). Laboratory experiments involving plastic materials and processes used in plastics industry. Concurrent enrollment in PET 185 General Plastics required.

PET 185. General Plastics. 3 hours. (3 hours lecture). Characteristics of thermoplastic and thermosetting materials. Concurrent enrollment in PET 180 General Plastics Laboratory required.

PET 281. Plastics Testing Technology. 3 hours. (3 hours lecture). Static and dynamic testing using ASTM and other industrial tests. Demonstration of strength of plastics specimens or parts and significant properties of the plastics involved. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory.

PET 380. Plastics Processing I Laboratory. 1 hour. (2 hours laboratory). Laboratory experiences with various thermoplastic processes. Concurrent enrollment in PET 385 Plastics Processing I required. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory. May be taken for honors.

PET 381. Plastics Processing II Laboratory. 1 hour. (2 hours laboratory). Laboratory experiences with various materials and processes. Corequisite: PET 386 Plastics Processing II. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory. May be taken for honors.

PET 383. Thermoset Resins Laboratory. 1 hour. (2 hours laboratory). Laboratory experiences with various thermoset resins. Corequisite: PET 388 Thermoset Resins. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory and CHEM 335 Organic Chemistry II and CHEM 336 Organic Chemistry Laboratory II. May be taken for honors.

PET 385. Plastics Processing I. 3 hours. (3 hours lecture). Methods for resin conversion to finished products. Concurrent enrollment in PET 380 Plastics Processing I Laboratory required. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory. May be taken for honors.

PET 386. Plastics Processing II. 3 hours. (3 hours lecture). Methods for resin conversion to finished products. Concurrent enrollment in PET 381 Plastics Processing II Laboratory required. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory. May be taken for honors.

PET 387. Thermoplastic Resins. 3 hours. (3 hours lecture). General properties and methods for determination. Concurrent enrollment in PET 389 Thermoplastic Resins Laboratory required. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory and CHEM 335 Organic Chemistry II and CHEM 336 Organic Chemistry Laboratory II or equivalent. May be taken for honors.

PET 388. Thermoset Resins. 3 hours. (3 hours lecture). General properties and methods for determination. Concurrent enrollment in PET 383 Thermoset Resins Laboratory required. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory and CHEM 335 Organic Chemistry II and CHEM 336 Organic Chemistry Laboratory II or equivalent. May be taken for honors.

PET 389. Thermoplastic Resins Laboratory. 1 hour. (2 hours laboratory). Laboratory experiences with various thermoplastic resins. Concurrent enrollment in PET 387 Thermoplastic Resins required. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory and CHEM 335 Organic Chemistry II and CHEM 336 Organic Chemistry Laboratory II or equivalent. May be taken for honors.

PET 585. Mold Design. 3 hours. (1 hour lecture, 4 hours laboratory). Designing and drawing molds for injection, compression and transfer molding of plastics.

Studies of gating, runners and mold formations. Prerequisite: MECET 121 Engineering Graphics I. Prerequisite or corequisite: MECET 122 Engineering Graphics II.

PET 586. Senior Project. 3 hours. (3 hours lecture). Research culminating in a plastics part or a product proposal which includes associated information for production possibilities. Prerequisite: Senior status (over 90 hours) or written permission of instructor.

PET 680. Composites Laboratory. 1 hour. (2 hours laboratory). Laboratory experiences with various reinforcements and resins. Concurrent enrollment in PET 685 Composites required. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory, CHEM 320 Introductory Organic Chemistry and CHEM 326 Organic Chemistry Laboratory, or CHEM 325 Organic Chemistry I and CHEM 326 Organic Chemistry Laboratory or equivalent.

PET 681. Elastomeric Materials Laboratory. 1 hour. (2 hours laboratory). Laboratory experiences with various elastomeric materials. Concurrent enrollment in PET 686 Elastomeric Materials required. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory and CHEM 335 Organic Chemistry II and CHEM 336 Organic Chemistry Laboratory II or equivalent. May be taken for honors.

PET 684. Plastics Part Design. 3 hours. A design process for both thermoplastic and thermoset parts including design structural concepts, layout of parts, dimensioning and problems. Prerequisites: MECET 121 Engineering Graphics I, PET 180 General Plastics Laboratory and PET 185 General Plastics, PET 385 Plastics Processing I, PET 386 Plastics Processing II, PET 387 Thermoplastic Resins, PET 388 Thermoset Resins. May be taken for honors.

PET 685. Composites. 3 hours. Theory and application of epoxy resins with various curing agents, fillers, catalysts and reinforcing material; for use with other composite materials to make products for aerospace, electronics and electrical applications. Concurrent enrollment in PET 680 Composites Laboratory required. Prerequisites: PET 185 General Plastics and PET 180 General Plastics Laboratory, CHEM 320 Introductory Organic Chemistry and CHEM 326 Organic Chemistry Laboratory, or CHEM 325 Organic Chemistry I and CHEM 326 Organic Chemistry Laboratory or equivalent. For graduate students or senior plastics majors who have taken all undergraduate plastics courses. May be taken for honors.

