

# Pre-Engineering Science

## Department of Computer Science and Pre-Engineering

### Department Chair: Abraham Teng

Office: CS 520j  
Telephone: 801-863-6201

Administrative Support III: Carol Robinson

Office: CS 520h  
Telephone: 801-863-8218

### Faculty:

Associate Professor  
Masood Amin  
Afsaneh Minaie  
Assistant Professor  
Abraham Teng

Advisor: Fred Orchard  
Office: CS 635  
Telephone: 801-863-6238

## School of Technology and Computing

Interim Dean: Ernest Carey  
Office: CS 720  
Telephone: 801-863-8321

Engineering is an exciting major in terms of professional career opportunities, job satisfaction and compensation. Career options exist in many engineering fields including: Aerospace, Biological, Biomedical, Chemical, Civil, Computer, Electrical, Environmental, Irrigation, Manufacturing, Materials, Mechanical and Systems. The pre-engineering program at UVSC has been created for students who plan to complete the first two to three years of their engineering education at UVSC and then transfer to a baccalaureate university to complete their engineering degree. With adequate planning, pre-engineering coursework completed at UVSC will transfer to all of the Utah universities with baccalaureate engineering degrees.

All students who declare pre-engineering as their major are automatically accepted into pre-engineering status. After completion of the pre-engineering program at UVSC, the student applies for professional status at an institution of the student's choice.

Students can choose from two degree plans. The Associate of Pre-Engineering

degree is comprised of those math, science, and engineering courses normally taken by first and second year students in a four-year program, along with a small number of general education courses. If a student adds appropriate general education courses, an Associate of Science Degree with a pre-engineering pre-major may be obtained. This option normally takes longer, unless the student has advanced placement or concurrent enrollment from high school; however, it has the added benefit of possible waiving of general education requirements at the student's follow-on school.

Pre-engineering programs will vary markedly from student to student depending on several factors including: high school preparation, engineering discipline of interest, and the intended four-year transfer school. The pre-engineering advisor will consider these factors when designing a program to fit the needs of each individual student. It is therefore important that pre-engineering students consult with the pre-engineering advisor concerning classes appropriate for their educational experience at UVSC. Call 801-863-6238 for a personal appointment.

The normal entry-level mathematics class for pre-engineering students is Calculus I (MATH 1210). Prerequisites for Calculus I are College Algebra (MATH 1050) and Trigonometry (MATH 1060) or placement through the ACT and/or UVSC New Student Assessment test. Remedial course work is available for students with inadequate high school preparation and achievement. Inadequately prepared students should see a pre-engineering advisor for recommended remedial courses which must be completed in addition to the normal pre-engineering requirements.

### AS Pre Major in Pre-Engineering 62 Credits

#### General Education Requirements: 39 Credits

• ENGL 1010	Introduction to Writing	3.0
• ENGL 2020	Intermediate Writing--Science and Technology	3.0
• MATH 1210	Calculus I	5.0
Complete one of the following:		
• HIST 1700	American Civilization (3.0)	3.0
• HIST 2700	US History to 1877 (3.0)	3.0
and HIST 2710	US History since 1877 (3.0)	3.0
• HIST 1740	US Economic History (3.0)	3.0
• POLS 1000	American Heritage (3.0)	3.0
• POLS 1100	American National Government (3.0)	3.0

Complete the following:		
• PHIL 2050	Ethics and Values	3.0
• HLTH 1100	Personal Health and Wellness (2.0)	2.0
or PES 1097	Fitness for Life	2.0

Distribution Courses:		
• BIOL 1010	General Biology*	3.0
• CHEM 1210	Principles of Chemistry I	4.0
• PHYS 2210	Physics for Scientists and Engineers I	4.0
• Humanities		3.0
• Fine Arts		3.0
• Social/Behavioral Science		3.0

#### Discipline Core Requirements: 23 Credits

• CS 1400	Fundamentals of Programming	3.0
• MATH 1220	Calculus II	5.0

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- PHYS 2220 Physics for Scientists and Engineers II 4.0

Complete ONE of the following sets of courses: 11.0

#### Mechanical/Civil Courses:

- ENGR 2010 Engineering Statics (3.0)
- ENGR 2030 Engineering Dynamics (3.0)
- ENGR 2140 Mechanics of Materials (3.0)
- Complete three credits of Pre-Engineering electives

#### Electrical/Computer Courses:

- EENG 2270 Circuit Theory (3.0)
- EENG 2275 Circuit Theory Lab (1.0)
- EENG 2700 Digital Design I (3.0)
- EENG 2705 Digital Design I Lab (1.0)
- Complete four credits of Pre-Engineering electives

#### Chemical/Biological Courses:

- CHEM 2310 Organic Chemistry I (4.0)
- ENGR 2010 Engineering Statics (3.0)
- Complete five credits of Pre-Engineering electives

#### Elective Requirements:

Students should carefully select electives based on the engineering discipline they are interested in and the college or university they want to attend to finish their BS degree. See your advisor.

