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Lucy S. Negrón Promotions and Admissions Officer
Nadia Gilbert AS, Promotions and Admissions Officer

Note: The programs, policies, requirements, and regulations published in this catalog are continually subject to review in order to serve the needs of the University’s various publics and to respond to the mandates of the Commission for Independent Education, Florida Department of Education. Changes in programs, policies, requirements, and regulations may be made without advance notice.
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Nadia Gilbert, AS
Library Technician and Placement Officer:
Judith Negrón, BA, MAEd

ACADEMIC CALENDAR
Fall 2013 (OF-13)
August 12 thru November 2, 2013

New Student Orientation July 31
Registration Aug 1-8
Classes Begin Aug 12
Late Registration/Changes Aug 9-15
100% Refund for Partial and/or Full Withdrawal Aug 9-16
Last date of Partial and/or Full Withdrawal with a refund of 33.00% (tuition of the term) Aug 19-23
Deadline for Professors to Report “NR” Aug 29
Midterm Exams Sept 16-21
Withdrawal Deadline Oct 24
Deadline to Remove Incomplete Grades from SP-13 (OS-13) and SU-13 (OU-13) Oct 17
Final Examinations Oct 28-Nov 2
Academic Recess Nov 4 - 17

Grades Due in Registrar’s Office Nov 6
Registration for Next Term WI-13 (OW-13) Nov 7-14
Classes Begin WI-13 (OW-13) Nov 18

Holidays

Labor Day Sept 2
Columbus Day Oct 14

Classes scheduled on a holiday will be rescheduled as follows:

Labor Day Saturday, Sept. 7
Columbus Day Saturday, Oct. 19
Winter 2013 (OW-13)
November 18, 2013 thru February 22, 2014

New Student Orientation    Nov 6
Registration    Nov 7-14
Classes Begin    Nov 18
Late Registration/Changes    Nov 15-21
100% Refund for Partial and/or Full Withdrawal    Nov 15-22

Last date of Partial and/or Full Withdrawal with a refund of 33.00% (tuition of the term)    Nov 25-27
Deadline for Professors to Report "NR"    Dec. 2-3
Midterm Exams    Nov 27
Deadline to Apply for Graduation for June 2014    Dec 16-20
Christmas Recess    Dec 23 - Jan 6
Deadline to Remove Incomplete Grades from FA-13 (OF-13)    Feb 6
Withdrawal Deadline    Feb 13
Final Examinations    Feb 17-22
Academic Recess    Feb 24-Mar 9
Grades Due in Registrar's Office    Feb 26
Registration for Next Term SP-14 (OS-14)    Feb 27-Mar 6

Classes Begin SP-14 (OS-14)    Mar 10

Spring 2014 (OS-14)
March 10 thru May 31, 2014

New Student Orientation    Feb 26
Registration    Feb 27-Mar 6
Classes Begin    Mar 10
Late Registration/Changes    Mar 7-13
100% Refund for Partial and/or Full Withdrawal    Mar 7-14
Last date of Partial and/or Full Withdrawal with a refund of 33.00% (tuition of the term)    Mar 17-21
Deadline for Professors to Report "NR"    Mar 26
Midterm Exams    April 14-18
Academic and Administrative Recess (Holy Week)    April 17-19
Deadline to Remove Incomplete Grades from WI-13 (OW-13)    May 15
Withdrawal Deadline    May 22
Final Examinations    May 27-31
Academic Recess    June 2-8
Grades Due in Registrar's Office    June 4
Registration for SU-14 (OU-14)    June 5-6
Classes Begin SU-14 (OU-14)    June 9

Holidays

Holy Thursday    April 17
Good Friday    No classes scheduled
Memorial Day    May 26

Classes scheduled on a holiday will be rescheduled as follows:

Holy Thursday
Holy Week (Saturday Classes)
Memorial Day

Holidays

Thanksgiving    Nov 27-29
Martin Luther King, Jr. Day    Jan 20
President's Day    Feb 17

Classes scheduled on a holiday will be rescheduled as follows:

Thanksgiving(Saturday Classes)    Monday, Dec 2
Thanksgiving(Thursday Classes)    Saturday, Dec 7
Martin Luther King, Jr. Day    Saturday, Jan 25
President's Day    Saturday, Feb 22

Polytechnic University of PR-Orlando Campus Catalog 2013-2014
Summer 2014 (OU-14)
June 9 thru July 18, 2014

New Student Orientation            June 4
Registration                        June 5-6
Classes Begin                       June 9
Late Registration/Changes           June 9-11
100% Refund for Partial and/or Full Withdrawal June 9-11

Last date of Partial and/or Full Withdrawal with a refund of 33.00% (tuition of the term)       June 12-13
Deadline for Professors to Report “NR”            June 18
Graduation Day for 2014           June 20
Midterm Exams                      June 23-27
Withdrawal Deadline               July 10
Final Examinations                 July 17-18
Grades Due in Registrar’s Office  July 21
Academic Recess                    July 21-Aug 11

Registration for Next Term FA-14 (OF-14)     July 3-Aug 7
Classes Begin FA-14 (OF-14)          Aug 11

Holiday

Independence Day                  July 4 (No classes scheduled)

PREFACE

This publication serves as a supplement to the current Polytechnic University of Puerto Rico Catalog and focuses on the degree offerings for Polytechnic University of Puerto Rico - Orlando Campus, Orlando, Florida location. It contains essential information needed by students about the curriculum, policies and procedures, student life, and finances related to Polytechnic University of Puerto Rico - Orlando Campus. A Catalog for Polytechnic University of Puerto Rico is available for reference at the Orlando, Miami or San Juan campuses.

While this Catalog is prepared on the basis of the best information available at the time of publication, all information including statements of fees, course offerings, admission, and graduation requirements is subject to change without notice or obligation. The University therefore reserves the right to change any section or part of the Catalog and to make such changes applicable to students currently enrolled as well as to new students.

PRESIDENT’S MESSAGE

You are embarking on a great journey that can ultimately afford you professional and personal success, a higher education degree. Education is the foundation to your future and we are proud you chose Polytechnic University of Puerto Rico - Orlando Campus.

Polytechnic University of Puerto Rico - Orlando Campus is here to support you academically in your endeavors and extends an open invitation to seek our assistance for academic advising, career counseling, placement opportunities or other related career and university issues. We are dedicated professionals, committed to quality education and community. Your success as a student is important to us.

Welcome!
Sincerely,

Ernesto Vázquez-Barquet
President
I. GENERAL INFORMATION

HISTORY
Polytechnic University of Puerto Rico (PUPR) is a private, nonprofit, coeducational nonsectarian institution founded in 1966. Until 1974, it offered specialized courses in Land Surveying and Mapping. In 1974, PUPR became a degree granting institution with Bachelor of Science in Land Surveying and Mapping (BSLS) and a Bachelor of Science in Civil Engineering (BSCE) followed by Bachelor of Science in Industrial Engineering (1980), Bachelor of Science in Electrical Engineering (1984), Bachelor of Science in Mechanical Engineering (1987), and Bachelor of Business Administration with a major in Industrial Management (1990). In 1992, the institution started offering a graduate program, a Master’s Degree in Engineering Management. In 1995, a Bachelor in Architecture program was initiated. Bachelor of Science in Chemical Engineering and a Bachelor of Science in Environmental Engineering were initiated in 1997. Also in 1998 the Master in Business Administration, Master of Science in Civil Engineering, Master of Science and Master of Engineering in Manufacturing Engineering, Master in Environmental Management, Master of Engineering in Civil Engineering, and Master of Science and Master in Manufacturing Competitiveness.

Polytechnic University of Puerto Rico in Orlando and Miami are Campuses of Polytechnic University of Puerto Rico, which is fully accredited and internationally recognized in the fields of engineering, architecture, computer sciences and business management and administration. PUPR is the nation’s second largest institution of higher education graduating Hispanic engineers. Currently, there are over 5,000 students at the San Juan campus.

The demand for increased higher education services to targeted Orlando and Miami audiences as well as responding to the State of Florida’s big need for increased Baccalaureate degrees prompted university officials to study, analyze and plan for new curriculum and degree programs. Curriculum is designed with a meaningful career choice in mind, and graduates will be able to identify available career opportunities.

MISSION
Provide opportunities for leadership, productivity and competitiveness in a global marketplace for individuals from diverse backgrounds while enhancing their intellectual curiosity, humanistic values, and technological competencies that stimulates greater social responsibility and improves the quality of life.

VISION
To be recognized as a leading higher education institution that meets high academic standards with international competitiveness and provides students opportunities for educational, professional and personal growth through collaboration and application.

Guiding Principles
- Commitment to Excellence
- Professionalism and Integrity
- Teamwork
- Diversity
- Creativity and Innovation

Goals
- To provide access of higher education for degree and non-degree Floridian population to improve their academic and competitive formation as an enhancement of our community.
- To develop a social contribution by forming an ethical committed professional involved in the economic development of the state.
- To develop the professional characteristics of an individual to be able to apply critical thinking and scientific approach to complex problems.
- To provide the latest technology in the application of engineering and management problem solutions.
- To support the socio-economic development of the state by generating highly qualified professionals dedicated to improve their social responsibility.
- To provide the adequate partnerships (Industry, Government, Businesses, and Professional Associations, High Education Institutions) for the students practical experience development and support the strength of the professional tools for their future.
- To provide the global market skills to develop an international professional with a broader span of knowledge.
Accreditation

Licensure and Certification
Many of the University’s courses and programs provide knowledge that may support a student’s efforts toward various licensures or certifications. However, these courses and curricula are not necessarily designed to meet various requirements among individual states guidelines. It is the responsibility of each student to check with regional authorities to confirm requirements in preparation for licensures and certifications.

The school is licensed by the Commission for Independent Education, 325 West Gaines Street, Suite 1414, Tallahassee, FL 32399-0400. (850) 245-3200.

- San Juan Campus: Accreditation Board for Engineering and Technology (ABET), International Assembly for Collegiate Business (IACBE) and National Architectural Accrediting Board (NAAB)

Statement of Non-Discrimination
Polytechnic University of Puerto Rico - Orlando Campus does not discriminate on the basis of race, religion, age, disability, sex, or national origin in the administration of its educational and admission policies, scholarship and loan programs, or other university administered programs.

Contact Information
Polytechnic University of Puerto Rico
Orlando Campus
550 Econlockhatchee Trail
Orlando, Florida 32825
Phone: (407) 677-7000
Fax: (407) 677-5082

Web: www.pupr.edu/orlando

Facilities
The Orlando Campus is located on a sixteen acre property in the Northeast area of Orlando, Florida. The campus consists of a main building, which houses administrative offices, classrooms, computer labs, engineering lab, electrical engineering lab, science lab, library, student and faculty lounge, indoor basketball court and outdoor athletic field and recreational areas for students.

Directions
From downtown Orlando:
Take Highway 408 East to Valencia College Lane (Right Exit).

Turn right (East) on Econlockhatchee Trail.

Map – Orlando Campus
II. ADMISSION

PROCEDURE
All students who have graduated from a recognized high school or equivalent (GED) prior to applying for admission to Polytechnic University of Puerto Rico - Orlando Campus must:

- Submit a completed application for admission with a thirty-dollar ($30) non-refundable for undergraduate and fifty dollars ($50) non-refundable for Graduate Programs. This application fee does not apply toward registration charges.
- Request an Official GED or High School transcript or an official college or university transcript. For Graduate Programs request an official transcript from the college or university that conferred the Bachelor Degree. Transcript(s) should be sent directly from the institution(s) to Polytechnic University of Puerto Rico - Orlando Campus Admissions Office. Student copies of transcripts will not be accepted. Transcripts must furnish a statement of good standing.
- Provide evidence of citizenship or legal resident status (birth certificate or U.S. passport, permanent resident card or any other document that proves legal status in the United States).
- Provide a copy of a current driver’s license or photo identification for placement in the files for official records upon acceptance to a degree program at the university.
- Graduate Programs request (3) Recommendations Letters. (Two must be professionals recommendations)

Entrance
Applicants must have a minimum high school grade point average depending on the program of interest:

<table>
<thead>
<tr>
<th>Discipline</th>
<th>H.S. GPA Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>2.50</td>
</tr>
<tr>
<td>Computer Science</td>
<td>2.00</td>
</tr>
<tr>
<td>Business/Management</td>
<td>2.00</td>
</tr>
<tr>
<td>Graduate Programs</td>
<td>Minimum Bachelor GPA Index 2.80</td>
</tr>
</tbody>
</table>

Applicants, who do not meet the stated high school grade point average, can request, in writing, special consideration by the Admission Committee due to extenuating circumstances.

Transfer students applying to the university must have a minimum of a 2.0 GPA. Applicants with less than a 2.0 GPA can request to the Admission Committee acceptance into the university. Final determination is at the discretion of the Admission Committee.

Polytechnic University of Puerto Rico - Orlando Campus grants entrance to students with consideration to:

- Past academic performance
- Rapport and mature intervention
- Recognition of ability and potential
- Evidence of personal drive
- Desire to learn and
- Plan for obtaining a degree

Special attention and support is given to individuals as follows:

- Talented students who, for socio cultural reasons, denote disadvantages in their knowledge and skills.
- Individuals who, for different reasons, could not complete a previously enrolled Bachelor’s Degree program in Engineering, Computer Science, or Business Administration.
- Individuals who have attained, or are on the way of attaining a college degree, but want to change their fields of specialization.
- Professionals who strive for self-improvement and who want to continue their development, either in their own field or in a new specialization.
- Individuals who at a mature age want to initiate university studies. Admission is based upon educational preparation; evidenced abilities necessary for academic success, minimum GPA of 2.0 must be earned for admission. Demonstrated personal potential to accept and commit to the rigors of academic life. Each applicant is accorded individual consideration through an Admission Committee review and notification process. An Admission Application and the corresponding fee are valid for one academic year.
The institution reserves the right to admit, on a temporary status or reject, any applicant who fails to meet any criteria.

**DEGREE STUDENTS**

A degree student is seeking a Bachelor’s or Master’s Degree in any one of the curriculum areas the university offers. An undergraduate degree seeking student is classified as follows:

- First year student (freshman) — a student who has passed between 0 and 30 credit hours.
- Second year student (sophomore) — a student who has passed between 31 and 60 credit hours.
- Third year student (junior) — a student who has passed between 61 and 90 credit hours.
- Fourth year student (Senior) — a student who has passed between 91 and above credit hours.

Classification of all students is made by the Office of the Registrar at the beginning of each academic year.

**FRESHMAN APPLICANTS**

Student applying for admission to a higher education institution for the first time are classified as freshman applicants. All students applying for admission to the freshman class at the Polytechnic University of PR-Orlando campus must meet the following requirements.

1. File application for admission. The application for admission form asks for important information which the applicant is responsible to submit. Any false information given in the application form will be enough reason to reject said application, unless the applicant is able to prove to the Registrar or the Director of Admissions that such information was given without malice aforethought.

2. Submit an official academic transcript form a high school certifying graduation or the results of high school equivalency examination.

3. Pay the thirty ($30.00) nonrefundable application fees. The application fee will not be applicable towards the student's registration charges. Fee is not valid for two consecutive quarters.

4. Aliens must submit a copy of immigration status.

5. Birth certificate

In considering an application, the Director of Admissions of Polytechnic University of PR-Orlando campus will take into account the scholastic record to determine qualification for admission. The University reserves the right to require further information form any applicant.

This table is used to locate students by results.

**Achievement test Score**

<table>
<thead>
<tr>
<th>College Board or SAT</th>
<th>Mathematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 0102</td>
<td>200-549</td>
</tr>
<tr>
<td>MATH 106</td>
<td>550-649</td>
</tr>
<tr>
<td>MATH 0110</td>
<td>650-699</td>
</tr>
<tr>
<td>MATH 1330</td>
<td>700-800</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>English</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 0100</td>
<td>200-599</td>
</tr>
<tr>
<td>ENL 0110</td>
<td>600-749</td>
</tr>
<tr>
<td>ENC 1010</td>
<td>750-800</td>
</tr>
</tbody>
</table>

Students with GED section of the catalog, in order for it to reflect our institutional requirement that students must have a minimum score of 560 in mathematics section for any Engineering Program and 520 in the area of science. This is only for Engineering and Computer Science.

The normal requirement of 410 per area and overall total of 2,250 remains the same for business students.

**TRANSFER STUDENTS**

An applicant who has studied at a recognized institution of higher education may apply for admission as a transfer student. They will be favorably considered for all academic work completed with a grade of “C” or higher at each prior institution for undergraduate programs; or a grade of “B” or higher for graduate programs.

A transfer applicant will not be considered if he/she is on academic probation, suspension or dismissal from the previous institution; if he/she would be on academic probation upon return to the previous institution; or if on disciplinary probation during or
following the last term at the previous institution; or within one (1) year after dismissal. Applicants with less than the minimum GPA can request to the Admission Committee acceptance into the university on a conditional status. Final determination is at the discretion of the Admission Committee.

Any undergraduate student applying for admission to Polytechnic University of Puerto Rico (Orlando Campus) should know that only two thirds of the total number of credits required for the degree can be awarded as transfer credits, including no more than half of the specialization’s credit requirements. The courses and credits that will be transferred to a student for the program they are enrolling in will be based on the academic program requirement. Transferred grades will not be used for the evaluation of her/his Grade Point Average. All transfer students must approve at Polytechnic University of Puerto Rico no less than 65% of the credits required for graduation to be eligible for academic honors.

Any graduate student applying for admission to Polytechnic University of Puerto Rico (Orlando Campus) should know that only 18 credits required for the degree can be awarded as transfer credits, including no more than half of the specialization’s credit requirements. Graduate students requesting transfer credits from our institution MEM program to the MBA program, or vice versa, will be awarded with only the 18 credits of the core courses. Courses already taken and not transferred should be substituted by other program courses. All students must request their Bachelor degree transcript to be submitted to the PUPR-Orlando.

**INTERNAL TRANSFER STUDENTS**

Internal Transfer Students (Students transferred between Polytechnic University Campuses).

1. Any student requesting a transfer from one campus to another should request from the campus of origin the following documents:
   - Complete an Authorization for Internal Transfer and forward to the transferring campus.
   - Official transcript.
   - The student’s academic file from the Registrar’s Office to the campus where the student is transferring.

2. If the student has previously studied at the campus transferring to, he/she should apply for readmission.

3. If the student has not previously studied at the campus transferring to, he/she should apply for an internal transfer at the Admissions Office.

4. The student must complete a minimum of 36 credits of the Bachelor Degree or 12 credits of the Master Degree in the Orlando Campus to be considered for admission.

All the courses and credits from the previous campus will be transferred to the program he/she is enrolling in. The additional courses analysis for the completion of the program will be based on the academic program requirements. However, all the attended credits under the same institution will be used to determine the student Grade Point Average.

An internal transfer student will not be considered if he/she is on academic probation, suspension or dismissal from the previous institution; if he/she would be on academic probation upon return to the previous institution; or if on disciplinary probation during or following the last term at the previous institution; or within one (1) year after dismissal. Applicants with less than the minimum GPA can request to the Admission Committee acceptance into the university on a conditional status. Final determination is at the discretion of the Admission Committee.

**INTERNATIONAL STUDENTS**

All instruction and written work at Polytechnic University is in English. Students whose primary language is not English must provide proof of English capacity. The standard measure of this ability is a score on the TOEFL (Test of English as a Foreign Language). The applicant should provide a minimum score of 79 (internet based test), 213 (computer based test), or 550 (paper test) to enter the regular program courses. If TOEFL is not provided or does not comply with the minimum score, an English proficiency test will be given by the Admission Office to assess his/her abilities and prepare a development plan.

The University is approved by the Immigration and Naturalization Services (INS) to issue a Certificate of Eligibility for Nonimmigrant (F-1) Student Status for qualified international students. Following admission acceptance, the applicant must submit all documentation required by the INS. Upon approval, the Student and Faculty Services Department will issue the I-20 to qualified applicants following receipt of all required
documents and paid registration fees for the first academic term of full-time enrollment.

Applicants who are not United States of America citizens or permanent residents must petition Polytechnic University of Puerto Rico - Orlando Campus to issue official forms required by the Bureau of Immigration and Citizenship Services (BICS). Upon completion of these forms and acceptance, these applicants will be classified as international students.

An applicant desiring to enroll as an international student must submit the following documents:

**International Applicants with Form I-20**

1. Complete the Application for Admission.
2. Pay a $50.00 Admission Fee (non-refundable).
3. Submit an official transcript certified by the education institution and validated by the Ministry of Education of the applicant's home country as well as a USA academic equivalence certification for that degree certified by an accredited evaluation firm (Josef Silney, World Education Services, etc.). The academic equivalence certification must include the equivalent USA degree with a detailed evaluation, course by course, of an official transcript from the education institution in the candidate’s home country. The document must be sent directly from the institution to the Admission Office of Polytechnic University of Puerto Rico - Orlando Campus.
4. Submit three letters of recommendation.
5. Demonstrate financial capacity to complete the required program, if personally by means of a funds availability certificate from the candidate’s banking institution or:
   a. Submit a sworn statement by the person that will cover the costs of the studies, indicating the annual amount assigned for this purpose and
   b. Submit a copy of the income tax return of the person, residing in the U.S. that will cover the cost of the studies or, if self-financed, submit a letter from the applicant’s banking institution, certifying availability of funds to cover the studies,
6. Applicants may be required to take the Test of English as a Foreign Language (TOEFL).

**NON-DEGREE SEEKING Students**

Applicants completing requirements from another institution of higher education and having authorization to enroll in a course(s) at Polytechnic University of Puerto Rico - Orlando Campus are classified as non-degree seeking students. Also, applicants who are not interested in obtaining an academic degree or receiving a grade from Polytechnic University of Puerto Rico - Orlando Campus except for use as professional development are classified as non-degree seeking students. Non-degree seeking students are not eligible for financial aid.

- Submit a completed application form for admission including a non-refundable fifty-dollar ($50) application fee that is not applied to the registration charges.
- Submit an authorization as Non-Degree Seeking Student.

**NON-DEGREE SEEKING Students to Regular Student Status**

If a non-degree seeking student would like a classification change, all requirements from the Admission Office must be met and a grade of "C" or better must be earned in the enrolled course. A non-degree seeking student qualifies for financial aid only when the classification to a regular student is official.
III. UNIVERSITY OPERATIONS

ACADEMIC INFORMATION AND SERVICES
The student should be familiar with:

- academic requirements for the degree he/she plans to earn
- major program of study
- any changes published after the printing of this catalog

A degree will be awarded only to a student who has satisfied all of the academic and administrative requirements of Polytechnic University of Puerto Rico - Orlando Campus.

ACADEMIC SCHEDULE
Registration for all students is held prior to the beginning of each trimester on designated registration days as stipulated in the Academic Calendar. Completion of registration for each term is a prerequisite to class attendance. The academic year consists of three terms, and one optional summer session. Fall, Winter, and Spring classes are scheduled from 4:00 pm to 10:00 pm, Monday through Thursday, and from 9:00 am to 1:00 pm on Saturdays. Depending on the term, students may be required to make up class contact hours lost because of holidays. Summer class hours are subject to defer pending student needs.

ACADEMIC LOAD
The minimum full-time load per term is twelve (12) credit hours for undergraduate students. To register for sixteen (16) credit hours or more, the student must acquire the approval of the Academic Director. The minimum full-time load per term is six (6) credit hours for graduate students. To register for nine (9) credit hours or more, the student must acquire the approval of the Academic Director. Credit hours will not be awarded for courses in which the student is not properly registered.

MODES OF INSTRUCTION
Traditional in-residence, teleconference courses, hybrids and online are offered on the campus during the evening during traditional academic terms throughout the year.

ADD/DROP PERIOD
Prior to the first class meeting of a course a student may, add or drop from courses by completing an Add/Drop Form at the Registrar's Office.

Policy: Students may add a course during the official Add/Drop period; dropped courses will not appear in permanent record. Approval of the student's instructor is necessary before any course change is made. For withdrawal after the Add/Drop period, refer to the Course Withdrawal Policy.

Withdrawal
Polytechnic University of Puerto Rico - Orlando Campus does not encourage course withdrawal. It is recommended the students meet with their academic advisor to discuss possible options. In the event that withdrawal is the only alternative or if for any reason a student needs to withdraw from the University, the following procedures must be performed.

Course Withdrawal:

- Complete a Withdrawal Form, available at the Office of the Registrar.
- Course withdrawal must be approved by the student's instructor, academic advisor, Financial Aid Officer and Finance Officer.
- The completed and approved Withdrawal Form must be submitted to the Office of the Registrar. Students may only withdraw from courses as stipulated in the Academic Calendar.

University Withdrawal:

- Complete a Withdrawal Form, available at the Office of the Registrar.
- Withdrawal from the University must be approved by the student’s academic advisor, Financial Aid Officer, Registrar and Finance Officer.
- The completed and approved Withdrawal Form must be submitted to the Office of the Registrar.

COURSE CANCELLATION
The University reserves the right to cancel any scheduled class within the first week of a trimester due to insufficient enrollment or for which the designated instructor is unable to meet his or her teacher commitment. Tuition is fully refundable for any cancelled course.
Grading system
The alpha numeric grading system will appear in the midterm and final reports are as follows:

A. Excellent (4 honor points per credit hour)
B. Good (3 honor points per credit hour)
C. Satisfactory (2 honor points per credit hour)
D. Deficient (1 honor point per credit hour)
F. Failure (0 honor points per credit hour)
I. Incomplete (0 honor points per semester hour)

Symbols
AU Auditor
R Repeated course
W (Withdrawal) Indicates that the student was permitted to withdraw from a course without penalty. It indicates the authorization of the officers named in the two previous sections.
P Passed, only for specified courses.
NP Not passed, only for specified courses.
S Satisfactory
NS Non Satisfactory
E Expired course
I Incomplete – Accompanied by a letter grade
RQ Student is not complying with the pre-requisites.
NR Never Reported (Registered student without attendance record)

Grade index
The grade index of a student is the measure of academic achievement. It is based on a 4-point system.

A student may be allowed to repeat a course passed with a “D”, before taking the next course in the sequence, if the corresponding Department Head considers that the case has sufficient merits to receive authorization. In computing the grade index, the highest grade obtained in a repeated course will be used whenever it is higher than the original grade. If the grade obtained in the repeated course is lower than the original grade, the original grade will prevail.

STUDENT ACADEMIC EVALUATION
The policy and procedures for student retention, probationary status, suspension, and permanent dismissal are established for the evaluation of a student’s academic achievement. Polytechnic University of Puerto Rico - Orlando Campus requires every student to demonstrate academic progress in the number of academic credit hours completed and the grade point average the student maintains.

Definitions
Credit Hour Credit hour corresponds to fifteen (15) contact hours per credit per term for a lecture course and thirty (30) to forty-five (45) contact hours per term per credit for laboratory or practicum course.

Attempted Credit Hours Credit hours the student has registered at Polytechnic University of Puerto Rico - Orlando Campus, and in which he/she has obtained I, A, B, C, D, F, or W, including all repetitions.

Transferred Credit Hours Credit hours taken on other college campuses, recognized by accrediting agencies, which the student has passed with grades of A, B or C, and that are accepted by the Department Director or the corresponding Dean’s approval, in accordance with Polytechnic University of Puerto Rico - Orlando Campus’s policy. Any credit hours taken to comply with the preparatory courses required in a program cannot be used as a general elective transferred class.

Passed Credit Hours Attempted credit-hours taken at Polytechnic University of Puerto Rico - Orlando Campus in which A, B, C or D grades are obtained, except in those specific cases defined by the departments.

Grade Point Average (GPA) The measure of academic merit achieved by the student. It is calculated by dividing the total accumulated honor points by the number of credit hours in which the student has received final grades, including outstanding F’s.

Dismissal for Academic Deficiency A student who systematically fails to satisfy the achievement index may be permanently dismissed from Polytechnic University of Puerto Rico - Orlando Campus for academic deficiency.

Academic Progress The measure that shows whether the student passes 66% of the attempted credit hour with a grade point average equal to, or higher than, the retention index. See Table A or Table B, whichever applies.
Repeated Courses Undergraduate courses enrolled two or more times because the student has obtained a grade of D, F or W. For the purpose of determining the Grade Point Average only the highest grade will be used.

Year Academic year consisting of three consecutive academic periods named trimesters from August to May of the following year. The Summer academic period is optional.

Doted Courses All courses will be extinct, expired or doted eight (8) years after being passed. This rule applies equally to courses passed at Polytechnic University of Puerto Rico - Orlando Campus or to transfer courses. The respective Director may validate some courses after evaluating each course. The student must repeat all those confirmed doted by the Director, or in its place may be authorized by the Dean instead to take advanced equivalent courses.

Academic Term One of the three consecutive academic periods named trimesters consisting of twelve (12) weeks each or the Summer consisting of six (6) weeks session which jointly constitute an academic year.

Retention Index (Qualitative Element)
Polytechnic University of Puerto Rico - Orlando Campus adopts the required retention index, as seen in Table A, in accordance with the number of completed credit hours and transferred credit hours. (Students are required to obtain an average of 2.00 in concentration courses for graduation purposes.) This constitutes the Institutional Policy, administered by the Registrar’s Office.

Table A

<table>
<thead>
<tr>
<th>Total Accumulated* Hours Range</th>
<th>Minimum Grade Point Average (GPA)</th>
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<tbody>
<tr>
<td>Credit Hours</td>
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<tr>
<td>0-30</td>
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<tr>
<td>31-60</td>
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<tr>
<td>61-90</td>
<td>1.80</td>
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<tr>
<td>91 or more</td>
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</tbody>
</table>

*Total accumulated = Transferred + Passed credit hours

Transferred credit hours will not be used to compute the grade point average, but they will be counted to determine the level or year to which the student belongs.

Maximum Time Allowed to Complete an Academic Degree, Students must complete graduation requirements within a maximum time equivalent to 150% of the credit hours required by the academic degree program enrolled.

Probationary and Suspension Status
Students whose academic progress does not satisfy the qualitative elements will begin a probationary period that will not exceed two consecutive academic terms before being suspended for one term. After suspension is effective, the student may return under a probationary status for a maximum period of one (1) additional academic term, at the end of which may be suspended for a period of three academic terms. The student may be admitted once again under a probationary status for one academic term. In the event he/she does not succeed, he/she will be permanently dismissed.

Incomplete If the professor grants an Incomplete (I) grade in a course, it must be accompanied by a letter grade. The student must complete course requirement within thirty (30) days. Otherwise, the incomplete grade will be changed to the grade which accompanied the incomplete.

Dual Courses Graduate courses which content can be validated to substitute an undergraduate course. These courses will be used in the graduate admission process as transferred and will be counted as part of the Master Degree. The maximum courses allow to be used per undergraduate program is 4 courses. The validation of these courses in the Master Degree will reduce the total credits from 39 to 27. The validation form should be approved by the Academic Dean prior attending to the course.

To apply for these courses the student should have:

- GPA of 3.25 or higher.
- Senior year
- Must have 3 to 12 credits on free electives
- Obtain grade of A or B
ACADEMIC PROGRESS REVIEW PROCEDURES

The academic progress of the students will be measured using the qualitative element which will be verified each academic year, during the summer.

The retention index (qualitative part) will be determined according to Table A. The GPA will be computed only with credits taken at Polytechnic University of Puerto Rico - Orlando Campus. Probation, suspension or dismissal will be determined, employing the following procedure:

1. When the accumulated index is lower than the established index as given in Table A, an academic probation period (P₁) will be granted for one academic term. The Registrar’s Office will notify the student of their academic status via a certified letter. At the same time, the Counseling Office will be notified to ensure the required follow-up.

