

SCHOOL OF ENGINEERING			
Degree: BACHELOR OF SCIENCE		CURRICULUM	
Credits: 131		Since August 2017	
Program: MECHANICAL ENGINEERING			
<p>Description: Mechanical engineers apply physical principles in the creation of useful devices, objects and machines. They design and develop everything that you may think of as a machine: from supersonic jets, to automobiles, to bicycles to toasters. The designs are analyzed using mathematics and physical principles of motion, energy, and force to ensure that the product functions reliably. In many cases the analyses are performed using impressive and exciting state-of-the-art computer aided design (CAD) software. Mechanical engineers also strive to create designs that can be manufactured at a competitive cost. Maintenance of the product after design and fabrication is also of concern to mechanical engineers. Practically every product or service in modern life has been touched in some way by a mechanical engineer. This makes mechanical engineering one of the oldest, one of the broadest, and one of the most exciting engineering disciplines.</p>			
Course Code	Course Title	Credits	Requisites
General Education Courses			
SPAN 152	Fundamentals of Reading and Writing	3	Placement Exam
SPAN 250	Writing Techniques	3	SPAN 152
ENGL 152	Fundamentals of Reading and Writing	3	Placement Exam
ENGL 153	Advanced Communicative English	3	ENGL 152
ENGL 231	Research and Writing	3	ENGL 153
MATH 152	Pre-Calculus II	4	Placement Exam
PHSC 215	Physics for Engineering I	4	MATH 221
CHEM 203	General Chemistry I	4	MATH 151 or MATH 152
HUMA 111	Universal Culture and Civilization I	3	
SOSC 111	Individual, Community, Government and Social Responsibility I	3	
SOSC 112	Individual, Community, Government and Social Responsibility II	3	SOSC 111
FSEN 105	Introduction to Engineering	3	
MATH 221	Calculus I	4	MATH 152
MATH 222	Calculus II	4	MATH 221
MATH 223	Calculus III	4	MATH 222
MATH 395	Differential Equations	3	MATH 222
PHSC 216	Physics for Engineering II	4	PHSC 215
Core Courses			
ENGI 122	Introduction to Computer Programming	3	MATH 152
ENGI 160	Engineering Graphics	3	MATH 152
ENGI 277	General Statics and Dynamics	3	PHSC 215
ENGI 280	Data Analysis	3	MATH 221
ENGI 478	Fundamentals of Engineering	3	ENGI 280/MEEN 420 or next-to-last semester status
ELEN 301	Electrical Networks I	3	PHSC 216
ELEN 302	Electrical Networks I Laboratory	1	[ELEN 301] Co-req.
Concentration Courses			
ENGI 244	Engineering Materials	3	CHEM 203 / PHSC 215
ENGI 305	Fluid Mechanics	3	ENGI 277/MATH 395
ENGI 318	Strength of Materials	3	ENGI 277
ENGI 319	Materials Testing Laboratory	1	ENGI 244 / ENGI 318
ENGI 333	Machine Shop Laboratory	1	ENGI 160/ENGI 244 /ENGI 318
MEEN 312	Kinematics of Mechanisms	3	ENGI 277
MEEN 320	Thermodynamics I	3	CHEM 203/ PHSC 216
MEEN 340	Computer Aided Design	3	ENGI 160/MATH 221
ENGI 406	Fluid Mechanics Laboratory	1	ENGI 305/MEEN 418

