

Master of Science Program

Program Summary Charts

Bioelectric Engineering

Course Number/Name	Lab.	Units	Prerequisites
3 courses to be selected from: 25625 Medical Imaging Systems 25631 Bio-System Modeling 25633 Bio-Signal Processing 25623 Bio-Instruments 25643 Computational Genomics		9	25051 25155
2 courses to be selected from: 25632 Bio-System Control 25636 Medical Ultrasound 25642 Medical Image Analysis & Processing 25635 Neural Modeling		6	25155
Elective courses (2): 25617 Pattern Recognition 25618 Advanced Bio-Instruments 25619 MRI Systems 25192 Time-Frequency Representation 25626 Vision in Man & Machine 25156 Digital Signal Processing II 25446 Fuzzy Logic & Applications 25638 Bio-Signal Processing II 25637 Robotics 25234 Advanced Solid State Physics 25089 Numerical Optimization Methods 25137 Blind Source Separation & Sparse Signals 25617 Pattern Recognition 25443 Neural Networks‡ 25826 Compressed Sensing Medical Image Compression 25639 Neuro-Muscular Control		6	25623 25155 25051 25155 40151 25633 25411
MSc Seminar		2	
MSc Thesis*		6	

‡ Allowed if 25617 is not taken

Communications (Communication Systems)

Course Number/Name	Lab.	Units	Prerequisites	
25113 Advanced Communication Systems		3	25112,25181	
25181 Random Processes		3	25111,25162 [†]	
Elective courses (5):		15		
25129 Coding Theory				
25128 Information & Coding Theory			25111	
25166 Detection Theory			25181	
25163 Estimation Theory				
25118 Queuing Theory				
25122 Switching Systems				
25165 Cryptography				
25158 Fourier Optics			25111	
25197 Radar Systems			25111	
25193 Satellite Communications			25111	
25167 Data Networks			25112	
25174 Advanced Data Networks			25167	
25195 Data Communication & Networks			25111	
25159 Speech Processing			25155	
25157 Digital Image Processing			25155	
25192 Time-Frequency Representation			25155	
25164 Signal Processors				
25156 Digital Signal Processing II			25155	
25171 Optical Communication Networks				
25169 Statistical Optical Communications				
25119 Optical Fibers			25141,25111	
25161 Adaptive Filters			25155	
25188 Broadband Access			25112	
DSP Laboratory				
Courses from other areas of EE (2 max)				
MSc Seminar		2		
MSc Thesis*		6		

Communications (Secure Communications & Cryptography)

Course Number/Name	Lab.	Units	Prerequisites
25165 Cryptography		3	
25172 Advanced Cryptography		3	25165
25126 Cryptography Mathematics		3	
25181 Random Processes		3	25111
Elective courses (3):		9	
25129 Coding Theory			
25128 Information & Coding Theory			25111
25113 Advanced Communication Systems			25181,25112
25167 Data Networks			25112
25174 Advanced Data Networks			25167
25195 Data Communication & Networks			25111
25159 Speech Processing			25155
25139 Information Hiding			25155/25181
25173 Computer & Network Security			
25191 Mobile Communications			25112
25127 Spread Spectrum Communications			25112
25833 Selected Topics in Cryptography			
25120 Special Topics in Communications			
Computation Complexity			
1 course from other areas of EE			
MSc Seminar		2	
MSc Thesis*		6	

Communications (Field & Wave Communications)

Course Number/Name	Lab.	Units	Prerequisites
25151 Advanced Electromagnetic Theory		3	25042
25194 Advanced Engineering Mathematics		3	
25154 Microwave & Photonic Solid State Devices		3	
2 courses from cluster A or B: Cluster A (Microwaves & Field Theory): 25153 Microwaves II 25182 Microwave Active Circuit Design 25149 Advanced Antennas 25186 Numerical Methods in Electromagnetics Cluster B (Optics): 25836 Guided Wave Optics 25837 Nonlinear Optics 25186 Numerical Methods in Electromagnetics		6	25145 25153 25144 25141 25762 25762 25141
Elective courses (2): 25185 Wave Scattering Theory 25135 Laser & Photonic Crystals 25146 Microwave Measurement 25175 Microwave Magnetic Devices 25176 Wave Propagation in Wireless Comm. 25184 Nonlinear Microwave Circuits 25158 Fourier Optics 25193 Satellite Communications 25835 Terahertz Technology 25832 Plasmonics & Metamaterials 25133 PLL's & Frequency Synthesizers 25831 Photonic Devices 25187 mm-Wave Solid State Devices Courses from other cluster		6	25141 25141,25223 25145 25141 25141 25145 25111 25111 25141 25762 25148 25141
MSc Seminar		2	
MSc Thesis*		6	