2. During the probation period (P₁), the student must raise the academic index to a value equal or higher than the corresponding one established in Table A.

3. If after this probation period the student does not comply with the established condition in Item 2, and does not remediate his/her academic deficiencies, he/she will be granted a second one academic term probation (P₂). If the student fails to succeed the probation (P₂), the student will be suspended for one academic year. The Registrar’s Office will notify the suspended student via a certified letter.

After the one year suspension, the student may be readmitted in probation (P₃) for one academic year.

In the event the student fails to reach a satisfactory retention index after the third probationary period (P₃), the student will be suspended for a period of three (3) academic years. Afterwards, the student may request readmission. The student may be admitted again under a probationary status for one academic year. In the event he/she does not succeed, he/she will be permanently dismissed.

RIGHT TO APPEAL

1. The student may appeal this decision under the following conditions:

   a. Any student who considers that a mistake has been made in the application of these policies and procedures used to evaluate academic progress may send a written request for reconsideration to the Academic Achievement Committee within ten (10) working days after written notification of the decision.

   b. The request for reconsideration should include the decision referred to, give a brief statement of facts, state and justify the basis for the requested change or restitution.

   c. Each request for reconsideration must be submitted to the Registrar’s Office.

   d. Presentations before the Academic Achievement Committee by persons who are not members of the Committee will be permitted in special cases. The Committee’s decision will be final.

Honor roll

Undergraduate students with a cumulative grade point average of at least 3.25 and who have been full-time students for the past year and have passed all the credits attempted will appear on the Honor Roll.

Dean’s list

An announcement is at the beginning of each term of those students who, in the previous term, completed a minimum of twelve (12) credit hours and accumulated a general grade point average of 3.25 or higher, and who are eligible for inclusion on the Dean’s List.

Readmission policy AND PROCEDURE

Students who are not active during two (2) or more consecutive terms, or who are under suspension for disciplinary or academic reasons, and who wish to continue their studies, must apply for readmission to the Institution.

Regular students who have discontinued their studies for one year or more will be readmitted under the procedure in effect. The applicable curriculum will be the one outlined in the Catalog in effect at the time of readmission. Each applicant will be evaluated by the Department Director to which the student is seeking readmission.

Polytechnic University of PR-Orlando Campus Catalog 2013-2014
Readmission applications must be submitted at least one (1) month prior to the next registration period. If the student does not register during the period requested, the application will remain active for one (1) additional term.

Steps for readmission:
1. The student will complete and submit the Readmission Application Form to the Registrar’s Office who will notify the Readmission Committee.
2. A nonrefundable readmission fee.
3. Upon payment of the readmission fee, the Finance Office will notify the student of any outstanding debt with the institution.
4. If the student is indebted to the Institution, the process of readmission will be delayed until the student pays the debt and receives clearance from the Finance Office.
5. The Registrar’s Office will apply the following criteria to evaluate the readmission application:
   a. Study any evidence of disciplinary measures taken or noncompliance with University regulations and any stipulations made.
   b. Verify that the student complies with the minimum GPA according to Table A (Retention Index).
   c. Confirm the student complies with the required suspension time limit.
6. A student whose readmission application has been denied may appeal to the Readmission Committee through the Registrar’s Office. The student will receive instructions regarding the procedure to follow in order to request reconsideration by the Committee.
7. If the student has a lower grade point than required or if the required suspension time limit has not expired, and the Committee rules in favor of the student, readmission will be granted on a probationary basis. The conditions of the probation period will be:
   a. The student must pass all courses for which he/she is registered with a grade of “C” or higher.
   b. The academic load will be limited to twelve (12) credit hours maximum per term for undergraduate students and six (6) credit hours maximum for graduate students.
   c. The GPA should be increased or improved according to what has been established.
8. Students who have interrupted their studies at Polytechnic University of Puerto Rico - Orlando Campus at their will, and during this inactive period have attended another institution (or other institutions) without prior permission from the Department Director, will have no right to request the transfer of credit hours taken at other institutions.
9. The decision of the Readmission Committee will be sent in writing to the student through the Registrar’s Office.

**NORMS AND PROCEDURES FOR THE EVALUATION OF STUDENT ACADEMIC PROGRESS AT THE GRADUATE LEVEL**

**Purpose**
This document includes the norms and procedures of student academic progress at the graduate level. The purpose of these norms and procedures is to define the parameters to be used in the retention, probation, suspension, and academic dismissal of students. They establish the mechanisms to be followed in the evaluation of student academic progress. These norms and procedures apply to every student admitted or readmitted to pursue graduate studies.

**Norms and Procedures**
The PUPR- Orlando Campus requires that all graduate students demonstrate academic progress through the number of approved credit-hours and general average.

**A. Definitions**
1. Attempted credit-hours - all credit-hours in which the student enrolls at the graduate level at the Polytechnic University of Puerto Rico, Orlando Campus, for which a grade of I, A, B, C, D, F, W, S, NS, NP, or P is given, including all the number of times the student has enrolled in the same course.
2. Transfer credit-hours - graduate credit-hours approved with a grade of “A”, “B” or its equivalent at an accredited institution of higher learning, and are accepted by the Graduate School in accordance with the prevailing norms at the PUPR-Orlando Campus. Transfer
credit-hours will not be taken into consideration in qualitative evaluation. These credit-hours will be considered to determine the level or year of study of the student at the graduate level. A maximum of six (6) credits will be accepted in transfer from other accredited institutions of higher learning after official admission.

3. Approved credit-hours – credit-hours attempted at the PUPR – Orlando Campus by students admitted to the Graduate School and approved with a grade of “A”, “B”, “C”, “S” or “P”.

4. General average - measure used to evaluate the academic performance of the graduate student. This measure is computed by dividing the total number of credit-hours accumulated by the total number of credit-hours in which the student has received final grades, including “F,s” that have not been removed. Courses in which grades of “S”, “NS”, “P” or “NP” will not be included for computing the measure.

5. Repetition of courses - practice under which the graduate student is allowed to repeat only a course in which he (she) obtained a grade of “C”, “D”, “F”, “NS”, or “NP”. In accordance with this practice, only the highest grade will be considered to determine the general average.

6. Probation - temporary condition of the graduate student at the PUPR- Orlando Campus because of academic reasons, in which both the quantitative and qualitative elements are taken into consideration.

7. Suspension because of academic deficiency -dismissal of the graduate student at PUPR-Orlando Campus for academic reasons, in which the qualitative elements, as well as the time on probation, are considered.

8. Academic year - three academic educational periods that makeup the academic year which begins with the autumn term.

9. Educational period - typical academic period during which the regular courses are offered, several periods of which three make up the academic year.

10. Probation to receive Financial Aid – student will be in probation status for one academic year because he/she did not fulfill deficiency shown in Table A and/or B from section 3.

11. Suspension of Financial Aid – student that at the end of his/her probation period does not surpass the deficiency shown in table A and/or B from section 3.

B. Norms of Academic Progress to be followed by the Registrar’s Office for the evaluation of students.

1. Academic index: Students are required a 3.00 or more general index for graduation and that they are not on probation or have-not dismissed.

2. Total number of credit-hours approved\(^1\): The student should pass 50% of all credit-hours attempted at the Institution.

3. Probation and suspension: All graduate students, whose academic progress does not comply with the retention indexes shown in Table A or with the conditions included in Table B, will begin an “On Probation” period for no more than a year. If the “On Probation” period is not overcome, the student will be suspended (dismissed) from the Institution.

| Table A  |
|------------------|------------------|
| Retention Index  | Minimum General  |
| Total Credit-     | Average          |
| hours accumulated |                  |
| at PUPR*          |                  |
| 0-9               | 2.50             |
| 10-18             | 2.80             |
| 19 or more        | 3.00             |

\(^*\)Total accumulates = Transferred + Passed credit hours

| Table B  |
|------------------|------------------|
| Reasons for a Probation Status  |                  |
| 4. Incompletes: If the course instructor has given an “Incomplete” in a course, the graduate student must complete the course requirements within the date stated in the next educational period. If the student does not comply with what is hereby stated-last day to remove grades of “Incomplete” the provisional grade |                  |

\(^1\) Apply only to students who have scholarship or loan.
given will be turned into the final grade in the course(s). Grades of "Incomplete" will be included to determine the general average using the provisional grade.

C. Procedures for evaluating graduate level students. The academic progress of all graduate level students will be measured in the following way:

1. The general average will be verified every trimester.
2. Probation will be granted for educational period.
3. If at the end of the year on probation, the student does not meet all the conditions established and does not overcome the academic deficiencies; he (she) will be permanently suspended from the Institution.

D. Appeals. The student may appeal a decision under the following conditions:

1. Every student is entitled to apply, in writing, to the Academic Achievement Committee a reconsideration of the above mentioned decision within the ten work days following the date in which the decision was notified.
2. The application for reconsideration should show the decision referred to, include a brief statement of facts, expose and justify the basics or foundation that support the appeal and indicate the change or remedy asked for.
3. All reconsideration applications should be filed in the Graduate School Deanship.
4. Exposition of the case by the student before the Academic Achievement Committee is acceptable, and if he (she) so wishes, can be accompanied by persons who are not members of the Committee.
5. The Academic Achievement Committee will inform the student in writing, of the decision taken in regard to the particular case appealed. If the Committee approves the case appealed, the student will be re-joined to his/her program on a suspension status and will be responsible of the total registration cost.

Effectiv Date
These rules and regulations are in effect since the beginning of the 2013-2014 academic year. Any student affected by norms and procedures eliminated by these new rules and regulations may apply for reconsideration of his (her) case.

GRADUATION APPLICATION
Candidates for a bachelor’s or master’s degree, who have completed at least 80% of the required credit hours, must apply for graduation. Applications may be obtained at the Registrar’s Office. The application must be completed and a graduation fee paid no later than the date specified in the Academic Calendar. The application should be completed and returned to the Registrar’s Office after obtaining the clearance of the Library, Financial Aid Office, and the Finance Office indicating payment of a nonrefundable graduation fee. Any alleged errors in the analysis of an academic record should be reported to the Registrar within a week after it has been received.

GRADUATION REQUIREMENTS
Polytechnic University of Puerto Rico - Orlando Campus reserves the right to make changes in the curricula and degree requirements whenever, in its judgment, the same are considered beneficial for the Institution. As a rule, a student is entitled to graduate under the curriculum requirements in effect at the time of admission to the University. However, students who fail to fulfill the graduation requirements within the regular period of time assigned to their corresponding curricula, and students who re-enroll after a period of one year of absence or more, are governed by the requirements applicable to the class in which they will graduate.

To receive a graduation diploma from Polytechnic University of Puerto Rico - Orlando Campus, candidates must meet the following conditions:

1. Apply for graduation after the successful completion of 80% of the required credit hours by filing an application form at the Registrar’s Office.
2. Pay the graduation fee and satisfy all other financial obligations to the University no later than the date specified in the Academic Calendar.
3. Their corresponding Dean and Faculty must have recommended students for the degree to the President of Polytechnic and to the Board of Trustees.

4. Students completing requirements in the Summer, Fall, Winter and Spring terms are invited to attend the Commencement Exercises the following Summer.

5. Students should have taken the final credit hours for the degree at Polytechnic University with the understanding that these credit hours correspond to at least the total credit hours of the last year of the program as specified and described in the Catalog.

6. The student must attain a minimum cumulative grade point average of 2.00 in the student’s major as well as a minimum cumulative grade point average of 2.00. It is highly recommended that students repeat, if possible, all concentration courses passed with “D” in order to improve their GPA.

7. The student must satisfy all credit hours specified for the degree within a period equivalent to six (6) years. After the expiration of said period, all doted or expired courses must be replaced with third and fourth year courses, unless otherwise authorized by the corresponding Department Head and Dean of Faculty.

8. For graduation with honors, the undergraduate student must satisfy all of the following additional criteria:
   a) Completed at least 65% of the credit hours required for graduation at Polytechnic University of Puerto Rico - Orlando Campus
   b) Earned, at Polytechnic University of Puerto Rico - Orlando Campus an overall (including all attempted credit hours) a grade point average of: 3.250-3.499 for Cum Laude; 3.500-3.899 for Magna Cum Laude; or 3.900-4.000 for Summa Cum Laude

If curriculum changes, students are not obligated, but may elect, the new course in lieu of the prescribed course in the entrance catalog. The Department Director will facilitate any necessary transitions if curriculum or requirements change.

TRANSFER OF CREDITS – OUT

Most colleges and universities accept transfer credits from regionally accredited universities, subject to limitations on elapsed time and the number of credits. Although the University is regionally accredited, it remains the responsibility of the student to confirm the transferability of Polytechnic University of Puerto Rico - Orlando Campus credits to another college or university program.

Certifications and transcripts

The Registrar will issue transcripts or any other official statement usually within two weeks after the student submits a written request and pays the corresponding fee. However, when a request is made at the beginning or the end of a term, a longer period of time for issuance may be required.

To transfer credit hours to other colleges and universities and to supply information to certifying agencies and prospective employers, official transcripts are issued in a confidential manner. These are mailed directly to the addresses designated by the students and are never given to the student or any other individual.

Students may also obtain an official copy of the transcript of credits marked student copy. Any alleged errors in the transcript should be reported to the Registrar within ten (10) days of receiving it.

A transcript and certification fee is charged for each transcript. All services are denied to debtor students.

Diplomas

The Registrar’s Office will contact graduates once the Diplomas are ready to be claimed.

Change of address

When students submit their applications for admission, they are required to write down their mailing address. After admission, changes of address should be reported immediately to the
Registrar’s Office. If the student does not update the student’s address, the University will not be responsible for correspondence it sends which is not received by the student. Any notice, official or otherwise, mailed to a student’s addresses as it appears on the records shall be deemed sufficient notice.

**Class attendance**

Students should maintain regular attendance if they are to attain maximum success in the pursuit of their studies. Students who have not attended any classes during the first two weeks of the academic term are automatically disqualified to charge such tuition to federal funds. The instructor, after receiving the class roster, will submit, in writing, the names of all such students to the Office of the Registrar.

It is recognized that the record of class attendance may vary according to the student, the instructor or the course. On occasions, it may be necessary for the student to be absent from scheduled classes or laboratories for health reasons. The student is responsible for contacting the instructor for all work, completed or assigned. Instructors in charge of courses in all programs of study are required to include in their midterm and final grade reports the total number of absences of all students. The Registrar will not accept reports if this condition is not met by the instructor.

**MILITARY TRAINING**

Polytechnic University of Puerto Rico - Orlando Campus students may request consideration of credit award for documented military training. The Academic Director has the responsibility of working with the student to evaluate the request and to determine if the credit option is appropriate. A maximum of 30 credit hours of military training will be accepted into the university.

**Standardized Examinations**

The University will accept a maximum of 30 credit hours of standardized testing credit. All such credit will be listed on the student’s transcript and will not be removed once it has been recorded. Students may receive credit after successfully completing any of the following standard examinations: College Level Examination Program (CLEP) and/or Defense Activity for Non-Traditional Educational Support (DANTES).
IV. ARTICULATIONS

AGREEMENT BETWEEN VALENCIA COMMUNITY COLLEGE AND POLYTECHNIC UNIVERSITY OF PUERTO RICO-ORLANDO CAMPUS

Articulated Pre-Major: ENGINEERING (Polytechnic University of Puerto Rico - Orlando Campus) (Course Titles and Codes based on Valencia Community College Catalog)

This pre-major is designed for the student who plans to transfer to the Polytechnic University of Puerto Rico - Orlando Campus (Polytechnic University of Puerto Rico - Orlando Campus) as a junior to complete a four-year bachelor’s degree in the School of Engineering. It is based upon an articulation agreement in Engineering with University of Puerto Rico - Orlando Campus.

Students who plan to transfer are responsible for completing the admission requirements of Polytechnic University of Puerto Rico - Orlando Campus.

Students in Pre-Majors must complete all required college-preparatory courses, prerequisites for the listed course requirements, and Valencia’s foreign language proficiency requirement. Courses meeting the preceding requirements will be in addition to the 60 credit hours listed. Extra Engineering Electives courses and the course listed in the NOTE below may also be taken at Valencia in addition to the 60 credit hours listed.

The courses do not have to be taken in the order listed; the sequence suggested is based upon prerequisites and level of course difficulty for most students.

FOUNDATION COURSES

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<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>ENC 1101</td>
<td>Composition I</td>
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<td>Engineering Concepts and Methods</td>
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<td>Fundamentals of Speech</td>
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INTERMEDIATE COURSES

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ADVANCED COURSES

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</tr>
<tr>
<td>*</td>
<td>MAP 2302</td>
<td>3</td>
</tr>
<tr>
<td>ECO 2013</td>
<td>Principles of Economics - Macro</td>
<td>3</td>
</tr>
<tr>
<td>*</td>
<td>EGS 2025</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

Total Hours Required 60

Engineering Electives (Polytechnic University of Puerto Rico - Orlando Campus)

Students will select a minimum 3 credit hours; Extra Engineering Electives courses as well as the course in the NOTE may be taken at Valencia, in addition to the 60 credit hours listed.

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>CHM 1045C General Chemistry with Qualitative Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>+</td>
<td>These courses must be completed with a minimum grade of C.</td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>These courses have a course prerequisite(s). See course descriptions in Valencia Community College</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: It is recommended that students also complete *CHM 1045C General Chemistry with Qualitative Analysis I.

Polytechnic University of PR-Orlando Campus Catalog 2013-2014
catalog. Specialized courses may not be offered every session.

ARTICULATION AGREEMENT BETWEEN SEMINOLE COMMUNITY COLLEGE AND POLYTECHNIC UNIVERSITY OF PUERTO RICO - ORLANDO CAMPUS

Articulated Pre-Major: Pre-majors of Accounting, General Business and Economics and Engineering (Polytechnic University of Puerto Rico - Orlando Campus)

PUPR Pre-requisites for the Bachelor of Business Administration
(Course Titles and Codes based on Seminole Community College Catalog)

This pre-major is designed for the student who plans to transfer to the Polytechnic University of Puerto Rico, Orlando Campus as a junior to complete a bachelor's degree in the School of Business. Students who plan to transfer are responsible for completing the admission requirements of the Polytechnic University of Puerto Rico, Orlando Campus.

The courses listed below do not have to be taken in the order listed; the sequence suggested is based upon prerequisites and level of course difficulty for most students. These courses will meet graduation requirements for the Associate of Arts from Seminole Community College and pre-requisites for one of the Business programs at the Polytechnic University of Puerto Rico, including: Accounting, General Business and Economics.

FOUNDATION COURSES

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC 1101</td>
<td>Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Humanities</td>
<td>General Elective</td>
<td>3</td>
</tr>
<tr>
<td>SPC 1600</td>
<td>Fundamentals of Speech</td>
<td>3</td>
</tr>
<tr>
<td>PSY 2012</td>
<td>Phycology General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>PHY 1020</td>
<td>Physical Science</td>
<td>3</td>
</tr>
<tr>
<td>CGS 2100C</td>
<td>Office Application</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

INTERMEDIATE COURSES

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC 1102</td>
<td>Composition II</td>
<td>3</td>
</tr>
<tr>
<td>Humanities</td>
<td>General Elective</td>
<td>3</td>
</tr>
<tr>
<td>SYG 2000</td>
<td>Social General Education</td>
<td>3</td>
</tr>
<tr>
<td>History</td>
<td>History General Education</td>
<td>3</td>
</tr>
<tr>
<td>MAC 1105</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>ACG 2021</td>
<td>Principle of Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>Are A or B General Education Science Course</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>21</td>
</tr>
</tbody>
</table>

ADVANCED COURSES

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>STA 2023</td>
<td>Composition II</td>
<td>3</td>
</tr>
<tr>
<td>ACG 2071</td>
<td>General Elective</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

Five of the following six courses:

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAN 2021</td>
<td>Introduction to Management</td>
<td>3</td>
</tr>
<tr>
<td>MAR 2011</td>
<td>Marketing</td>
<td>3</td>
</tr>
<tr>
<td>BUL 2241</td>
<td>Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>FIN 2001</td>
<td>Business Finance</td>
<td>3</td>
</tr>
<tr>
<td>ECO 2013</td>
<td>Principles of Economics (MACRO)</td>
<td>3</td>
</tr>
<tr>
<td>ECO 2023</td>
<td>Principle of Economics (MICRO)</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

TOTAL 60

PUPR Pre-requisites for the Bachelor of Science in Civil Engineering, Electrical Engineering or Computer Engineering

This pre-major is designed for the student who plans to transfer to the Polytechnic University of Puerto Rico, Orlando Campus as a junior to complete a bachelor’s degree in the School of Engineering. Students who plan to transfer are responsible for completing the admission requirements of the Polytechnic University of Puerto Rico, Orlando Campus.

The courses listed below do not have to be taken in the order listed; the sequence suggested is based upon prerequisites and level of course difficulty for most students. These courses will meet graduation requirements for the Associate of Arts from Seminole Community College and pre-requisites for Engineering at the Polytechnic University of Puerto Rico.
### FOUNDATION COURSES

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC 1101</td>
<td>English I</td>
<td>3</td>
</tr>
<tr>
<td>Humanities</td>
<td>Humanities General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>MAC 2311</td>
<td>Analytic Geometry and Calculus I</td>
<td>5</td>
</tr>
<tr>
<td>SPC 1600</td>
<td>Fundamentals of Speech</td>
<td>3</td>
</tr>
<tr>
<td>Social</td>
<td>Social General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>Area A or B General Education Science Course</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>20</td>
</tr>
</tbody>
</table>

### INTERMEDIATE COURSES

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC 1101</td>
<td>English II</td>
<td>3</td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus II</td>
<td>5</td>
</tr>
<tr>
<td>PHY 2048C</td>
<td>Physics with Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>CHM 2045C</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>Humanities</td>
<td>Humanities General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>Social</td>
<td>Social General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>History</td>
<td>History General Education Course</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>25</td>
</tr>
</tbody>
</table>

### ADVANCED COURSES

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC 2313</td>
<td>Analytic Geometry and Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>PHY 2049C</td>
<td>Physics with Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MAP 2302</td>
<td>Elementary Differential Equation</td>
<td>3</td>
</tr>
<tr>
<td>XXX XXXX</td>
<td>Elective</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>15</td>
</tr>
</tbody>
</table>

|               | TOTAL                             | 60           |

**TOTAL 60**
V. FINANCIAL INFORMATION AND SERVICES

TUITION AND FEES SCHEDULE

Students can obtain the current Tuition and Fees Schedule by visiting or contacting the Admission or the Finance Officer.

Tuition
Undergraduate Tuition:

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Tuition Fee</th>
<th>Fee Details</th>
<th>Credit Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Courses</td>
<td>$345.00</td>
<td>Institutional Scholarship</td>
<td>$30.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cost for the 1st year 2012-2013</td>
<td>$315.00</td>
</tr>
</tbody>
</table>

Business & General Courses

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Tuition Fee</th>
<th>Fee Details</th>
<th>Credit Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Courses</td>
<td>$315.00</td>
<td>Per Credit Hour Scholarship</td>
<td>$40.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cost for the 1st year 2012-2013</td>
<td>$275.00</td>
</tr>
</tbody>
</table>

Graduate Tuition: $395.00

Fees
Undergraduate Application Fee (non-refundable): $30.00
Graduate Application Fee (non-refundable): $50.00
Application Fee International Students (non-refundable): $50.00
Non degree students: $50.00
Lab Fee: $115.00
Technology Fee: $40.00 Per Trimester
Library Fee: $40.00 Per Trimester
Student Identification Card: $15.00 Per Occurrence
Registration Fee: $10.00
Late Registration Fee: $40.00
Return Check Fee: $50.00
Transcript/Certification Fee: $5.00
Student Activity Fee: $10.00
Add/Drop Course Fee: $15.00 Per Course
Deferred Payment Fee: $60.00
Undergraduate Readmission Fee (non-refundable): $30.00
Graduate Readmission Fee (non-refundable): $30.00
Withdrawal Fee (each): $15.00 Per Course
Graduation Fee: $165.00
Academic Evaluation Fee (1st one is Free): $15.00
Change for Academic Concentration or Programs: $25.00

Copy of Registration Report: $5.00
Duplicate Diploma: $75.00
ID Card or Duplicate: $15.00
Athletic Fee: $15.00

Tuition & Fees are subject to change.

PAYMENT PROCEDURES

Tuition and fees are payable in full during the registration period, or prior to the first day of classes. Students may opt to defer payment for thirty (30) days at a cost of the deferred payment fee, after paying at least 50% of total cost (including other financial aid). The “deferred payment” will allow the student a grace period after the first day of classes to pay the remaining balance without paying “late charges.” The registration process is not complete until all fees have been paid or proper arrangement for deferred payment has been made. Late charges on pending balances are 1.5% per month.

COLLECTION POLICY

a) Tuition and fees due from previous terms of study must be paid in full prior to the student registering for any additional courses.

b) Any balance remaining after 30 days will be subject to a 1.5% monthly charge.

c) Balances remaining unpaid after 180 days will be subject to a collection fee of $20 plus the 1.5% monthly charge.

Students who requested financial aid or veteran benefits must consult the Financial Aid Coordinator before their registration may be completed.

Payments of fees can be made either in cash, money order, a certified check, Visa, Master Card, American Express or Discover Card. Failure to pay any University fees when due may result in administrative withdrawal and/or in holding copies of student’s academic records or other documents. Students with pending balances on their accounts are not permitted to enroll in subsequent trimesters.

REFUND POLICIES

The Finance Office is responsible for complying with the refund policies established by the Institution. These policies take into consideration institutional and current federal regulations. The procedure to apply for a refund must be submitted
in writing, and in accordance with the academic calendar. The policies will be applied as follows:

Total withdrawal for student registered for the 12 weeks term

On or before the first day of the term  
100%
First week  
100%
Second week  
33.33%
Third week and after  
0%

Refund percentage only applies to tuition costs. Registration, Library, Educational Technology Center and activities fees are nonrefundable.

Financial Delinquency
Students failing to pay their debts to the university on or before the day payment is due may be excluded from graduation. The university may also withhold grades, the issuance of transcripts, degrees, diplomas, and the granting of certificates of good standing to any student whose account is in arrears.

FINANCIAL AID

The Financial Aid Office provides information to students and their families regarding the available financial aid programs as well as the application process and eligibility requirements. Our mission is to provide accurate and clear consumer information to help students explore the different financial aid resources that can help them obtain the necessary funding to reach their academic goals.

Polytechnic University of Puerto Rico participates in the following financial aid programs from federal, state, institutional and private sources:

- Federal Pell Grant
- Federal Supplemental Educational Opportunity Grant (FSEOG)
- Florida Student Assistance Grant Program (FSAG)
- Access to Better Learning and Education Grant
- Florida Bright Futures Scholarship
- José Martí Scholarship Challenge Grant
- Scholarship For Children and Spouses of Deceased or Disable Veterans
- Federal Work-Study Program (FWSP)
- Florida Work Experience Program
- Federal Direct Loan Program for Students
- Federal Direct Loan Program for Parents of Undergraduate Students
- Federal Direct Loan Program for Graduate Students
- Private Student Loans
- Institutional Scholarships
- Private Scholarships

The availability of the above programs will depend on the total funds allotted to the Institution for the 2013-2014 academic year.

General Eligibility Requirements
To be eligible to receive financial aid from most federal and state programs, the student must:

- Be enrolled as a regular student
- Be working towards a degree in an eligible program
- Be a U.S. citizen or eligible non-citizen with valid Social Security Number
- Have a high school diploma or its equivalent
- Meet the Standards of Satisfactory Academic Progress
- Demonstrate financial need (except for some loans)
- Register with the Selective Service, if male between the ages of 18 and 25
- Certify that will use federal student aid only for educational purposes. The student must also certify that is not in default on a federal student loan and do not owe money on a federal student grant.
- Have no history of certain drug convictions

In addition to the above basic eligibility requirements, the student could be required to meet additional requirements such as minimum enrollment credits, minimum GPA, state residency status among others depending on the financial aid program. For the eligibility requirements of a specific program, contact the Financial Aid Office.

Application Process
To determine student’s eligibility for federal aid, the student must complete the Free Application for Federal Student Aid (FAFSA). Some financial aid programs, such as state grants, student loans and federal work-study, require an additional application.
The student must reapply for financial aid every year. Since some federal and state funds are limited, students are encouraged to apply as soon as possible after January 1st. New students should apply for financial aid at least two months before the first day of classes of the period for which they will enroll. Regular students must submit their 2013-2014 application before April 25, 2013.

Follow these steps to complete your 2013-2014 FAFSA:

1. Obtain a PIN for yourself at www.pin.ed.gov. If you are a dependent student, your parents will need a PIN to sign the FAFSA. If you got a PIN for the last year, you can use it to renew your FAFSA.

2. Collect the following information:
   - Your social security number and your parents’ social security numbers, and dates of birth, if you are a dependent student.
   - Your driver’s license number (if applicable).
   - If you are not a U.S. citizen, your alien registration number.
   - 2012 Income tax returns, W-2 forms and other records of income earned for yourself and your parents/spouse.
   - Evidence of untaxed income during 2012 such as Child Support, veteran’s none educational benefits, among other.
   - Information about savings, investments as well as business and farms assets for yourself and your spouse/parents, if applicable.
   - PUPR’s School code: 014255

3. Complete the FAFSA at www.fafsa.gov. FAFSA is free! You should not pay for completing this application. If you need assistance to complete the FAFSA, contact the Financial Aid Office.

4. After the FAFSA application is processed by the Department of Education, the Financial Aid Office will receive a report with the reported information. If your application is selected for verification, the Financial Aid Officer will request you to provide evidence to confirm the information submitted in your application. No financial aid disbursement will be processed until the verification process is completed.

5. After completing your FAFSA application, you may complete your student loan application at http://www.pupr.edu/orlando/fa-form.asp.

Florida Residency Requirement

The Financial Aid Office is responsible to confirm the student’s Florida residency status before disbursing any State fund. To be classified as a Florida resident, the student (or claimant) must present evidence of having established a legal residence in Florida and maintained that legal residence for 12 consecutive months prior to the term in which the Florida resident classification is sought. Students’ residence in Florida must be as a bona fide domiciliary rather than for the purpose of maintaining a mere temporary residence for enrollment in an institution of higher education. The student (and claimant) is required to be a United States citizen, resident alien, parolee, Cuban national, Vietnamese refugee, or other refugee or asylee so designated by the Bureau of Citizenship and Immigration Services. Students must complete the Affidavit for Florida Residency Classification and submit it with necessary documentation before the first day of classes of the academic period.

Transfer Students

Financial aid awards cannot be transferred automatically from one post-secondary institution to another. The student must correct the FAFSA application to include Polytechnic University’s Code: 014255. After the Financial Aid Office receives your FAFSA results, we can determine your eligibility for the available financial aid programs. Transfer students with previous student loans can defer paying loan payments if enrolled at least half-time. The deferment will not be automatically granted with your enrollment. To defer a student loan, the student must complete a deferment form and submit it to the Registrar’s Office. The deferment form is available at www.pupr.edu/orlando and at the Financial Aid Office.

Awarding Process

The student’s eligibility for financial aid programs will be determined after the FAFSA application is received and the verification process is completed, if selected. The student’s Expected Family Contribution (EFC) and the cost of attendance will be considered when preparing the award package. The student will not be considered for a Student Loan or for the Federal Work-Study program unless proper program application has been completed. Priority will be given to students with economic
need, in order of application processing date, for supplemental aid programs.

