



UNIVERSIDAD POLITÉCNICA DE PUERTO RICO
DOCTOR OF PHILOSOPHY IN ENGINEERING AND APPLIED SCIENCES
2026-2028



COURSE	COURSE TITLE	PRE-REQUISITES	2026-2027			2027-2028		
			FA	WI	SP	FA	WI	SP
PRINCIPAL AREA OF STUDY COURSES*								
* The student could substitute at most 3 credit-hours (one core course) by another Principal Area of Study graduate course if recommended and approved by his/her advisor.								
BIOMEDICAL ENGINEERING COURSES								
BME 6005	Biosensors and Transducers	None		X			X	
BME 6100	Bioengineering and Physiological Systems	None	X	X	X	X	X	X
BME 6210	Manufacture of Biotechnology Pharmaceutical Products	None		X			X	
MMP 6000	Advanced Statistics and Quality Improvement	MGM 5700 or SC	X	X	X	X	X	X
CIVIL ENGINEERING COURSES								
EMPHASIS IN STRUCTURES								
CE 6320	Advanced Strength of Materials		X					
CE 6330	Advanced Topics in Structural Engineering					X		
CE 6350	Dynamics of Structures						X	
CE 6370	Finite Element Methods in Engineering				X			X
MMP 6000	Advanced Statistics and Quality Improvement	MGM 5700 or SC	X	X	X	X	X	X
EMPHASIS IN WATER RESOURCES AND WATER TREATMENT								
CE 6210	Probability and Statistics in Water Resources					X		
CE 6250	Advanced Hydrologic and Hydraulic Models			X				
CE 6410	Water and Wastewater Treatment Applications			X				
CE 6460	Water Quality Control and Management		X					
MMP 6000	Advanced Statistics and Quality Improvement	MGM 5700 or SC	X	X	X	X	X	X
EMPHASIS IN GEOTECHNICAL								
CE 6100	Soil Shear Strength		X					
CE 6335	Advanced Foundations				X			
CE 6355	Advanced Earthquake Engineering							X
CE 6370	Finite Element Methods in Engineering				X			X
MMP 6000	Advanced Statistics and Quality Improvement	MGM 5700 or SC	X	X	X	X	X	X
EMPHASIS IN CONSTRUCTION								
CE 6512	Value Engineering							X
CE 6520	Construction Contracting and Procurement			X				
CE 6530	Schedule Impact Analysis				X			
CE 6532	Construction Cost Control					X		
MMP 6000	Advanced Statistics and Quality Improvement	MGM 5700 or SC	X	X	X	X	X	X
COMPUTER ENGINEERING COURSES								
CECS 6120	Computer Architecture	Circuit Logic, Statistics & Probabilities, Calculus II			X			X
CECS 6130	Data Communication Networks			X			X	
CECS 6150	Object-Oriented Design	Data Structure	X			X		
CECS 6510	Software Engineering I			X			X	
ELECTRICAL ENGINEERING COURSES								
EMPHASIS IN COMMUNICATION SYSTEMS								
EE 6010	Mathematical Methods for Signal Processing	Calculus & Diff Eqs.			X			X
EE 6020	Stochastic	Prob & Stat or RP.	X			X		
EE 6030	Linear Systems	None		X			X	
EE 6760	Digital Communications	EE 5714			X			X
EMPHASIS IN POWER SYSTEMS AND RENEWABLE ENERGY								
EE 6010	Mathematical Methods for Signal Processing	Calculus & Diff Eqs.			X			X
EE 6400	Direct Energy Conversion and Renewables	None		X			X	
EE 6402	Market, Environmental, and Public Policy Issues of Energy Systems	None	X			X		
EE 6412	Energy Management	None				X		
MANUFACTURING ENGINEERING COURSES								
MMP 6000	Advanced Statistics and Quality Improvement	MGM 5700 or SC	X	X	X	X	X	X
MMP 6002	Operations Planning and Control	MGM 5700 or SC		X	X		X	X
MMP 6006	Lean Manufacturing	MMP 6002	X	X	X	X	X	X
MMP 6130	Six Sigma	MMP 6000	X		X	X		X
MECHANICAL ENGINEERING COURSES								
EMPHASIS IN DESIGN								
ME 6014	Advanced Engineering Mathematics			X			X	
ME 6200	Advanced Solid Mechanics							
ME 6330	Finite Element Analysis							X
ME 6360	Optimization in Engineering Design						X	
EMPHASIS IN THERMAL AND FLUID MECHANICS								
ME 6014	Advanced Engineering Mathematics			X			X	
ME 6100	Advanced Thermodynamics			X				
ME 6120	Advanced Convection Heat Transfer and Fluid Mechanics	ME 6100						X
ME 6360	Optimization in Engineering Design						X	