Course Code	Course Title	Credits	Requisites
MEEN 418	Experimental Methods	1	PHSC 216 / ENGI 122
MEEN 420	Heat Transfer	3	ENGI 305 / MEEN 320
MEEN 421	Thermodynamics II	3	ENGI 305 / MEEN 320
MEEN 425	Design of Machine Elements	3	ENGI 318
MEEN 475	Multidisciplinary Experience in Industry Laboratory	1	MEEN 418/MEEN 420/ MEEN 425 or last semester status
MEEN 460	Control of Dynamic Systems	3	ELEN 301/ELEN 302/ENGI 277/MATH 395
MEEN 461	Controls Laboratory	1	ELEN 301/ELEN 302/ENGI 277/MATH 395 / [MEEN 460] Co-req.
MEEN 481	Mechanical Systems Design	3	MEEN 340/MEEN 425 or last semester status
MEEN 485	Thermal Systems Design	3	MEEN 420 / MEEN 421 or last semester status
MEEN 464	Mechanical Vibrations	3	ENGI 277/MATH 395
Elective Courses (Select a minimum of 6 credits from below as indicated.) plus 3 credits for free elective			
MEEN 465	Vehicle Dynamics Fundamentals	3	MEEN 425
MEEN 482	Failure of Materials in Mechanical Design	3	MEEN 425
MEEN 484	Corrosion in Metals	3	MEEN 425 / MEEN 425
MEEN 489	Air Conditioning	3	MEEN 420/ MEEN421
MEEN 497	Special Problems	3	Chairperson's Permission
MEEN 498	Undergraduate Research I	3	Chairperson's Permission
MEEN 499	Undergraduate Research II	3	Chairperson's Permission
Alternative Energy courses that may be used as ME Electives			
MEEN 641	Sustainable Energy	3	Senior status & Chair's Permission
MEEN 462	Grid Integration	3	Senior status & Chair's Permission
MEEN 643	Energy Management	3	Senior status & Chair's Permission
MEEN 644	Photovoltaic Energy Conversion	3	Senior status & Chair's Permission
MEEN 646	Solar Refrigeration and Air Conditioning	3	Senior status & Chair's Permission
MEEN 648	Advanced Topics in Alternative Energy	3	Senior status & Chair's Permission
MEEN 649	Independent Study in Alternative Energy	3	Senior status & Chair's Permission
MEEN 651	Ocean Energy	3	Senior status & Chair's Permission
MEEN 652	Biofuels	3	Senior status & Chair's Permission
Aerospace Engineering courses that may be used as ME Electives			
MEEN 502	Aircraft Design	3	Senior status & Chair's Permission
MEEN 503	Fundamentals of Aerospace Engineering	3	Senior status & Chair's Permission
MEEN 612	Aerospace Structural Analysis	3	Senior status & Chair's Permission
MEEN 613	Flight Mechanics	3	Senior status & Chair's Permission
MEEN 614	Propulsion Systems	3	Senior status & Chair's Permission
MEEN 615	Aerodynamics II	3	Senior status & Chair's Permission
MEEN 622	Compressible Flow	3	Senior status & Chair's Permission
MEEN 624	Combustion	3	Senior status & Chair's Permission
MEEN 628	Advanced Topics in Aerospace Engineering	3	Senior status & Chair's Permission
MEEN 629	Independent Study in Aerospace Engineering	3	Senior status & Chair's Permission

Course Code	Course Title	Credits	Requisites
Additional Courses that may be used as ME Electives			
MEEN 501	Finite Element Analysis	3	Senior status & Chair's Permission
MEEN 601	Advanced Mathematics	3	Senior status & Chair's Permission
MEEN 602	Advanced Mechanics of Material	3	Senior status & Chair's Permission
MEEN 603	Advanced Fluid Mechanics	3	Senior status & Chair's Permission
MEEN 604	Aerodynamics I	3	Senior status & Chair's Permission
MEEN 611	Composite Materials	3	Senior status & Chair's Permission
MEEN 616	Introduction to Aeroelasticity	3	Senior status & Chair's Permission
MEEN 621	Boundary Layers	3	Senior status & Chair's Permission
MEEN 623	Multi-scale Turbulence	3	Senior status & Chair's Permission
MEEN 645	Wind Energy	3	Senior status & Chair's Permission
MEEN 671	Advanced Heat Conduction	3	Senior status & Chair's Permission
MEEN 673	Computational Fluid Dynamics (CFD)	3	Senior status & Chair's Permission
MEEN 674	Micro and Nano Heat Transfer	3	Senior status & Chair's Permission
MEEN 675	MEMS and Energy Harvesting	3	Senior status & Chair's Permission
MEEN 676	Design Optimization	3	Senior status & Chair's Permission
MEEN 678	Advanced Topics	3	Senior status & Chair's Permission
MEEN 679	Independent Study	3	Senior status & Chair's Permission
MEEN 681	Introduction to Biomechanics	3	Senior status & Chair's Permission
MEEN 682	Systems Engineering	3	Senior status & Chair's Permission
MEEN 683	Friction, Wear and Lubrication	3	Senior status & Chair's Permission
MEEN 684	Advanced Tribology	3	Senior status & Chair's Permission
MEEN 685	Applied Modern Control	3	Senior status & Chair's Permission