#### Introduction to Engineering Disciplines

- ENGR 1000 Introduction to Engineering (3.0)
- ENGR 2450 Computational Methods for Engineering Analysis (3.0)
- ENGR 295R Special Topics (1.0)

#### Math and Science Electives (required by most engineering programs):

- MATH 2210 Calculus III (3.0)
- MATH 2270 Linear Algebra (3.0)
- MATH 2280 Ordinary Differential Equations (3.0)
- PHYS 2215 Physics for Scientists and Engineers I Lab (1.0)
- PHYS 2225 Physics for Scientists and Engineers II Lab (1.0)
- CHEM 1215 Principles of Chemistry I Laboratory (1.0)

#### Biological and Chemical Engineering Electives:

- BIOL 1610 College Biology I (4.0)
- BIOL 1615 College Biology I Laboratory (1.0)
- BIOL 1620 College Biology II (3.0)
- BIOL 1625 College Biology II Laboratory (1.0)
- MICR 2060 Microbiology for Health Professions (4.0)
- CHEM 1220 Principles of Chemistry II (4.0)
- CHEM 1225 Principles of Chemistry II Laboratory (1.0)
- CHEM 2315 Organic Chemistry I Laboratory (1.0)
- CHEM 2320 Organic Chemistry II (4.0)
- CHEM 2325 Organic Chemistry II Laboratory (1.0)

#### Civil and Mechanical Engineering Electives:

- EENG 2210 Fundamentals of Electric Circuit Analysis (3.0)
- ENGR 2300 Engineering Thermodynamics (3.0)
- EGDT 1040 Computer Aided Drafting--AutoCAD (3.0)
- EGDT 1400 Surveying (4.0)

#### Computer and Electrical Engineering Electives:

- CS 1410 Object-Oriented Programming (3.0)
- CS 2810 Computer Organization and Architecture (3.0)
- CS 2300 Discrete Structures I (3.0)
- CS 2420 Introduction to Algorithms and Data Structures (3.0)

#### Graduation Requirements:

- 1 Completion of a minimum of 62 semester credits.
- 2 Overall grade point average of 2.0 (C) or above. 2.5 or above in Math, Science, and Engineering courses.
- 3 Residency hours: minimum of 20 credit hours through course attendance at UVSC.
- 4 Completion of GE and specified departmental requirements.

#### Footnotes:

- \* CHEM/BIOL Engineering students should consider BIOL 1610 in lieu of BIOL 1010.

### APE in Associate in Pre-Engineering 68-69 Credits

#### General Education Requirements: 28 Credits

- ENGL 1010 Introduction to Writing 3.0
- ENGL 2020 Intermediate Writing--Science and Technology 3.0

Complete the following Natural and Physical Science courses:

- BIOL 1010 General Biology 3.0
- CHEM 1210 Principles of Chemistry I 4.0
- CHEM 1215 Principles of Chemistry I Laboratory 1.0

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- PHYS 2210 Physics for Scientists and Engineers I 4.0
  - PHYS 2215 Physics for Scientists and Engineers I Lab 1.0
- Complete any combination of the following with no more than 1 course each from Humanities, Fine Arts, and Social/Behavioral Science: 6.0
- Humanities (from list)
  - Fine Arts (from list)
  - Social/Behavioral Sciences (from list)
- Complete any American Institutions course 3.0
- POLS 1000 American Heritage (3.0)
  - HIST 2700 US History to 1877 (3.0)
- and HIST 2710 US History since 1877 (3.0)
- HIST 1700 American Civilization (3.0)
  - HIST 1740 US Economic History (3.0)
  - POLS 1100 American National Government (3.0)

Discipline Core Requirements: 18 Credits	
• MATH 1210	Calculus I 5.0
• MATH 1220	Calculus II 5.0
• CS 1400	Fundamentals of Programming 3.0
• PHYS 2220	Physics for Scientists and Engineers II 4.0
• PHYS 2225	Physics for Scientists and Engineers II Lab 1.0

Emphasis:	
Complete one of the following:	
• Biological and Chemical Engineering	23.0
• Civil and Mechanical Engineering	22.0
• Computer and Electrical Engineering	23.0

- Graduation Requirements:**
- 1 Completion of a minimum of 68 semester credits.
  - 2 Overall grade point average of 2.0 (C) or above. 2.5 or above in Math, Science, and Engineering
  - 3 Residency hours -- minimum of 20 credit hours through course attendance at UVSC.
  - 4 Completion of GE and specified departmental requirements.