Control & Dynamical Systems

Course Number/Name	Lab.	Units	Prerequisites
3 courses to be selected from: 25426 Optimal Control 25477 Multivariate Control 25461 Robust Control 25479 Nonlinear Control 25194 Advanced Engineering Mathematics		9	25431 25431 25431 25411
Elective courses (5): 25765 Digital Signal Processing I 25441 Estimation Theory & Optimal Filters 25444 System Identification 25481 Model Predictive Control 25161 Adaptive Filters 25446 Fuzzy Logic & Applications 25442 Inertial Navigation 25478 Adaptive Control 25447 Artificial Neural Networks & Applications 25449 Intelligent Control 25451 Robot Control I 25452 Robot Control II 25463 Advanced Instrumentation 25428 Large Scale Systems 1 course (max) from other areas of EE		15	25742 25181,25431 25114 25155 40151 25411 25431 25431 25451 25417 25426,25792
MSc Seminar		2	
MSc Thesis*		6	

Digital Electronic Systems

Course Number/Name	Lab.	Units	Prerequisites	
25563 Microprocessors II		3	25535	
25535 Advanced Computer Structure		3	25754,25771 [†]	
25561 Digital VLSI System Design		3		
1 course from		3		
25167 Data Networks			25112	
25537 Parallel Programming & Architecture			25754,25777	
Elective courses (3):		9		
25447 Artificial Neural Networks & Applications				
25536 Digital VLSI Architectures			25561	
25540 Topics in Digital Systems				
25549 Fuzzy Systems				
25553 Computer Vision			25765	
25555 Internet Programming			25777	
25558 Computer Interfacing			25771	
25570 Special Problems in Digital Systems				
25571 Special Topics in VLSI			25561	
25576 Fault Tolerance				
Courses from other areas of EE (2 max)				
MSc Seminar		2		
MSc Thesis*		6		

Electronics (Microelectronic Circuits)

Course Number/Name	Lab.	Units	Prerequisites
25253 CMOS Circuit Design I		3	25761
25231 Semiconductor Technology		3	
25262 Digital Electronics		3	25032
Elective courses (4):		12	
25254 CMOS Circuit Design II			25253
25225 Integrated Circuit Design			25212,25033
25271 RF Integrated Circuits			25253,25148
25269 Advanced Solid State Devices			25234,25268
25274 Integrated Filter Design			25773
25568 VLSI Circuits			25031,25546
25214 Advanced Electronics			25212,25033
25261 Integrated Circuit Applications			
25252 Data Converter Circuit Design			25033
Courses from other areas of EE (2 max)			
MSc Seminar		2	
MSc Thesis*		6	

Electronics (Nano- & Microelectronic Devices)

Course Number/Name	Lab.	Units	Prerequisites
25268 Applied Quantum Mechanics		3	
25231 Semiconductor Technology		3	
25234 Advanced Solid State Physics		3	
25269 Advanced Solid State Devices		3	25234,25268
Elective courses (4):		12	
25246 Optical ICs			
25251 Principles of Superconductivity			
25242 Superconducting Devices			
25239 Optoelectronics			25042
25264 Semiconductor Device Characterization			25231/25223
25237 Engineering Quantum Electronics			
25247 Optical ICs II			25246
25245 Laser Technology & Application			25031,25041
25124 Photonic Crystals			25141
25238 Photonic Semiconductor Dev. Fabrication			
Courses from other areas of EE (2 max)			
MSc Seminar		2	
MSc Thesis*		6	

Electric Energy Systems (Power Electronics & Electric Machines)

Course Number/Name	Lab.	Units	Prerequisites
3 courses from		9	
25328 Electric Machine Theory			25326
25363 Power Electronics I			25213
25365 Controlled AC Drive			25328
25325 Electric Machine Design			25062
25351 Power Quality			
25395 Advanced Dielectrics & High Voltage			25341
Elective courses (4):		12	
25366 Flexible DC & AC Transfer Systems			
25353 Reactive Power Control			25311
25251 Principles of Superconductivity			25114
25348 Analysis of New Energy Sources			
25347 Power System Transients			25333
25339 Power System Reliability			25333
25394 Resonant Converters & Soft Switching			25363
25367 Modelling & Control of Power Converters			25363
25335 Non-Traditional Electric Machines			25781
Courses from other areas of EE (2 max)			
MSc Seminar		2	
MSc Thesis*		6	

Electric Energy Systems (Power Systems)

Course Number/Name	Lab.	Units	Prerequisites
3 courses from 25328 Electric Machine Theory 25339 Power System Reliability 25347 Power System Transients 25353 Reactive Power Control 25338 Power System Dynamics I 25355 Advanced Power System Operation		9	25326 25333 25333,25311 25311,25333† 25333 25333
Elective courses (4): 25366 HVDC & FACTS 25398 Power System Planning 25309 Engineering System Reliability 25348 Analysis of New Energy 25351 Power Quality 25339 Power System Reliability 25346 Power System Dynamics II 25337 Power System Restructuring 25395 Advanced Dielectrics & High Voltage 25334 Electric Energy Distribution Systems 25089 Numerical Optimization Methods Courses from other areas of EE (2 max)		12	25333 25114 25333 25338 25311 25341 25782
MSc Seminar		2	
MSc Thesis*		6	