The student will receive an Award Letter listing the student aid programs awarded for the academic year. Initial student aid awards are offered based on full-time enrollment. Awards may be then adjusted, if applicable, to actual enrollment after the drop/add period for each trimester. Other sources of assistance such as merit awards and private and institutional scholarships will be taken into consideration when preparing the student’s award package.

**Students repeating a course may not be eligible for financial aid for that specific course.**

**Financial Aid Disbursements**

Financial aid funds are credited to the student’s institution account to cover tuition costs and fees. The student’s enrollment status and eligibility for the financial aid program will be verified every trimester before disbursing any money. If there is an excess fund paid, a check will be issued to refund the student. If the financial aid is not sufficient to cover all charges, the student is responsible for paying the outstanding balance. The following are some of the reasons why the student’s aid disbursements may be delayed or cancelled:

- Application submitted after deadline
- Not providing all required documentation before deadline
- Not completing the Entrance Counseling and/or Master Promissory Note for Direct Loan borrowers
- Not keeping the minimum academic load and GPA requirements
- Not making Satisfactory Academic Progress towards the program degree
- Being in default on a student loan or owing a repayment to any Title IV financial aid program

**Return of Financial Aid**

Students who drop or withdraw might have to repay portion or the total amount of financial aid received. Students that enroll but do not attend to class will also be required to repay any received financial aid.

If an over award occurs, the student’s award package will be reduced which may result in a repayment. To avoid over awards, students must notify the Financial Aid Office of any potential awards such as private scholarships, vocational rehabilitation benefits, etc., that were not included in the Award Letter.

**Refer to the Federal Financial Aid Return Policy for more information on the calculation procedure and for an example of the calculation. This document is available at [www.pupr.edu/orlando](http://www.pupr.edu/orlando).**

**STANDARD OF SATISFACTORY ACADEMIC PROGRESS FOR STUDENTS WITH FINANCIAL AID**

The Standard of Satisfactory Academic Progress of the Financial Aid Office establishes the evaluation criteria to determine the student’s academic progress, which is one of the eligibility requirements to participate in student financial aid from the Title IV of the Federal Department of Education, State, Institutional and Private programs.

The minimum federal components to measure the satisfactory academic progress require three specific measures: qualitative, quantitative, and maximum time to receive Federal aid. These three components provide a measure on the reasonable progress of student to successfully complete the academic career.

**Evaluation Criteria for Undergraduate Students**

**A. Qualitative Measure**

One of the elements of the Standard of Satisfactory Academic Progress is the qualitative measure. This component consists of the grade point average and the total accumulated credits at the end of the academic year.

The Polytechnic University of Puerto Rico, adopts the retention rate (qualitative measure) according to the following chart:
### Total Earned Credits *<sup>(1+2)</sup>

<table>
<thead>
<tr>
<th>Minimum Required Grade Point Average (GPA)</th>
<th>Total Earned Credits *&lt;sup&gt;(1+2)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>0 - 36</td>
</tr>
<tr>
<td>1.65</td>
<td>37 - 72</td>
</tr>
<tr>
<td>1.80</td>
<td>73 - 108</td>
</tr>
<tr>
<td>2.00</td>
<td>109 +</td>
</tr>
</tbody>
</table>

*Total Earned Credits includes transferred credits and completed credit hours at PUPR.*

Credits transferred from other colleges are not taken into consideration to calculate the grade point average, but they are considered to calculate the student’s level or year.

### B. Quantitative Measure

The second element of the Standard of Satisfactory Academic Progress is the quantitative measure. This component compares the number of credits attempted by students in the institution, versus the number of approved credits. The student must approve at least the 66% of all the credits attempted at UPPR. This measure will be cumulative.

### C. Maximum time to receive payments from federal financial aid.

All students must complete the graduation requirements within a maximum equivalent to 1.5 times (150%) of the program degree credits. Preparatory courses will not be considered in the evaluation of the maximum time, but all courses attempted at our Institution will be included.

Students who have completed the maximum time do not qualify for financial aid.

The student will receive payment of federal financial aid for preparatory courses up to a maximum of 30 credits.

**Example:**

**Student in Accounting Program**

The Accounting Program requires 120 credits to complete the curriculum

Maximum time (120 crds. x 150%) 180 attempted credits

- The credits hours will be used to determine the maximum time.
- The maximum time must be 150% of the credits hours required to complete the program degree.

- All attempted credits, even those in which the student did not receive financial aid, counts towards the established maximum.
- This policy includes and measures students who are enrolled half-time.
- All courses attempted in the institution, except for preparatory courses, will be included. Transferred courses will also be included for the maximum time.

- If a student changes of Major or School (eg. from Engineering to Architecture), will be measured with the new concentration requirements (total of required credits). All courses taken at UPPR, including credits from previous Major/School, credits from the new Major/School as well as transferred credits, will be included.

### Evaluation Criteria for Graduate Students

#### A. Qualitative Measure

One of the elements of the Standard of Satisfactory Academic Progress is the qualitative measure. This component consists of the grade point average and the total accumulated credits at the end of the academic year.

The Polytechnic University of Puerto Rico, adopts the retention rate (qualitative measure) according to the following chart:

<table>
<thead>
<tr>
<th>Total Earned Credits *&lt;sup&gt;(1+2)&lt;/sup&gt;</th>
<th>Minimum Required Grade Point Average (GPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 9</td>
<td>2.50</td>
</tr>
<tr>
<td>10 - 18</td>
<td>2.80</td>
</tr>
<tr>
<td>19 +</td>
<td>3.00</td>
</tr>
</tbody>
</table>

*Total Earned Credits includes transferred credits and completed credit hours at PUPR.*

Credits transferred from other colleges are not taken into consideration to calculate the grade point average, but they are considered to calculate the student’s level or year.

#### B. Quantitative Measure

The second element of the Standard of Satisfactory Academic Progress is the quantitative measure. This component compares the number of credits attempted by...
students in the Institution, versus the number of approved credits. The student must approve at least the 66% of all the credits attempted at UPPR. This measure will be cumulative.

C. Maximum time to receive payments from federal financial aid.
All students must complete the graduation requirements within a maximum equivalent to 1.5 times (150%) of the program degree credits. Preparatory courses will not be considered in the evaluation of the maximum time, but all courses attempted at our Institution will be included.

Students who have completed the maximum time do not qualify for financial aid.

Example:
Student in Master of Business Administration - Accounting
The MBA-ACCO Program requires 39 credits to complete the curriculum
Maximum time (39 crds. x 150%) = 58 attempted credits

• The credits hours will be used to determine the maximum time.
  • The maximum time must be 150% of the credits hours required to complete the program degree.
  • All attempted credits, even those in which the student did not receive financial aid, counts towards the established maximum.
  • This policy includes and measures students who are enrolled half-time.
  • All courses attempted in the institution, except for preparatory courses, will be included. Transferred courses will also be included for the maximum time.

• If a student changes of Major or School (eg. from Business Administration to Engineering), will be measured with the new concentration requirements (total of required credits). All courses taken at UPPR, including credits from previous Major/School, credits from the new Major/School as well as transferred credits, will be included.

Students in Probation or Suspension
The Satisfactory Academic Progress of students is evaluated once a year at the end of the academic year (June).

If the student does not meet one of the evaluation criteria of the Standard of Satisfactory Academic Progress, will be classified with a status of probation or suspension. The Financial Aid Office will notify the student about his/her status.

Probation Status
A student in probation status is the one that has not met the Standard of Satisfactory Academic Progress for the first time. If in probation, the student does not qualify for Federal, State and Institutional aids programs. Only students in probation that submit an appeal, and it is approved, are eligible to receive Federal, State and/or Institutional aid.

Procedure for Appealing a Probation Status
1. How the student can appeal a probation status?
The student must go to www.pupr.edu to complete the Academic Progress Appeal Form and carefully follow the instructions.

2. Where to submit the Appeal Form?
The student must submit the Appeal Form and supporting documentation before the deadline to the Financial Aid Office.

3. Once submitted, the appeal will be evaluated by the Satisfactory Academic Progress Committee:
   • If approved - Continue to step #4
   • If denied – You will not be eligible the Federal, State and/or Institutional aid programs until you comply with the Standard of Satisfactory Academic Progress.

4. Plan to improve your academic progress:
   • Once the appeal is approved, the student will be referred to meet with the Academic Dean to establish an academic plan for the next 3 trimesters. The academic plan will be established at the beginning of each trimester.
   • Sign the academic plan agreement with the Academic Dean.
   • Submit copy of the established academic plan to the Financial Aid Office to reactivate your financial aids.
5. The academic plan will be evaluated every trimester by the Academic Dean to see if the student is complying with it. While the student complies with his/her academic plan, can continue to be eligible to receive Federal, State and/or Institutional aids as long as he/she meets the other requirements to receive financial aid. If the student does not meet any of the terms set forth in the academic plan, will lose all his/her Federal, State and/or Institutional aids until he/she complies with the Standard of Satisfactory Academic Progress are met.

Suspension Status
If a student does not overcome the probation status will fall in a suspension status. A student in suspension status does not qualify for Federal, State and/or Institutional aid and cannot appeal this status.

The student may be eligible to receive funds from Federal, State and Institutional aid and loans, when he/she complies with the Standards of Satisfactory Academic Progress again.

Definitions
1. Attempted credits – Enrolled credits at UPPR in which the student has obtained grades of I, I (with grades), A, B, C, D, F or W, WF, NR, including all courses repetitions.
2. Transferred Credits - Credits taken at other Institutions of Higher Education recognized by accrediting agencies that were approved with A, B or C and which are accepted by the Department Director or by the authorized Dean in compliance with the standards of the UPPR.
3. Earned Credits - Credits of courses attempted in the UPPR which obtained grades of A, B, C or D with the exception of specific cases defined by the Department.
4. Grade Point Average (GPA) - The measure of academic merit achieved by the student. It is calculated by dividing the total number of accumulated honor points by the number of credits in which the student has received final grades, including F's and WF's which have not been removed.
5. Repeated Courses – Undergraduate courses that the student repeats when it has obtained qualification of D, F, W or WF. For the purpose of determining the Grade Point Average only the highest grade will be used. Repeated courses will be considered in the quantitative measure.
6. Academic Progress – Is the measure which shows whether the student passes the percentage (66%) of the attempted credits versus those approved and whether the academic index is equal to or higher than the established retention index.
7. Academic year - Consists of three academic terms that begin in August and end in May. The summer term is optional.
8. Academic Term - Typical academic term during which the regular courses are offered, and which consists of 12 weeks beginning on the first day of school and ending on the last day of final examinations. In summer, the academic term is reduced to 6 weeks, doubling the weekly contact hours.
9. Provisional Grades (Incompletes) - If the Professor gives an incomplete in a course, the student must complete the requirements of the course within the established date in the next academic term. The Professor will remove the incomplete within the established date. If the incomplete is not removed, it will become the provisional grade until the professor changes the grade. Provisional grades are considered in the calculation of the qualitative and the quantitative measures.
10. Courses with grade W - Course from which the student withdraw official and voluntarily. These withdrawals must be authorized by the Financial Aid Office, Registrar Office, Counseling Office, and Finance Office. These courses will be considered in the calculation of the quantitative measure.
11. Preparatory courses (Remedial) - These are basic courses required by the program (includes courses in MATH, SCIE, ATUL, ENGL, SPAN, and others starting with 01xx). These courses will be covered by federal financial aid up to a maximum of 30 credits.
12. Expired credits - Courses approved seven or more years ago in this or other institution will expire at the date of applying for re-admission with the exception of those validated by the Department Director and the Dean of Faculty. The student must repeat all courses declared outdated or must take other equivalent course of the existing curriculum with the approval of the Director of Department and the Dean of the
Faculty. These courses are considered for the calculation of the quantitative measure.

13. Suspension of financial aid - Students who at the end of the probation period do not overcome deficiencies with the qualitative and/or quantitative element, or does not comply with the established Academic Plan, will have his/her financial aid suspended. Federal financial aid will also be suspended if the student exceeds the maximum time required to complete his/her program of studies. The maximum time is equal to 150% of the of the program credits. All the attempted credits and transferred courses will be taken into consideration.

14. No Satisfactory Academic Progress (NPAS - suspension) - Classification that is given to the student who at the end of his Financial Aid Probation period does not overcome the academic deficiencies or has not completed the Academic Plan as agreed. The student does not qualify for Federal, State or Institutional aid.

**Student's Rights and Responsibilities**
The student has the right to receive the following information from the Financial Aid Office:

1. Available financial aid programs
2. Application process, deadlines and eligibility requirements
3. Awarding and disbursement procedures
4. What financial aid must be repaid, the terms and schedules for repayment
5. The terms and conditions of any employment that is part of the financial-aid award
6. What is the criterion for maintaining satisfactory academic progress and how to re-establish eligibility.
7. Institution's refund policy for students that withdraw from school

It will be student’s responsibility to:

1. Comply with deadlines.
2. Provide all required documents in a timely fashion.
3. Provide the Financial Aid Office with information on changes in family’s household, income or enrollment status.
4. Inform the Financial Aid Office of any outside scholarships, vocational rehabilitation benefits, tuition assistance or VA benefits that will be receiving during the academic year.
5. Use any financial aid received from federal or state programs for expenses related his/her education.
6. Notify any change in name, social security, citizenship status, address, phone number and e-mail address.
7. Understand and comply with the policies regarding to refunds, repayments and satisfactory academic progress.
8. Complete the Exit Counseling for federal student loans programs before departure from college.

**Privacy Notice**
The Financial Aid Office ensures the confidentiality of students’ records. For this reason, confidential information will not be released by email or phone to the student. In addition, no information will be released to any third party, unless legally required to do so, without a written authorization from the student. This includes parents, spouse, siblings or friends.

*For further information on financial aid programs, feel free to contact the Financial Aid Office.*
VI. STUDENT INFORMATION AND SERVICES

STUDENT SERVICES
The Student Services Department offers students the opportunity to seek assistance in various aspects of the university, such as course registration, advisement, career information, and guidance in the personal, vocational, and educational aspects that may hinder the students from attaining a college education. It aims at assisting the student individually in making appropriate educational, vocational and personal choices. Among other new activities undertaken by the Student Services Department is providing or taking the lead in the following endeavors:

a) New Student Orientation
b) Registration of new students
c) Faculty training in:
   1. Use of the MIS in Academic Advisement
   2. Disabilities Act
   3. Specific Learning Problems
   4. Emotional Issues in the Learning Teaching Process
   5. Training students and faculty in the recognition, prevention and intervention in issues related to drug, alcohol, violence, harassment, ADA and contemporary social, cultural, professional and environment affairs.

REGISTRAR’S OFFICE
The Registrar’s Office is primarily concerned with custody of the student’s academic record. Given the office’s mission of providing registration services, there are a number of related services that must be attended to that assure the integrity of the academic records and recording systems. The related services that are performed by this office are: Registration, Readmission, Withdrawal, Mid-term and Final grades, Certification, Transcripts, Academic Calendar, Graduation Evaluation and others.

STUDENT COUNCIL AND STUDENT ORGANIZATIONS AND ACTIVITIES
The Student Council is the representative organization of the students. It aims to express student opinions and promote communication and cooperation among students, faculty, and administrative personnel. Representatives of the Student Council are voting members in various University Wide Standing Committees such as the Academic Council, Library Committee, Student Affairs Committee, Discipline Committee and others.

GUIDANCE AND CAREER EDUCATION
The Academic Office offers students curriculum assistance, career information, and guidance in the personal, vocational, and academic aspects that may impede the student's attaining a college education. Counselors assist students individually in making appropriate educational, vocational, and personal choices. The office coordinates assisted institutional services for special needs students.

Course selection is critical to student success; therefore, students should make an appointment with either their program director or registrar to confirm proper course selection prior to registration.

Previously taken courses and the grades earned will be reviewed and analyzed for proper course placement at Polytechnic University of Puerto Rico - Orlando Campus.

Career education awareness is presented at workshops, seminars, colloquiums and receptions with notables. Student publications may also feature stories on career opportunities.

INTERNSHIP AND MENTOR PROGRAMS
Students may be able to participate in local and national work related experiences pertinent to their course of study. Career awareness and placement activities are incorporated in student life as a pre-step to applying for a summer internship. Internships are optional, but preferred experience for students.

Students are eligible for mentor assistance as another form of a personal career guidance opportunity. Community leaders and business professionals collaborate with students on a one-on-one basis as needed, or present vital information at open forums on campus.

IDENTIFICATION CARDS
An identification card (Campus Card) is issued to students during the registration period. The identification card is needed for students to obtain access to Polytechnic University of Puerto Rico - Orlando Campus’s facilities and services.

ACTIVITIES AND ORGANIZATIONS
There are opportunities for students to reinforce their curricular experience by participating in curricular related activities such as colloquium,
workshops, seminars and one-on-one meetings with notable community leaders.

Campus organizations focus on the adult learner who may be employed and offers a mature level of activity. Events are designed to foster greater career opportunities as well as recognize students for their academic achievement.

**LIBRARY FACILITIES**

The Orlando and Miami Campus Libraries are well-equipped for student use. Both libraries maintain computer-based and hard-bound periodicals for student and faculty use. Both Florida Campus libraries have basic collections that are strengthened and supported by the main library in San Juan, Puerto Rico that consists of over 65,000 volumes classified according to the Library of Congress Classification System. The main Library is specialized in land surveying, engineering, architecture and business administration. At the present time, the Library subscribes to over 2,000 periodicals and publications, both general and technical. Both Libraries are fully automated in services and administrative procedures. As part of its services, the Libraries offer access to a Local Area CD Rom Network, Internet, and other data base services. Also interlibrary loans are used for resources not owned by the Library. The Orlando and Miami Campus Libraries are part of library consortiums for the state of Florida. The administrative and technical procedures are jointly operated by the Main Library and Branch Campus Libraries. To help students develop information skills and become independent users/researchers, the Libraries have a literacy skills program, as well as audiovisual equipment.

**Honor code**

**ACADEMIC AND PROFESSIONAL BEHAVIORAL CODE OF CONDUCT**

**General**

The purpose of this section is to clarify as much as possible what the student and the University should expect of each other in the area of rights, responsibilities, and conduct.

All students enrolled at Polytechnic University of Puerto Rico - Orlando Campus assume an obligation to conduct themselves at all times as responsible members of the campus community and respect the personal and property rights of others and the educational mission of the University. Because those who earn a degree ultimately determine the University's reputation, the University will insist upon its students demonstrating personal and professional integrity in addition to academic excellence. The University's Board of Trustees has delegated full authority to the University administration to prepare and administer policies and procedures for the welfare and discipline of its students.

**Student Rights and Responsibilities**

Polytechnic University of Puerto Rico - Orlando Campus recognizes the rights of students as outlined in the American Association of University professors’ Joint Statement, dated 1967. These rights include the following:

1. Freedom of access to higher education
2. Freedom of classroom expression
3. Confidentiality of records
4. Participation in student affairs
5. Off-campus freedoms
6. Procedural standards in disciplinary proceedings

**Code of Conduct**

The University is dedicated to the advancement of knowledge and learning, as well as to the development of responsible personal and social conduct. Each student, by registering, assumes the responsibility of becoming familiar with and abiding by the general standards of conduct expected by the University. Specifically, each student is expected to refrain from:

1. Academic dishonesty of any kind with respect to examinations or course work. This includes any form of cheating and plagiarism. (see Academic Dishonesty and Plagiarism section).
2. Falsification or alteration of University documents, records, or identification cards.
3. Forgery, issuing bad checks, or not paying financial obligations to the University.
4. Theft and the deliberate damaging or misusing of property belonging to others and the property of the University.
5. The manufacture, possession, use, or distribution of any form of alcoholic beverages or illegal drugs while on University property.
6. Possession, display or use of any dangerous instrument; weapon or explosives (law enforcement officers
required by their employer to carry a firearm are excluded).

7. Disrupting the study of others or of University activities, or interfering with the freedom of movement of any member or guess of the University community.

8. Deliberate interference with academic freedom and freedom of speech and movement of any member or guest of the University community.

9. Participation in any activity which disrupts or interferes with the education of others or the orderly operation of the University.

10. Physical abuse, threatening acts or harassment, toward others.

Expulsion, suspension, or any lesser penalty may be imposed upon any student enrolled who is found to be in violation of these standards of conduct.

Harassment

Polytechnic University of Puerto Rico - Orlando Campus does not tolerate any form of employee or student harassment, either verbal or physical, based on race, color, religion, gender, national origin, age, physical disability, medical condition, or marital status. The University strives to provide a work environment free of sexual harassment. Harassment on the basis of sex is a violation of Section 703 of Title VII of the Civil Rights Act of 1964. It is a policy of the University that sexual harassment of employees or students is regarded as unprofessional and improper conduct.

Sexual harassment is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual or otherwise offensive nature.

Conduct of this nature is improper whether, a) submission to the conduct is either an explicit or implicit term or condition of employment or student status; b) submission to or rejection of the conduct is used as a basis of employment or student standing; c) the conduct has the effect of substantially interfering with an individual's work or academic performance; or d) the conduct or sexually suggestive conduct or language has the effect of causing uncomfortable living or working conditions.

All employees and students of the University are expected to avoid any behavior or conduct toward any other employee or student that could be interpreted as sexual harassment.

Students who believe they have been the victim of sexual or other harassment should immediately report the matter to their advisor or, if necessary, to an administrator or a faculty member.

Any faculty member or administrator who has received a complaint from an employee or student alleging harassment will immediately notify the Campus Director. Similarly any administrator, faculty member or supervisor who becomes aware of a situation involving potential harassment of an employee or student will contact the Campus Director.

All complaints of harassment will be investigated promptly and will be kept confidential to the extent possible. Appropriate disciplinary action will be taken against any employee or student found to have engaged or abetted in harassment.

Alcohol and Drug Abuse

University policy strictly prohibits consumption or use of alcohol and illegal drugs on University property. It is the obligation of all members of the University, as well as students, to uphold the laws of the federal, state and local authorities that regulate the use of drugs and alcohol.

Any violations that cannot be handled through counseling, or which endanger the welfare of the person involved or the community will be reported to law enforcement authorities. Any student or member of the University found guilty of a drug or alcohol felony is subject to dismissal from the University and prosecution consistent with local, state and federal law. Information regarding the prevention of alcohol and drug abuse is posted visibly around the University campus.

Academic Dishonesty and Plagiarism

The University seeks to foster a spirit of honesty and integrity. Any work submitted by a student must represent original work produced by that student. Any source used by a student is to be documented through normal scholarly references and citations, and the extent to which any sources have been used must be apparent to the reader. The University, further, considers resubmission of a work produced for one course in a subsequent course or the submission of work done partially or entirely by another to be academic dishonesty. It is the student's responsibility to seek clarification from the course instructor about how much help may be received in completing an assignment or exam or project or what sources may be used. Students found guilty of academic dishonesty or plagiarism
shall be liable for sanctions up to and including dismissal from the University.

The University requires students to adhere to the writing style prescribed in the Publication Manual of the American Psychological Association, Fourth Edition, 1995. This manual includes clear definitions of plagiarism, paraphrasing and other related matters. All students are urged to acquire and use this manual early in their studies at the University.

The University’s policies call for all written work to be submitted typed and “in standard written English.” If necessary, students may employ an editor to assist with grammar and style, but not content. The editor’s name, address, and telephone number must appear on the document and the student’s unedited work must be attached.

**Dual Relationships with Students**

In the interest of avoiding situations in which students may feel that they (or other students) are receiving special attention or privileges, all University faculty and staff are advised to totally avoid any financial relationships with students (or their employers) as long as there is any potential for the University employee to influence the student’s grades, progress, or success in our programs. Similarly, faculty and staff members are advised to avoid close personal relationships with students. Even if a relationship is “above board,” the appearance of favoritism can be a problem.

**Gifts from Students**

Students (individuals or groups) are asked not to offer gifts to members of the University faculty or staff. If an employee has done an outstanding job or provided exceptional service (and we hope that occurs regularly), a short note of appreciation or a verbal “thanks” is ample reward.

Collection for group gifts for faculty or staff can easily be perceived as coercive if some students in a class do not share the organizers’ enthusiasm or financial means. Gifts can become a dangerous norm and can be seen as leading to preferential treatment.

If a student (or group) offers a gift, employees have been advised to express appreciation and explain that our policies prohibit accepting gifts. General tokens of appreciation such as flowers for the lobby or snacks to be shared by employees and students do not violate the policy or its intent.

**Academic Credentials**

The University maintains a strong commitment to developing practitioners who demonstrate high levels of professionalism. All students are expected to pursue their academic programs with honesty and integrity.

**Evaluation of Instructors by Students**

At the conclusion of in-residence courses and upon the completion of on-line or independent studies, students will be asked to provide candid feedback regarding their perceptions of the quality of the course and the performance of the course instructor. All students are expected to participate in these evaluation sessions as student input is an important contribution to the University’s efforts to improve its programs.

**Evaluation of Student Support Services**

Two times a year, a Student Services Survey is sent to all students to provide evaluative feedback of the following: physical facilities and equipment, classroom environment, registration process, financial aid, student records, library staff and resources, computer access and equipment, textbooks and materials, academic advising, faculty access and interaction, international student concerns, etc. The Survey also gives each student an opportunity to make general comments and suggestions regarding the University.

All students are urged to participate in these evaluation activities, as student input is an important component of the University’s efforts to improve its programs and enhance student services and support.

**Grievance Procedures**

The University provides students with opportunities to request administrative or peer review of actions taken by University faculty or staff that the student perceives to be unfair. Students who believe that they have been treated in a biased fashion, in violation of University policies or without due process may file an appeal with the Campus Director or designee. The student may initiate the grievance process by sending the Campus Director a written account of the actions leading to the grievance and a description of the student’s attempts to resolve it informally (if any).

The Campus Director or a designee will contact the involved parties directly and will attempt to resolve the matter informally. If a satisfactory resolution is not achieved informally, the Campus Director will
convene a committee of faculty members and/or administrators to consider the matter and recommend a resolution. Considering the recommendation of the committee, the Campus Director will again contact the parties involved and inform them of the University’s response to the appeal.
VII. UNDERGRADUATE PROGRAMS

SCHOOL OF MANAGEMENT

The School of Management seeks to provide theoretical and practical knowledge to those students who aim to receive a Bachelor Degree in Business Administration or Science in Organizational Management. The School of Management is guided by the following principles: The business programs contribute to the intellectual and professional formation of students through the development of critical and analytical thinking skills. It fosters the necessary motivation that will enable students to know and relate to the reality of the entrepreneurial world. The Department develops in students the awareness of the social responsibility of management within the economic system of free enterprise. The academic programs encourage the exploration and study of the field of business and management. Students are exposed to the various areas of business to include Accounting, Management, Marketing, Economics, Statistics, and Finance, and their applications in a corporate, service or manufacturing environment.

Mission

The School of Management of Polytechnic University of Puerto Rico - Orlando Campus provides opportunities for individuals from diverse backgrounds to cultivate their potential for leadership, productivity and competitiveness with a sense of social responsibility toward their communities, through the exposure to intellectual, humanistic and technological advancement in business and management.

Career Opportunities

Business Administration and Organizational Management students are highly regarded and sought by service, manufacturing, and production industries. Graduates have been provided the knowledge and skills to meet the needs and demands of an ever-changing society. Through various internships, students are exposed to various career positions in business. Graduates can assume career roles such as Accountants, Information Technology Managers, Sales and Marketing Managers, and a variety of managerial supervisory positions in both profit and non-profit organizations.

Program Educational Objectives

The School of Management academic program objectives are:

- Develop technically educated individuals for employment as business administrators or entrepreneurs in their communities.
- Develop graduates with a well-developed social conscience.
- Develop of competitive graduates for advanced study in the areas of business.

Degrees Offered

Currently, the School of Management offers the following degrees:

- Bachelor of Business Administration (BBA)
  - Management of Information Systems;
  - Marketing,
  - Accounting
  - General Management
  - Construction Management
- Bachelor of Science in Organizational Management (BSOM)

*not all programs are offered at each location, please contact the campus for specific information

PROGRAM ENTRANCE

All students that request admission and are admitted to the business programs must show evidence that they have acquired the academic abilities and skills necessary to progress through the major program of study. Those who do not have these abilities and skills as reflected by the results of their (1) College Entrance Examination Board exam, (2) High School grades, (3) previous college experience, (4) PUPR Math & English Assessment Tests or (5) other evidence, will be required to take additional courses to gain the knowledge. Thus, there may be variations on how to fulfill the Minimum Graduation Requirements stated below. The component of these courses, if required, is in addition to the credits of the Business Administration or Organizational Management degree program. The following is a partial list of preparatory courses offered by the university:

PREPARATORY COURSES

<table>
<thead>
<tr>
<th>Credit</th>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>MATH 0102</td>
<td>Preparatory Mathematics</td>
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</tr>
<tr>
<td>3</td>
<td>ENGL 0100</td>
<td>Preparatory English</td>
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</tr>
<tr>
<td>3</td>
<td>ENGL 0110</td>
<td>English Grammar</td>
<td></td>
</tr>
</tbody>
</table>
Students enrolled in one of the academic programs of the School of Management will need to have successfully prepared for their studies within the school. An articulation agreement or transfer program has been signed with many area community colleges to accept students who have earned an Associate Degree in a related field. In many cases, all or most of the 60 credit hours completed by students in the community colleges count towards the BBA program and will transfer into the School of Management at Polytechnic University of Puerto Rico - Orlando Campus.