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Continued

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			FA	WI	SP	FA	WI	SP
EMPHASIS IN AEROSPACE								
ME 6014	Advanced Engineering Mathematics			X			X	
ME 6140	High Speed Aerodynamics	ME 6100				X		
ME 6300	Advanced Aerospace Structures		X					
ME 6350	Mechanical and Aerospace Control Systems					X		
SUPPLEMENTARY AREA OF STUDY COURSES**								
** The student must select 9 credit-hours. These credit-hours could be distributed between two Supplementary Areas of Study as recommended and approved by his/her advisor.								
BUSINESS ADMINISTRATION COURSES								
MBA 5600	Managerial Economics		X			X		
MBA 5700	Managerial Marketing			X			X	
MBA 6830	Operations Management			X			X	
MGM 6620	Managerial Finance	MGM 5500	X	X	X	X	X	X
COMPUTER SCIENCE COURSES								
CECS 7230	Network Security			X			X	
CECS 7235	Computer Forensics		X			X		
CECS 7530	Data Mining and Data Warehousing			X			X	
CECS 7570	Computer Security		X	X	X	X	X	X
ENGINEERING MANAGEMENT COURSES								
MEM 6110	Engineering Management I		X	X		X	X	
MEM 6120	Engineering Management II	MEM 6110	X	X	X	X	X	X
MGM 6690	Decision Making Techniques	MGM 5700	X	X	X	X	X	X
MMP 6000	Advanced Statistics and Quality Improvement	MGM 5700 or SC	X	X	X	X	X	X
ENVIRONMENTAL MANAGEMENT COURSES								
EPM 6800	Solid Waste Management		X			X		
EPM 6810	Environmental Regulations		X			X		
EPM 6850	Management for Sustainable Future			X			X	
MMP 6000	Advanced Statistics and Quality Improvement	MGM 5700 or SC	X	X	X	X	X	X
GEOSPATIAL SCIENCE AND TECHNOLOGY COURSES								
GEOM 6630	Geospatial Modeling & Analysis	GEOM 5600 or Undergraduate Course in GIS and MGM 5700				X		
GEOM 6634	Cartography, Map Design & Geovisualization				X			
GEOM 6646	Environmental Assessment & Geospatial Tech.							X
GEOM 6648	Business Geography					X		
GEOM 6710	Image Acquisition, Analysis, and Processing		X					
MANUFACTURING COMPETITIVENESS COURSES								
MMP 6000	Advanced Statistics and Quality Improvement	MGM 5700 or SC	X	X	X	X	X	X
MMP 6002	Operations Planning and Control	MGM 5700 or SC		X	X		X	X
MMP 6006	Lean Manufacturing	MMP 6002	X	X	X	X	X	X
MMP 6130	Six Sigma	MMP 6000	X		X	X		X
ADVANCED GRADUATE COURSES								
EAS 8130	Advanced Theory of Elasticity		As per Academic Mentoring Recommendation					
EAS 8131	Nonlinear Finite Element Methods							
EAS 8140	Sustainable Engineering							
EAS 8200	Manufacturing Systems Analysis							
EAS 8210	Statistical Modeling for Resources Optimization	MMP 6000						
EAS 8310	Energy Management							
EAS 8320	Modeling and Simulation							
EAS 8400	Advanced Optimization and Modeling							
EAS 8401	Advanced Vibrations							
EAS 8902	Doctoral Independent Study							
COMMON DOCTORAL COURSES								
EAS 8900	Comprehensive Examination*	6 Seminar Credit - Hours	X	X	X	X	X	X
EAS 8901	Doctoral Seminar		X	X	X	X	X	X
EAS 8910	Qualitative and Quantitative Research Methods		**	**	**	**	**	**
EAS 9000	Doctoral Dissertation	EAS 8900, 6 credits in EAS 8901 and Graduate Mentor Approval	X	X	X	X	X	X
EAS 9001	Doctoral Dissertation Extension	EAS 9000 and Graduate Mentor Approval	X	X	X	X	X	X

Legend:

SC = Similar Course

* As per Committee Request

** As per Graduate School Recommendation