



UNIVERSIDAD POLITÉCNICA DE PUERTO RICO
DOCTOR OF PHILOSOPHY IN ENGINEERING AND APPLIED SCIENCES
2018 - 20



COURSE	COURSE TITLE	PRE-REQUISITES	2018-2019			2019-2020		
			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.								
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		X		
CE 6250	Advanced Hydrologic and Hydraulic Models						X	
CE 6410	Water and Wastewater Treatment Applications (SUMMER)							
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								
EE 6010	Mathematical Methods for Signal Processing	Calculus & Diff Eqs.	X		X		X	
EE 6020	Stochastic	Prob & Stat or RP.		X		X		X
EE 6030	Linear Systems	None		X		X		X
EE 6760	Digital Communications	EE 5714	X		X		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			X			X	
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			X		
ME 6120	Advanced Fluid Mechanics	ME 6100						X
ME 6360	Optimization in Engineering Design						X	
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	X		X
MBA 5700	Managerial Marketing	MARK 1010		X			X	
MBA 6830	Operations Management			X	X		X	X
MGM 6620	Managerial Finance	MGM 5500	X	X	X	X	X	X

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			FA	WI	SP	FA	WI	SP
COMPUTER SCIENCE COURSES								
CECS 7230	Network Security			X			X	
CECS 7235	Computer Forensics		X		X	X		X
CECS 7530	Data Mining and Data Warehousing			X			X	
CECS 7570	Computer Security			X	X		X	X
ENGINEERING MANAGEMENT COURSES								
MEM 6110	Engineering Management I		X	X	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	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				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						X	
EAS 8131	Nonlinear Finite Element Methods				X			X
EAS 8140	Sustainable Engineering					X		
EAS 8200	Manufacturing Systems Analysis			X			X	
EAS 8210	Statistical Modeling for Resources Optimization	MMP 6000				X		
EAS 8310	Energy Management			X			X	
EAS 8320	Modeling and Simulation					X		
EAS 8400	Advanced Optimization and Modeling				X			X
EAS 8401	Advanced Vibrations			X			X	
EAS 8902	Doctoral Independent Study		X	X	X	X	X	X
COMMON DOCTORAL COURSES								
EAS 8900	Comprehensive Examination*	6 Seminar Credit - Hours		X	X	X	X	X
EAS 8901	Doctoral Seminar			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
EAS 9001	Doctoral Dissertation Extension	EAS 9000 and Graduate Mentor Approval		X	X	X	X	X

Legend:

SC = Similar Course

* As per Committee Request

** As per Graduate School Recommendation