**BACHELOR OF BUSINESS ADMINISTRATION PROGRAM**

The student must complete the following minimum requirements to earn the BBA degree:

1. **GENERAL EDUCATION COURSES (30)**

2. **FOUNDATION COURSES (15)**

3. **ELECTIVE COURSES (18)**

4. **CORE COURSES (27)**

**ACCOUNTING DISCLOSURE**

The accounting concentration and courses provided knowledge that may support a student’s efforts toward CPA certification. However, this concentration is not necessarily designed to meet various requirements among individual state guidelines. It is the responsibility of the student to check with regional authorities to confirm requirements in preparation for certification.
### 5. BBA TRACKS

#### a. MANAGEMENT INFORMATION SYSTEMS

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEC 3000</td>
<td>Object Oriented Programming (C/C++) I</td>
<td>3</td>
</tr>
<tr>
<td>CEC 3070</td>
<td>Visual Basic Programming</td>
<td>3</td>
</tr>
<tr>
<td>ISY 3540</td>
<td>Computer and Information Technology</td>
<td>3</td>
</tr>
<tr>
<td>ISY 3550</td>
<td>Data Communications and Networks I</td>
<td>3</td>
</tr>
<tr>
<td>ISY 4510</td>
<td>Systems Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>ISY 4520</td>
<td>Computer Security and Audit</td>
<td>3</td>
</tr>
<tr>
<td>ISY 4530</td>
<td>Local Area Network Systems</td>
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<tr>
<td>MGT 4570</td>
<td>Management Information Systems Practice</td>
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</tr>
<tr>
<td>Electives</td>
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<td></td>
<td><strong>TOTAL</strong></td>
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#### b. MARKETING

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<tbody>
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<td>MARK 3410</td>
<td>Sales &amp; Retail Management</td>
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<tr>
<td>MARK 3430</td>
<td>Product Management</td>
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<td>MARK 3450</td>
<td>Advertising</td>
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<td>MARK 3460</td>
<td>Public Relations</td>
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<tr>
<td>MARK 4410</td>
<td>Marketing Research</td>
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<td>MARK 4470</td>
<td>Marketing Project</td>
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<tr>
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<td>Department Directed Electives</td>
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<tr>
<td>Elective</td>
<td>Department Directed Electives</td>
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<tr>
<td></td>
<td><strong>TOTAL</strong></td>
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#### c. ACCOUNTING

<table>
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<tr>
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<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 3310</td>
<td>Cost Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 3320</td>
<td>Computer Applications in Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 3330</td>
<td>Intermediate Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ACC 3340</td>
<td>Intermediate Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>ACC 3360</td>
<td>Federal Income Taxes</td>
<td>3</td>
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<tr>
<td>ACC 4310</td>
<td>Advanced Accounting</td>
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<tr>
<td>ACC 4320</td>
<td>Auditing</td>
<td>3</td>
</tr>
<tr>
<td>MGT 4670</td>
<td>Management Practices</td>
<td>3</td>
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<tr>
<td>Elective</td>
<td>Department Directed Electives</td>
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<tr>
<td></td>
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<td><strong>32</strong></td>
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#### d. GENERAL MANAGEMENT

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
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</thead>
<tbody>
<tr>
<td>MGT 3610</td>
<td>Human Resources Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 3630</td>
<td>Organizational Development</td>
<td>3</td>
</tr>
<tr>
<td>MGT 4610</td>
<td>Total Quality Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 4670</td>
<td>Management Practices</td>
<td>3</td>
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<tr>
<td>Electives</td>
<td>Department Directed Electives</td>
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<td><strong>TOTAL</strong></td>
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#### f. CONSTRUCTION MANAGEMENT

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
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</thead>
<tbody>
<tr>
<td>MGMT 3210</td>
<td>Construction Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 3220</td>
<td>Construction Contracts and Legal Documents</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 3230</td>
<td>Construction Materials and Methods</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 3240</td>
<td>Construction Costs and Estimates</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 4210</td>
<td>Project Planning and Control (PERT)</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 4270</td>
<td>Construction Management Project</td>
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</tr>
<tr>
<td>Electives</td>
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</table>
**BBA FLOW CHART**

**General Education**
(30 credit hours)
**Business Foundation**
(15 credit hours)
**Foundation Electives**
(6 credit hours)
*MAR 1011 is required for Marketing*
**Electives**
(18 credit hours)
**BBA Core Requirements**
(27 credit hours)
COM 3010 – Database Management
ISY 3510 – Management of Information Systems
MGT 3110 – Managerial Accounting
MGT 3620 – Organizational Behavior
MGT 3640 – Organizational Communications
MGT 3650 – Business Law & Ethics
MGT 4620 – Strategic Management
MGT 4630 – International Business

---

**Academic Tracks**

- **Management Information Sys.** 30 credit hours
- CEC 3000
- CEC 3070/ISY 3540
- ISY 3550
- ISY 4510
- ISY 4520
- ISY 4530
- MGT 4570

- **Marketing** 30 credit hours
- MARK 3410
- MARK 3430
- MARK 3450
- MARK 3460
- MARK 4410
- MARK 4470

- **Accounting** 32 credit hours
- ACC 3310
- ACC 3320
- ACC 3330
- ACC 3340
- ACC 3360
- ACC 4310

- **General Management** 30 credit hours
- MGT 3610
- MGT 3630
- MGT 3640
- MGT 3650
- MGT 4620
- Business Elective

- **Construction Management** 30 credit hours
- MGMT 3210
- MGMT 3220
- MGMT 3230
- MGMT 3240
- MGMT 4210
- MGMT 4270

---

Polytechnic University of PR-Orlando Campus Catalog 2013-2014
# BACHELOR OF SCIENCE IN ORGANIZATIONAL MANAGEMENT PROGRAM

Students must complete the following minimum requirements to earn the BSOM degree:

## GENERAL EDUCATION COURSES – 30 credit hours
12 credit hours in Humanities  
(6 credit hours must include English Composition I and II)
9 credit hours in Social Sciences
9 credit hours in Mathematics/Science  
(3 credit hours must include College Algebra)

## BUSINESS FOUNDATION – 9 credit hours (choice of three)
Accounting, Macroeconomics, Microeconomics, Finance, Marketing, Management

## ELECTIVES – 30 credit hours

## CORE COURSES – 27 credit hours

## ACADEMIC TRACK – 24 credit hours

### 1. GENERAL EDUCATION COURSES (30)

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
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<tr>
<td>ENC 1101</td>
<td>English Composition I</td>
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<tr>
<td>ENC 1102</td>
<td>English Composition II</td>
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<tr>
<td>LIT 2411</td>
<td>Literature and Culture Issues</td>
<td>3</td>
</tr>
<tr>
<td>HUE 1999</td>
<td>Selected Topics in Humanities</td>
<td>3</td>
</tr>
<tr>
<td>PSY 2012</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SYG 2000</td>
<td>Introduction to Sociology</td>
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<tr>
<td>SSE 1999</td>
<td>Selected Topics in Social Science</td>
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<tr>
<td>MAC 1105</td>
<td>College Algebra</td>
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<tr>
<td>PSC 1121</td>
<td>Physical Science</td>
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<td>CGS 1100</td>
<td>Computer Science</td>
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### 2. FOUNDATION COURSES (9)

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<tbody>
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<td>ACC 2001</td>
<td>Principles of Accounting I</td>
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<tr>
<td>FIN 2000</td>
<td>Principles of Finance</td>
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<td>MAR 1011</td>
<td>Principles of Marketing</td>
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### 3. BSOM ELECTIVE COURSES (30)

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### 4. CORE COURSES (27)

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<tbody>
<tr>
<td>MGT 3640</td>
<td>Organizational Communications</td>
<td>3</td>
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<tr>
<td>MGT 3620</td>
<td>Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>MGT 3120</td>
<td>Critical Thinking for Managers</td>
<td>3</td>
</tr>
<tr>
<td>MGT 3220</td>
<td>Leadership in Organizations</td>
<td>3</td>
</tr>
<tr>
<td>MGT 3650</td>
<td>Business Law &amp; Ethics</td>
<td>3</td>
</tr>
<tr>
<td>ISY 3510</td>
<td>Management of Information</td>
<td>3</td>
</tr>
<tr>
<td>MGT 3210</td>
<td>Managing Diversity in the Workplace</td>
<td>3</td>
</tr>
<tr>
<td>MGT 4630</td>
<td>International Business</td>
<td>3</td>
</tr>
<tr>
<td>MGT 4620</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 3610</td>
<td>Management Resources</td>
<td>3</td>
</tr>
<tr>
<td>MGT 4020</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 4030</td>
<td>Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 4130</td>
<td>Managing Change</td>
<td>3</td>
</tr>
<tr>
<td>MGT 4230</td>
<td>Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 4410</td>
<td>Quality Assurance</td>
<td>3</td>
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### 5. ELECTIVES

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<th>CREDIT HOURS</th>
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</thead>
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</tr>
<tr>
<td><strong>TOTAL</strong></td>
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<td><strong>6</strong></td>
</tr>
</tbody>
</table>
BSOM Flow Chart

General Education
(30 credit hours)

Business Foundation
(9 credit hours)

Electives
(30 credit hours)

BSOM Core Requirements
(27 credit hours)
- MGT 3640 – Organizational Communications
- MGT 3120 – Critical Thinking for Managers
- MGT 3620 – Organizational Behavior
- MGT 3220 – Leadership in Organizations
- MGT 3650 – Business Law & Ethics
- ISY 3510 – Management of Information Systems
- MGT 3210 – Managing Diversity in the Workplace
- MGT 4630 – International Business
- MGT 4620 – Strategic Management

BSOM ACADEMIC TRACK
(24 credit hours)
- MGT 3610
- MGT 4020
- MGT 4030
- MGT 4130
- MGT 4230
- MGT 4410
- Business Elective
- Business Elective

Total hours of program: 120 credit hours
SCHOOL OF ENGINEERING

The School of Engineering provides students an opportunity to grow knowledgeable in the theoretical, technical, social, cultural and practical aspects of the profession, and thus be able to enter and excel in the engineering industries. Towards such end, the school’s well-balanced curriculum is both structured and flexible for student learning. The School’s program of studies will prepare students to face situations of considerable complexity, comprehensiveness and social responsibility, at the same time allowing for personal interests to mature in individually chosen fields. The School offer engineering degrees in civil, electrical and computer areas.

Mission

The School of Engineering of Polytechnic University of Puerto Rico - Orlando Campus provides opportunities for individuals from diverse backgrounds to cultivate their potential for leadership, productivity and competitiveness with a sense of social responsibility toward their communities, through the exposure to intellectual, humanistic and technological advancement in engineering and computer science.

Career Opportunities

Engineering students are highly regarded and sought by service, manufacturing, and production industries. Graduates have been provided the knowledge and skills to meet the needs and demands of an ever-changing society. Through various internships, students are exposed to various career positions in engineering. Graduates can assume various career roles such as Computer Programmers and Engineers within specific areas of specialty, and a variety of professional positions in both profit and non-profit organizations.

Program Educational Objectives

The School of Engineering and Computer Science academic program objectives are:

- Develop technically educated individuals for employment as engineers or computer science technologists in their communities.
- Develop graduates with a well-developed social conscience.
- Develop competitive graduates for advanced study in the areas of engineering or computer science.

Degrees Offered

Currently, the School of Engineering offers the following degrees:

- Bachelor of Science in Civil Engineering (BSCE)
- Bachelor of Science in Electrical Engineering (BSEE)
- Bachelor of Science in Computer Engineering (BSCoE)
- Bachelor of Science in Computer Science (BSCS)
- Bachelor of Science in Mechanical Engineering (BSME)

PROGRAM ENTRANCE

All students that request admission and are admitted to the engineering programs must show evidence that they have acquired the academic abilities and skills necessary to progress through the major program of study. Those who do not have these abilities and skills as reflected by the results of their (1) College Entrance Examination Board exam, (2) High School grades, (3) previous college experience, or (4) other evidence, will be required to take additional courses to gain the knowledge. Thus, there may be variations on how to fulfill the Minimum Graduation Requirements stated below. The component of these courses, if required, is in addition to the credits of the Engineering degree program. The following is a partial list of preparatory courses offered by the university:

PREPARATORY COURSES

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>MATH 0102</td>
<td>Preparatory Mathematics</td>
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<tr>
<td>MATHH 0110</td>
<td>Algebra</td>
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<tr>
<td>MATH 1330</td>
<td>Pre-calculus I</td>
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</tr>
<tr>
<td>MATH 1340</td>
<td>Pre-calculus II</td>
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</tr>
<tr>
<td>ENGL 0100</td>
<td>Preparatory English</td>
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<tr>
<td>ENGL 0110</td>
<td>English Grammar</td>
<td>3</td>
</tr>
<tr>
<td>ENC 1003</td>
<td>Advanced English Preparatory</td>
<td>3</td>
</tr>
</tbody>
</table>

Students enrolled in one of the academic programs of the School of Engineering will need to have successfully prepared for their studies within the school. These programs are designed to provide the students with the tools that will empower them to solve high complexity problems in innovative ways,
using state of the art technology. The Bachelor of Science in Civil, Electrical and Computer Engineering are designed to accept students directly from high school or Community College who have earned an Associate Degree in a related field.
Civil engineers are responsible for providing the world's Infrastructure facilities, which are basic to the existence of modern society. These facilities can be large and complex, thus requiring the civil engineers to be broadly trained and able to deal with the latest technologies. The goal of the Civil Engineering Program at the Polytechnic University of PR-Orlando Campus is to develop in the students a professional knowledge of the technology needed to enter into these highly competitive fields, and to prepare the graduates to pursue a productive civil engineering career that is characterized by continued professional growth. The student develops the ability to apply pertinent knowledge to the practice of engineering design in the major discipline areas of civil engineering: Structural Engineering, Geotechnical Engineering, Highway and Transportation Engineering, Water Resources and Environmental Engineering, and Construction Engineering. This engineering design experience is built upon the fundamental concepts of mathematics, basic sciences, engineering sciences, and the humanistic and social sciences. This will provide civil engineers a healthy self-image, a well-rounded knowledge of their role in society, the ability to communicate and to develop their creativity to apply engineering design with originality.

CIVIL ENGINEERING PROGRAM

PROGRAM MISSION:
The mission of the Civil Engineering Program is to prepare and motivate students from diverse backgrounds to achieve excellence through intellectual, humanistic, scientific and technological advancement on their way to becoming practicing professional civil engineers with a sense of social responsibility.

PROGRAM EDUCATIONAL OBJECTIVES:
The graduates of the Civil Engineering Program will be able to:

1. **Engineering Practice**: Incorporate analysis, technical tools and managerial skills to provide practical solutions to civil engineering problems.

2. **Leadership**: Perform as effective leaders and team members, and communicate effectively both written and orally.

3. **Professional Development**: Enhance their professional knowledge through activities such as the pursuing of licensure as a Professional Engineer, participation in professional association and a lifetime of continuing education.

4. **Service**: Provide service to society and the civil engineering industry, demonstrating an unique opportunity to earn the Bachelor of Science in Electrical Engineering in four (4) years, while continuing to work in their current positions. It is also suitable for full-time students that have the desire to devote his/her entire time to pursue this degree. The program may be completed in 4 years by enrolling on about 12 credits per term.

5. **Academic Load**: The minimum full time load per trimester is twelve credit-hours. To register for sixteen (16) credit-hours or above the student must obtain the approval of the Department Head and Dean. Credit-hours will not be awarded for courses in which the student is not properly registered.

DURATION: The program's format offers any professional, in other disciplines the unique opportunity to earn the Bachelor of Science in Electrical Engineering in four (4) years, while continuing to work in their current positions. It is also suitable for full-time students that have the desire to devote his/her entire time to pursue this degree. The program may be completed in 4 years by enrolling on about 12 credits per term.

ACADEMIC SCHEDULE: Registration for all students is held prior to the beginning of each term on designated registration days as stipulated on the Academic Calendar. Completion of registration for each term is required prior to class attendance. The academic year consists of three regular terms, and one summer session. Fall, Winter and Spring classes are scheduled from 6:00 PM to 10:00 PM, Monday through Thursday, and from 8:00 AM to 12:00 PM on Saturdays. Students are required to make up class contact hours lost because of holidays.

CAREER OPPORTUNITIES:
Civil engineers are involved in almost all aspects of public works and utilities infrastructure development. They provide the engineering design of a multistory building, a highway, a bridge, a retaining wall to support soil pressure, a water supply system, a storm sewer, a sanitary sewer system, a dam, among other things. They may analyze the hydrologic conditions of a particular area, the mechanical properties of soils, the transportation needs of a community, or the expected behavior of a structure. They may also
plan, overview and manage the execution of the jobs previously mentioned.

DEGREE OFFERED: The Department of Civil offers undergraduate instruction leading to the degree of Bachelor of Science in Civil Engineering (B.S.C.E.).

MINIMUM GRADUATION
15 Credit-hours in Mathematics
14 Credit-hours in Basic Sciences
21 Credit-hours in Socio-humanistic Studies and Languages
34 Credit-hours in Engineering Sciences
59 Credit-hours in Civil Engineering
6 Credit-hours in Technical Elective Courses
149 Total Credit-hours
(This program may use Dual Courses to complete the curriculum)

1. General Education Courses (50)

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<th>COURSE</th>
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<tr>
<td>ENC 1101</td>
<td>English Composition I</td>
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<td>ENC 1102</td>
<td>English Composition II</td>
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<td>SPC 1026</td>
<td>Speech Communication Fund.</td>
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<td>ETH 2020</td>
<td>Ethics for Engineers</td>
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<td>WOH 2012</td>
<td>World Civilization I</td>
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<tr>
<td>MATH 1350</td>
<td>Calculus I (Differential)</td>
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<tr>
<td>MATH 1360</td>
<td>Calculus II (Integral)</td>
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<tr>
<td>MATH 1370</td>
<td>Calculus III (ts &amp; vectorial)</td>
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<tr>
<td>MATH 2350</td>
<td>Differential Equations</td>
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<tr>
<td>SCIE 1210</td>
<td>Principles of Chemistry</td>
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<tr>
<td>SCIE 1211</td>
<td>Principles of Chemistry Laboratory</td>
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<td>SCIE 1430</td>
<td>Physics I</td>
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<td>SCIE 1431</td>
<td>Physics I Laboratory</td>
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<td>SCIE 1440</td>
<td>Physics II</td>
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<td>SCIE 1441</td>
<td>Physics II laboratory</td>
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<td>ARH 1000</td>
<td>Art Appreciation</td>
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<td>Selected Topics in Humanities</td>
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<td>LIT 2411</td>
<td>Literature and Culture Issues</td>
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<td>MUL 1010</td>
<td>Music Appreciation</td>
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<td>SPN 1120</td>
<td>Elementary Spanish I</td>
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<td>PSY 2012</td>
<td>Introduction to Psychology</td>
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<td>Selected Topics in the Social Sciences</td>
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<td>SYG 2000</td>
<td>Introduction to Sociology</td>
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2. Civil Engineering Foundation (34)

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<td>ENGI 2110</td>
<td>Engineering Mechanics-Statics</td>
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<tr>
<td>ENGI 2120</td>
<td>Mechanics of Materials</td>
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</tr>
<tr>
<td>ENGI 2260</td>
<td>Engineering Economics</td>
<td>3</td>
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<tr>
<td>ENGI 2410</td>
<td>Engineering Mechanics-Dynamics</td>
<td>3</td>
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<td>ENGI 2420</td>
<td>Fluid Mechanics</td>
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<td>ENGI 2421</td>
<td>Fluid Mechanics Laboratory</td>
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<tr>
<td>CEE 1010</td>
<td>Engineering Graphics for Civil</td>
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3. Civil Core Courses (59)

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<td>CEE 2110</td>
<td>Engineering Geology</td>
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<td>CEE 2210</td>
<td>Probability and Statistics for Civil and Environmental</td>
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<tr>
<td>CEE 2310</td>
<td>Algorithms, Programming, and Numerical Analysis</td>
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<td>CEE 2311</td>
<td>Algorithms, Programming, and Numerical Analysis Laboratory</td>
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<td>CEE 3410</td>
<td>Water Resources and Hydraulic Engineering</td>
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<td>SURV 2095</td>
<td>Principles of Surveying</td>
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<table>
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<td>Structural Analysis I</td>
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<tr>
<td>CE 3120</td>
<td>Structural Analysis II</td>
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<tr>
<td>CE 3121</td>
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<tr>
<td>CE 3130</td>
<td>Steel Structures Design</td>
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</tr>
<tr>
<td>CE 3210</td>
<td>Geotechnical Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>CE 3211</td>
<td>Geotechnical Engineering</td>
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<tr>
<td>CE 3220</td>
<td>Geotechnical Engineering II</td>
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<tr>
<td>CE 3221</td>
<td>Geomechanics Laboratory</td>
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<tr>
<td>CE 3310</td>
<td>Route Location and Geometric Design</td>
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<tr>
<td>CE 3320</td>
<td>Highway Engineering</td>
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<tr>
<td>CE 3330</td>
<td>Transportation Engineering and Urban Planning</td>
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</tr>
<tr>
<td>CE 3331</td>
<td>Highway and Transportation Engineering Laboratory</td>
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<tr>
<td>CE 3420</td>
<td>Water Supply Engineering</td>
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<tr>
<td>CE 3520</td>
<td>Construction Project Management</td>
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<tr>
<td>CE 4140</td>
<td>Concrete Structures Design</td>
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<tr>
<td>CE 4150</td>
<td>Foundation Engineering</td>
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<tr>
<td>CE 4430</td>
<td>Wastewater Engineering</td>
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<td>CE 4440</td>
<td>Environmental Engineering for Civil Engineers</td>
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<tr>
<td>CE 4441</td>
<td>Environmental Engineering Laboratory</td>
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<tr>
<td>CE 4530</td>
<td>Construction Methods and Productivity Improvement</td>
<td>3</td>
</tr>
<tr>
<td>CE 4911</td>
<td>Civil Engineering Senior Design Project I</td>
<td>3</td>
</tr>
<tr>
<td>CE 4920</td>
<td>Civil Engineering Senior Design Project II</td>
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Electives
Any Civil Engineering Elective course

TOTAL: 149
<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
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<tbody>
<tr>
<td>CE 5004</td>
<td>Advanced AutoCAD for Civil Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 5010</td>
<td>Civil Engineering Practice</td>
<td>3</td>
</tr>
<tr>
<td>CE 5108</td>
<td>Prestressed Concrete Structures Design</td>
<td>3</td>
</tr>
<tr>
<td>CE 5116</td>
<td>Design of Wood Structures</td>
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</tr>
<tr>
<td>CE 5208</td>
<td>Soil Improvement</td>
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</tr>
<tr>
<td>CE 5308</td>
<td><em>Urban Transportation Planning</em></td>
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</tr>
<tr>
<td>CE 5220</td>
<td>Pavement Design</td>
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</tr>
<tr>
<td>CE 5406</td>
<td>Open Channel Engineering</td>
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<tr>
<td>CE 5412</td>
<td>Applied Surface Water</td>
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<td></td>
<td>Hydrology</td>
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<tr>
<td>CE 5510</td>
<td>Construction Planning, Scheduling, and Cost</td>
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<td></td>
<td>Estimates</td>
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<tr>
<td>CE 5522</td>
<td>Construction Documents for Civil Engineering</td>
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<tr>
<td>CEE 5020</td>
<td>Environmental Laws and Regulations</td>
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<tr>
<td>CEE 5030</td>
<td>Advanced Hydraulics</td>
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<td><strong>TOTAL:</strong></td>
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<td><strong>149</strong></td>
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ELECTRICAL, COMPUTER ENGINEERING & COMPUTER SCIENCE (ECECS) DEPARTMENT

Our society is increasingly dependent on the generation and distribution of energy in the form of electricity, and continues to develop at an accelerated pace electronic communication devices and computers designed to capture, create, process, transform, and distribute information. Electrical Engineering is one of the disciplines supporting the development and operation of this key infrastructure. It has evolved from the study of fundamental electrical principles to encompass sophisticated communication, and computation techniques, thus helping spawn new disciplines in Computer Engineering and Computer Science. The ECECS Department offers students an opportunity to meet their learning goals and to be key contributors in our information society by pursuing any one of three different Bachelor of Science degrees.

These are:

- Electrical Engineering
- Computer Engineering
- Computer Science

Students with interests in electricity and computer hardware and software will find a wide variety of subjects shared among these three programs. In addition, the department also offers Master’s degree programs in Electrical Engineering, Computer Engineering and Computer Science, which are described in the graduate catalog.

ELECTRICAL ENGINEERING PROGRAM

The Electrical Engineering Program offers Power and Electronics as areas of interest, including Communications and Controls under Electronics. It is a five-year program designed to develop the required knowledge and skills to face the dynamic technological environment of today’s society. Theoretical and practical experiences are combined throughout the program, using an adequate combination of socio-humanistic studies, mathematics, basic sciences, engineering science, and engineering design experience. The design experience in the Electrical Engineering curriculum begins at the second year with a basic introductory course to engineering design. This first design experience is focused towards the development of the student’s creativity, establishment of objectives, construction and testing of a problem’s solution. At this stage the students have little knowledge of the basic mathematics, basic sciences and engineering sciences. Some of the third year courses such as Dynamics, and Electronics I, have design content. Fourth year courses that contain design are Logic Circuits, Electronics II, Electronics Laboratory, and Automatic Controls. During the fourth year students are free to select 3 credit hours from the department elective courses in their areas of interest and 6 credit hours identified as a technical elective from the EE department. In their selection students are required to include courses that contain enough design experience so as to complete approximately 8 credit hours. In their fifth year students must approve the Capstone Design I and Capstone Design II courses, which are meant to be a final comprehensive design experience.

Real life engineering problems from the industry and society are defined and solved, integrating into the process the fundamental elements of modern design theory and methodology, creativity, formulation of design problem statements and specifications, consideration of alternative solutions, open-ended problems, feasibility considerations, concurrent engineering, and detailed system description. The students set educational objectives in view of the main areas of Electrical Engineering subjects:

- Electronics, Controls and Communications Engineering- This area of interest prepares students for analog electronics, digital electronics, process control systems, and communications.
- Electric Power Engineering- This area of interest prepares students for planning and design of generation, transmission, distribution, and end user electrical system.

PROGRAM MISSION:

“To produce graduates with a broad background in computers, mathematics, science, and electrical engineering capable of performing successfully as electrical engineers and pursuing graduate studies.”

PROGRAMS EDUCATIONAL OBJECTIVES:

The educational objectives are:

1. **Engineering Practice**: Apply their technical knowledge to develop professionally and ethically in the chosen area of interest:
communications, controls, electronics or electric power.

2. **Leadership:** Engage appropriately as leaders and in a teamwork environment, and communicate effectively both written and orally.

3. **Professional Development:** Enhance their professional knowledge through activities such as the pursuing of licensure as a Professional Engineer, participation in professional association and a lifetime of continuing education.

4. **Service:** Contribute to society and the electrical engineering industry with an understanding of the contemporary issues in today’s global and societal context.

**ACADEMIC LOAD:** The minimum full time load per trimester is twelve credit-hours. To register for sixteen (16) credit-hours or above the student must obtain the approval of the Department Head and Dean. Credit-hours will not be awarded for courses in which the student is not properly registered.

**DURATION:** The program's format offers any professional, in other disciplines the unique opportunity to earn the Bachelor of Science in Electrical Engineering in four (4) years, while continuing to work in their current positions. It is also suitable for full-time students that have the desire to devote his/her entire time to pursue this degree. The program may be completed in 4 years by enrolling on about 12 credits per term.

**ACADEMIC SCHEDULE:** Registration for all students is held prior to the beginning of each term on designated registration days as stipulated on the Academic Calendar. Completion of registration for each term is required prior to class attendance. The academic year consists of three regular terms, and one summer session. Fall, Winter and Spring classes are scheduled from 6:00 PM to 10:00 PM, Monday through Thursday, and from 8:00 AM to 12:00 PM on Saturdays. Students are required to make up class contact hours lost because of holidays.

**CAREER OPPORTUNITIES:**

Electric Power, Electronics, Controls, Communications, and other related technologies remain as continuous sources of employment for Electrical Engineering graduates in USA. Polytechnic University of Puerto Rico Traditional electricity industry as well as modern high technology industry, maintain a high level of activity even in adverse economic environments. The growing application of electricity, related analytical and processing methods, and computers, to all possible fields of human development assure our well-equipped graduates the availability of good jobs in the foreseeable future.

a. Electrical Engineering Student Chapter of the Board of Engineers and Land Surveyors of Puerto Rico.

b. IEEE Student Branch- This is an organization for registered undergraduates currently enrolled in electrical

**MINIMUM GRADUATION**

15 Credit-hours in Mathematics
14 Credit-hours in Basic Sciences
21 Credit-hours in Socio-humanistic Studies and Languages
20 Credit-hours in Engineering Sciences
34 Credit-hours in Electrical Engineering
3 Credit-hours in Free Elective Courses

a. Communication & Control Track
   37 Credit-hours
   **144 Total Credit Hours**

b. Power Track
   37 Credit-hours
   **144 Total Credit-hours**

The student must complete the following minimum requirements to earn the Bachelor of Science in Electrical Engineering degree:

1. **General Education Courses (50)**

   **| COURSE NUMBER | COURSE TITLE | CREDIT HOURS |
   --|----------------|--------------|--------------|
   ENC 1101 | English Composition I | 3 |
   ENC 1102 | English Composition II | 3 |
   SPC 1026 | Speech Communication Fund. | 3 |
   ETH 2020 | Ethics for Engineers | 3 |
   WOH 2012 | World Civilization I | 3 |
   MATH 1350 | Calculus I (Differential) | 4 |
   MATH 1360 | Calculus II (Integral) | 4 |
   MATH 1370 | Calculus III (Ts & vectorial) | 4 |
   MATH 2350 | Differential Equations | 3 |
   SCIE 1210 | Principles of Chemistry | 4 |
   SCIE 1211 | Principles of Chemistry Laboratory | 0 |
   SCIE 1430 | Physics I | 4 |
   SCIE 1431 | Physics I Laboratory | 1 |
   SCIE 1440 | Physics II | 4 |
   SCIE 1441 | Physics II laboratory | 1 |

   **Choose 1 of the following**
   ARH 1000 | Art Appreciation | 3 |
   HUE 1999 | Selected Topics in Humanities | 3 |
   HUM 1020 | Humanities | 3 |
   LIT 2411 | Literature and Culture Issues | 3 |
   MUL 1010 | Music Appreciation | 3 |
   SPN 1120 | Elementary Spanish I | 3 |

   **Choose 1 of the following**
   PSY 2012 | Introduction to Psychology | 3 |
   SSE 1999 | Selected Topics in the Social Sciences | 3 |

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### 2. EE Foundation (20)

<table>
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<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>CECS 2200</td>
<td>Computer Programming</td>
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<tr>
<td>CECS 2202</td>
<td>Computer Programming I</td>
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<tr>
<td>CECS 2203</td>
<td>Computer Programming I lab</td>
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<tr>
<td>EE 1130</td>
<td>Freshman Design w. Computer Graphics</td>
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<tr>
<td>ENGI 2260</td>
<td>Engineering economics</td>
<td>3</td>
</tr>
<tr>
<td>ENGI 2270</td>
<td>Eng. Probability &amp; Statistics</td>
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</tr>
<tr>
<td>ENGI 3440</td>
<td>Thermo fluids</td>
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### 3. EE Core Courses (34)

<table>
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<tr>
<td>COE 2300</td>
<td>Logic Circuits</td>
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<td>Logic Circuits Lab.</td>
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<tr>
<td>EE 2000</td>
<td>Circuit Analysis I</td>
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<tr>
<td>EE 2001</td>
<td>Electrical Measurements Lab.</td>
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<tr>
<td>EE 2010</td>
<td>Computational Methods in Engineering</td>
<td>3</td>
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<tr>
<td>EE 2020</td>
<td>Circuit Analysis II</td>
<td>3</td>
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<tr>
<td>EE 2030</td>
<td>Electromagnetic Theory</td>
<td>3</td>
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<tr>
<td>EE 2400</td>
<td>Electromechanical Energy Conversion I</td>
<td>3</td>
</tr>
<tr>
<td>EE 2401</td>
<td>Electromechanical Energy Conversion I Lab</td>
<td>1</td>
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<tr>
<td>EE 2500</td>
<td>Electronics I</td>
<td>3</td>
</tr>
<tr>
<td>EE 3002</td>
<td>Signals &amp; Systems</td>
<td>3</td>
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<tr>
<td>EE 3520</td>
<td>Electronics II</td>
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<tr>
<td>EE 3521</td>
<td>Electronics Lab.</td>
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<tr>
<td>EE 3600</td>
<td>Automatic Controls</td>
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### 4. Free Elective (3)

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<tr>
<td>Free Elective</td>
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### 5. Tracks

#### a. Communication and Control (37)

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<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>COE 3320</td>
<td>Microprocessors</td>
<td>3</td>
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<td>COE 3321</td>
<td>Microprocessors Lab.</td>
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<tr>
<td>EE 3700</td>
<td>Communication &amp; Wireless Systems I</td>
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<tr>
<td>EE 4002</td>
<td>Capstone Design I</td>
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<tr>
<td>EE 4022</td>
<td>Capstone Design II</td>
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</tr>
<tr>
<td>COE 4340</td>
<td>Microcomputer Interfacing</td>
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<td>COE 4341</td>
<td>Microcomputer Interfacing Lab</td>
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<tr>
<td>EE 3220</td>
<td>Software Applications for Electrical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EE 3610</td>
<td>Automation Engineering</td>
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#### b. Power Academic (37)

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<tr>
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<td>Electromechanical Energy Conversion II</td>
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<td>Electromechanical Energy Conversion II Lab</td>
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<tr>
<td>EE 3420</td>
<td>Power System Analysis I</td>
<td>3</td>
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<tr>
<td>EE 3440</td>
<td>Electric System design I</td>
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<tr>
<td>EE 3610</td>
<td>Automation Engineering</td>
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<td>EE 3611</td>
<td>Automation Engineering Lab</td>
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<td>EE 4400</td>
<td>Power System Analysis II</td>
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<td>EE 4401</td>
<td>Power System Analysis Lab.</td>
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<td>EE 4430</td>
<td>Power System Protection</td>
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<td>Power System Protection Lab.</td>
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<td>EE 4436</td>
<td>Distribution System Design</td>
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<td>EE 4022</td>
<td>Capstone Design I</td>
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<td>EE 4022</td>
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<tr>
<td>Tech Elect.</td>
<td>EE Electric Technical Elective</td>
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**TOTAL:** 144
COMPUTER ENGINEERING PROGRAM

Computer Engineering is a rapidly changing field that covers a wide range of topics concerned with the design, implementation and programming of computers and digital systems. Computer engineers develop integrated hardware and software systems and apply these to the creative solution of problems in government and business. These solutions are key enablers to our economic development, and social welfare. A sample of the range of solutions created by Computer Engineers include: industrial and military control systems, database management systems, health care information systems, networked systems, end-user embedded computer controlled products, and computer-aided design tools to automate and leverage human performance in many other disciplines. The Bachelor of Science in Computer Engineering provides both breadth and depth in the discipline by incorporating physical and mathematical sciences, core engineering subjects, fundamental computer science topics, and a wide set of specialized courses in areas of long range relevance to computer engineering. It has been designed as a flexible program that is able to accommodate particular student’s interests through electives.