Options ("Líneas de profundización")

Students may elect to follow an option which provides depth in an area. It consists of three courses. These may be taken as the two required Mechanical Engineering Electives and the Free Elective in which case the student will finish with 131 credits. Options will not appear in the transcript nor the diploma; however, the School of Engineering will provide a certificate of completion.

Alternative Energy Option

- Become part of the energy revolution taking place in Puerto Rico and the entire world as fossil fuel sources deplete and alternative sources of energy become necessary.
- Choose one course from the list **Alternative Energy Courses** and two more courses from either the same list or the list of **Additional Courses**. The course MEEN 489 Air Conditioning may also be used as one of the three courses required for this option.
- If you decide to continue on to the ME Master's program, all the Master's level courses will be covalidated.

Aerospace Engineering Option

- Become part of one of the fastest growing sectors in Puerto Rico - the Aerospace Engineering industry.
- Choose one course from the list **Aerospace Engineering Courses** and two more courses from either the same list or the list of **Additional Courses**.
- If you decide to continue on to the ME Master's program, all the Master's level courses will be covalidated.

Quality Assurance and Experimental Design Option

- Excellent option to expand your opportunities in the pharmaceutical and medical devices industries in PR.
- The student must enroll in IMEN 395 Inferential Statistics for Engineers, IMEN 405 Statistical Quality Control, and IMEN 416 Design of Industrial Experiments.
- This option may be upgraded to a "Minor" by taking the additional course IMEN 205 Introduction to Engineering Mgmt.*

Industrial Engineering courses that may be used as ME Electives			
IMEN 395	Inferential Statistics for Engineers	3	Chairperson's permission
IMEN 402	Work Measurement	3	Chairperson's permission
IMEN 405	Statistical Quality Control	3	Chairperson's permission
IMEN 416	Design of Industrial Experiments	3	Chairperson's permission
IMEN 205	Introduction Engineering Management (*Only accepted if upgrading to a minor)	3	Chairperson's permission. (*Only accepted if upgrading to a minor.)

Engineering Management Option

- Gain the knowledge to oversee the operational performance of complex engineering driven enterprises.
- Choose three courses from the list Master's in Engineering Management Courses
- If you decide to enroll in the Eng. Management Master's program, all the Master's level courses will be covalidated.

	Master's in Engineering Management Courses that may be used as ME Electives		
IMEN 510	Engineering Management	3	Chairperson's permission
IMEN 551	Advanced Engineering Project management	3	Chairperson's permission
IMEN 610	Statistics for Decision Modeling	3	Chairperson's permission
IMEN 620	Advanced enterprise Continuous Improvement	3	Chairperson's permission
IMEN 630	Supply chain Management for Engineers	3	Chairperson's permission.
IMEN 635	Logistics Methods and Strategies	3	Chairperson's permission.
IMEN 640	Design and Operation of Logistics Network	3	IMEN 635
IMEN 645	Analytics for Decision Making	3	IMEN 610

Minimum grade required: All courses of the program must be approved with a minimum grade of C.

Revised April, 2017.

