

CSU IP Mexico: Engineering Program Tecnológico de Monterrey, Querétaro, Mexico

Students who are selected for the Engineering Program in Mexico are required to take a prescribed set of courses that total the equivalent of 15 CSU semester units each semester.

Below is the academic schedule for the Engineering Program in Mexico. All courses listed are required and taught in English except for Spanish language courses.

Semester 1 (Fall Semester)	Units
Spanish Language (see section below)	6
Statics	3
Differential Equations	3
Mathematics III (Calculus III/ Multi-variable Calculus)	3
Minimum number of units required for Semester 1:	15

Semester 2 (Spring Semester)	Units
Spanish Language (see section below)	6
Solid Mechanics	3
Dynamics	3
Fluid Mechanics	3
Minimum number of units required for Semester 2:	15

Spanish Language Requirement

Enrollment in Spanish language courses in Semesters 1 and 2 is a required part of the Engineering Program curriculum. Prior to the program start date, students take an online Spanish placement test and will be placed in the appropriate level of Spanish language. As students are required to have completed at least one term of Spanish language study or equivalent prior to starting the program, most students are placed at the beginning/intermediate level and take the following courses during the year:

- **HI1005 Basic Spanish II (6).** Spanish alphabet, orthography, punctuation, and accent marks. Enunciation fundamentals. Verb tenses and moods and their enunciative quality. Enunciative functions. Lower division.
- **HI2015 Intermediate Spanish I (6).** Question words, noun gender and number, agreement and placement of adjectives, comparisons, verb moods and tenses, reflexive verbs, verbs like "gustar", complement pronouns, uses of "se", "ser" and "estar", imperative, prepositions, vocabulary related to student life, hobbies, trips, traditions and environment. Lower division.

Students with higher levels of Spanish language proficiency will be placed in a course which is appropriate to their level of Spanish. Intermediate and advanced Spanish language courses are listed below.

- **HI2016 Intermediate Spanish II (6).** Study of grammar in greater depth in order to produce correct structures using all verb tenses. Correct use of pronouns, prepositions, conjunctions, all *se* functions, and written accents. Lower division.
- **HI3010 Advanced Spanish I (6).** Spanish enunciation system. Indicative and subjunctive tenses. Object pronouns, value and use of infinitive, gerund and participle. Reflexive constructions, indefinite pronouns and adverbs. Prepositions and connecting words. Articles, adjectives and adverbs. Orthography and accent marks. Expressions for interacting. Idiom, proverbs and riddles. Articulation of Spanish sounds. Reading and writing techniques. Upper division.
- **HI3011 Advanced Spanish II (6).** Course covers how to correctly express ideas, opinions and arguments in Spanish using elaborated elements and discursive resources. To be able to understand the complexity of Spanish speaker countries cultural elements. Upper division.

Course Descriptions

REQUIRED ENGINEERING COURSES IN SEMESTER 1

M1003 Statics (3)

This is a basic course in the engineering area, in which the student applies his knowledge of physics and handling of vectors to solve problems associated with static equilibrium of rigid bodies. Lower division. Taught in English.

MA2010 Differential Equations (3)

This course provides students with the mathematical tools necessary to model and analyze the behavior of physical systems using differential equations. Learning outcome: students will be able to 1. Understand the basic concepts of matrix algebra. 2. Solve systems of linear equations using the tools of matrix algebra. 3. Understand the basic concepts of differential equations and the methods of solving them. 4. Understand the Laplace transform. 5. Apply the Laplace transform in solving differential equations (linear with constant coefficients). 6. Apply the concepts of differential equations to modeling and solving problems of medium complexity. Lower division. Taught in English.

MA2009 Mathematics III (Calculus III/Multi-variable Calculus) (3)

This course is intended to facilitate understanding of Engineering situations and phenomena through the development of mathematical thinking related to the ideas of variation and change, and its application to solving engineering problems involving quantities that are related to several variables. The course requires prior knowledge of differential and integral calculus of single-variable functions and elementary vector algebra. As a result of learning, the student values, understands and uses infinitesimal arguments to study concepts and build engineering formulas involving quantities related to several variables, relying on technological resources as required. Lower division. Taught in English.

REQUIRED ENGINEERING COURSES IN SEMESTER 2

CV2003 Solid Mechanics (3)

This course provides the basic solids and structural mechanics concepts with the goal of knowing the behavior of the mechanical elements subject to deformations and/or internal and external forces. Requires previous static, differential and integral calculus, differential equations and physics elements. As learning result it is expected that the student applies the concepts, analytical resources and procedures for the understanding of the deformation and internal forces states in mechanical members. Lower division. Taught in English.

M1005 Dynamics (3)

In this basic engineering course, students apply their knowledge of statics and calculus to solve problems associated with the plane motion of rigid bodies. This course requires prior knowledge of vectors, free-body diagrams, principles of differential and integral calculus, evaluation of support forces and reactions with or without friction. The learning outcome of this course are: to obtain the kinematic conditions (position, speed and acceleration) in the motion of rigid bodies; assess the required force and momentum to maintain or cause motion in rigid bodies; and select the most appropriate analysis method for a specific application. Lower division. Taught in English.

M2021 Fluid Mechanics (3)

This is an intermediate mechanical engineering course that provides students with the tools to solve complex problems related to fluid flow, external flow, gauging, flow measurement and flow properties using mathematical analysis and thinking. This course requires prior knowledge of differential equations. As a learning outcome, students propose solutions to problems related to fluids, using mathematical and experimental analysis. They evaluate the performance of systems that use fluids as a means of operation and suggest improvements for these systems. Upper division. Taught in English.

ELECTIVE COURSES

Students are required to select an elective course (or courses) during their year abroad to bring the total number of units to the equivalent of 15 CSU semester units, the CSU IP requirement for CSU IP participants each semester.

Students can take courses in English or Spanish (depending on Spanish placement scores). All courses are subject to availability and prerequisites, and may not be offered each year. Classes need a minimum enrollment of eight students to remain open. Therefore students must be flexible with their selection of courses. For course information, to go the Academic Bulletin or click [here](#).