Topics covered includes: algorithms and languages, digital system design, networks and communications, computer organization and architecture, microprocessor-based systems, database systems, software engineering, operating systems, capstone design courses, and entrepreneurship, among many.

PROGRAM MISSION:

“To educate graduates with broad background in mathematics, science, software, and hardware capable of performing successfully as computer engineers and/or pursuing graduates studies.”

PROGRAM EDUCATIONAL OBJECTIVES:

The long-term educational objectives for the Computer Engineering graduates are:

1. Engineering Practice: Apply the technical and decision-making skills to provide solutions to the technological challenges of the Computer Engineering industry
2. Leadership: Fulfill their responsibilities as leaders and team members, and communicate effectively both written and orally.
3. Professional Development: Enhance their professional knowledge through activities such as the pursuing of licensure as a Professional Engineer, participation in professional association and a lifetime of continuing education.
4. Service: Contribute to society and the electrical engineering industry with an understanding of the contemporary issues in today’s global and societal context.

CAREER OPPORTUNITIES:

The demand for Computer Engineers continues to expand parallel to the computer and informatics revolution that has characterized the last part of the twentieth century. This trend is expected to continue well into the twenty-first century as computers continue to impact the way we evolve all disciplines, do business, research and even the way we entertain ourselves. Job opportunities exist within all kinds of businesses given their need and reliance on a computational infrastructure, as well as in organizations devoted to research and development of computer technologies.

ACADEMIC LOAD: The minimum full time load per trimester is twelve credit-hours. To register for sixteen (16) credit-hours or above the student must obtain the approval of the Department Head and Dean. Credits will not be awarded for courses in which the student is not properly registered.

DURATION: The program’s curriculum format offers the professional the unique opportunity to earn the Bachelor of Science in Computer Engineering in four (4) years, while continuing to work in their current positions. It is also suitable for full-time students that have the desire to devote his/her entire time to pursue this degree. The program may be completed in 4 years by enrolling on about 13 credits per trimester.

ACADEMIC SCHEDULE: Registration for all students is held prior to the beginning of each term on designated registration days as stipulated on the Academic Calendar. Completion of registration for each term is required prior to class attendance. The academic year consists of three regular terms, and one summer session. Fall, winter and spring classes are scheduled from 6:00 PM to 10:00 PM, Monday through Thursday, and from 8:00 AM to 12:00 PM on Saturdays. Students are required to make up class contact hours lost because of holidays.

PREPARATORY STUDIES: All students that request admission and are admitted to the Computer Engineering program must show evidence that they have acquired the academic
abilities and skills necessary to progress through this major. Those not demonstrating the complete acquisition of these abilities will be required to take preparatory courses. Abilities and skills are demonstrated through the results of the College Entrance Examination Board Test, results in PUPR’s placement test, previous university experience, other tests, or criteria. The courses are designed to help students overcome deficiencies in languages, mathematics, and science. These preparatory courses are in addition to the 149 credits of the Computer Engineering Program. The courses are awarded their corresponding credits according to contact hours. The courses are the following:

MINIMUM GRADUATION
15 Credit-hours in Mathematics
14 Credit-hours in Basic Sciences
21 Credit-hours in Socio-humanistic Studies and Languages
43 Credit-hours in Engineering Sciences
47 Credit-hours in Computer Engineering
6 Credit-hours Technical electives
3 Credit-hours Free Electives
149 Total Credit Hours

The student must complete the following minimum requirements to earn the Bachelor of Science in Computer Engineering degree:

1. General Education Courses (50)

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
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<tr>
<td>ENC 1101</td>
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<td>ENC 1102</td>
<td>English Composition II</td>
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<td>SPC 1026</td>
<td>Speech Communication Fund.</td>
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<td>ETH 2020</td>
<td>Ethics for Engineers</td>
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<td>WOH 2012</td>
<td>World Civilization I</td>
<td>3</td>
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<tr>
<td>MATH 1350</td>
<td>Calculus I (Differential)</td>
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</tr>
<tr>
<td>MATH 1360</td>
<td>Calculus II (Integral)</td>
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<tr>
<td>MATH 1370</td>
<td>Calculus III (ts &amp; vectorial)</td>
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<td>MATH 2350</td>
<td>Differential Equations</td>
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<tr>
<td>SCIE 1210</td>
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<td>SCIE 1211</td>
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<td>SCIE 1430</td>
<td>Physics I</td>
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Choose 1 of the following:
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<td>ARH 1000</td>
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<td>HUE 1999</td>
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<td>HUM 1020</td>
<td>Humanities</td>
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<td>LIT 2411</td>
<td>Literature and Culture Issues</td>
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<td>MUL 1010</td>
<td>Music Appreciation</td>
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<td>SPN 1120</td>
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Choose 1 of the following:
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<tr>
<td>PSY 2012</td>
<td>Introduction to Psychology</td>
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<tr>
<td>SSE 1999</td>
<td>Selected Topics in the Social Sciences</td>
<td>3</td>
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<tr>
<td>SYG 2000</td>
<td>Introduction to Sociology</td>
<td>3</td>
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</table>

2. Computer Engineering Foundation (43)

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
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<tbody>
<tr>
<td>EE 1130</td>
<td>Freshman Design with Comp. Graph.</td>
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<tr>
<td>EE 2000</td>
<td>Circuit Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>EE 2001</td>
<td>Electrical Measurements Lab</td>
<td>1</td>
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<tr>
<td>EE 2010</td>
<td>Computational Methods in Electrical &amp; Comp. Eng.</td>
<td>3</td>
</tr>
<tr>
<td>EE 2500</td>
<td>Electronics I</td>
<td>3</td>
</tr>
<tr>
<td>EE 2020</td>
<td>Circuit Analysis II</td>
<td>3</td>
</tr>
<tr>
<td>EE 3002</td>
<td>Signals and Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE 4720</td>
<td>Digital Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>ENGI 2260</td>
<td>Engineering Economics</td>
<td>3</td>
</tr>
<tr>
<td>ENGI 2270</td>
<td>Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ENGI 2910</td>
<td>Engineering Mechanics, Stat. &amp; Dyn.</td>
<td>3</td>
</tr>
<tr>
<td>CECS 2200</td>
<td>Computer Programming Fundamentals</td>
<td>1</td>
</tr>
<tr>
<td>CECS 2204</td>
<td>Discrete Structures</td>
<td>3</td>
</tr>
<tr>
<td>CECS 2202</td>
<td>Computer Programming I</td>
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</tr>
<tr>
<td>CECS 2203</td>
<td>Computer Programming I Lab</td>
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<tr>
<td>CECS 2222</td>
<td>Computer Programming II</td>
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<tr>
<td>CECS 2223</td>
<td>Computer Programming II Lab</td>
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3. Computer Engineering Core Courses (47)

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>COE 2300</td>
<td>Logic Circuits</td>
<td>3</td>
</tr>
<tr>
<td>COE 2301</td>
<td>Logic Circuits Lab</td>
<td>1</td>
</tr>
<tr>
<td>COE 3320</td>
<td>Microprocessors</td>
<td>3</td>
</tr>
<tr>
<td>COE 3321</td>
<td>Microprocessors Lab.</td>
<td>1</td>
</tr>
<tr>
<td>COE 3302</td>
<td>Digital Systems Design with VHDL</td>
<td>3</td>
</tr>
<tr>
<td>COE 4320</td>
<td>Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>COE 4321</td>
<td>Computer Architecture Lab.</td>
<td>1</td>
</tr>
<tr>
<td>COE 4330</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>COE 4331</td>
<td>Computer Networks Lab.</td>
<td>1</td>
</tr>
<tr>
<td>COE 4340</td>
<td>Microcomputer Interfacing</td>
<td>3</td>
</tr>
<tr>
<td>COE 4341</td>
<td>Lab.</td>
<td>1</td>
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<tr>
<td>CECS 3210</td>
<td>Advanced Programming</td>
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<tr>
<td>CECS 3212</td>
<td>Data Structures</td>
<td>3</td>
</tr>
<tr>
<td>CECS 3302</td>
<td>Data Communications</td>
<td>3</td>
</tr>
<tr>
<td>CECS 4202</td>
<td>Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>CECS 4204</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CECS 4230</td>
<td>Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>COE 4002</td>
<td>Capstone I</td>
<td>3</td>
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<tr>
<td>COE 4022</td>
<td>Capstone II</td>
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4. Technical Elective (6)

<table>
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<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
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<tbody>
<tr>
<td>Tech Elective</td>
<td>EE Technical Electives</td>
<td>6</td>
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</table>

5. Free Elective (3)

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Elective</td>
<td>FREE ELECTIVE</td>
<td>3</td>
</tr>
</tbody>
</table>

TOTAL: 149
Today the field of computer science is one of the most popular academic disciplines in universities across the nation. Computer Scientists build computer-aided design tools, manage information technology enterprises, build business information systems (including banking and automotive systems), build healthcare information systems, design and support networks such as wide area networks and cellular telephony, and design end-user embedded computer-controlled products and systems such as smart cards and vision recognition systems. The computer science program is a flexible program that can be tailored to the student's interests and accommodate to the rapid changes in the industry. The computer science curriculum was designed to satisfy the following:

- University general education requirements
- A common core of computer science courses to ensure a good level of understanding of computer science.
- A breadth requirement to provide the students with a broad knowledge of the computer science field.
- A depth requirement to ensure that the students have at least a minimum level of competence in a concentration area
- A senior project experience under the supervision of a faculty member
- Elective courses to permit further breadth/depth customization of the student program
- ABET accreditation requirements

**PROGRAM MISSION:**

"To produce graduates with a broad background in computers, mathematics, science, ethical and legal aspects of computing, programming languages, design and analysis of algorithms, database systems and software engineering, capable of performing successfully as computer scientists and pursuing graduate studies."

**CAREER OPPORTUNITIES:**

The Bachelor's Degree in Computer Science is one of the most popular programs in today's high-tech, computer oriented academic curriculums. It is ideal for undergraduates that want to obtain professional knowledge and skills that will eventually lead to a career in computer programming or a related field. The Bachelor's Degree in Computer Science (CS) will prepare the student with skills that are already of great demand in today's fast paced, highly competitive work areas. Related positions are well paid because companies are in need of resources that know how to develop and/or maintain software and hardware components and computer systems. This program is an excellent choice for students who want to continue careers in application development, software engineering, appropriate analysis and design methods, and the development of hardware and software components.

**DEGREE OFFERED:** PUPR offers a Bachelor of Sciences in Computer Science (BSCS) degree. In order to earn the BSCS degree, the student must complete the following requirements:

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSC 1005</td>
<td>Introduction to Biology</td>
<td>3</td>
</tr>
<tr>
<td>CHM 1025</td>
<td>Introduction to Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>ENC 1101</td>
<td>English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENC 1102</td>
<td>English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>MAC 1105</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MAC 1147</td>
<td>Pre-Calculus</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1350</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1360</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>SCIE 1430</td>
<td>Physics I</td>
<td>4</td>
</tr>
<tr>
<td>SPC 1026</td>
<td>Fundamentals of Speech</td>
<td>3</td>
</tr>
<tr>
<td>WOH 2012</td>
<td>World Civilization I</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose 1 of the following:

- ARH 1000 Art Appreciation
- HUM 1020 Humanities
- LIT 2411 Literature and Culture Issues
- MUL 1010 Music Appreciation
- SPN 1120 Elementary Spanish I

Choose 2 of the following:

- PSC 1121 Physical Science
- MSE 1999 Selected Topics in Mathematics or Sciences
- PSY 2012 Introduction to Psychology
- SSE 1999 Selected Topics in the Social Sciences
- SYG 2000 Introduction to Sociology

**1. General Education (48)**

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGS 1100</td>
<td>Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CGS 2405</td>
<td>Intermediate Programming in C</td>
<td>3</td>
</tr>
<tr>
<td>CEC 3000</td>
<td>Object Oriented Programming I</td>
<td>3</td>
</tr>
<tr>
<td>CEC 3070</td>
<td>Visual Basic Programming</td>
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<tr>
<td>CEC 3300</td>
<td>Object Oriented Programming II</td>
<td>3</td>
</tr>
<tr>
<td>ETH 3020</td>
<td>Contemporary Social</td>
<td>3</td>
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</tbody>
</table>

Polytechnic University of PR-Orlando Campus Catalog 2013-2014
Problems in Computers &
Technology
ETH 3050  Ethical/Legal Aspects of
Computers & Technology  3
ENGI 2270  Probability & Statistics  3

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
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<tbody>
<tr>
<td>CEC 3650</td>
<td>Data Structures</td>
<td>3</td>
</tr>
<tr>
<td>CEC 4000</td>
<td>Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>CEC 4050</td>
<td>Data Communications</td>
<td>3</td>
</tr>
<tr>
<td>CEC 4100</td>
<td>Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>CEC 4120</td>
<td>Assembly Programming Language</td>
<td>3</td>
</tr>
<tr>
<td>CEC 4650</td>
<td>Software Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>CEC 4710</td>
<td>Computer Science Senior Project</td>
<td>3</td>
</tr>
<tr>
<td>CEC 4750</td>
<td>Design and Analysis of Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>CEC 4800</td>
<td>E-Commerce Technology</td>
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<tr>
<td>MAT 3400</td>
<td>Discrete Mathematics</td>
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Core Courses (27)

Tech Elective

<table>
<thead>
<tr>
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<tbody>
<tr>
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Free ELECTIVES 1(8)

<table>
<thead>
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<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Any General Elective</td>
<td>18</td>
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</table>

TOTAL: 123
MECHANICAL ENGINEERING DEPARTMENT

Mechanical Engineering embraces the generation, conversion, transmission, and operation of mechanical and thermal devices and systems. The program is suited for students with a keen interest in science and mathematics. The curriculum in Mechanical Engineering covers the fundamental aspects of the field, stresses on basic principles and educates students in the use of these principles to solve engineering problems. In the freshman and sophomore years, emphasis is on humanities, mathematics, physics, and computer aided drafting and design with an introduction to design, numerical control manufacturing, and automation. The junior and senior years are devoted to solid mechanics, applied mechanics, materials, thermodynamics, heat transfer, fluid mechanics, dynamic systems and controls, thermal and mechanical design, manufacturing, finite element analysis, computer aided engineering, and the application of the fundamentals to the solution of the vast variety of problems encountered in mechanical engineering.

MECHANICAL ENGINEERING PROGRAM

PROGRAM MISSION:
The Mechanical Engineering program at Polytechnic University of Puerto Rico is designed to develop graduates from different backgrounds who can deal with situations that involve technological and humanistic/societal issues and to cultivate their potential for leadership. The program emphasizes on developing the ability and competency of our students in utilizing scientific and engineering methods for devising useful products to satisfy the community in an economical way, while considering the impacts on society.

ACADEMIC LOAD: The minimum full time load per trimester is twelve credit-hours. To register for sixteen (16) credit-hours or above the student must obtain the approval of the Department Head and Dean. Credit-hours will not be awarded for courses in which the student is not properly registered.

DURATION: The program’s format offers any professional, in other disciplines the unique opportunity to earn the Bachelor of Science in Electrical Engineering in four (4) years, while continuing to work in their current positions. It is also suitable for full-time students that have the desire to devote his/her entire time to pursue this degree. The program may be completed in 4 years by enrolling on about 12 credits per term.

ACADEMIC SCHEDULE: Registration for all students is held prior to the beginning of each term on designated registration days as stipulated on the Academic Calendar. Completion of registration for each term is required prior to class attendance. The academic year consists of three regular terms, and one summer session. Fall, Winter and Spring classes are scheduled from 6:00 PM to 10:00 PM, Monday through Thursday, and from 8:00 AM to 12:00 PM on Saturdays. Students are required to make up class contact hours lost because of holidays.

CAREER OPPORTUNITIES:
Mechanical Engineers have many professional options due to the breadth of their preparation. Mechanical engineers can pursue their careers with local, state, and federal agencies, as well as with private enterprise, or even organize their own businesses and/or pursue graduate studies. Graduates from this program have found successful careers in a variety of industries such as aerospace, pharmaceuticals, electric utilities, electronics, medical devices, air conditioning, food industry, mechanical services among others.

DEGREE OFFERED:
The Mechanical Engineering program offers undergraduate instruction leading to the degree of Bachelor of Science in Mechanical Engineering (B.S.M.E.).

MINIMUM GRADUATION
15 Credit-hours in Mathematics
14 Credit-hours in Basic Sciences
21 Credit-hours in Socio-humanistic Studies and Languages
39 Credit-hours in Engineering Sciences
46 Credit-hours in Mechanical Engineering
9 Credit-hours Technical electives
3 Credit-hours Business
147 Total Credit Hours

1. General Education Courses (50)

<table>
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<th>COURSE TITLE</th>
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<td>ENC 1102</td>
<td>English Composition II</td>
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<tr>
<td>SPC 1026</td>
<td>Speech Communication Fund.</td>
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<tr>
<td>ETH 2020</td>
<td>Ethics for Engineers</td>
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<tr>
<td>WOH 2012</td>
<td>World Civilization I</td>
<td>3</td>
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<tr>
<td>MATH 1350</td>
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<tr>
<td>COURSE NUMBER</td>
<td>COURSE TITLE</td>
<td>CREDIT HOURS</td>
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<tr>
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<td>-----------------------------------</td>
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</tr>
<tr>
<td>MATH 1360</td>
<td>Calculus II (Integral)</td>
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<tr>
<td>MATH 1370</td>
<td>Calculus III (ts &amp; vectorial)</td>
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<tr>
<td>MATH 2350</td>
<td>Differential Equations</td>
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<tr>
<td>SCIE 1210</td>
<td>Principles of Chemistry</td>
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<td>SCIE 1211</td>
<td>Principles of Chemistry Laboratory</td>
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<td>SCIE 1430</td>
<td>Physics I</td>
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<tr>
<td>SCIE 1431</td>
<td>Physics I Laboratory</td>
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<td>SCIE 1440</td>
<td>Physics II</td>
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<tr>
<td>SCIE 1441</td>
<td>Physics II laboratory</td>
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<tr>
<td>ARH 1000</td>
<td>Art Appreciation</td>
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<tr>
<td>HUE 1999</td>
<td>Selected Topics in Humanities</td>
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<tr>
<td>HUM 1020</td>
<td>Humanities</td>
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<tr>
<td>LIT 2411</td>
<td>Literature and Culture Issues</td>
<td>3</td>
</tr>
<tr>
<td>MUL 1120</td>
<td>Elementary Spanish I</td>
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<td>PSY 2012</td>
<td>Introduction to Psychology</td>
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<tr>
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<tr>
<td>SYG 2000</td>
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2. Foundation Courses

<table>
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<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>EE 2000</td>
<td>Circuits I</td>
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<tr>
<td>ENGI 2110</td>
<td>Engineering Mechanics, Statics</td>
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</tr>
<tr>
<td>ENGI 2260</td>
<td>Engineering Economics</td>
<td>3</td>
</tr>
<tr>
<td>ENGI 2270</td>
<td>Engineering Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ENGI 2410</td>
<td>Engineering Mechanics, Dynamics</td>
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</tr>
<tr>
<td>ENGI 2420</td>
<td>Fluid Mechanics</td>
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<tr>
<td>ENGI 2421</td>
<td>Fluid Mechanics Lab.</td>
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<tr>
<td>ME 1210</td>
<td>Design</td>
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<tr>
<td>ME 1211</td>
<td>Conventional Manufacturing Lab.</td>
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<tr>
<td>ME 2010</td>
<td>ME</td>
<td>3</td>
</tr>
<tr>
<td>ME 2020</td>
<td>Applied Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ME 2210</td>
<td>Engineering Materials</td>
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<tr>
<td>ME 2211</td>
<td>Engineering Materials Lab.</td>
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</tr>
<tr>
<td>ME 2220</td>
<td>Mechanism Design</td>
<td>3</td>
</tr>
<tr>
<td>ME 2230</td>
<td>Solid Mechanics I</td>
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3. ME Core Courses (55)

<table>
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<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
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<tbody>
<tr>
<td>ME 3011</td>
<td>Engineering Measurements Lab.</td>
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</tr>
<tr>
<td>ME 3030</td>
<td>System Dynamics and Controls</td>
<td>3</td>
</tr>
<tr>
<td>ME 3040</td>
<td>Mechatronics</td>
<td>3</td>
</tr>
<tr>
<td>ME 3110</td>
<td>Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>ME 3120</td>
<td>Thermodynamics II</td>
<td>3</td>
</tr>
<tr>
<td>ME 3140</td>
<td>Intermediate Fluid Mechanics</td>
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</tr>
<tr>
<td>ME 3150</td>
<td>Heat Transfer I</td>
<td>3</td>
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<tr>
<td>ME 3160</td>
<td>Heat Transfer II</td>
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<tr>
<td>ME 3230</td>
<td>Solid Mechanics II</td>
<td>3</td>
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<tr>
<td>ME 3240</td>
<td>Design of Machine Elements I</td>
<td>3</td>
</tr>
<tr>
<td>ME 3250</td>
<td>Design of Machine Elements II</td>
<td>3</td>
</tr>
<tr>
<td>ME 3260</td>
<td>Manufacturing Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ME 4011</td>
<td>Mechatronics Lab.</td>
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ME 4110 Design of Thermal Systems 3
ME 4111 Thermal Engineering Lab. 1
ME 4251 Modeling and Product Realization Lab. 1
ME 4992 ME Capstone Design I 3
ME 4994 ME Capstone Design II 3

Technical Electives (9)

<table>
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<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT 4660</td>
<td>Entrepreneurship</td>
<td>3</td>
</tr>
</tbody>
</table>

TOTAL: 147
VIII. UNDERGRAD COURSE DESCRIPTIONS

ACC 2001 Principles of Accounting
Three credit-hours
Pre-requisites: NONE
An introduction to the basic principles of financial accounting with emphasis on basic accounting procedures. Analysis of income statement procedures, computerized accounting applications and the accounting cycle are highlighted. Other topics include inventories, receivables, and cash.

ACC 2011 Principles of Accounting II
Three credit-hours
Pre-requisites: ACC 2001
A continuation of Accounting I this course emphasizes accounting theory and applications as they apply to the accounting cycle. Discussions also include plant assets, intangible assets, current and long-term liabilities.

ACC 3310 Cost Accounting
Three credit-hours
Pre-requisites: ACC 2001
A study of the methods and procedures of accounting in the determination of the unit cost of a product. It includes the procedures for the three main elements of the cost of the product (material, labor and overhead) using cost accumulation and standard cost. Emphasis is placed in the control of production costs.

ACC 3320 Computer Applications in Accounting
Three credit-hours
Pre-requisites: ACC 2001, CGS 1100
Installation, application and study of accounting software such as Peachtree and other popular packages in extensive use. These programs are used to analyze various accounting scenarios and prepare financial statements.

ACC 3330 Intermediate Accounting I
Four credit-hours
Pre-requisites: ACC 2011
This is the first of two courses designed to cover financial topics in depth. The course covers the development of accounting principles, preparation of financial statements, and use of time value of money.

ACC 3340 Intermediate Accounting II
Four credit-hours
Pre-requisites: ACC 3330
This course continues Intermediate Accounting I and is designed to cover additional financial topics in depth. The course covers the development of financial instruments and an introduction to the decisions and opinions of the regulatory bodies of the accounting practice.

ACC 3360 Federal Income Taxes
Three credit-hours

Three credit-hours
Pre-requisites: ACC 2011
A study of the principles and procedures used to prepare income tax returns for individuals, partnerships, and corporations.

ACC 4310 Advanced Accounting
Three credit-hours
Pre-requisites: ACC 3340
Special problems in the field of accounting. Includes partnerships, installment sales, consignments, home offices, consolidations, and non-profit organizations. It also includes topics in fund accounting.

ACC 4320 Auditing
Three credit-hours
Pre-requisites: ACC 2001
A study of the principles of auditing and their application to financial statements. Internal control systems, auditing programs, ethical principles and responsibilities of auditors are covered.

ARH 1000 Art Appreciation
Three credit-hours
Pre-requisites: NONE
A chronological survey of the visual arts from pre-history to modern day. Students’ will discover the visual arts as an important social force throughout history.

BSC 1005 Introduction to Biology
Three credit-hours
Pre-requisites: NONE
Selected principles in biological science, including the cell concept, the organization of multi-cellular systems, plants and animals as organized systems, and man in relation to his environment.

CE 1011 Introduction to Civil Engineering
One credit hour
Pre-requisite: CEE 1010
An introduction to the civil engineering profession, design philosophy, techniques, theory, methodology, and creative problem solving with emphasis on teamwork, as well as on design issues and practices in the profession. The course includes several design cases. Project design explicitly concerns technical approaches as well as consideration of the existing built environment, natural environment, economic, social, and cultural factors. Critical thinking and logic presentation of an engineering analysis.

CE 2510 Construction Materials
Three credit-hours
Pre-requisites: ENGI 2120 and CEE 2210
Co-requisite: CE 2511
Application of the physical, mechanical, and chemical properties of materials such as concrete, aggregate, ferrous metals, nonferrous metals, timber, plastics, and asphalt cements. Selection of materials and their
behavior in civil engineering practice. Test principles and methods applied to construction materials and failure analysis in accordance to the ASTM.

**CE 2511 Construction Materials Laboratory**  
*One credit hour*  
**Pre-requisites:** ENGI 2120 and CEE 2210  
**Co-requisite:** CE 2510  
Laboratory techniques and procedures to determine properties of concrete, coarse and fine aggregates, wood, and steel. Design and preparation of concrete mixes. Tests on concrete specimens.

**CE 3110 Structural Analysis I**  
*Three credit-hours*  
**Pre-requisites:** ENGI 2120, CEE 2310, and CEE 2311  

**CE 3120 Structural Analysis II**  
*Three credit-hours*  
**Pre-requisite:** CE 3110  
**Co-requisite:** CE 3121  

**CE 3121 Structural Engineering Laboratory**  
*One credit hour*  
**Pre-requisites:** CE 3110  
**Co-requisite:** CE 3120  
Verify theoretical results with simple laboratory experiences on bars under axial and torsional loads, beams, columns, trusses, and frames. Measurement of deflections, angle of twist, support reactions, internal forces, and strains as the structural response of interest under a specified applied loads.

**CE 3130 Steel Structures Design**  
*Three credit-hours*  
**Pre-requisite:** CE 3110  

**CE 3210 Geotechnical Engineering I**  
*Three credit-hours*  
**Pre-requisites:** ENGI 2120, ENGI 2420, CEE 2110, CEE 2310, and CEE 2311  
**Co-requisite:** CE 3211  

**CE 3211 Geotechnical Engineering Laboratory**  
*One credit hour*  
**Pre-requisites:** ENGI 2120, ENGI 2420, CEE 2110, CEE 2310, and CEE 2311  
**Co-requisite:** CE 3210  
Laboratory techniques to determine the basic properties of soils including soil sampling and description, relationships among soil phases, consistency limits, and grain size distribution. Soil classification systems, compaction, and field density. Coefficient of permeability.

**CE 3220 Geotechnical Engineering II**  
*Three credit-hours*  
**Pre-requisites:** CE 3210 and CE 3211  
**Co-requisite:** CE 3221  
Compressibility of soils, consolidation settlements, rate of consolidation. Subsoil exploration and sampling. Soil strength parameters and their use in the evaluation of pressure on retaining structures, soil bearing capacity, and slope stability. Basic concepts of deep foundations.

**CE 3221 Geomechanics Laboratory**  
*One credit hour*  
**Pre-requisites:** CE 3210 and CE 3211  
**Co-requisite:** CE 3220  
**Classification:** Required  
Consolidation test of fine soil samples. Preparation of soil profile including physical properties. Determination of soil shear strength parameters for common geotechnical engineering applications. Unconfined compression, direct and tri-axial shear tests performed on SPT-retrieved samples to obtain total stress parameters. Evaluation of soil stiffness. Application problems.

**CE 3310 Route Location and Geometric Design**  
*Three credit-hours*  
**Pre-requisites:** SURV 2095, CEE 2310, and CEE 2311  

**CE 3320 Highway Engineering**  
*Three credit-hours*  
**Pre-requisites:** CE 2510, CE 3210, and CE 3310  
analysis. Interchange design principles. At-grade
intersection design principles.

**CE 3330 Transportation Engineering and Urban Planning**

**Three credit-hours**

**Pre-requisite:** CE 3320

**Co-requisite:** CE 3331

Intersection capacity and level of service. Planning and
design aspects of transportation systems. Urban
transportation planning models. Development principles
of transportation facilities. Design and operational
analysis of pedestrian and bicycle facilities. Public
transportation.

**CE 3331 Highway and Transportation Engineering Laboratory**

**One credit hour**

**Pre-requisite:** CE 3320

**Co-requisite:** CE 3330

Data collection techniques and use of equipment
associated with different types of transportation studies.
Application of statistics and probability in transportation
data presentation and analysis. Application of computer
software.

**CE 3420 Water Supply Engineering**

**Three credit-hours**

**Pre-requisites:** SCIE 1210, SCIE 1211, and CEE 3410

Water supply sources. Demand and use of water.
Physical, chemical, and biological characteristics of
water. Safe Drinking Water Act and other water quality
regulations. Water treatment: rapid mix, flocculation,
sedimentation, filtration, disinfection, softening, and
other processes. Design of a water distribution system:
configuration and requirements, losses, analysis of flow,
pipe materials, pumps, and pumping stations.

**CE 3520 Construction Project Management**

**Three credit-hours**

**Pre-requisites:** ENGI 2260, CE 2510, and CE 2511

The course discusses management of construction
projects from site investigation, planning, and design to
construction and application of controls. Topics include
project administration, organizations, project costs
estimation, bidding of contracts and awards, planning
and scheduling techniques, labor relations, claim and
dispute resolution, safety, and risk management.

**CE 4140 Concrete Structures Design**

**Three credit-hours**

**Pre-requisites:** CE 3120, CE 3121, and CE 3130

Design of reinforced concrete structures using the
Ultimate Strength Design Method. Design for flexure
and shear. Continuous beams and one-way slab systems.
Development of reinforcing bars. Introduction to column
design.

