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.

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.edu – 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/

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 check on our Programs of Study link to view the information for each certificate program: http://www.imperial.edu/courses-and-programs/programs-of-study/
## 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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 200</td>
<td>General Inorganic Chemistry I</td>
<td>5.0</td>
</tr>
<tr>
<td>ENGR 210</td>
<td>Statics</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 210</td>
<td>Calculus III</td>
<td>5.0</td>
</tr>
<tr>
<td>PHYS 200</td>
<td>Principles of Physics I</td>
<td>5.0</td>
</tr>
</tbody>
</table>

II. Three (3.0) units selected from:

- ENGR 212* Dynamics (3.0)
- ENGR 240* Electronic Circuit Analysis (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:

- ENGR 212* Dynamics (3.0)
- ENGR 240* Electronic Circuit Analysis (3.0)

IV. Five (5.0) units selected from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 202</td>
<td>General Inorganic Chemistry II</td>
<td>5.0</td>
</tr>
<tr>
<td>CHEM 204</td>
<td>Organic Chemistry I (5.0)</td>
<td></td>
</tr>
<tr>
<td>CHEM 206</td>
<td>Organic Chemistry II (5.0)</td>
<td></td>
</tr>
<tr>
<td>CIS 210</td>
<td>Programming in C++ (3.0)</td>
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<tr>
<td>CS 220</td>
<td>Introduction to Object-Oriented Programming Using Java (4.0)</td>
<td>3.0</td>
</tr>
<tr>
<td>ENGR 212*</td>
<td>Dynamics (3.0)</td>
<td></td>
</tr>
<tr>
<td>ENGR 240*</td>
<td>Electronic Circuit Analysis (3.0)</td>
<td></td>
</tr>
<tr>
<td>MATH 119</td>
<td>Elementary Statistics (4.0)</td>
<td></td>
</tr>
<tr>
<td>MATH 220*</td>
<td>Elementary Differential Equations (3.0)</td>
<td></td>
</tr>
<tr>
<td>MATH 230*</td>
<td>Introduction to Linear Algebra w/Applications (3.0)</td>
<td></td>
</tr>
<tr>
<td>PHYS 202</td>
<td>Principles of Physics II (5.0)</td>
<td></td>
</tr>
<tr>
<td>PHYS 204</td>
<td>Principles of Physics III (5.0)</td>
<td></td>
</tr>
</tbody>
</table>

* 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