SCHOOL OF ENGINEERING			
Degree: BACHELOR OF SCIENCE		PLAN OF STUDY	
Credits: 131		Since August 2017	
Program: MECHANICAL ENGINEERING			
Course Code	Course Title	Credits	Requisites
FIRST YEAR - FIRST SEMESTER			
FSEN 105	Introduction to Engineering	3	
MATH 152	Precalculus II	4	Placement Exam
SOSC 111	Individual, Community, Government and Social Responsibility I	3	
ENGL 152	Fundamentals of Reading and Writing	3	Placement Exam
SPAN 152	Fundamentals of Reading and Writing	3	Placement Exam
		16	
FIRST YEAR - SECOND SEMESTER			
ENGI 160	Engineering Graphics	3	MATH 152
MATH 221	Calculus I	4	MATH 152
CHEM 203	General Chemistry I	4	MATH 151
ENGL 153	Advanced Communicative English	3	ENGL 152
SPAN 250	Writing Techniques	3	SPAN 152
		17	
SECOND YEAR - FIRST SEMESTER			
ENGI 122	Introduction to Computer Programming	3	MATH 152
ENGI 280	Data Analysis	3	MATH 221
MATH 222	Calculus II	4	MATH 221
PHSC 215	Physics for Engineering I (includes Lab)	4	MATH 221
ENGL 231	Research and Writing	3	ENGL 153
		17	
SECOND YEAR - SECOND SEMESTER			
ENGI 244	Engineering Materials	3	CHEM 203/PHSC 215
ENGI 277	General Statics and Dynamics	3	PHSC 215
MATH 223	Calculus III	4	MATH 222
MATH 395	Differential Equations	3	MATH 222
PHSC 216	Physics II for Engineering (includes Lab)	4	PHSC 215
		17	
THIRD YEAR - FIRST SEMESTER			
ELEN 301	Electrical Networks I	3	PHSC 216
ELEN 302	Electrical Networks I Laboratory	1	[ELEN 301]Co-req.
ENGI 305	Fluid Mechanics	3	ENGI 277/MATH 395
ENGI 318	Strength of Materials	3	ENGI 277
MEEN 312	Kinematics of Mechanisms	3	ENGI 277
MEEN 320	Thermodynamics I	3	CHEM 203/PHSC 216
MEEN 418	Experimental Methods	1	PHSC 216 / ENGI 122
		17	
THIRD YEAR - SECOND SEMESTER			
ENGI 319	Materials Testing Laboratory	1	ENGI 244/ENGI 318
ENGI 333	Machine Shop Laboratory	1	ENGI 160/ENGI 244/ ENGI 318
ENGI 406	Fluid Mechanics Laboratory	1	ENGI 305/ MEEN 418
MEEN 340	Computer Aided Design	3	ENGI 160/MATH 221

MEEN 420	Heat Transfer	3	ENGI 305/MEEN 320
Course Code	Course Title	Credits	Requisites
MEEN 421	Thermodynamics II	3	ENGI 305/MEEN 320
MEEN 425	Design of Machine Elements	3	ENGI 318
		15	
FOURTH YEAR - FIRST SEMESTER			
ENGI 478	Fundamentals of Engineering	3	ENGI 280 / MEEN 420 or next-to-last semester status
MEEN 464	Mechanical Vibrations	3	ENGI 277/MATH 395
MEEN 460	Control of Dynamic Systems	3	ELEN 301/ELEN 302/ ENGI 277 / MATH 395
MEEN 461	Controls Lab	1	ELEN 301/ELEN 302/ ENGI 277 / MATH 395 / [MEEN 460] Co-Req
	Mechanical Engineering Elective I	3	Depends on Selected Elective
HUMA 111	Universal Culture and Civilization	3	
		16	
FOURTH YEAR - SECOND SEMESTER			
MEEN 475	Multidisciplinary Experience in Industry	1	MEEN 418 / MEEN 420 / MEEN 425 OR LAST SEMESTER STATUS. Requires an approved proposal prior to registration.
MEEN 481	Mechanical Systems Design (Capstone)	3	MEEN 425/MEEN 340 or Last semester status
MEEN 485	Thermal Systems Design	3	MEEN 420/MEEN 421 or Last semester status
	Mechanical Engineering Elective II	3	Depends on Selected Elective
SOSC 112	Social Sciences or Humanistic Elective I	3	Depends on Selected Elective
	Free Elective	3	
		16	

Minimum grade required: All courses of the program must be approved with a minimum grade of C.