## Emphasis in Biological and Chemical Engineering 23 Credits

Emphasis Requirements: 8 Credits	
• CHEM 1220	Principles of Chemistry II 4.0
• CHEM 1225	Principles of Chemistry II Laboratory 1.0
• ENGR 2010	Engineering Statics 3.0

Emphasis Elective Requirements: 15 Credits	
Students should carefully select electives from the following list, based on the engineering discipline (Biological or Chemical) they are interested in and the college or university they want to attend to finish their BS degree. See your advisor.	

- BIOL 1610 College Biology I (4.0)
- BIOL 1615 College Biology I Laboratory (1.0)
- BIOL 1620 College Biology II (3.0)
- BIOL 1625 College Biology II Laboratory (1.0)
- MICR 2060 Microbiology for Health Professions (4.0)
- CHEM 1220 Principles of Chemistry II (4.0)
- CHEM 1225 Principles of Chemistry II Laboratory (1.0)
- CHEM 2310 Organic Chemistry I (4.0)
- CHEM 2315 Organic Chemistry I Laboratory (1.0)
- CHEM 2320 Organic Chemistry II (4.0)
- CHEM 2325 Organic Chemistry II Laboratory (1.0)
- ENGR 1000 Introduction to Engineering (3.0)
- ENGR 2450 Computational Methods for Engineering Analysis (3.0)
- ENGR 295R Special Topics (1.0)
- MATH 2210 Calculus III (3.0)
- MATH 2270 Linear Algebra (3.0)
- MATH 2280 Ordinary Differential Equations (3.0)

## Emphasis in Civil and Mechanical Engineering 22 Credits

Emphasis Requirements: 9 Credits	
• ENGR 2010	Engineering Statics 3.0
• ENGR 2030	Engineering Dynamics 3.0
• ENGR 2140	Mechanics of Materials 3.0

Emphasis Elective Requirements: 13 Credits	
Students should carefully select electives from the following list, based on the engineering discipline (Civil or Mechanical) they are interested in and the college or university they want to attend to finish their BS degree. See your advisor.	

- EGDT 1040 Computer Aided Drafting--Auto-CAD (3.0)
- EGDT 1400 Surveying (4.0)
- ENGR 1000 Introduction to Engineering (3.0)
- EENG 2210 Fundamentals of Electric Circuit Analysis (3.0)
- EENG 2215 Fundamentals of Electric Circuit Analysis Lab (1.0)

- ENGR 2300 Engineering Thermodynamics (3.0)
- ENGR 2450 Computational Methods for Engineering Analysis (3.0)
- ENGR 295R Special Topics (Must be taken 3 times) (1.0)
- MATH 2210 Calculus III (3.0)
- MATH 2270 Linear Algebra (3.0)
- MATH 2280 Ordinary Differential Equations (3.0)

## Emphasis in Computer and Electrical Engineering 23 Credits

Emphasis Requirements: 8 Credits	
• EENG 2270	Circuit Theory 3.0
• EENG 2275	Circuit Theory Lab 1.0
• EENG 2700	Digital Design I 3.0
• EENG 2705	Digital Design I Lab 1.0

Emphasis Elective Requirements: 15 Credits	
Students should carefully select electives from the following list, based on the engineering discipline (Computer or Electrical) they are interested in and the college or university they want to attend to finish their BS degree. See your advisor.	

- CS 1410 Object-Oriented Programming (3.0)
- CS 2810 Computer Organization and Architecture (3.0)
- CS 2300 Discrete Structures I (3.0)
- CS 2420 Introduction to Algorithms and Data Structures (3.0)
- EENG 3740 Digital Design II (3.0)
- ENGR 1000 Introduction to Engineering (3.0)
- ENGR 2450 Computational Methods for Engineering Analysis (3.0)
- ENGR 295R Special Topics (1.0)
- MATH 2210 Calculus III (3.0)
- MATH 2270 Linear Algebra (3.0)
- MATH 2280 Ordinary Differential Equations (3.0)

See Course Descriptions section of the catalog for detailed course information. This department manages the following course prefixes:

- EENG, Electrical Engineering
- ENGR, Engineering Science