**CE 4150 Foundation Engineering**

**Three credit-hours**

**Pre-requisites:** CE 3220, CE 3221, and CE 4140

Evaluation of sub-soil conditions as they affect the
behavior, proportions and choice of type foundation.
Combined and strap footing. Retaining walls. Sheetpiling
walls. Pile group and pile cap design. Mat foundations.

**CE 4430 Wastewater Engineering**

**Three credit-hours**

**Pre-requisite:** CE 3420

Wastewater sources: domestic, industrial, and
infiltration/inflow. Wastewater flow rates. Gravity and
pressure sanitary sewer systems. Physical, chemical,
and biological characteristics of wastewater. Wastewater
treatment processes: a) preliminary treatment:
screening, coarse solids reduction, grit removal, flow
equalization, odor control and coagulation/flocculation;
b) primary treatment: sedimentation; c) secondary
treatment: activated sludge and trickling filters; d)
advanced treatment: filtration, adsorption, ion exchange,
air stripping, nitrification-denitrification, reverse osmosis,
microfiltration and ultrafiltration, chemical precipitation,
Effluent disposal and reuse alternatives. Treatment and
disposal of sludge. The Clean Water Act. Regulatory
agencies and their requirements.

**CE 4440 Environmental Engineering for Civil Engineers**

**Three credit-hours**

**Pre-requisite:** CE 4430

Overview to the field of environmental engineering.
Environmental phenomena. Materials and energy
balances. Ecosystems. Environmental fate and transport
of contaminants. Impact of pollutants in aquatic, soil, and
air environments. Surface water pollution and quality.
Air pollution control. Solid waste management. Construction
and demolition debris management. Noise pollution.
Environmental laws and regulations. Environmental
impact assessment. Ethical perspective of environmental
engineering.

**CE 4441 Environmental Engineering Laboratory**

**One credit hour**

**Pre-requisite:** CE 4430

**Co-requisite:** CE 4440

Laboratory techniques to determine the properties of
water and wastewater. Sampling: collection, storage and
preservation. Tests for physical characteristics: color,
turbidity, temperature and solids content (total,
settlesable, suspended, volatile and fixed). Tests for
chemical characteristics: pH, alkalinity, hardness,
chlorine, conductivity, dissolved oxygen, BOD, COD,
nitrogen, and phosphorus. Tests for biological
characteristics: fecal and total coliform. Other tests such
as meteorological factors measurements. Experiments
focused on process monitoring and control as part of the
water resources and environmental engineering design
processes.
CE 4530 Construction Methods and Productivity Improvement
Three credit-hours
Pre-requisite: CE 3520
Classification: Required
This course discusses technical aspects of the construction process, and how they can be improved. Construction methods for heavy and building construction will be studied. Also, organizing a project with productivity improvement as a goal will be studied. Students will learn how to calculate and measure worker productivity. In addition, various models and methods for improving productivity will be studied and applied to construction problems.

CE 4911 Civil Engineering Senior Design Project I
One credit hour
Pre-requisites: CE 3330, CE 4140, CE 4430, and CE 4530
First part of a two-period open ended design project that involves most areas of Civil Engineering. The project allows correlating the different areas of Civil Engineering, to apply the principles of engineering design and science at a high level, and to develop awareness of social and economic effects of engineering projects. This first course will concentrate in the site analysis, in all the laboratory and field studies required by the specific project (i.e., topography, as-built, structure inventory, soil exploration, traffic study, among others), in the development of a project proposal, and in the site design and environmental evaluation of the proposal.

CE 4920 Civil Engineering Senior Design Project II
Three credits hours
Pre-requisite: CE 4150, CE 4440, and CE 4911
It’s a continuation of CE 4911. Second part of a two-period open ended design project that involves most areas of Civil Engineering. The project allows correlating the different areas of Civil Engineering, to apply the principles of engineering design and science at a high level, and to develop awareness of social and economic effects of engineering projects. This second course will concentrate in the detailed analyses and designs required by the specific project, with a clear identification of hypothesis and assumptions, limitations of the study, design criteria, methods and tools, costs, safety, feasibility, and design parameters adopted for each design. Oral presentations and written reports will be used to develop the objectives.

CE 5010 Principles of Architecture for Civil Engineers
Three credit-hours
Pre-requisites: CEE 1010 and CE 1011
Introduce civil engineering students to architectural concepts. It is a morphological study of the essentials elements of form, space, organization, circulation, proportion, scale, and ordering principles. The course emphasizes the element of form as the primary tool of the designer. The relationship between architecture, nature, urban context, culture, history, social and political issues are included.

CE 5108 – Prestressed Concrete Structures Design
Three credit-hours
Pre-requisite: CE 4140
Classification: Elective

CE 5116 – Design of Wood Structures
Three credit-hours
Pre-requisites: CE 2510 and CE 3110
Wood buildings and design criteria. Properties of wood and lumber grades. Vertical design loads and lateral forces. Design of beams and columns for vertical loads. Design of horizontal diaphragms and shear walls for lateral forces. Connection design, including the overall tying together of the vertical and lateral force-resisting systems.

CE 5208 – Soil Improvement
Three credit-hours
Pre-requisites: CE 3220 and CE 3221
Course Description: Current ground modification techniques to improve soil stability, reduce deformation, control seepage, and increase erosion resistance.

CE 5220 – Pavement Design
Three credit-hours
Pre-requisites: CE 3220, CE 3221, CE 3320, CE 4140, and CEE 3410
Stress and deformation of flexible and rigid pavements, traffic loading, material parameters, drainage design. Pavement performance and reliability concepts. Design of flexible and rigid pavements, overlay design, Superpave, new developments in pavement design. Computerized pavement design.

CE 5308 – Urban Transportation Planning
Three credit-hours
Pre-requisite: CE 3330

CE 5406 – Open Channel Engineering
Three credit-hours
Pre-requisite: CE 3402
Course Description: Open channels, properties and classification. Basic definitions and equations governing flow in open channels. Laws of conservation of energy and momentum equation. Uniform flow: basic principles and application. Gradually varied flow: basic principles
and channel design. Rapidly varied flow: basic principles, bridge piers, hydraulic jumps, and transition structures. Unsteady flow: basic principles and governing equations.

**CE 5412 - Applied Surface Water Hydrology**  
*Three credit-hours*  
*Pre-requisite: CE 3402*  
Occurrence and distribution of water by natural processes including precipitation, runoff, infiltration, water losses, flood routing, catchment's characteristics. Precipitation runoff models. Current hydrologic

**CE 5510 – Construction Planning, Scheduling, and Cost Estimates**  
*Three credit-hours*  
*Pre-requisite: CE 3520*  
This course comprises the work plan development process and the use of several scheduling techniques such as precedence diagrams, progress schedules, the critical path method (CPM), program evaluation and review technique (PERT), crashing and delay analysis. Project cost controls, earned value principles, cost estimate studies for construction projects from conceptual and preliminary to detailed estimates are also studied.

**CE 5522–Construction Documents for Civil Engineering**  
*Three credit-hours*  
*Pre-requisite: CE 3520*  
A comprehensive coverage of documents generated before and during the construction process, including the origin and format of construction documents, which ones are used and why. Globalization aspects on how documents are utilized and how they work together as a system. Contract forms, contract conditions, and specifications are the main core for study. Construction drawings and technical specifications are studied as a design and construction tool into the process. Bidding requirements are discussed as part of the project manual.

**CEE 5020 - Environmental Laws and Regulations**  
*Three credit-hours*  
*Pre-requisite: CE 4440 or ENVE 4610*  
Introduction to the technical, economic, political, administrative, and social forces that influence the environmental quality regulations and the use of natural resources. Review of federal and state laws, regulations, and programs enacted to minimize air, land, and water pollution. Review of public participation mechanisms.

**CEE 5030– Advanced Hydraulics**  
*Three credit-hours.*  
*Pre-requisite: CEE 3410*  
Advanced hydraulics for the design and analysis of systems concerned with the use and control of water, storage, water transmission; design of open channels and pressure conduits. Design of storm and sewer systems. Performance and design of culverts. Sediment transport and sedimentation in reservoirs. Groundwater hydraulics and well hydraulics.

**CEC 3000 Object Oriented Programming (C/C++) I**  
*Three credit hours*  
*Pre-requisite: MAT 2000 or MAC 1105*  
Introduces students to computers; Algorithm development, UNIX, and C++ are discussed in detail. The introduction covers top down analysis, problem analysis, flow charts, and pseudocode. Structured programming and development and debugging are also emphasized. C++ coverage includes variables, data types, operators, and functions.

**CEC 3070 Visual Basic Programming**  
*Three credit hours*  
*Pre-requisite: CEC 3000*  
This course introduces the student to Visual Basic. Course covers the fundamentals of visual programming in Visual Basic. Topics discussed cover: variables and operators, using decision structures, loops and timers, strings, modules, procedures, and arrays.

**CEC 3300 Object Oriented Programming (C/C++) II**  
*Three credits hours*  
*Pre-requisite: CEC 3000*  
The course continues with the development of programming skills using C++. It emphasizes modular program design, arrays, and pointer usage. Structured data types (arrays, structures, and linked list) and dynamic storage is introduced. The course presents some object-oriented concepts.

**CEC 3650 Data Structures**  
*Three credits hours*  
*Pre-requisite: CEC 3000 or MAT 2000*  
The course covers the understanding of data structures and programming logic and their implementation using C++ or another similar language. The course emphasizes on recursion, and the use of pointers, lists, stacks, queues, and trees. Searching and sorting techniques are also discussed. Several programs are assigned.

**CEC 4000 Database Systems**  
*Three credit hours*  
*Pre-requisite: CEC 3650*  
The course begins with an overview of the concepts, role, nature and purpose of database systems and computers in the application environment. It presents the relational model (as the primary design tool for today's database systems), hierarchies and SQL. The course explores database constraints from the standpoint of integrity.

**CEC 4050 Data Communications**  
*Three credit hours*  
*Pre-requisite: CEC 3300*  

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This course is concerned with the exchange of data between two directly linked devices. The key aspects of transmission, interfacing, link control, and data transfers are examined. The physical and data link layers are discussed.

CEC 4100 Operating Systems
Three credit hours
Pre-requisite: CEC 3300
The course discusses various aspects of computer operating systems: processes, concurrent programming, and deadlocks.

CEC 4120 Assembly Programming Language
Three credit hours
Pre-requisite: CEC 3000
This course introduces students to the fundamental principles of machine language. Basic concepts such as number or data representation (binary, hexadecimal and others), branching and looping, memory organization, operands, instruction cycle, addressing modes, exception handling, etc. are introduced.

CEC 4200 Internet Programming
Three credit hours
Pre-requisite: CEC 3300
The course introduces the student to JAVA programming. How to create applets in JAVA; JAVA applets vs. autonomous programs; simple mathematical operations with JAVA applets; how to force JAVA applets to make decisions; how to make JAVA applets repeat one or more instructions; use of functions to simplify the applets; interaction with HTML and other topics.

CEC 4650 Software Engineering I
Three credit hours
Pre-requisite: CEC 4000
This course presents an engineering approach to the development of large software development projects. The course explains the successive steps of requirements analysis, specifications, designs, coding, debugging and testing, maintenance, and thorough documentation.

CEC 4710 Computer Science Senior Project I
Three credit hours
Pre-requisite: Senior Standing
Design of projects based on open-minded requirements. Projects will be selected to cover most areas of interest (i.e. Computer Software, Database Systems, investigative research based on issues that concern computer science and technology etc.). Projects will be selected in accordance with the student's area of interest.

CEC 4750 Design and Analysis of Algorithms
Three credit hours
Pre-requisite: CEC 3650
This course covers issues that arise in the analysis and design of algorithms used for solving computational problems. A number of common algorithm design paradigms and examples are presented and explained. Algorithm design issues are contemplated. Computability and computational tractability concepts are introduced. The importance of time and space requirements are greatly considered as the student designs algorithms to solve computational problems.

CEC 4800 Electronic Commerce (EC) Technology
Three credit hours
Pre-requisite: CEC 3300
This course will study the structure, organization, and use of the Internet. Internet technologies and their potential applications are examined including electronic commerce, database connectivity, and security. An emphasis will be placed on evaluating, organizing, and developing efficient models of electronic transactions and Web Information Systems. Prerequisite: CEC 3300. (3 credits)

CECS 2004 Discrete Structures
Three credit-hours
Pre-requisites: None
Co-requisites: MATH 1360
Fundamental mathematical concepts related to computer science, include finite and finite sets, relations, functions, and prepositional logic. Introduction to other proofing techniques. Modeling and solving problems in computer science. Introduction to other permutations, combination graphs, and tree with applications.

CECS 2200 Computer Programming Fundamentals
One credit hour
Pre-requisites: MATH 1360
Introductory laboratory teaching the concept of an algorithm as a systematic solution to a problem. Students learn to represent algorithms using flowcharts and pseudocode. Fundamental constructs of structured programming languages such as variables, operators, selection, and repetition statements are then used to capture these algorithms for automated execution in a computer. Students learn to use a development environment and a high level language such as C++.

CECS 2202 Computer Programming I
Four credit-hours
Pre-requisites: MATH 1350, CECS 2200
Co-requisites: CECS 2203
The course is a follow-up to the CECS 2200 course and continues with the development of algorithms and programming skills using C++. It emphasizes modular program design using functions, arrays, and pointers. The course introduces fundamental object-oriented concepts such as class, object, instance variables, instance methods, and constructors and destructors.
CECS 2203 Computer Programming I Laboratory  
Zero credit hour  
Pre-requisites: MATH 1350, CECS 2200  
Co-requisites: CECS 2202  
This course is the Laboratory companion to the Computer Programming I course (CECS2202). It uses two different pedagogic strategies to assure that student carry out their lab projects successfully. The students complete a set of mini-projects in a closed laboratory setting. Each set of mini-projects provides them with the practical skills required to tackle a major project as a take home open-lab assignment. All projects are carried out using an Integrated Development Environment for the C++ language.

CECS 2222 Computer Programming II  
Four credit-hours  
Pre-requisites: MATH 1360, CECS 2202  
Co-requisites: CECS 2223  
This course continues the development of the students’ skills in algorithm programming using the object oriented paradigm. It emphasizes dynamic memory allocation, composition, inheritance, templates, exception handling, and file processing.

CECS 2223 Computer Programming II Laboratory  
Zero credit hour  
Pre-requisites: MATH 1360, CECS 2202  
Co-requisites: CECS 2222  
This course is the Laboratory companion to the Computer Programming II course (CECS2222). The students complete a set of mini-projects in a closed laboratory setting. Each set of mini-projects provides them with the practical skills required to tackle a major project as a take home open-lab assignment. All projects are carried out using an Integrated Development Environment for the C++ language.

CECS 3210 Advanced Programming  
Three credit-hours  
Pre-requisites: CECS 2222  
This course aims to advance your basic programming skills, with special attention to user interface design, problem solving, and coding style in an object-oriented event-driven language, such as C#. Topics include: objects, classes and events, GUI design, and multithreading. Optional topics are: graphics and databases.

CECS 3212 Data Structures  
Three credit-hours  
Pre-requisites: CECS 2222  
The course covers fundamental data structures, the tradeoffs these imply for various sorting and searching algorithms, and their application using C++ or similar high-level language. The course emphasizes recursion, and the use of pointers, lists, stacks, queues, tables, and trees. The computational performance of searching and sorting techniques using big-O notation are also discussed. Several programs are assigned.

CECS 3302 Data Communications  
Three credit-hours  
Pre-requisites: COE 2300  
This course is concerned with the exchange of data between directly connected devices. The key aspects of transmission, interfacing, link control, and error-free data transfers are examined. The physical and data link layers are discussed for a variety of LAN and WAN technologies. Design projects are required.

CECS 4200 Programming Languages  
Three credit-hours  
Pre-requisite: CECS 3212  
The general concepts and constructs of several major programming paradigms are covered. The design issues involved in the various language constructs are discussed, and how these choices lead to different languages. Imperative, declarative, logic, functional, structural, and object-oriented programming paradigms are illustrated in languages such as Pascal, Prolog, Lisp and C++. Methods used for describing the semantics and syntaxes of programming languages are introduced, such as: EBNF, syntax graphs, attribute grammars, operational and denotational semantics.

CECS 4202 Database Systems  
Three credit-hours  
Pre-requisites: CECS 2222  
This course is an introduction to the database concept. The course covers data models, relational database concepts, hierarchies, relational algebra and SQL, storage structures, and the role of databases and computers in application environments. Various programming assignments in SQL and a design project are required.

CECS 4204 Software Engineering  
Three credit-hours  
Pre-requisites: CECS 4202  
Familiarity with Windows or Unix applications, and knowledge of advanced object oriented programming is required. An entire software development cycle is executed on a small scale project. The Object Oriented analysis, design, coding, and testing techniques using the Unified Modeling Language (UML) are discussed in detail. Tools to support Software Engineering methods for Project Planning, Software Configuration Management, and OOD are demonstrated and used by the students to create sample Software Engineering work products. Some of these Computer Aided Software Engineering (CASE) tools include MS Project, WinCVS, Visual Source Safe, Visual Studio .NET.

CECS 4230 Operating Systems  
Three credit-hours  
Pre-requisites: COE 4320  
Operating systems are the programs that manage the computer hardware resources, and augment or enhance their basic functionality on behalf of the application.
programs that use the computer. The course discusses various aspects of computer operating systems including processes, process scheduling, memory management, concurrent programming, deadlocks, and others.

**CEE 1010 Engineering Graphics for Civil and Environmental Engineers**  
*Four credit-hours*  
**Pre-requisites:** None  
An introduction to the field of engineering graphics and descriptive geometry as a design and documentation tool. Topics include orthographic projection, pictorial drawings, dimensioning, feature control symbols, and tolerancing. Use of a computer aided design (CAD) system to create engineering drawings.

**CEE 2110 Engineering Geology**  
*Three credit-hours*  
**Pre-requisites:** SCIE 1210 or SCIE 1214  

**CEE 2210 Probability and Statistics for Civil and Environmental Engineers**  
*Three credit-hours*  
**Pre-requisites:** MATH 1370, and CE 1011 or ENVE 1011  

**CEE 2310 Algorithms, Programming, and Numerical Analysis**  
*Three credit-hours*  
**Pre-requisites:** MATH 2350 and CEE 2210  
Co-requisite: CEE 2311  
An introduction to programming and algorithms applied to numerical analysis. The most commonly used numerical methods in civil and environmental engineering practice are introduced. Roots of equations, systems of linear equations, curve fitting techniques, numerical differentiation and integration, and ordinary differential equations.

**CEE 2311 Algorithms, Programming, and Numerical Analysis Laboratory**  
*One credit-hour*  
**Pre-requisites:** MATH 2350 and CEE 2210  
Co-requisite: CEE 2310  
An introduction to programming and algorithms applied to numerical analysis. Programming of numerical methods commonly used in civil and environmental engineering practice, using Visual Basic for Applications within Excel as the programming environment.

**CEE 3410 Water Resources and Hydraulic Engineering**  
*Three credit-hours*  
**Pre-requisites:** ENGI 2420, ENGI 2421, CEE 2310, and CEE 2311  

**CGS 1100 Computer Science**  
*Three credit-hours*  
**Pre-requisites:** NONE  
An introduction to computer fundamentals including information processing, operation, and usage of an operating system. Applications in word processing, electronic spreadsheets, electronic filing systems are presented.

**CGS 2405 Intermediate Programming in C Language**  
*Three credit-hours*  
**Pre-requisites:** CGS 1100  
An advanced application programming course using the C language. Emphasis will be on the design and use of structure computer algorithms for problem solving using “C”. Topics covered will include the design of independent modules, processing of text data as input, advanced sorting techniques, various file handling techniques, advanced data manipulation and data structures.

**CHM 1025 Introduction to Chemistry**  
*Three credits-hours*  
**Pre-requisites:** MAC 1105  
Elementary principles of modern chemistry, including concepts of atomic and molecular structure, chemical bonding, stoichiometry, and the properties of solutions.

**COE 2300 Logic Circuits**  
*Three credit-hours*  
**Pre-requisites:** CECS 2202, EE 2500  
Co-requisites: COE 3301  
This course covers a full range of topics such as number systems and codes, digital circuits, Boolean algebra, minimization of logic functions, combinational logic design and practices, introduction to combinational logic design with PLDs, sequential logic design principles and practices. A general exposure to the combinational design of an Arithmetic-Logical Unit (ALU) and the sequential logic design with PLDs. ROM and RAM system-level design is given. Design Projects will be required.
COE 2301 Logic Circuits Laboratory  
**One credit hour**  
**Pre-requisites:** EE 2001  
**Co-requisites:** COE 3301  
This laboratory provides an experimental study using the TTL digital logic circuits. Two levels of integration are used: small-scale integration (SSI) and medium-scale integration (MSI). These logic circuits are then used in such applications like: combinational logic analysis and design, multiplexing, decoding, arithmetic and comparison operations, memory devices, counting, and sequential logic analysis and design. Computer simulation will also be required.

COE 3302 Digital System Design with VHDL  
**Three credit-hours**  
**Pre-requisites:** COE 2300  
Study of the modern methodology for digital system design using CAD tools and VHDL/Verilog as design language. Design of components toward integration into a system to be used for particular purposes.

COE 3320 Microprocessors  
**Three credit-hours**  
**Pre-requisites:** COE 2300  
**Co-requisites:** COE 3321  
This course covers a full range of topics such as: numerical base, basic computer architecture and organization, microprocessor and microcontroller architecture, programmer models, microprocessor addressing modes, instruction set, and assembly language. A design project will be required.

COE 3321 Microprocessors Laboratory  
**One credit hour**  
**Pre-requisites:** COE 2301  
**Co-requisites:** COE 3320  
The laboratory provides an introduction to microprocessor systems programming, including both hardware interfacing and software fundamentals.

COE 4002 Capstone Design I  
**Three credit-hours**  
**Pre-requisites:** Director Permission  
First part of a two-term course on the design of projects based on open-ended requirements. Projects will be selected in accordance with the student’s area of interest (i.e., digital circuits, VLSI testing, software engineering, parallel processing, computer graphics, visualization, artificial intelligence, data base, HCI, computer Hardware, computer Software, data mining, etc.). Students must approve both Capstone Design Courses in sequence and without interruptions. Students that approve the first course and miss the second course will be required to repeat the first course again.

COE 4022 Capstone Design II  
**Three credit-hours**  
**Pre-requisites:** COE 4002  
Second part of a two-term course on the design of projects based on open-ended requirements. Students must approve both Capstone Design Courses in sequence and without interruptions. Students that approve the first course and miss the second course will be required to repeat the first course again.

COE 4320 Computer Architecture  
**Four credit-hours**  
**Pre-requisites:** COE 3320  
**Co-requisites:** COE 4321  
Instruction set architecture, functional organization, and implementation of a computer are studied from the performance point of view, to provide the students with the principles and techniques used in the design of modern computer systems.

COE 4321 Computer Architecture Lab  
**Zero credit hour**  
**Pre-requisites:** COE 3320  
**Co-requisites:** COE 4320  
A practical experience on design, organization, performance measurement, benchmarks, and implementation of a computer system.

COE 4330 Computer Networks  
**Three credit-hours**  
**Pre-requisites:** COE 3302  
**Co-requisites:** COE 4331  
Focuses on the ISO-layers above the Data link layer. Problems solved by each layer are discussed and the entities, techniques and protocols used as solutions are presented and discussed in detail. Algorithms for routing, spanning tree, and others are presented. Techniques for improving flow control, their impact on performance, and criteria for their adoption are discussed. IP addressing schemes and address translation between addressing levels are discussed. The course closes with the discussion of various application-level protocols; file transfer, network management and others.

COE 4331 Computer Networks Lab  
**One credit hour**  
**Pre-requisites:** CECS 3302  
**Co-requisites:** COE 4330  
The laboratory exemplifies the techniques and devices that implement the solutions to communication problems discussed in class. Covers structured wiring schemes and their combination with wireless access schemes. Configures communication protocol stacks within various operating systems. Simulation and analysis of techniques that solve important communication problems. Covers various communication applications and issues of security and reliability related to different network topologies and configurations.

COE 4340 Microcomputer Interfacing  
**Four credit-hours**
Pre-requisites: COE 3320
Co-requisites: COE 4341
Practical architectural view of microprocessor and detailed description of its interfacing elements. Laboratory assignments place emphasis on the MC68HC12 and MC9S12DP256B microcontrollers, their I/O capabilities; peripheral interfacing chips for memory and devices, and counter-timers and interrupts. Interrupts and interrupt handlers are discussed in detail. Weekly interfacing problems and a design project are required.

**COE 4341 Microcomputer Interfacing Laboratory**
Zero credit hour
Pre-requisites: COE 3320
Co-requisites: COE 4340
The laboratory emphasizes in the I/O capabilities, peripheral interfacing chips for memory and devices, counter-timers and interrupts. Interrupts are discussed in detail. Weekly interfacing problems are discussed. A design project is required.

**COM 3010 Database Management**
Three credit-hours
Pre-requisites: NONE
A study of the principles of a database system. Surveys the methodology used in database management and analyses the software and programming of the database environment.

**ECO 2013 Principles of Microeconomics**
Three credit-hours
Pre-requisites: NONE
A study of basic economic concepts. Topics include the modern national income formation theory, economics fluctuations, money, banking monetary, and fiscal policy, economic stabilization theory and policy, the public sector, economic growth and development, and comparative economics systems.

**EE 1130 Freshman Design for Electrical & Computer Engineers**
Three credit-hours
Pre-requisite: MATH 1340
An introduction to the engineering design philosophy, techniques, methodology, and graphical tools, with emphasis on teamwork. The course seeks to develop creativity and imagination skills in the solution of engineering problems, including critical thinking and logical presentation of an engineering analysis.

**EE 2000 Circuit Analysis I**
Three credit-hours
Pre-requisite: SCIE 1441, MATH 1370, CECS 2202, ENGI 2310/
ME Students only: ME 2010 and ME 3010
Co-requisites: MATH 2350 Course

**EE 2001 Electrical Measurements Laboratory**
One credit hour
Pre-requisite: ENGI 2270, EE 2000
Modern electronics measurement methods. Instrument calibration and use. Experimental verification of fundamental laws of electric circuits and magnetism. Experimental study of capacitive and inductive circuits. Use computer programs to analyze circuits. Safety consideration in the laboratory.

**EE 2010 Computational Methods in Electrical & Computer**
Three credit-hours
Pre-requisite: CECS 2202, EE 2000

**EE 2020 Circuit Analysis II**
Three credit-hours
Pre-requisite: EE 2000

**EE 2030 Applied Electromagnetics**
Three credit-hours
Pre-requisite: EE 2000
Study of time-varying electric and magnetic fields and Maxwell’s equations describing time-varying fields. Use of Maxwell’s equations to describe the propagation of electromagnetic plane waves. Reflection and transmission of waves at discontinues boundaries.

**EE 2400 Electromechanical Energy Conversion I**
Three credit-hours
Pre-requisite: EE 2000, EE 2030
Co-requisites: EE 2020
The study of the transformers, rotating machinery basics and DC machines under steady state. Safety considerations with the electric machines.

**EE 2401 Electromechanical Energy Conversion I Laboratory**
One credit hour
Pre-requisite: EE 2001, EE 2400
Experimental study of electrical machines. Safety considerations with electric machines. This course is designed to give electrical engineering students a one trimester course in laboratory work on: electrical and
mechanical measurements and basic operation characteristics of transformers (single and three phase) and DC machines used as motor and as generators.

**EE 2410 Electromechanical Energy Conversion II**  
*Three credit-hours*  
**Pre-requisite:** EE 2400  
The study of the three phase transformers and one phase/three phase ac induction motor.

**EE 2411 Electromechanical Energy Conversion II Laboratory**  
*One credit hour*  
**Pre-requisite:** EE 2401, EE 2410  
Experimental study of induction (single and three phase), universal and synchronous motors. Safety considerations with electric machines. This course is designed to give electrical engineering students a one-trimester course in laboratory work on: electrical and mechanical measurements and basic operation characteristics of AC machines (single and three phase).

**EE 2500 Electronics I**  
*Three credit-hours*  
**Pre-requisite:** EE 2000, EE 1130  
**Co-requisites:** EE 2001  
This course is the first of a three-course series in electronics. Subjects include operational amplifiers, semiconductor devices, diodes, rectification, bipolar transistors, amplification, switching and an introduction to field-effect transistors. Design and analysis techniques are presented for each subject.

**EE 3002 Signals and Systems**  
*Three credit-hours*  
**Pre-requisite:** EE 2012, EE 2020  

**EE 3220 Software Applications for Electrical Engineering**  
*Three credit-hours*  
**Prerequisites:** CECS 2202  
Basic knowledge of various engineering software applications that have proven to be very intensively used in the industry and academic environments. Introduction to Microsoft Office, MATLAB, SIMULINK, Mathcad and Pspcie Family Design Center.

**EE 3420 Power System Analysis I**  
*Three credit-hours*  
**Pre-requisite:** EE 2400  
**Co-requisites:** EE 2410  
The study of the power concepts in a process of generation, transmission and distribution of an electric system.

**EE 3440 Electric System Design I**  
*Three credit-hours*  
**Pre-requisite:** EE 2400  
General Design of electrical systems based in the National Electrical Code and the Florida Electric Power Authority Code.

**EE 3520 Electronics II**  
*Three credit-hours*  
**Pre-requisite:** EE 2020, EE 2500  
This is the second course in a three-course series in electronics. More advanced topics of semiconductor devices are introduced. Discussion topics include differential amplifiers, multistage amplifiers, frequency response, and design and analysis of other common amplifier configurations using MOSFETs and bipolar junction transistors (BJTs).

**EE 3521 Electronics Laboratory**  
*One credit hour*  
**Pre-requisite:** EE 2001, EE 3520  
Review of laboratory measurement equipment. Perform several design experiments according with topics on electronic theory: diodes and power supplies. Behavior of BJT as amplifier, timers, OP-amp and some design applications; MOSFET as an amplifier.

**EE 3600 Automatic Controls**  
*Three credit-hours*  
**Pre-requisite:** EE 3520, EE 3002  
Study of linear control systems. Transfer functions. Stability criteria. Compensation techniques. Analysis of a particular system and determination of an optimal design complying with given specifications. A design project will be required.

**EE 3610 Automation Engineering**  
*Three credit-hours*  
**Pre-requisite:** COE 2300, COE 2301  
**Co-requisites:** EE 3611  
Study of the theory and practices of the technologies used for industrial automation. The PLC is used as the main micro-controller device to interface with sensors, relays, electro-pneumatics, and motors. Different problems and situations are presented to the students and they prepare and design the solution. A final project is presented at the end of the class.

**EE 3611 Automation Engineering Laboratory**  
*One credit hour*  
**Pre-requisite:** COE 2300, COE 2301  
**Co-requisites:** EE 3610  
Experimental exercises with sub-systems used on industrial control applications. The PLC is used as the main micro-controller. Design and programming of PLC based systems are performed. A field trip to the industry is made as part of the laboratory.

**EE 3700 Communication & Wireless Systems I**  
*Three credit-hours*  
**Pre-requisite:** ENGI 2270, EE 2030, EE 3002
Frequency domain analysis of communication signals and systems. Amplitude modulation (AM) and angle modulation (FM, PM). Introduction to Random Processes and the study of noise associated with AM and FM modulation systems. The sampling theorem. Design projects will be required.