PET 686. Elastomeric Materials. 3 hours. Properties and technology of natural rubbers and synthetic elastomers such as Buna N, Buna S, Butyl, Neoprene, Silicone, Polysulfide, Polyurethanes and their applications. Prerequisites: CHEM 335 Organic Chemistry II and CHEM 336 Organic Chemistry Laboratory II or equivalent. For graduate students or senior plastics majors who have taken all undergraduate plastics courses or are concurrently enrolled in the final course. May be taken for honors.

TECHNICAL SUPPORT CLASSES

ETECH 200. Cooperative Education (____). 1-6 hours. A cooperative college-industry, college-business, or college-government work experience. The student is interviewed and employed by an industrial, business or government organization, then a work program is outlined. Supervision of the work experience is conducted by the employer and the college coordinator. May be repeated if subject matter is different. Written permission of department chairperson required. Offered on a Pass-Fail basis only.

ETECH 206. Seminar in Technology (____). 1/2 credit hour. Lectures and written reports on current topic in technology. May be repeated for a maximum of 2 hours. Written permission of instructor required. Offered on Pass/Fail basis only.

ETECH 241. Engineering Technology Professional Development (Electronics). 0.5 hours. (1 hour lecture). Discussion of academic preparation methods and strategies, including utilization of new technologies. Introduction to concepts of professional development career preparation. Investigation into student employment, internship, and cooperative opportunities.

ETECH 294. Engineering Technology Laboratory Internship (____). 1-4 hours. Variable credit for one to four hours. Can be repeated. Freshmen/Sophomore engineering technology students can enroll for the course in their technical area as laboratory assistants during the semester a specific laboratory is offered. Prerequisite: Written permission of instructor.

ETECH 300. Cooperative Education (____). 3-6 hours. A cooperative college-industry, college-business or college-government work experience. The student is interviewed and employed by an industrial, business, or government organization, then a work program is outlined. Supervision of the work experience is conducted by the employer and the college coordinator. May be repeated if subject matter is different. Written permission of department chairperson is required. Offered on a Pass/Fail basis only.

ETECH 400. Cooperative Education (____). 3-6 hours. A cooperative college-industry, college-business or college-government work experience. The student is interviewed and employed by an industrial, business, or government organization, then a work program is outlined. Supervision of the work experience is conducted by the employer and the college coordinator. May be repeated if subject matter is different. Written permission of department chairperson is required. Offered on a Pass/Fail basis only.

ETECH 401. Investigations in Technology (____). 1-4 hours. Special studies in technology to provide for the individual requirements of the student desiring supplemental work in the student's field of special interest. Prerequisite: Written permission of department chairperson. May be repeated if subject matter is different.

ETECH 406. Seminar in Technology (____). 1/2 credit hour. Lectures and written reports on current topic in technology. May be repeated for a maximum of 2 hours. Prerequisite: Written permission of department chairperson. Offered on Pass/Fail basis only.

ETECH 502. Engineering Economy. 2-3 hours. (2-3 hours lecture). Analysis of engineering proposals utilizing time value of money and related factors. Includes depreciation and after-tax consequences, feasibility and optimum life comparisons. Additional topics for three hours of credit are manufacturing cost

studies, estimating, sources of costs, allocation of costs and justifications. Students should register for either two or three hours, based on specific program requirements.

ETECH 694. Engineering Technology Laboratory Internship (____). 1-4 hours. Variable credit for one to four hours. Can be repeated. Junior/ Senior engineering technology students can enroll for the course in their technical area as laboratory assistants during the semester a specific laboratory is offered. Prerequisites: Junior/Senior standing and written permission of instructor. May be taken for honors.

ETECH 795. Special Topics in Engineering Technology (____). 1-3 hours. Selected topics in engineering technology. Regularly scheduled classroom and laboratory study pertaining to a distinct body of technical knowledge. May be repeated if subject matter is different. Written permission of department chairperson required.

MASTER OF ENGINEERING TECHNOLOGY

ETECH 795. Special Topics in Engineering Technology (____). 1-3 hours. Selected topics in engineering technology. Regularly scheduled classroom and laboratory study pertaining to a distinct body of technical knowledge. May be repeated if subject matter is different. Written permission of department chairperson required.

ETECH 804. Quality: Management and Control. 3 hours. (3 hours lecture). The use of advanced statistical process control techniques, Total Quality Management (TQM), ISO:9000 concepts and procedures, Design of Experiments (DOE), and process optimization using computer applications. Prerequisite: A working knowledge of statistical process control and computers or permission of instructor.

