

# The TECHNICAL QUALIFYING EVALUATION (TQE)

Department of Electrical Engineering and Computer Science  
Academic Year 2021-2022

## Instructions for Graduate Counselors:

Entering graduate students must complete the Technical Qualifying Evaluation (TQE). Their TQE plan must be submitted by February 1<sup>st</sup>, 2022. Students are encouraged to complete the TQE by the fourth term as a graduate student (summer session is not included).

To satisfy the TQE requirement, four subjects are required from an approved TQE grid composed of 9 Groups. Two subjects must be selected from a single Group. The remaining two subjects must be selected from two other Groups. A minimum of three grades of A, and one grade of B must be obtained to pass the TQE outright. All EECS graduate students may select four subjects from all nine Groups.

The approved TQE grid is found below with the subject titles and their term offering listed on the back, page 2.

<p><b>Group 1: Systems in CS</b></p> <p>6.375, [6.820 xor 6.822], 6.823, 6.824, 6.825, 6.829, 6.830, 6.836, 6.858</p>	<p><b>Group 2: Theoretical CS</b></p> <p>6.840*, 6.841*, 6.850, 6.852, 6.854*, 6.856, 6.875</p> <p>(*see notes below)</p>	<p><b>Group 3: Artificial Intelligence</b></p> <p>[6.345 xor 6.863 xor 6.864], [6.866 xor 6.869], [6.437 xor 6.438 xor 6.867], [6.832 xor 6.843], 6.838, 6.839*, 6.871 [6.874 xor 6.878], 6.884</p> <p>(*see notes below)</p>
<p><b>Group 4: System Science and Control Engineering</b></p> <p>[6.231 xor 6.241], [6.251 xor 6.255], [6.341 xor 6.344 xor 6.555]</p>	<p><b>Group 5: Circuits and Electronic Systems</b></p> <p>6.334, 6.336, 6.374, 6.775</p> <p>(Any 1 or 2 subjects allowed)</p>	<p><b>Group 6: Information Science and Communication</b></p> <p>6.262, 6.267, 6.436, [6.437 xor 6.438], 6.441, 6.450</p>
<p><b>Group 7: Bioelectrical Engineering</b></p> <p>6.521, 6.522, 6.556</p> <p>(Any 1 or 2 subjects allowed)</p>	<p><b>Group 8: Electromagnetics</b></p> <p>6.630, 6.631, 6.634 [6.640 xor 6.685], 6.561</p>	<p><b>Group 9: Physical Science and Engineering</b></p> <p>6.720, 6.728, 6.730</p> <p>(Any 1 or 2 subjects allowed)</p>

Notes:

- \* 6.840 or 6.854 are recommended for students who plan to take only one subject in Group 2.
- \* For students with a strong background in the area, 6.841 may be substituted for 6.840- submit dept petition.
- \* 6.839 can be used as the second AI subject, but not the only subject.

NOT offered academic year  
2020-2021

NOT offered academic year  
2021-2022

**Group 1: Systems in Computer Science**

Spring	6.375	Complex Digital Systems Design
Fall	6.820	Foundations of Program Analysis
Spring	6.822	Formal Reasoning about Programs
Fall	6.823	Computer System Architecture
Spring	6.824	Distributed Computer Systems Engineering
Spring	6.825	Hardware Architecture for Deep Learning
Fall	6.829	Computer Networks
Spring	6.830	Database Systems
Fall	6.836	Multicore Programming
Spring	6.858	Computer Systems Security

**Group 2: Theoretical Computer Science**

Fall	6.840	Theory of Computation
Spring	6.841	Advanced Complexity Theory
Spring	6.850	Geometric Computing
Fall	6.852	Distributed Algorithms
Fall	6.854	Advanced Algorithms
Spring	6.856	Randomized Algorithms
Fall	6.875	Cryptography and Cryptanalysis

**Group 3: Artificial Intelligence**

Spring	6.345	Spoken Language Processing
Spring	6.437	Inference and Information
Fall	6.438	Algorithms for Inference
Spring	6.832	Underactuated Robotics
Spring	6.838	Shape Analysis
Fall	6.839	Advanced Computer Graphics
Fall	6.843	Robotic Manipulation
Spring	6.863	Natural Language and the Computer Representation of Knowledge
Fall	6.864	Advanced Natural Language Processing
Fall	6.866	Machine Vision
Fall	6.867	Machine Learning
Spring	6.869	Advances in Computer Vision
Spring	6.871	Machine Learning for Healthcare
Spring	6.874	Computational Systems Biology: Deep Learning in the Life Sciences
Fall	6.878	Advanced Computational Biology: Genomes, Networks, Evolution
Spring	6.884	Sensorimotor Learning

**Group 4: System Science and Control Engineering**

Spring	6.231	Dynamic Programming and Reinforcement Learning
Spring	6.241	Dynamic Systems and Control
Fall	6.251	Introduction to Mathematical Programming
Fall	6.255	Optimization Methods
Fall	6.341	Discrete-Time Signal Processing
Spring	6.344	Digital Image Processing
Spring	6.555	Biomedical Signal and Image Processing

**Group 5: Circuits and Electronic Systems**

Spring	6.334	Power Electronics
Fall	6.336	Introduction to Numerical Simulation
Fall	6.374	Analysis and Design of Digital Integrated Circuits
Spring	6.775	CMOS Analog and Mixed-Signal Circuit Design

**Group 6: Information Science and Communication**

Spring	6.262	Discrete Stochastic Processes
Fall	6.267	Heterogeneous Networks: Architecture, Transport, Protocols and Management
Fall	6.436	Fundamentals of Probability
Spring	6.437	Inference and Information
Fall	6.438	Algorithms for Inference
Fall	6.441	Information Theory
Fall	6.450	Principles of Digital Communication

**Group 7: Bioelectrical Engineering**

Fall	6.521	Cellular Neurophysiology and Computing
Spring	6.522	Quantitative Physiology: Organ Transport Systems
Fall	6.556	Data Acquisition and Image Reconstruction in MRI

**Group 8: Electromagnetics**

Fall	6.561	Fields, Forces, and Flows in Biological Systems
Fall	6.630	Electromagnetics
Fall	6.631	Optics and Photonics
Spring	6.634	Nonlinear Optics
Fall	6.640	Electromagnetic Fields, Forces and Motion
Spring	6.685	Electric Machines (next offering unknown)

**Group 9: Physical Science and Engineering**

Fall	6.720	Integrated Microelectronic Devices
Fall	6.728	Applied Quantum and Statistical Physics
Spring	6.730	Physics for Solid-State Applications