MIT EECS

Electrical Engineering | Computer Science | Artificial Intelligence + Decision-making

The TECHNICAL QUALIFYING EVALUATION (TQE): Instructions

Academic Year 2025-2026 EFFECTIVE FALL 2025

Graduate students enrolling in fall 2025 are expected to submit their TQE plan by February 1, 2026. Four subjects are required: two subjects from a single Group and two subjects from two other Groups. TQE plans may be submitted online at https://eecsis.mit.edu/phd_status.cgi

Once you enter your TQE plan into the portal, your graduate counselor will approve your submission online or offer other suggestions. Once agreed upon by you and your graduate counselor, your TQE plan will be monitored by the Graduate Office. If you need to change your submitted TQE plan, please see the appropriate administrative staff in the EECS Graduate Office. [Note: modifications to the TQE grid are made every fall and spring term.]

NOTES

GROUP 1: SYSTEMS in CS			
Subj # (old #)	**Title**	**Offered**	**Comments**
6.5110 (6.820)	Foundations of Program Analysis [xor 6.5120]	Fall	**Not Offered AY25/26**
6.5130 (6.S981)	Introduction to Program Synthesis [xor 6.5110]	Fall	
6.5820 (6.829)	Computer Networks	Fall	
6.5900 (6.823)	Computer System Architecture	Fall	**Not Offered AY25/26**
6.5940	Tiny ML and Efficient Deep Learning Computing	Fall	**Not Offered AY25/26**
6.5080 (6.836)	Multicore Programming	Spring	
6.5120 (6.822)	Formal Reasoning about Programs [xor 6.5110]	Spring	
6.5610	Applied Cryptography and Security [xor 6.5620]	Spring	
6.5660 (6.858)	Computer Systems Security	Spring	
6.5830 (6.830)	Database Systems	Spring	
6.5840 (6.824)	Distributed Computer Systems Engineering	Spring	
6.5910 (6.375)	Complex Digital Systems Design	Spring	**Next Offering Unknown**
6.5930 (6.825)	Hardware Architecture for Deep Learning	Spring	
6.5950 (6.S983)	Secure Hardware Design	Spring	
6.8530 also 6.C85	Interactive Data Visualization	Spring	

GROUP 2: THEORETICAL COMPUTER SCIENCE (*see notes below)			
Subj # (old #)	**Title**	**Offered**	**Comments**
6.5210* (6.854)	Advanced Algorithms	Fall	**Not Offered AY25/26**
6.5240	Sublinear Time Algorithms	Fall	**Not Offered AY25/26**
6.5250 (6.852)	Distributed Algorithms	Fall	**Not Offered AY25/26**
6.5400* (6.840)	Theory of Computation	Fall	
6.5620 (6.875)	Cryptography and Cryptanalysis [xor 6.5610]	Fall	
6.5220 (6.856)	Randomized Algorithms	Fall	
6.7350	Numerical Algorithms for Computing and Machine Learning	Fall	Pilot Offering
6.5320 (6.850)	Geometric Computing	Spring	**Not Offered AY26/27**
6.5410* (6.841)	Advanced Complexity Theory	Spring	
*6.5400 or 6.5210 are recommended for students who plan to take only one subj in Group 2			
*for students with a strong background in the area, 6.5410 may substitute 6.5400			

GROUP 3: ARTIFICIAL INTELLIGENCE (AI) (*see note below)			
Subj # (old #)	**Title**	**Offered**	**Comments**
6.4212 (6.843)	Robotic Manipulation [xor 6.8210]	Fall	
6.7810 (6.438)	Algorithms for Inference [xor 6.7800 xor 6.7900]	Fall	
6.7900 (6.867)	Machine Learning [xor 6.7800 xor 6.7810]	Fall	
6.7960	Deep Learning	Fall	
6.8700 (6.878)	Advanced Computational Biology: Genomes, Networks, Evolution [xor 6.8710]	Fall	
6.7800 (6.437)	Inference and Information [xor 6.7810 xor 6.7900]	Spring	
6.7930 (6.871)	Machine Learning for Healthcare	Spring	
6.8200 (6.884)	Sensorimotor Learning	Spring	
6.8210 (6.832)	Underactuated Robotics [xor 6.4212]	Spring	
6.8300 (6.869)	Advances in Computer Vision	Spring	
6.8410 (6.838)	Shape Analysis	Spring	**Not Offered AY26/27**
6.8420 (6.839)	Computational Design and Fabrication	Spring	
6.8610 (6.864)	Quantitative Methods for Natural Language Processing [xor 6.8620 xor 6.8630]	Spring	
6.8620 (6.345)	Spoken Language Processing [xor 6.8630 xor 6.8610]	Spring	**Not Offered AY26/27**
6.8630 (6.863)	Natural Language and the Computer Representation of Knowledge [xor 6.8610 xor 6.8620]	Spring	
6.8710 (6.874)	Computational Systems Biology: Deep Learning in the Life Sciences [xor 6.8700]	Spring	**Not Offered AY25/26**
6.S877	Ethical Machine Learning in Human Systems	Spring	**NEW to Grid**
*6.8420 can be used as the second AI subject, but not the only subject.			