**EE 4002 Capstone Design Course I**  
**Three credit-hours**  
**Pre-requisite:** Departmental Permit. Must have approved all basic Electrical Engineering core courses plus ENGI 2260, plus 15 credits of EE Department Electives.  
First part of a two-term course on the design of projects based on open-ended requirements. Projects will be selected in accordance with the student’s area of interest (i.e., Electric Power, Electronics, Communications, Automatic Controls, etc.). Students must approve both Capstone Design Courses in sequence and without interruptions. Students that approve the first course and miss the second course will be required to repeat the first course again.

**EE 4022 Capstone Design Course II**  
**Three credit-hours**  
**Pre-requisite:** EE 4002  
Second part of a two-term course on the design of projects based on open-ended requirements. Students must approve both Capstone Design Courses in sequence and without interruptions. Students that approve the first course and miss the second course will be required to repeat the first course again.

**EE 4400 Power System Analysis II**  
**Three credit-hours**  
**Pre-requisite:** EE 3420  
**Co-requisites:** EE 2411, EE 4401  

**EE 4401 Power System Analysis Laboratory**  
**One credit hour**  
**Pre-requisite:** EE 3420  
**Co-requisites:** EE 4400  
Experiments with electric power transmission systems, three phase generation, power lines, and synchronous motors.

**EE 4430 Power System Protection**  
**Three credit-hours**  
**Pre-requisite:** EE 4400  
Introduction and general philosophies of protection for power systems. Analysis of power system during faults and abnormal conditions. Application of protective relays in electric power systems. Study of protection schemes for Transmission and Distribution lines, Substations, Transformers and Generators.

**EE 4431 Power System Protection Laboratory**  
**One credit hour**  
**Pre-requisite:** EE 4430  
Experimental works with protective relays and auxiliary equipment. Calibration, testing and setting of protective relays. Discussions topics include transient effects in power system networks, short circuit analysis using symmetrical components, instruments transformer PT’s and CT’s test, moderates protective relaying coordination studies, overcurrent relays, directional overcurrent relays, bus and transformer differential relays test and simulation. Protection and control drawing interpretation containing ANSI and IEEE guides and standard.

**EE 4436 Distribution System Design**  
**Three credit-hours**  
**Pre-requisite:** EE 4400  

**EE 4602 Process Control & Instrumentation**  
**Three credit-hours**  
**Prerequisites:** ENGI 2910, EE 3600  
Study of process control strategies. Electronic and pneumatic instrumentation. Linearization of nonlinear continuous systems. Application of linear control theory to nonlinear continuous process. Study of a particular process and determination of the necessary instrumentation and control strategy to be used. Study of ladder logic networks and its implementation with PLC controllers. Design projects will be required.

**EE 4603 Process Control & Instrumentation Lab.**  
**One credit-hours**  
**Prerequisites:** EE 4602  
Experiments for process control and instrumentation. Transducers, transmitters, analog and digital controllers, controls valves, switches, and indicators. Experiments with a process control trainer and programmable logic controllers.

**EE 4720 Digital Signal Processing**  
**Three credit-hours**  
**Pre-requisite:** EE 3002  
Topics include LSI systems, sampling, the DTFT, the DFT, and the FFT. Study of linear and cyclic convolution. The Ztransform. Filter structures. Introduction to FIR and IIR digital filter design. Several DSP applications are discussed and demonstrated. MATLAB simulations and a final project are required.

**ENC 1003 Advanced English Preparatory**  
**Three credit-hours**
Pre-requisites: ENGL 0110 or Placement by Admission Office
This course is designed with the necessary reading skills students need to succeed in their everyday life as well as in their academic atmosphere. Students are expected to improve their reading skills as well as speaking and writing.

ENC 1101 English Composition I
Three credit-hours
Pre-requisites: ENC 1003 or Placement by Admission Office
This is a required general education course in college-level writing. Emphasis is placed on unified, coherent, and organized essay writing. Sentence and paragraph structure and writing fundamentals will also be reviewed.

ENC 1102 English Composition II
Three credit-hours
Pre-requisites: ENC 1101
This is a required general education course in college level writing and builds on the foundation of English Composition I. Further development of the students' skills in composition, essay, communication, and research are included. Prerequisite: ENC 1101.

ENGI 2110 Engineering Mechanics, Statics
Three credit-hours
Pre-requisites: MATH 1360 and SCIE 1430
Co-requisite: MATH 1370

ENGI 2120 Mechanics of Materials
Three credit-hours
Pre-requisite: ENGI 2110
Introduction to the mechanics of deformable bodies. Study and analysis of stresses and strains on connections and bar elements subjected to axial, torsional, and transverse loads. Internal forces as stress resultants; shear force and bending moment diagrams. Analysis of structural elements subjected to combined stresses. Transformation of stresses, Mohr’s Circle. Column stability analysis and buckling.

ENGI 2260 Engineering Economics
Three credit-hours
Pre-requisite: MATH 1350

ENGI 2270 Probability & Statistic for Engineers
Three credit-hours
Pre-requisite: MATH 1350
This course introduces the student to the basic concepts on probability and statistics and its application to the solution of engineering problems. Principles of probability theory, discrete and continuous random variables, probability distribution, hypothesis testing, correlation and simpler linear regression concepts will be essential to identify, formulate and solve engineering problems.

ENGI 2410 Engineering Mechanics, Dynamics
Three credit-hours
Pre-requisite: ENGI 2110
Co-requisites: MATH 2350 Differential Equations
Kinematics and kinetics of particles and rigid bodies. Work and Energy and Impulse and Momentum methods.

ENGI 2420 Fluid Mechanics
Three credit-hours
Pre-requisites: ENGI 2410

ENGI 2421 Fluid Mechanics Laboratory
One credit hour
Pre-requisite: ENGI 2420, ENGI 2270

ENGI 2910 Engineering Mechanics - Statics and Dynamics
Three credit-hours
Pre-requisites: MATH 1360, SCIE 1430
Co-requisite: MATH 1370
Examines vector representation of force and moment, equivalent force systems, centroids and centers of gravity, distributed forces, free body diagrams and equations of equilibrium, applications to trusses, and beams. Examines fundamentals of dynamics, kinematics of particles, and kinetics of particles using force, mass, and acceleration.

ENGI 3440 Thermo-Fluids
Three credit-hours
Pre-requisites: ENGI 2410 or ENGI 2910
An introduction to thermodynamics and fluid mechanics. Study the concept of energy and the laws governing the transfers and transformations of energy. Emphasis on thermodynamic properties and the first and second law analysis of systems and control volumes. Integration of these concepts into the analysis of basic power cycles is introduced. Study of the fundamentals of fluid mechanics. Fluid Statics. Fluid kinematics. Control volume analysis: conservation of mass, momentum, and energy. Dimensional analysis Viscous flows in pipes.

ENGL 0100 Preparatory English
Three credit-hours
Pre-requisites: NONE

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The course is designed to develop basic written and oral skills. It promotes oral communication and personal expression, giving special emphasis to the development of vocabulary. By performing language functions, students acquire the basic skills of the English language.

**ENGL 0110 English Grammar**  
*Three credit-hours*  
*Pre-requisites: ENGL 0100 or Placement by Admission Office.*

Fundamental course in language designed to provide students with grammar skills in English for listening and writing with emphasis in increasing student's capability of developing logical thinking both in speaking and writing.

**ETH 2020 Ethics In Engineering**  
*Three credit-hours*  
*Pre-requisite: None*

Study of the philosophical and legal aspects of ethics and their application to the professional responsibility in the field of engineering.

**ETH 3020 Contemporary Social Problems in Computers and Technology**  
*Three credit-hours*  
*Pre-requisite: None*

Study and analysis of contemporary social problems that affect the engineering profession: e.g. ethical issues, conservation of the environment, restriction of financial resources, and possible solutions to these problems.

**ETH 3050 Ethical and Legal Aspects of Computers and Technology**  
*Three credit-hours*  
*Pre-requisite: None*

This course introduces students to the social, legal and moral aspects of computing, and the dilemmas that result from the evolution of computer technology. Course contents include ethical theory, decision making, professional code of ethics, “hacking” and computer crime, law enforcement, privacy and intellectual property issues, as well as environmental/health issues.

**FIN 2000 Principles of Finance**  
*Three credit-hours*  
*Pre-requisites: NONE*

This course is an introductory course reviewing the creation allocation and utilization of money, and the effect of monetary policy upon individuals, business, national and international economics.

**HUM 1020 Humanities**  
*Three credit-hours*  
*Pre-requisites: NONE*

A basic approach to the creative ideas, works, and accomplishments of various cultures from the areas of art, drama, music, and literature.

**HUE 1999 Selected Topics in Humanities**  
*Three credit-hours*  
*Pre-requisites: NONE*

In-depth, intensive study of selected topics in the area of Humanities. If different topics are studied, this course may be taken twice for credit.

**ISY 3510 Management Information Systems**  
*Three credit-hours*  
*Pre-requisites: NONE*

Introduction to the concepts of management information systems. Emphasis on system design. Analyze the organization in terms of its structure and information requirements. Identify major subsystems of the organization. Such as requirements planning, manufacturing, human resources, etc.

**ISY 3540 Computers and Information Technology**  
*Three credit-hours*  
*Pre-requisites: NONE*

Provides students with a conceptual foundation in the areas of computer architecture, operating systems, programming, and telecommunications. Intended to serve as a facilitating course to allow the students to communicate effectively with technical members of the IT community.

**ISY 3550 Data Communications and Networks I**  
*Three credit-hours*  
*Pre-requisites: COM 3010*

A study of topics in teleprocessing. Analysis of data transmission, channels, computer equipment configuration, security of teleprocessing systems. Teleconferencing, electronic mail, electronic fund transfer, integration of teleprocessing and automation, internet, electronic commerce and EDS concepts.

**ISY 4510 Systems Analysis and Design**  
*Three credit-hours*  
*Pre-requisites: ISY 3510*

This course introduces the student to the basic system analysis tools and the procedures to conduct a systems analysis. Topics covered include: initial analysis, logical design, and proposal preparation. Students gain experience through projects and/or case studies.

**ISY 4520 Computer Security and Audit**  
*Three credit-hours*  
*Pre-requisites: ISY 3510*

This course is an introduction to systems auditing with emphasis on identification and correction of deficiencies, audit controls, and security. Topics include: audit techniques, security measures, and data security during transmission.

**ISY 4530 Local Area Network Systems**  
*Three credit-hours*  
*Pre-requisites: ISY 3550*

This course examines LAN technology, the use of data, text, voice and image technology across a network, and
the impact of automation in the enterprise. Students learn how to install, run, maintain, and manage a LAN.

**LIT 2411 Literature and Culture Issues**  
**Three credit-hours**  
**Pre-requisites:** NONE  
In this course the student will delve into the basics of literature. The creation of imaginative literature will be reviewed as well as the aesthetic value. Consideration will be given to techniques and theories with the focus on practical criticism. Several genres and literary periods will be studied.

**MAC 1105 College Algebra**  
**Three credit-hours**  
**Pre-requisites:** MAT 0050 or Equivalent: Placement Test by Admission Office  
A detailed introduction to the fundamental concepts of algebra. Topics include linear and quadratic equations, graphing, functions, inequalities, rational expressions, radicals, and system of equations. The course emphasizes critical thinking and problem solving skills.

**MAC 1147 Pre-Calculus Algebra and Trigonometry**  
**Three credit-hours**  
**Pre-requisites:** MAC 1105 or equivalent  
This covers topics in Algebra and Trigonometry including linear and quadratic equations, solutions of triangles and complex numbers, rational expressions, functions, and radian measure. Prerequisite: MAC 1105. (3 credits)

**MAR 1011 Principles of Marketing**  
**Three credit-hours**  
**Pre-requisites:** NONE  
This course deals with the distribution of goods from producer to consumer and covers such topics as market research and analysis, buying and selling, product design, pricing, promotion, transportation, competition, and the responsibilities of the marketing manager.

**MARK 3410 Sales and Retail Management**  
**Three credit-hours**  
**Pre-requisites:** MAR 1011  
This course presents problems in hiring and supervising sales people. It focuses on prospective evaluation methods of sales people, budget and control of sales. Study of incentive plans to stimulate sales. Study of sales and retail functions for a business. Considerations of problems that may arise in sales and retail for small and large organizations, operation control, design of facilities and new strategies developed in the retail business.

**MARK 3430 Product Management**  
**Three credit-hours**  
**Pre-requisites:** MAR 1011  
This course focuses on the study of techniques and practices used in creating, developing and implementing new products in the market. The product life cycle and marketing strategies that can be used in each stage is analyzed. Case study of real products and projections of future products.

**MARK 3450 Advertising**  
**Three credit-hours**  
**Pre-requisites:** MAR 1011  
This course teaches existing techniques and skills used in advertising. It focuses in the more effective way to develop an advertising plan to reach the objectives. It shows how advertising is applied to products, service, manufacturers or retail business and profit and non-profit organizations. It analyzes the advertising media and new techniques in Internet.

**MARK 3460 Public Relations**  
**Three credit-hours**  
**Pre-requisites:** MAR 1011  
This course studies public affairs as a professional activity for business promotion in terms of the different groups that can influence a business. It focuses on the techniques and skills for the evaluation of advertising outcomes, public image and relations with communication media. How to maintain a good image before the consumers and how to conceptualize the business and its products in terms of quality and service.

**MARK 4410 Marketing Research**  
**Three credit-hours**  
**Pre-requisites:** MAR 1011, STA 2010, CGS 1100  
Study the research activity in the marketing field, data collection analysis and methods. Emphasize marketing quantitative techniques, computers role in marketing research, control and evaluation of the marketing function.

**MARK 4470 Marketing Project**  
**Three credit-hours**  
**Pre-requisites:** Academic Department Authorization  
The Marketing Project course is oriented to integrate the knowledge and skills that student obtain in marketing area. The student will be using his presentation, research, creative and organization skills. The marketing project must be assigned by the professor in two principal aspects: First, make a research project creating a marketing plan for a professor theme. Second, the student can work in a company in marketing area (not sales). A written paper is required.

**MAT 3400 Discrete Mathematics**  
**Three credit-hours**  
**Pre-requisites:** MAT 2000  
Includes the study of functions of several variables, partial derivatives, multiple integrals and their applications, vector analysis and surface integrals. Stoke’s, Green’s, and Gauss’s Theorems; convergence and divergence of sequences and series.

**MAT 5000 Advanced Topics in Mathematics**  
**Three credit-hours**  
**Pre-requisites:** MAT 3100
This course covers different topics of mathematics such as algorithms, graphs, path and circuits, applications of path and circuits, trees, applications, of derivatives, integrations of functions with Matlab (multiple integrals, Romberg integration, and adaptive quadrature), series and Fourier series.

**MATH 0102 Preparatory Mathematics**  
**Three credit-hours**  
**Prerequisites:** Placement Test by Admission Office  
Study of basic operations on natural, whole integers, rationals, irrational numbers. Includes also fundamental properties of arithmetic, percent, ratio and elements of algebra; polynomial-basic operations; algebraic fractions; exponents and radicals and applications. A grade of “C” or better must be earned for placement in the next course.

**MATH 0110 Algebra**  
**Three credit-hours**  
**Prerequisites:** MATH 0102 or Equivalent: Placement Test by Admission Office  
This course includes the study of linear and nonlinear inequalities in one variable, inequalities and equations with absolute value; linear and quadratic equations, functions with applications, and relations and functions with its graphs. Includes also the study of algebra of functions, special functions, operations with functions, and inverse functions. A grade of “C” or better must be earned for placement in the next course.

**MATH 1330 Pre-calculus I**  
**Three credit-hours**  
**Prerequisites:** MATH 0110 or equivalent; Placement Test by Admission Office  
Relations and functions; curve sketching, rational function, polynomial function, synthetic division, remainder and factor theorems, zeros of polynomials, graphs, trigonometric function and graphs, sine and cosine laws, solutions of right and oblique triangle, identities and trigonometric equations, and inverse function.

**MATH 1340 Pre-calculus II**  
**Three credit-hours**  
**Prerequisites:** MATH 1330 or equivalent; Placement Test by Admission Office.  
**Course Description:** This course includes the study of trigonometry and its applications, complex numbers operations and De Moivre’s Theorem, matrix and linear algebra, study of system of linear equations, determinants and Cramer Rule, vectors, analytic geometry and conic sections, exponential and logarithmic functions and its applications

**MATH 1350 Calculus I**  
**Four credit-hours**  
**Prerequisite:** MATH 1340 or equivalent  
This course will acquaint the student with the concepts of limits and their properties, the derivative and its applications; finding derivatives by means of rules; chain rule, higher order derivatives; maxima and minima; related rates of changes; curve sketching using derivatives, definite and indefinite integral; area under a curve, differentiation and integration of logarithmic, exponential and other transcendental functions; Inverse trigonometric functions, hyperbolic functions: differentiation and integration; area between curves, volumes of solids of revolutions; arc length, surfaces of revolution; moments, centers of mass and centroids.

**MATH 1360 Calculus II**  
**Four credit-hours**  
**Prerequisite:** MATH 1350  
This course will acquaint the student with the concepts of limits and their properties, the derivative and its applications; finding derivatives by means of rules; chain rule, higher order derivatives; maxima and minima; related rates of changes; curve sketching using derivatives, definite and indefinite integral; area under a curve, differentiation and integration of logarithmic, exponential and other transcendental functions; Inverse trigonometric functions, hyperbolic functions: differentiation and integration; area between curves, volumes of solids of revolutions; arc length, surfaces of revolution; moments, centers of mass and centroids.

**MATH 1370 Calculus III**  
**Four credit-hours**  
**Prerequisite:** MATH 1360  
This course will acquaint the student with the concepts of: vectors-valued functions: differentiation and integration, velocity and acceleration, tangent and normal vectors, arc length and curvature. Includes the study of function of several variables: limit, continuity, partial derivatives and their applications, LaGrange multipliers; multiple integrals and their applications, change of variables: polar coordinates, cylindrical and spherical coordinates, vector fields, line integrals, conservative vector fields, Stokes’s, Green’s and Gauss’s Theorems.

**MATH 2350 Differential Equations**  
**Three credit-hours**  
**Prerequisites:** Math 1360  
The course includes the study of ordinary differential equations of first and second order; higher order equations; the fundamental existence theorem; modeling and its applications, and Laplace transforms. It emphasizes concepts of fundamental solution sets, linear independence and superposition principle along with solution methods and their applications in the fields of mechanical vibrations, and electrical networks.

**ME 1210 Computer Aided Drafting and Design-CADD**  
**Three credit-hours**  
**Pre-requisite:** None  
Introduction to Computer Aided Drafting and Design. Engineering design process: drafting, solid modeling, dimensioning, and tolerances. Graphics communication
in mechanical engineering. 2D and 3D construction, visualization, sketching and standard lettering techniques using freehand tools and CADD. Orthographic Projections. Multi-view drawings for engineering design and production. Basic Dimensioning and Tolerancing.

**ME 1211 Conventional Manufacturing Laboratory**  
One credit hour  
Pre-requisite: ME 1210  
Hands on experiences on a variety of techniques and processes for conventional manufacturing of engineering components including, operation of machine tools and welding machines. Prototypes are designed and manufactured by teams under the guidance of the instructor.

**ME 2010 Computer Programming for ME**  
Three credit-hours  
Pre-requisite: MATH 1340  
This course will introduce the student to computer programming using Matlab and Visual C. Students will develop programs using basic program constructions in both programming languages and will be also able to add built in functions to create nontrivial programs. Weekly programming assignments will be furnished.

**ME 2020 Applied Numerical Analysis**  
Three credit-hours  
Pre-requisite: ME 2010  
Co-requisites: MATH 2350  

**ME 2210 Mechanic Design**  
Three credit-hours  
Pre-requisite: ENGI 2410, ME 2020, ME 1211  

**ME 2220 Engineering Materials**  
Three credit-hours  
Pre-requisite: SCIE 1210, SCIE 1211  
Co-requisite: ENGI 2110  

**ME 2211 Engineering Materials Laboratory**  
One credit hour  
Pre-requisite: ME 2210, ENGI 2270  
Hand on experience in materials characterization: tension test, hardness, micro hardness and metallography, phase transformation and heat treatment of metals. Emphasis on errors and statistical analysis and team work. Oral and written reports are required.

**ME 2230 Solid Mechanics I**  
Three credit-hours  
Pre-requisites: ENGI 2110, ME 2020, ME 2210  

**ME 3011 Engineering Measurements Laboratory**  
One credit hour  
Pre-requisite: ME 3110, EE  
Hand on experience in instrumentation, data acquisition, and calibration in fluid and thermal systems, heat transfer, and materials. Emphasis on errors and statistical analysis and team work. Oral and written reports are required.

**ME 3030 System Dynamics and Controls**  
Three credit-hours  
Pre-requisite: ENGI 2420, EE 3000  
Mathematical modeling of mechanical, electrical, thermal and fluid systems. Linear system analysis. Stability.

**ME 3040 Mechatronic**  
Three credit-hours  
Pre-requisite: ME 3030, ME  
Automation and digital control of industrial systems. Electrical, electronic, hydraulic and pneumatic control systems. Topics in this course include design of control circuits and analysis of the response of several mechanical systems to external conditions. Emphasis is placed on automation and applications of these topics to real-world situations. It is assumed that the students have a background in linear passive circuit theory, which includes the use of the Kirchhoff's laws in DC and AC circuits.

**ME 3110 Thermodynamics I**  
Three credit-hours  
Pre-requisite: ENGI 2420  

**ME 3120 Thermodynamics II**  
Three credit-hours  
Pre-requisite: ME 3110, and ME 2020
ReACTING MIXTURES AND COMBUSTION; VAPOR AND GAS POWER SYSTEMS; REFRIGERATION AND HEAT PUMP SYSTEMS.

**ME 3140 INTERMEDIATE FLUID MECHANICS**

*Three credit-hours*

**Pre-requisite:** ENGI 2420, ME 2020

**Co-requisite:** ENGI 2421


**ME 3150 HEAT TRANSFER I**

*Three credit-hours*

**Pre-requisite:** ME 3110, ME


**ME 3160 HEAT TRANSFER II**

*Three credit-hours*

**Pre-requisite:** ME 3150, ENGI 2421


**ME 3230 SOLID MECHANICS II**

*Three credit-hours*

**Pre-requisite:** ME 2230

Pressure vessels and combined loadings. Stress/strain transformations. Theories of failure for static load conditions. Statically indeterminate beams. Buckling of columns. Introduction to energy methods.

**ME 3240 DESIGN OF MACHINE ELEMENTS I**

*Three credit-hours*

**Pre-requisite:** ME 3230


**ME 3250 DESIGN OF MACHINE ELEMENTS II**

*Three credit-hours*

**Pre-requisite:** ME 3240, ME 2220

Design of machine elements: Spur, helical, bevel, and worm gears; shafts, clutches and brakes, belts, chains, hydrodynamic drives. Static and dynamic loading conditions, application of failure theories, selection of flexible power transmission elements.

**ME 3260 MANUFACTURING ENGINEERING**

*Three credit-hours*

**Pre-requisite:** ME 3230


**ME 4011 MECHATRONICS LABORATORY**

*One credit hour*

**Pre-requisite:** ME 3040

Hands on experience in automation and electrical, electronic, hydraulic, and pneumatic control systems. Topics in this course include selection and implementation of actuators (mechanical, pneumatics and hydraulics). Electronic data acquisition cards and Programmable Logic Controllers (PLC’s) and Microcontrollers based systems are used as input and output interfaces to personal computers. Emphasis is placed on the applications of these topics to real-world situations.

**ME 4110 DESIGN OF THERMAL SYSTEMS**

*Three credit-hours*

**Pre-requisite:** ME 3160, ME 3120, ENGI 2260

Integrated concepts to analyze, simulate, and design energy systems. System economics, and design optimization are covered. A design project is required.

**ME 4111 THERMAL ENGINEERING LABORATORY**

*One credit hour*

**Pre-requisite:** ME 3011, ME

Experimental analysis of fluid and thermal systems such as heat exchanger, steam generators, cooling towers, refrigeration and air conditioning systems, wind tunnel, compressible fluid flow and turbo machinery. Oral and written reports are required.

**ME 4251 MODELING AND PRODUCTION REALIZATION LABORATORY**

*Three credit-hours*

**Pre-requisites:** ME 3260, ME 2220

The use of computer software and numerical controlled equipment for modeling and developing products. Models are tested to predict mechanical failures, minimize prototype cost by optimization, use of rapid prototyping equipment, and use reverse engineering techniques.

**ME 4992/94 MECHANICAL ENGINEERING CAPSTONE**

*Design I and II*

*Three credit-hours*

**Pre-requisites:** ME 3040, ME 3250

**Co-requisites:** ME 4110, ME 4011

Teams perform a systematic design process to solve a multidisciplinary mechanical engineering problem. Weekly written and oral reports are required.

**MGMT 3210 CONSTRUCTION MANAGEMENT**

*Three credit-hours*

**Pre-requisites:** MGT 2021

This course discusses the concepts of Construction Management with emphasis in the contractor enterprise organization includes the operation and administration of a construction company, trade of services, costs control, and the project organization. It also addresses the basic concepts of economy used in the construction projects organization.
MGMT 3220 Construction Contracts and Legal Documents
Three credit-hours
Pre-requisites: MGT 3650
Study of construction contracts and legal documents, specifically: definitions, interpretation and utilization of drawings, specifications agreements, bidding forms, bidding forms, general conditions, bonds, subcontracts and related documents. Cover the impact of the legal systems on corporate strategy, managerial decisions and planning processes; consumer, contract, commercial and secured financing laws. Also, discuss employer liability to PROSHO/OSHA, regulation aspects of the construction industry.

MGMT 3230 Construction Materials and Methods
Three credit-hours
Pre-requisites: MAC 1105 & MGMT 3210
Introduction to the materials and methods of building construction drawings. Discussion the foundation, structural framing, floor, roof and wall systems, mechanical, electrical and communication installations. Field Trip.

MGMT 3240 Construction Estimates and Costs
Three credit-hours
Pre-requisites: FIN 2000 & MGMT 3210
The course presents the necessary concepts to prepare a construction cost estimate. It exposes the student to different elements of direct and indirect costs that are considered conceptual or detailed cost estimates.

MGMT 4210 Project Planning and Control (PERT)
Three credit-hours
Pre-requisites: MGMT 3210
Study the Network planning techniques for project management and resource allocation. Emphasis on PERT, CPM, heuristic models for multi-project, and scheduling. The use of computer software for project planning will be covered. Management techniques of construction are discussed in relation to alternative means of project execution. Organizational structures, management systems and controls are examined from the point of view of owners, constructors and managers.

MGMT 4270 Construction Management Project
Three credit-hours
Pre-requisites: Academic Dept. Authorization
Study the stages of a construction project form the development and planning, to estimating cost, construction, project control and final stage. Students must apply real world construction projects to different techniques and models learned. The work performed by the students will be supervised by instructors from the Business Administration Program. A written paper is required.

MGMT 4660 Entrepreneurship
Three credit hours
Pre-requisite: NONE
This course teaches the process of establishing and managing a business enterprise. The student will learn to identify and develop the necessary skills to become an entrepreneur as well as laws, and social and economic factor related to business establishment. Also, the student will analyze the conflicts and problems faced by an entrepreneur in his/her way to success.

MGMT 2021 Principles of Management
Three credit-hours
Pre-requisites: NONE
This course analyzes the major functions of management including planning, staffing, directing, and controlling. Emphasis is placed on learning how to manage organizations. Topics include goal setting, strategic planning, decision making, and organizational structure.

MGMT 3110 Managerial Accounting
Three credit hours
Pre-requisites: ACC 2011
Focuses on the compilation, use and analysis of financial accounting as tools for management decision process, the role of the accounting manager in the enterprise, and the interpretation of financial systems; the use of costs as a tool for planning and controlling the activities of manufacturing and distributing merchandise as well as directing service enterprises. Emphasis on quantitative aspects of budgets, cost per unit, break-even point and decision process techniques.

MGMT 3120 Critical Thinking for Managers
Three credit-hours
Pre-requisites: NONE
Principles, procedures, and practices of good communication and their relationship to management supervision are discussed. Oral and written communication skills as well as critical thinking skills and time management planning are emphasized.

MGMT 3210 Managing Diversity in the Workplace
Three credit-hours
Pre-requisites: NONE
The course gives recognition to cultural diversity and strategies associated with workplace management. Concepts, delivery strategies, and values associated with cultural diversity are examined.

MGMT 3220 Leadership in Organizations
Three credit-hours
Pre-requisites: NONE
This course examines the skills for understanding and leading individuals and groups in attaining both personal and organizations objectives are developed. The basic concepts of motivation, control changed, team building, and developing effective relationships in diverse work environments are examined. Proactive leadership devices such as organizational development, decision-making, and influence techniques are presented.
MGT 3610 Human Resources Management
Three credit-hours
Pre-requisites: NONE
A framework for the study, understanding, and application of human resources management in an organization. It includes topics such as EEO, and global human resource management. Job analysis, recruitment, performance evaluation, compensation, employee benefits and safety are also included.

MGT 3620 Organizational Behavior
Three credit-hours
Pre-requisites: NONE
This course focuses on the importance of understanding behavior in organizational settings and applying scientific methods to the resolution of managerial problems and the improvement of the organization.

MGT 3630 Organizational Development
Three credit-hours
Pre-requisites: NONE
The course studies organizational change, processes, decision making styles, organizational effectiveness, efficiency, and productivity. It emphasizes the use of innovative models of intervention theories, corporate evolution, and organizational cultural change. The course focuses in the development of a new philosophy of doing business.

MGT 3640 Organizational Communications
Three credit-hours
Pre-requisites: NONE
The role of communication in the effective management of formal organizations is studied. Contemporary communication theory as well as a set of strategies and methods helpful in analyzing an organization’s ability is examined.

MGT 3650 Business Law and Ethics
Three credit-hours
Pre-requisites: NONE
Current topics in the area of law, regulatory controls, and ethical issues and their effect on decision making are examined. Attention is given to developing critical thinking skills to make humane and informed choices in resolving managerial dilemmas which pose ethical or legal problems.

MGT 4020 Project Management
Three credit-hours
Pre-requisites: NONE
The course examines the formal and informal functions of organizations and diagnose an agency or organization based on a systems model. Student will analyze and solve problems using systematic approaches associated with project management.

MGT 4030 Financial Management
Three credit-hours
Pre-requisites: ACC 2011 (BBA), FIN 2000 (BSOM)
Utilization of accounting and financial data as a managerial decision tool is discussed. Students will explore methods of measuring the financial strength and stability of organizations through financial statements, ratios, and current market data.

MGT 4130 Managing Change
Three credit-hours
Pre-requisites: NONE
This course examines concepts and strategies for managing change in the business environment. Processes, procedures, and skills for managing change are also discussed.

MGT 4230 Marketing Management
Three credit-hours
Pre-requisites: NONE
Management of the marketing function of firms. Fundamental procedures for decision-making in areas such as promotion, product research, channel selection, and pricing.

MGT 4410 Quality Assurance
Three credit-hours
Pre-requisites: NONE
The modern management principles of the quality movement are presented. The history of total quality management, process management, and implementation of quality assurance programs in organizations are examined.

MGT 4570 Management Information Systems Practice
Three credit-hours
Pre-requisites: Senior Standing
This course is designed to provide the student with practical and real life experiences in the field. A written report reflecting the course experiences will be prepared by the student.

MGT 4610 Total Quality Management
Three credit-hours
Pre-requisites: STA 2010
The course presents the different elements in the total quality control management function. It focuses upon the foundations of quality control and their industrial applications. Statistical principles will be used as a basic tool in decision making related to the variables that need to be controlled.