ETECH 805. Current Issues in Engineering Technology. 3 hours. Study of specific activities/topics/trends impacting the various engineering technology disciplines. Case studies and current innovation emphasis. May be repeated.

ETECH 807. Systems Engineering and Analysis. 3 hours. A systems approach to product/project design. System design process from needs identification through conceptual and detail design, product/project development, systems testing and evaluation. Operational and economic feasibility, reliability, maintainability, supportability. Consideration of various project/product design aspects (mechanical, thermal, electrical/electronic, aesthetic, safety, etc.).

ETECH 809. Engineering Management. 3 hours. The design and control of technologically based projects. Considering theoretical and practical aspects of systems models, organizational development, project planning and control, resource allocation, team development, quantitative and qualitative decision making, financial and legal issues.

ETECH 810. Collaborative Projects for Engineering Technology. 3 hours. Multidisciplinary capstone course incorporating aspects of design, project/product management, value engineering, quality control, current technologies and specific engineering/technology techniques to develop/design/improve products or processes. Collaboration of multidisciplinary backgrounds to address technical issues of varying duration and magnitude. Prerequisite: Should be taken as one of the last graduate courses in program. Permission of instructor.

ETECH 831. Value Engineering. 3 hours. (3 hours lecture). Value engineering concepts, function analysis system techniques (FAST) diagramming, creativity, matrix evaluation, design-to-cost, life cycle costing, human relations and strategies for organizing, performing and implementing value engineering work. Prerequisite: Written permission of instructor.

CMCET 832. Land Development. 3 hours. Development of land for commercialization/improvement. Introduction to land development design, governmental planning and regulations, project approvals, site analysis, environmental considerations, development patterns and principles, site development, utility integration, property surveying and law. Use of case studies.

CMCET 833. Estimating and Bidding Strategy. 3 hours. (3 hours lecture). Strategy of contracting to maximize profit through overhead distribution, breakeven analysis, probability and statistical technique, a realistic risk and uncertainty objective, and bid analysis both in theory and in practice. Prerequisites: CMCET 631 Construction Estimating I and 639 Construction Estimating II or equivalent, graduate standing.

CMCET 834. Advanced Construction Management. 3 hours. (3 hours lecture). Existing and emerging systems for designing, planning, and construction of projects. Changing roles, relationships, and responsibilities of the parties involved. Time-cost relationships for various construction operations.

CMCET 835. Advanced Construction Structures. 3 hours. (3 hours lecture). Methods of analysis for framed structures, trusses, rigid frames, statically indeterminate structures, composite materials. Two-dimensional and three-dimensional finite element analysis.

EET 840. Networks and Systems. 3 hours. Theoretical and practical applications of networks and systems with major emphasis on electronic networks and systems. Steady state and transient response. Transform theory with computer applications. System description, simplification and optimization techniques. Prerequisites: 30 semester hours of undergraduate electronics, 5 semester hours of undergraduate physics, MATH 155 Calculus II.

EET 845. Advanced Microprocessor Systems and Applications. 3 hours. Microcomputer systems and applications including 16/32 Bit Microprocessors, digital signal processing (DSP) and microcontrollers. Assembly language programming using development systems. Prerequisite: 6 semester hours undergraduate work in microprocessor systems (hardware and software applications).

ETECH 851. Technical Publications. 3 hours. Creation and use of internal and external organizational documentation. Topics include users manuals, assembly/operating instructions, parts lists, product illustrations, maintenance

instructions, procurement specifications/drawings, drawings, change notices, retrofit kits, shop instructions.

ETECH 852. Integrated Design and Manufacturing Concepts. 3 hours. Automated design and manufacturing methods explored. 3-D modeling for drawings/analysis; same model used for geometry prototype and pattern/mold fabrication; integrated with foundry operations or plastic processes for part production.

PET 882. Advanced Plastics Materials and Processes. 3 hours. Overview of thermoplastic and thermoset materials and processes. Laboratory work required. Not open to graduates of PSU Plastics Engineering Technology undergraduate degree.

PET 883. Rheology of Plastic Materials. 3 hours. The study of flow behavior of plastic materials as effected by temperature, time, and shear of material. Alloying, compounding and utilization for processing. Laboratory work required.

PET 884. Elastomeric Materials. 3 hours. Elastomeric materials, both natural and synthetic, their manufacture methods, chemical structures, compounding, and vulcanization. Processing methods, properties, test methods and characterizations. Laboratory work required.

PET 885. Composite Materials and Testing. 3 hours. New and advanced techniques of processing composites including resin structures and non-destructive testing techniques associated with composites. Laboratory work required.

PET 887. Plastics Simulation and Instrumentation. 3 hours. Computer simulations and use of specialized testing equipment for polymer materials. High and low temperature testing. Laboratory work required.

PET 888. Design of Experiments. 3 hours. The use of competing experimental strategies by blending them into a more powerful approach to solving production and processing problems. Prerequisite: Recommended knowledge of statistics.