# PRE-ENGINEERING

**DEGREES, CERTIFICATES AND AWARDS**
Associate in Science Degree (A.S.)

## DESCRIPTION

The IVC Pre-Engineering program provides a foundation of mathematics, chemistry and physics courses necessary to transfer to a four-year institution and complete a bachelor's degree in engineering. Students should consult the institution to which they wish to transfer for specific lower division requirements.

People working in the field of engineering and related technical fields "bridge the gap" between scientific principles and the application of these principles to the needs of society. An engineer uses experience and judgment, as well as advanced training in engineering, science, and mathematics, to formulate ideas and designs, and to determine standards, specifications, work orders and schedules so that projects can be economically beneficial to mankind. Engineering offers diverse and exciting job opportunities for people with mathematical, scientific, and technical skills.

## PROGRAM LEARNING OUTCOMES

1. Have a working knowledge of the theories and principles of physics in the areas of Newtonian mechanics, gravitation, electricity and magnetism, wave motion and physical optics.
2. Be acquainted with standard methods of mathematical analysis including trigonometry and analytic geometry, differential and integral calculus, matrices and linear algebra, and the solutions to differential equations.
3. Can use the computer to store and process technical data, to access information remotely over the internet, and as a computational tool related to the engineering process.

## ASSOCIATE DEGREE PROGRAM

**The Associate in Arts (AA) or the Associate in Science (AS) Degree** involves satisfactory completion of a minimum of 60 semester units with a C average or higher, including grades of C in all courses required for the major, and fulfillment of all IVC district requirements for the associate's degree along with all general education requirements. The degree provides a sound basis for transfer to upper division institutions for additional degrees or for higher vocational preparation. To be eligible to receive an Associate Degree the student must complete the requirements for the major, the District requirements for an Associate Degree, and the General Education requirements. In addition students must maintain a minimum grade point average and meet the minimum grade requirements of their program. Detailed information is available in the college catalog.

## CAREER OPPORTUNITIES

Of the career opportunities identified, many will require the completion of bachelor's degree requirements at 4-year colleges and universities. Career options include:

| | | |
|---|---|---|
| Aerospace Engineer | Civil Engineer | Structural Engineer |
| Electrical Engineer | Computer Engineer | |
| Environmental Engineer | Mechanical Engineer | |

**Gainful Employment:** Federal regulations require institutions to provide students with Gainful Employment information for specific certificate programs offered at IVC. Please click on our Programs of Study link to view the information for each certificate program: **http://www.imperial.edu/courses-and-programs/programs-of-study/**

## TRANSFER PREPARATION

Courses that fulfill major requirements for an associate degree at Imperial Valley College may not be the same as those required for completing the major at a transfer institution offering a bachelor's degree. Students who plan to transfer to a four-year college or university should schedule an appointment with an IVC Counselor to develop a student education plan (SEP) before beginning their program.

### Transfer Resources:

**www.ASSIST.org** – CSU and UC Articulation Agreements and Majors Search Engine

**www.CSUMentor.org** – CSU System Information

**www.universityofcalifornia.edu/admissions/index.html** - UC System Information

**www.aiccu.edu** – California Independent Colleges and Universities, Association of

**http://wiche.edu/wue** - Western Undergraduate Exchange Programs

## FINANCIAL AID

Paying for the cost of a college education requires a partnership among parents, students and the college. As the cost of higher education continues to rise we want you to know that IVC offers a full array of financial aid programs – grants, work study, scholarships, and fee waivers (we do not participate in the federal loan programs). These programs are available to both full and part time students who are seeking a degree or certificate. For those who qualify, financial aid is available to help with tuition, fees, books and supplies, food, housing, transportation, and childcare. Please log onto our website for additional information: **www.imperial.edu/students/financial-aid-and-scholarships/**

# PRE-ENGINEERING

## ASSOCIATE DEGREE PROGRAM

**PRE-ENGINEERING – A.S. DEGREE**
Twenty-nine (29.0) units required for the major.

ALL COURSES FOR THIS MAJOR MUST BE COMPLETED WITH A MINIMUM GRADE OF "C" OR BETTER.

| | | | | |
|---|---|---|---|---|
| **I.** | **Eighteen (18.0) units required:** | | | |
| | CHEM | 200 | General Inorganic Chemistry I | 5.0 |
| | ENGR | 210 | Statics | 3.0 |
| | MATH | 210 | Calculus III | 5.0 |
| | PHYS | 200 | Principles of Physics I | 5.0 |
| **II.** | **Three (3.0) units selected from:** | | | **3.0** |
| | MATH | 220* | Elementary Differential Equations (3.0) | |
| | MATH | 230* | Introduction to Linear Algebra w/Applications (3.0) | |
| **III.** | **Three (3.0) units selected from:** | | | **3.0** |
| | ENGR | 212* | Dynamics (3.0) | |
| | ENGR | 240* | Electronic Circuit Analysis (3.0) | |
| **IV.** | **Five (5.0) units selected from** | | | **5.0** |
| | CHEM | 202 | General Inorganic Chemistry II (5.0) | |
| | CHEM | 204 | Organic Chemistry I (5.0) | |
| | CHEM | 206 | Organic Chemistry II (5.0) | |
| | CIS | 210 | Programming in C++ (3.0) | |
| | CS | 220 | Introduction to Object-Oriented Programming Using Java (4.0) | |
| | ENGR | 212* | Dynamics (3.0) | |
| | ENGR | 240* | Electronic Circuit Analysis (3.0) | |
| | MATH | 119 | Elementary Statistics (4.0) | |
| | MATH | 220* | Elementary Differential Equations (3.0) | |
| | MATH | 230* | Introduction to Linear Algebra w/Applications (3.0) | |
| | PHYS | 202 | Principles of Physics II (5.0) | |
| | PHYS | 204 | Principles of Physics III (5.0) | |

** If not used for required courses under sections II. or III. above.*

| | |
|---|---|
| Total Major Units | 29.0 |
| IVC Graduation Requirements and GE Pattern: | 30.0 |
| Electives (as needed to reach 60 degree applicable units) | ____ |
| **Total Maximum Units:** | **60.0** |