GROUP 4: SYSTEM SCIENCE and CONTROL ENGINEERING			
Subj # (old #)	**Title**	**Offered**	**Comments**
6.7000 (6.341)	Discrete-Time Signal Processing [xor 6.7010 xor 6.8800]	Fall	**Not Offered AY25/26**
6.C57 (6.255)	Optimization Methods [xor 6.7210]	Fall	
6.7210 (6.251)	Introduction to Mathematical Programming [xor 6.7200 also 6.C57]	Fall	
6.7010 (6.344)	Digital Image Processing [xor 6.7000 xor 6.8800]	Spring	
6.7100 (6.241)	Dynamic Systems and Control	Spring	
6.7220	Nonlinear Optimization	Sping	
6.8800 (6.555)	Biomedical Signal and Image Processing [xor 6.7000 xor 6.7010]	Spring	

GROUP 5: CIRCUITS and ELECTRONIC SYSTEMS			
Subj # (old #)	**Title**	**Offered**	**Comments**
6.6010 (6.374)	Analysis and Design of Digital Integrated Circuits	Fall	
6.6020	High-Frequency Integrated Circuits	Fall	
6.7300 (6.336)	Introduction to Modeling and Simulation	Fall	
6.6000 (6.775)	CMOS Analog and Mixed-Signal Circuit Design	Spring	
6.6220 (6.334)	Power Electronics	Spring	

GROUP 6: INFORMATION SCIENCE and COMMUNICATION			
Subj # (old #)	**Title**	**Offered**	**Comments**
6.7410 (6.450)	Principles of Digital Communication	Fall	
6.7420 (6.267)	Heterogenous Networks: Architecture, Transport, Protocols and Management	Fall	**Not Offered AY25/26**
6.7480	Information Theory: from Coding to Learning	Fall	**Not Offered AY26/27**
6.7700 (6.436)	Fundamentals of Probability	Fall	
6.7730	Modern Mathematical Statistics	Fall	**NEW to Grid**
6.7810 (6.438)	Algorithms for Inference [xor 6.7800]	Fall	
6.7710 (6.262)	Discrete Stochastic Processes [xor 6.7720]	Spring	
6.7720	Discrete Probability and Stochastic Processes [xor 6.7710]	Spring	
6.7800 (6.437)	Inference and Information [xor 6.7810]	Spring	

GROUP 7: BIOLOGICAL ENGINEERING			
Subj # (old #)	**Title**	**Offered**	**Comments**
6.4822 (6.522)	Quantitative Physiology: Organ Transport Systems	Fall	
6.4852	Multiphysics Systems Modeling	Fall	**NEW to Grid**; Pilot Offering
6.8810 (6.556)	Data Acquisition and Image Reconstruction in MRI	Fall	**Not Offered AY25/26**
6.C67	Computational Imaging: Physics to Algorithms	Fall	Pilot Offering
6.4812 (6.521)	Cellular Neurophysiology and Computing	Spring	

GROUP 8: ELECTROMAGNETICS			
Subj # (old #)	**Title**	**Offered**	**Comments**
6.4832 (6.561)	Fields, Forces and Flows in Biological Systems	Fall	
6.6210 (6.640)	Electromagnetic Fields, Forces and Motion [xor 6.6280]	Fall	
6.6300 (6.630)	Electromagnetics	Fall	
6.6310 (6.631)	Optics and Photonics	Fall	
6.6280 (6.685)	Electric Machines [xor 6.6210]	Fall	Next Offering Unknown
6.6340 (6.634)	Nonlinear Optics	Spring	
6.7121 (6.S967)	Principles of Modeling, Computing and Control of Decarbonized Electric Energy Systems	Spring	

GROUP 9: PHYSICAL SCIENCE and ENGINEERING			
Subj # (old #)	**Title**	**Offered**	**Comments**
6.6400 (6.728)	Applied Quantum and Statistical Physics	Fall	
6.6500 (6.720)	Integrated Microelectronic Devices	Fall	
6.S063	Principles/Applications of Quantum Optics: Fundamentals and Emerging Technologies	Fall	**Not Offered AY25/26**; Pilot Offering
6.6320	Silicon Photonics	Spring	
6.6420	Quantum Information Science	Spring	
6.6510 (6.730)	Physics for Solid-State Applications	Spring	
6.S966	Symmetry and its Application to Machine Learning	Spring	Pilot Offering
6.S987	Physics and Engineering of Superconducting Qubits	Spring	

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