



# MIT EECS

Electrical  
Engineering

Computer  
Science

Artificial Intelligence +  
Decision-making

## The TECHNICAL QUALIFYING EVALUATION (TQE): Instructions

### Academic Year 2022-2023

Graduate students enrolling fall 2022 are expected to submit their TQE plan by February 1<sup>st</sup>, 2023. Four subjects are required: 2 subjects from a single Group and two subjects from two other Groups. TQE plans may be submitted online at: [https://eecs.mit.edu/phd\\_status.cgi](https://eecs.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 Janet Fischer in the EECS Graduate Office.

### NOTES

---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---

GROUP 1: SYSTEMS in CS			
Subj # (old #)	Title	Offered	Comments
6.5080 (6.836)	Multicore Programming	Fall	Not Offered AY22/23
6.5110 (6.820)	Foundations of Program Analysis [xor 6.5120]	Fall	Not Offered AY22/23
6.5820 (6.829)	Computer Networks	Fall	
6.5900 (6.823)	Computer System Architecture	Fall	
6.5120 (6.822)	Formal Reasoning about Programs [xor 6.5110]	Spring	
6.5660 (6.858)	Computer Systems Security	Spring	
6.5830 (6.830)	Database Systems	Spring	Not Offered AY23/24
6.5840 (6.824)	Distributed Computer Systems Engineering	Spring	
6.5910 (6.375)	Complex Digital Systems Design	Spring	Not Offered AY23/24
6.5930 (6.825)	Hardware Architecture for Deep Learning	Spring	

GROUP 2: THEORETICAL COMPUTER SCIENCE (*see notes below)			
Subj # (old #)	Title	Offered	Comments
6.5210* (6.854)	Advanced Algorithms	Fall	
6.5250 (6.852)	Distributed Algorithms	Fall	Not Offered AY23/24
6.5400* (6.840)	Theory of Computation	Fall	
6.5620 (6.875)	Cryptography and Cryptanalysis	Fall	
6.5220 (6.856)	Randomized Algorithms	Spring	Not Offered AY23/24
6.5320 (6.850)	Geometric Computing	Spring	
6.5410* (6.841)	Advanced Complexity Theory	Spring	Not Offered AY22/23
*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	
6.8420 (6.839)	Computational Design and Fabrication	Fall	
6.8610 (6.864)	Quantitative Methods for Natural Language Processing [xor 6.8620 xor 6.8630]	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	
6.8620 (6.345)	Spoken Language Processing [xor 6.8630 xor 6.8610]	Spring	Not Offered AY22/23
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	
old 6.866	Machine Vision		No Longer Being Offered
*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	
6.7200 (6.255)	Optimization Methods [xor 6.7210]	Fall	
6.7210 (6.251)	Introduction to Mathematical Programming [xor 6.7200]	Fall	
6.7010 (6.344)	Digital Image Processing [xor 6.7000 xor 6.8800]	Spring	
6.7100 (6.241)	Dynamic Systems and Control [xor 6.7940]	Spring	
6.7940 (6.231)	Dynamic Processing and Reinforcement Learning [xor 6.7100]	Spring	Not Offered AY22/23
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	
6.7300 (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 AY23/24
6.7470 (6.441)	Information Theory	Fall	Not Offered AY22/23
6.7700 (6.436)	Fundamentals of Probability	Fall	
6.7810 (6.438)	Algorithms for Inference [xor 6.7800]	Fall	
6.7710 (6.262)	Discrete Stochastic Processes	Spring	Not Offered AY23/24
6.7800 (6.437)	Inference and Information [xor 6.7810]	Spring	

**GROUP 7: BIOLOGICAL ENGINEERING**

Subj # (old #)	Title	Offered	Comments
6.8810 (6.556)	Data Acquisition and Reconstruction in MRI	Fall	Not Offered AY22/23
6.4812 (6.521)	Cellular Neurophysiology and Computing	Spring	
6.4822 (6.522)	Quantitative Physiology: Organ Transport Systems	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.S967 (6.S967)	Principles of Modeling, Simulation and Control of Electric Energy Systems	Fall	<b>NEW SUBJECT</b> on grid
6.6280 (6.685)	Electric Machines [xor 6.6210]	Spring	Next Offering Unknown
6.6340 (6.634)	Nonlinear Optics	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.S976 ( <b>NEW</b> )	Silicon Photonics	Fall	<b>NEW SUBJECT</b> on grid
6.6510 (6.730)	Physics for Solid-State Applications	Spring	



# MIT EECS

Electrical  
Engineering

Computer  
Science

Artificial Intelligence +  
Decision-making

[www.eecs.mit.edu](http://www.eecs.mit.edu)

<https://www.eecs.mit.edu/wp-content/uploads/2022/08/TQE-Grid-Aug-2022.pdf>