MGT 4620 Strategic Management
Three credit-hours
Pre-requisites: NONE
This course studies contemporary models geared toward development of strategies, planning, and control of organizations. It focuses on strategic management and business policy as well as the decision making process to develop competitive organizations.

MGT 4630 International Business
Three credit-hours
Pre-requisites: NONE
This course examines the aspects and activities of international business and offers insight into the importance of world trade among multinational organizations. The diversity among international markets is also examined.

MGT 4670 Management Practices
Three credit-hours
Pre-requisites: Senior Standing
This course is designed to provide the student with practical and real life experiences in the field. A written report reflecting the course experiences will be prepared by the student.

MSE 1999 Selected Topics in Mathematics or Sciences
Three credit-hours
Pre-requisites: NONE
In-depth, intensive study of selected topics in the areas of Mathematics or Sciences. If different topics are studied, this course may be taken twice for credit.

MUL 1010 Music Appreciation
Three credit-hours
Pre-requisites: NONE
A chronological survey of music from pre-history to modern day. Students will discover music as an important social force throughout history.

PSY 2012 Introduction to Psychology
Three credit-hours
Pre-requisites: NONE
This course is designed to be an overview of the field of psychology. It provides a basic understanding of human behavior.

PSC 1121 Physical Science
Three credit-hours
Pre-requisites: NONE
A general study of the common phenomena, concepts and principles selected from astronomy, physics and chemistry.

SCI 0110 Introduction to Physics
Three credit-hours
Pre-requisites: NONE
Introduction to Physical Sciences with classroom demonstrations. Includes the following: general guidelines about history and development of scientific thought and method, measurements and conversion of units and some useful fundamental mathematics for physics, basic concepts in mechanics; motion description in one and two dimensions. A grade of "C" or better must be earned for placement in the next course.

SCI 1210 Introduction to General Chemistry
Four credit-hours
Pre-requisite: MATH 1340 or equivalent
This course emphasizes in: Principles of chemistry, principles of stoichiometry, solutions, thermo chemistry, atomic and molecular structure, and gases.

SCIE 1211 Introduction to General Chemistry Lab
Zero credit hour
Pre-requisite: MATH 1340 or equivalent
This course is designed to provide the beginning chemistry student exposure to the basic techniques of laboratory work and the practical experience necessary to better the general information presented in the text and lecture.

SCIE 1430 Physics I
Four credit-hours
Pre-requisite: MATH 1340 or equivalent
This course will emphasize the principles and applications of basic mechanics, simple harmonic motion, waves, sound, and fluids dynamics. Calculus is emphasized throughout the course.

SCIE 1431 Physics I Lab
One credit hour
Pre-requisite: Math 1340 or equivalent
Co-requisites: SCIE 1430
Three-hour laboratory period per week. The first of a sequence of two laboratory courses. The experiences of this laboratory are designed to complement the Physics I.

SCIE 1440 Physics II
Four credit-hours
Pre-requisite: SCIE 1430, SCIE 1431, MATH 1350
This course will emphasize the principles and applications of general thermodynamics, electricity and magnetism Calculus is emphasized throughout the course.

SCIE 1441 Physics II Lab
One credit hour
Pre-requisite: SCIE 1430, SCIE 1431
Three-hour laboratory period per week. The second of a sequence of two laboratory courses. The experiences of this laboratory are designed to complement the Physics II.

SSE 1999 Selected Topics in the Social Sciences
Three credit-hours
Pre-requisites: NONE
In-depth, intensive study of selected topics in the area of Social Sciences. If different topics are studied, this course may be taken twice for credit.

SYG 2000 Introduction to Sociology
Three credit-hours
Pre-requisites: NONE
An overview of society with emphasis on the relationships between human culture and the individual.
It looks at cultural norms, the organization of society, human behavior in groups, social institutions, and the implications of social change.

**SPC 1026 Fundamentals of Speech Communications**  
**Three credit-hours**  
**Pre-requisites:** ENC 1101  
This course reviews the oral communication skills necessary for success in the student’s personal, professional and educational settings. The student will develop appropriate communication behaviors.

**SPN 1120 Elementary Spanish I**  
**Three credit-hours**  
**Pre-requisites:** NONE  
A course designed for beginners to acquire proficiency in the basic skills of Spanish listening/understanding, speaking, reading, and writing. Emphasis is placed on vocabulary and pronunciations.

**SPN 1121 Elementary Spanish II**  
**Three credit-hours**  
**Pre-requisites:** SPN 1120  
A continuation of Elementary Spanish I, this course is designed to take the beginning Spanish speaking learner to the next level. Continued emphasis is placed on listening/understanding, speaking, reading, and writing.

**SSE 1999 Selected Topics in Social Sciences**  
**Three credit-hours**  
**Pre-requisites:** NONE  
In-depth, intensive study of selected topics in the area of Social Sciences. If different topics are studied, this course may be taken twice for credit.

**STA 2010 Probability and Statistics**  
**Three credit-hours**  
**Pre-requisites:** MAC 1105  
Introduction to the fundamentals of descriptive and inferential statistics; procedures for the collection organization and analysis of data; frequency distributions, graphing techniques, measures of central tendency, measures of dispersion, standard deviation and probability distributions.

**SURV 2095 Principles of Surveying for Engineers Laboratory**  
**One credit-hour**  
**Prerequisites:** CEE 2110, CEE 2210  
**Co-requisites:**  
Through conferences and field practice, the student will be exposed to the basic Surveying concepts applicable for route design and construction.

**WOH 2012 World Civilization I**  
**Three credit-hours**  
**Pre-requisites:** NONE  
A survey course emphasizing world civilizations from the prehistoric period to the 18th century. Discussion traces events which have shaped our cultural history.
IX. GRADUATE PROGRAMS

POLYTECHNIC UNIVERSITY OF PR
YOUR DOOR FOR THE FUTURE

GRADUATE SCHOOL
The Graduate School at Polytechnic University of Puerto Rico - Orlando Campus provides a solid foundation in business concepts and technological perspective to those students who aim to receive a Master Degree. The graduate program contributes to the intellectual and professional formation of students through the development of critical and analytical thinking skills, enabling students to relate to the reality of the entrepreneurial world and the convergence of technology and management. The program is designed to create awareness of the social responsibility of management within the global economic system and the importance of effective communication. It encourages creative leadership, and flexibility to adapt to rapid change. Polytechnic University of Puerto Rico - Orlando Campus offers a Master of Business Administration degree and a Master in Engineering Management degree as part of the Graduate Program.

ADMISION
Any students applying for the graduate at PUPR-Orlando must follow the admission process, on the ADMISION PROCEDURE Section II page 6.

CAREER OPPORTUNITIES
Graduates from this program are highly regarded and sought by the manufacturing, hospitality, health, production and construction industries, as well as the Government and service sector of the economy. The program prepares students to assume managerial responsibilities in today’s technological environment.

MISSION
The Graduate School of Polytechnic University of Puerto Rico - Orlando Campus provides opportunities for individuals from diverse backgrounds to enhance their potential for leadership, productivity and competitiveness with a sense of social responsibility toward their communities, through exposure to intellectual, humanistic and technological advancement, in the business administration field.

PROGRAM EDUCATIONAL OBJECTIVES
The educational objectives of the Graduate School are:
- Develop technically educated individuals that can effectively function as business administrators or entrepreneurs in their communities.
- Develop graduates with a well-developed social conscience.
- Develop graduates that contribute to the advancement of the body of knowledge in all areas of business administration.

DEGREE OFFERED
The Graduate School offers graduate instruction leading to the degree of Master of Business Administration (MBA) with six (6) areas of specialization: Management of Technology, Management of International Enterprises, General Management Studies, Accounting, Finance, and Human Resources. Polytechnic University of Puerto Rico - Orlando Campus also offers graduate instruction leading to the degree of Master of Engineering Management (MEM) with four (4) areas of specialization: Construction Management, Manufacturing Management, Environmental Management, and General Engineering Management.

PREPARATORY COURSES
The MBA and MEM programs are designed to allow the participation of students with diverse educational backgrounds. Students registering for the MBA or MEM program are encouraged to meet certain preparatory courses before entering the core courses. Listed below are suggested preparatory courses: Financial Accounting, Business Finance, Introduction to Marketing, Micro Economics, and Macro Economics.

MINIMUM REQUIREMENTS
The MBA degree requires a minimum of 39 credit hours of graduate course work with a minimum grade point average of 3.0 on a 4.0 system. No thesis or comprehensive exams are required.

The MEM degree requires a minimum of 39 credit hours of graduate course work with a minimum grade point average of 3.0 on a 4.0 system. No thesis or comprehensive exams are required.

Polytechnic University of Puerto Rico - Orlando Campus will accept transfer of graduate credits from regionally accredited institutions. The maximum amount of acceptable transfer credits, per program, is up to 18 credit hours. Transfer of credits can be considered only for courses completed with a grade of “B” or better prior to admission to the University. These credits must have been earned within ten years before the date of admission to the specific degree program. No credits will be considered for courses completed elsewhere after admission to the University.

ACADEMIC LOAD
The minimum full-time load per term is six (6) for graduate students. To register for nine (9) credit hours or more, the student must acquire the approval of the Department Director.

MASTER IN BUSINESS ADMINISTRATION
The Master of Business Administration (MBA) degree is one of the most sought after degrees in the world because of its value to people in business and administration. The MBA degree has been designed to provide the student with a personalized education that fits his/her background, experience, and goals, and that challenges to reach fullest potential. It provides students from diverse academic backgrounds a solid foundation in business concepts and a broad management perspective for today’s global business environment. Emphasis is placed on teaching students to fully utilize today’s rapidly advancing technology to more quickly and effectively attain the organization’s goals and objectives.

PROGRAM PHILOSOPHY AND OBJECTIVES
Organizations today demand multitalented knowledgeable professionals who can contribute and succeed in a team/project management environment. The MBA Program has been carefully crafted to train professionals through the study of management theory and practical problems solving. It focuses on developing versatility through critical thinking, intellectual flexibility, analytical and applied research skills, creativity, and high standards for professional integrity and ethics. Globalization issues of management are instilled into many of the Program courses. Teamwork is an essential component of organizational dynamics, and it is stressed through team projects that encourage face-to-face meetings as well as synchronous and asynchronous on-line meetings. To implement our Philosophy and vision, the MBA Program has established the following goals:

- To help students transform themselves into knowledgeable managers that understand business dynamics at all levels.
- Present the interrelatedness of the functional areas of business, and be able to integrate them in the performance of business decisions and in solving complex business issues.
- Dispense relevant curriculum that combines academic theory with practical problem-solving skills.
- Provide the fundamental concepts and principles that underlie the operation of business enterprises as well as offer a comprehensive set of more specialized courses to allow students to tailor their education to their specific needs and career goals.
- Develop students with the ability and insight to apply cross-functional approaches.

CAREER OPPORTUNITIES
Because of their ability to analyze problems, address unstructured business challenges, and generate alternatives for a given situation, MBA graduates are among the most sought by companies throughout the world. There are many opportunities in the private sector as well as in the public or not-for-profit sectors, which offer extensive employment opportunities. Success will depend
ultimately on self-awareness, research and preparation. The Master of Business Administration degree has been so popularized over the last decades that many employers now consider it a prerequisite for entry into several career fields, and a must for growth consideration. It is a requisite in many companies for certain positions, just as the bachelor’s degree was a few decades ago.

The student must complete the following minimum requirements to earn the Master in Business Administration Degree.

### 1. CORE COURSES (18)

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
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<tbody>
<tr>
<td>MGM 5500</td>
<td>Managerial Accounting</td>
<td>3</td>
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<tr>
<td>MGM 5700</td>
<td>Probability and Statistical Methods</td>
<td>3</td>
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<td>MGM 6070</td>
<td>Managing Human Resources</td>
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<td>MGM 6560</td>
<td>Management of Information Systems</td>
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<td>MGM 6620</td>
<td>Managerial Finance</td>
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<tr>
<td>MGM 6690</td>
<td>Decision Making Techniques</td>
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### 2. BUSINESS COURSES (12)

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<tr>
<td>MBA 5600</td>
<td>Managerial Economics</td>
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<td>MBA 5700</td>
<td>Managerial Marketing</td>
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<td>MBA 6830</td>
<td>Operations Management</td>
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<td>MBA 6900</td>
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### 3. TRACKS

#### a. MANAGEMENT OF INTERNATIONAL ENTERPRISES

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<td>MIE 7010</td>
<td>International Business</td>
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<td>MIE 7020</td>
<td>International Business</td>
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<td>MIE 7110</td>
<td>International Finances</td>
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#### b. MANAGEMENT OF TECHNOLOGY

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<td>MMT 6010</td>
<td>Management of Technology I</td>
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<td>MMT 6020</td>
<td>Management of Technology II</td>
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<td>MMT 6030</td>
<td>Technical Enterprises</td>
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#### c. ACCOUNTING

Requires ACC 3300, ACC 3340

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<td>ACC 6500</td>
<td>Accounting Information Systems</td>
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<td>ACC 6600</td>
<td>Advanced Auditing</td>
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<td>ACC 6800</td>
<td>Advanced Financial Accounting</td>
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#### d. FINANCE

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<td>FIN 6500</td>
<td>Advanced Corporate Finance</td>
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<td>MIE 7110</td>
<td>International Finance</td>
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<td>FIN 6800</td>
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#### e. HUMAN RESOURCES

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<th>COURSE NUMBER</th>
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<td>HRM 6500</td>
<td>Employee and Labor Law</td>
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<td>HRM 6600</td>
<td>Training and Development</td>
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<td>HRM 6800</td>
<td>Compensation and Benefits</td>
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</tbody>
</table>

#### f. GENERAL BUSINESS

This concentration allows the students to design their own program by selecting courses from any of the other concentrations, to match their particular interests. A total of 9 credits must be taken.

TOTAL CONCENTRATION 9

### MASTER IN ENGINEERING MANAGEMENT

The Master in Engineering Management (MEM) program prepares engineers for managing complex technological organizations in service and manufacturing industries. The program of study is multi and intra disciplinary, merging the latest development in management and technology theory and practices. The program design aims at developing the knowledge, abilities and judgment to become a successful manager and entrepreneur using best practices, techniques and paradigms of project management, supply chain operations and system thinking. Therefore, it provides a well-balanced education among management and business thinking, engineering judgment, and technological operations. The Master’s Degree in Engineering Management was authorized by the Council of Higher Education of Puerto Rico in 1992.

### PROGRAM PHILOSOPHY AND OBJECTIVES

The combination of management concepts and technical skills presented in the MEM Program allows engineers to acquire the managerial skills necessary to advance in today's technological driven organizations, in either the service or
manufacturing sector. Emphasizing the continuity of management and engineering related efforts from planning through development, operations and controlling, and stressing the application of management and system theory and techniques to increase the efficiency and effectiveness of the organization, is one key issue facing many organizations. Based on these realities the Program stresses the importance on using practices of project and program management, management information systems, organizational behavior, and system operations. It is amply confirmed that the MEM Program is well designed to develop future industry leaders by combining a core management curriculum with a master's level education. The goals of the Program are:

- To help students understand the management dimension, and advantages in technological driven organizations.
- Gain experience using management methods of a quantitative nature to design and efficiently operate today's technically involved business systems.
- Demonstrate an understanding of management and organizational theory and the principles of organized labor as they apply to the efficient and effective operation of the organization.
- Develop skills and competencies related to a broad range of management functions, allowing the student to work in fields of management, in organizations of varying size, requiring strategic planning, technical knowledge, development skills, and general operational knowledge of management.

**CAREER OPPORTUNITIES**

The complete experience is stimulating and offers outstanding career opportunities. The graduates from this program will be adequately qualified to perform effectively as managers of technological or scientific enterprises. The Program has been particularly structured to fit the needs of engineers in Puerto Rico and Latin America. Also, through its areas of emphasis, it provides an opportunity to hold leadership positions in managing business firms in Manufacturing, Public and Service Enterprises, Construction and Environmental Management.

The student must complete the following minimum requirements to earn the Master in Engineering Management Degree.

### 1. CORE COURSES (18)

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGM 5500</td>
<td>Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>MGM 5700</td>
<td>Probability and Statistical</td>
<td>3</td>
</tr>
<tr>
<td>MGM 6070</td>
<td>Managing Human Resources</td>
<td>3</td>
</tr>
<tr>
<td>MGM 6560</td>
<td>Management of Information</td>
<td>3</td>
</tr>
<tr>
<td>MGM 6620</td>
<td>Managerial Finance</td>
<td>3</td>
</tr>
<tr>
<td>MGM 6690</td>
<td>Decision Making Techniques</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
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### 2. ENGINEERING Management (12)

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
<th>CREDIT HOURS</th>
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</thead>
<tbody>
<tr>
<td>MEM 5600</td>
<td>Engineering Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MEM 6110</td>
<td>Engineering Management I</td>
<td>3</td>
</tr>
<tr>
<td>MEM 6120</td>
<td>Engineering Management II</td>
<td>3</td>
</tr>
<tr>
<td>MEM 6970</td>
<td>Engineering Management Problems</td>
<td>3</td>
</tr>
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</table>

### 3. TRACKS

#### a. Engineering Management (9)

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>MEM 6420</td>
<td>Maintenance Management</td>
<td>3</td>
</tr>
<tr>
<td>MEM 6610</td>
<td>Productivity Management</td>
<td>3</td>
</tr>
<tr>
<td>MBA 6830</td>
<td>Operations Management</td>
<td>3</td>
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<td><strong>TOTAL</strong></td>
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#### b. Manufacturing Management (9)

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
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</tr>
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<tbody>
<tr>
<td>MEM 6410</td>
<td>Construction Management</td>
<td>3</td>
</tr>
<tr>
<td>MEM 6170</td>
<td>Cost Estimating and Contracting</td>
<td>3</td>
</tr>
<tr>
<td>MEM 6820</td>
<td>Business and Construction Law</td>
<td>3</td>
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<tr>
<td><strong>TOTAL CONCENTRATION</strong></td>
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#### c. Construction Management (9)

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<tr>
<td><strong>TOTAL CONCENTRATION</strong></td>
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</table>

#### d. Environmental Management (9)

<table>
<thead>
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<th>COURSE NUMBER</th>
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<th>CREDIT HOURS</th>
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</thead>
<tbody>
<tr>
<td>EPM 6910</td>
<td>Intro. to Environmental Regulations</td>
<td>3</td>
</tr>
<tr>
<td>MEM 6920</td>
<td>Environmental Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MEM 6930</td>
<td>Energy and Environment</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL CONCENTRATION</strong></td>
<td></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>
e. GENERAL ENGINEERING MANAGEMENT (9)
This concentration allows the students to design their own program by selecting courses from any of the other concentrations, to match their particular interests. A total of 9 credits must be taken.

TOTAL CONCENTRATION 9

MBA/MEM FLOWC CHART

<table>
<thead>
<tr>
<th>MBA Track</th>
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<tbody>
<tr>
<td>(12 credit hours)</td>
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</tr>
<tr>
<td>MBA 5600 - Managerial Economics</td>
<td>MEM 5600 - Eng. Econ. Analysis</td>
</tr>
<tr>
<td>MBA 3700 - Managerial Marketing</td>
<td>MEM 6110 - Engineering Mgt. I</td>
</tr>
<tr>
<td>MBA 6820 - Operations Management</td>
<td>MEM 6120 - Engineering Mgt. II</td>
</tr>
<tr>
<td>MBA 6900 - Strategic Management</td>
<td>MEM 6910 - Engineering Mgt.</td>
</tr>
</tbody>
</table>

MBA Concentrations (9 credit hours)
One of these tracks

MEM Concentrations (9 credit hours)
One of these tracks

Mgmt. of int’l Enterprises
MIE 7010
MIE 7020
MIE 7110

Accounting
ACC 6500
ACC 6600
ACC 6800

HR Mgmt.
HRM 6500
HRM 6600
HRM 6800

Mgmt. of Technology
MTM 6010
MTM 6020
MTM 6030

Finance
FIN 6500
MIE 7110
FIN 6800

General Mgmt.
Business Elective
Business Elective
Business Elective

Total hours for MBA Program: 39 credit hours
Total hours for MEM Program: 39 credit hours

Graduate School
X. GRADUATE COURSES DESCRIPTION

**ACC 6500 Accounting Information Systems**  
*Three credit-hours*  
Pre-requisites: ACC 3330/3340, MGM 6560  
An introduction to accounting information systems (AIS) and the relationship of AIS to Management Information Systems. Includes analysis of hardware and software, system design and the systems development life cycle (SDLC) approach, database management systems (DBMS), internal control, flowcharting, data flow diagrams and their application to the accounting cycles (revenue, expenditure, conversion). Microsoft Access will be used to develop a basic system.

**ACC 6600 Advanced Auditing**  
*Three credit-hours*  
Pre-requisites: ACC 3330/3340, ACC 4320  
A study of modern auditing techniques. Includes tools and techniques of risk assessment, the audit risk model and the audit plan. The implications and auditing of information systems and technology, GAAS and PCAOB standards, ethics and the Sarbanes-Oxley requirements.

**ACC 6800 Advanced Financial Accounting**  
*Three credit-hours*  
Pre-requisites: ACC 3330/3340  
A study of theory and techniques preparing consolidated financial statements, partnerships, foreign subsidiary accounting and non-profit accounting.

**EPM 6910 Introduction to Environmental Regulations**  
*Three credit-hours*  
Pre-requisites: MEM 6110, MEM 6120  
Discusses the technical, economical, political, administrative and social forces that influence the environmental quality regulations and the use of natural resources. Review of federal and state regulations and programs to minimize air, land, and water pollution.

**FIN 6500 Advanced Corporate Finance**  
*Three credit-hours*  
Pre-requisites: MGM 6620  
This course extends the principles of corporate finance. Value of the firm, raising capital, dividend policy, mergers and acquisitions, derivative instruments and risk management will be studied.

**FIN 6800 Investments**  
*Three credit-hours*  
Pre-requisites: MGM 6620, MBA 5600 or ECO 2013  
Topics include fundamental and technical security analysis, portfolio strategy, risk/return analysis, the operation of U.S. securities markets, investment in fixed income securities, mutual funds, and international investment. Prerequisite: MGM-6620 & MBA-5600 or ECO 2013

**HRM 6500 Employee and Labor Law**  
*Three credit-hours*  
Pre-requisites: NONE  
History, structure, policies, and operations of labor unions, the functioning of industrial relations activities within organizations, and important concepts and terminology in labor management relations. Contract administration is emphasized with a focus on the day-to-day relationships.

**HRM 6600 Training and Development**  
*Three credit-hours*  
Pre-requisites: NONE  
This course offers the theoretical and applied components of training and development within all types of organizations. Principles of adult learning, identifying training needs, developing and delivering effective training programs, and evaluating training are explored.

**HRM 6800 Compensation and Benefits**  
*Three credit-hours*  
Pre-requisites: NONE  
This course will examine compensation and benefits programs and how they inter-relate with other strategic programs of the organization. Students will view these programs from both the management and the employee perspective, using both theory and practice to grow in their understanding.

**MBA 5600 Managerial Economics**  
*Three credit-hours*  
Pre-requisites: MGM 5500, MGM 6620  
Fundamentals of supply and demand, analysis of consumer behavior, analysis of production cost, main structures of the market place, brief introduction to linear programming of the economic systems, and development of economic concepts and macroeconomics.

**MBA 5700 Managerial Marketing**  
*Three credit-hours*  
Pre-requisites: NONE  
The study of the strategic processes of creating time and place utilities. It deals with how to identify customer's needs, change those needs to wants, and sustain the desire of the particular product (service or good). How this process can be applied to profit and nonprofit organizations.

**MBA 6830 Operations Management**  
*Three credit-hours*  
Pre-requisites: NONE  
This is a graduate course in manufacturing techniques. In this course the student will become familiar with the tools, techniques, and types of manufacturing processes and with production planning, scheduling, and control. Topics such as Inventory Control, Just-In-Time, TQM, and World Class Manufacturing will be discussed. Also, introduction to manufacturing systems such as factory layout, robotics, and manufacturing cells will be included.

Polytechnic University of PR-Orlando Campus Catalog 2013-2014
**MBA 6900 Strategic Management**  
*Three credit-hours*  
Pre-requisites: Completion of MBA Core Courses  
This course will be studied in the context of cases. Mergers, acquisitions, international boundaries and global perspectives on a broad range of issues are explored. The issues are addressed from the perspective of films ranging in size from small companies to multinationals.

**MEM 5600 Engineering Economic Analysis**  
*Three credit-hours*  
Pre-requisites: MGM 5500, MGM 6620  
This is a graduate course in engineering analysis emphasizing the planning and control of engineering economics, including manufacturing costs. Project cost evaluation, interest rates, continuous compounding, present worth and capitalization are included. Rate of return, replacement analysis, cash flow diagrams, decision trees, and value engineering techniques are included.

**MEM 6110 Engineering Management I**  
*Three credit-hours*  
Pre-requisites: MEM 6600  
Introduction to the elements of modern management and business practices. This course is designed to provide students with the principles used by professionally trained managers to guide the typical industrial and business enterprise.

**MEM 6120 Engineering Management II**  
*Three credit-hours*  
Pre-requisites: MEM 6110  
This course enables the students to gain an understanding of the fundamental concepts and principles of general management emphasizing their application in technological and scientific organizations. The management process is broken down into: planning, organizing, leading, and controlling.

**MEM 6170 Cost Estimation and Contracting**  
*Three credit-hours*  
Pre-requisites: MGM 5500, MGM 6620.  
This course introduces the engineer to the fundamental principles that govern public enterprises such as government departments, state and municipal government, etc. Probability and decision theory, as well as cost-effectiveness studies are introduced.

**MEM 6410 Construction Management**  
*Three credit-hours*  
Pre-requisites: MGM 5500, MGM 6620  
The management of construction is studied. The course addresses planning, scheduling, controlling, and following different activities such as cost estimation, insurance, accounting, labor relations, etc. The course is designed to help students gain a perspective of the construction industry.

**MEM 6420 Maintenance Management**  
*Three credit-hours*  
Pre-requisites: NONE  
This course is designed to help students gain a perspective regarding the maintenance of buildings, industries, and facilities management. Administrative tools and methodology specific to maintenance activities are introduced. Students learn how to manage money, equipment, materials, and personnel to carry out maintenance functions.

**MEM 6610 Productivity Management**  
*Three credit-hours*  
Pre-requisites: NONE  
This course introduces the engineer to the different approaches to Total Quality Management. Throughout the course, various techniques are discussed, such as TQM, Crosby, Juran, and Deming philosophies are discussed. The concepts of quality circles, zero defect, corrective action, Pareto analysis, and others are discussed.

**MEM 6820 Business and Construction Law**  
*Three credit-hours*  
Pre-requisites: NONE  
Concepts of business law and construction law are discussed. Zoning, codes, and construction litigation are discussed.

**MEM 6920 Environmental Engineering**  
*Three credit-hours*  
Pre-requisites: NONE  
This course introduces the student to the different methods of water purification for industrial use, waste water treatment and disposal, air pollution control, and toxic waste management and disposal.

**MEM 6930 Energy and the Environment**  
*Three credit-hours*  
Pre-requisites: NONE  
Introduction to the supply and demand of energy resources, including petroleum, natural gas, coal, nuclear power, solar, wind, and ocean energy sources. Conservation and efficient use of energy in different engineering activities are introduced.

**MEM 6970 Engineering Management Problems**  
*Three credit-hours*  
Pre-requisites: MEM 6120  
This is a project course that provides the opportunity to apply concepts and methods studied previously to the solution of problems in engineering administration. Students work individually or in small groups on a number of projects approved by the instructor.

**MIE 7010 International Business Operations**  
*Three credit-hours*  
Pre-requisites: Completion of MBA Core Requisites  
This course examines the global environment, and reasons for an organization to become global. Michael
Porter's diamond theory of international competitiveness is discussed, as well as the latest work on the theory of multinational enterprises.

**MIE 7020 International Business Strategies**  
**Three credit-hours**  
Pre-requisites: MIE 7010  
This course examines international business strategies using an integrated approach. Functional international strategies are explained in the context of actions taken by global companies in a variety of settings. Foreign exchange and multinational strategies are covered.

**MIE 7110 International Finances**  
**Three credit-hours**  
Pre-requisites: MGM 6620  
Financial concepts encountered in engineering situations are discussed. Auditing, budgeting, funding, evaluation of alternatives and control of expenses are discussed.

**MGM 5500 Managerial Accounting**  
**Three credit-hours**  
Pre-requisites: NONE  
This graduate course studies the financial and economic principles and techniques of decision making. The role of decision criteria based on generally accepted accounting principles is explained in detail. The student acquires the basic information needed by a manager to have control of the firm and achieve his objectives in an efficient manner. (3 credits)

**MGM 5700 Probability and Statistical Methods**  
**Three credit-hours**  
Pre-requisites: NONE  
The course explains various probability and statistical methods to sample, measure dispersion, skewness, and probability distributions. Testing hypothesis, analysis of variance, linear regression, correlation, multivariable analysis, and time series analysis are introduced. Case studies of quality control and engineering decisions are assigned and discussed.

**MGM 6070 Managing Human Resources**  
**Three credit-hours**  
Pre-requisites: NONE  
Principles and methodology to manage Human Resources in scientific and technical enterprises. Techniques for hiring, benefits, incentives, promotion, retention, development, etc. are discussed, emphasizing the human dimension. Techniques for handling complaints, insubordination, and violations of regulations are introduced.

**MGM 6560 Management of Information Systems**  
**Three credit-hours**  
Pre-requisites: NONE  
Information systems designed to support management in the areas of finance, manufacturing, marketing databases, and data communication are introduced.

**MGM 6620 Managerial Finance**  
**Three credit-hours**  
Pre-requisites: MGM 5500  
Financial concepts encountered in engineering situations are introduced based on the fact that they are an integral part of planning, organizing, directing, and controlling activities. The financial cycle of budgeting, accounting, controlling and auditing is discussed.

**MGM 6690 Decision Making Techniques**  
**Three credit-hours**  
Pre-requisites: MGM 5700  
This is a course where the scientific management methods for making decisions and solving administrative problems are explored. Bayesian analysis, linear programming, and analysis of alternatives are discussed. Strategic analysis, projections, forecasting, PERT, CPM, and other management techniques are introduced.

**MGM 6010 Management of Technology I**  
**Three credit-hours**  
Pre-requisites: MGM 6560  
This course examines external environmental factors essential to managing organizations involved in new technologies. Considers the adoption of technologies and innovative processes. The students develop skills in acquiring and interpreting information about the external environment to facilitate technology management.

**MGM 6020 Management of Technology II**  
**Three credit-hours**  
Pre-requisites: MMT 6010  
This course analyzes the issues associated with resource management for a technology based firm. This includes manufacturing technologies, information technologies, work force and materials.

**MMT 6030 Technical Enterprises**  
**Three credit-hours**  
Pre-requisites: NONE  
This course emphasizes the interface of technology with technical issues. Emphasis is given to the spirit of enterprise, business incubators, and the government role.
X. FACULTY

**Abdel Hassan**
ME Educational Technology, Caribbean University
BA Education, Interameric University of Puerto Rico

**Abigail Fuentes**
PhD Candidate, University of Central Florida
MS Computer Engineering, University of Puerto Rico-Mayaguez
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BS Civil Engineering, Instituto Tecnológico de Santo Domingo

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BA Education, Interameric University of Puerto Rico

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MED Counseling, University of Puerto Rico- Rio Piedras
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BBA Business Administration, Florida International University

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