The TECHNICAL QUALIFYING EVALUATION (TQE)

Department of Electrical Engineering and Computer Science

Academic Year 2015-2016

Instructions for Graduate Counselors:

Entering graduate students must complete the Technical Qualifying Evaluation (TQE). Their TQE plan must be submitted by Feb. 1st of the spring term following entry into the program. Students are encouraged to complete the TQE by the third 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.

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

Group 1: Systems in CS 6.820, 6.824, 6.829, 6.830, 6.375, 6.823, 6.836, 6.858, 6.831 (see note below)	**Group 2: Theoretical CS** 6.840 (see note below), 6.841, 6.845, 6.850, 6.852, 6.854, 6.856, 6.875 (Any 1 or 2 subject allowed)	**Group 3: Artificial Intelligence** [6.345 xor 6.863 xor 6.864], [6.866 xor 6.869], [6.437 xor 6.438 xor 6.867], 6.832, [6.831* xor 6.839*], [6.874 xor 6.878] (*see note below)
Group 4: System Science and Control Engineering 6.241, [6.251 xor 6.255], [6.341 xor 6.344 xor 6.555]	**Group 5: Circuits and Electronic Systems** 6.334, 6.336, 6.374, 6.775 (Any 1 or 2 subject allowed)	**Group 6: Information Science and Communication** 6.262, 6.267, 6.436, [6.437 xor 6.438], 6.450, 6.453
Group 7: Bioelectrical Engineering 6.521, 6.522, 6.551 (Any 1 or 2 subject allowed)	**Group 8: Electromagnetics** 6.631, 6.632, 6.634 6.641, 6.561, 6.685 (Any 1 or 2 subject allowed)	**Group 9: Physical Science and Engineering** 6.720, 6.728, 6.730, 6.774, 6.777 (Any 1 or 2 subject allowed)

Note: Students in Area II (CS) select subjects from Group 1, 2, 3 only (shaded boxes)

- 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.
- 6.831 can be the second subject in Group 1 or 3, but not the only subject in either group.

Group 1: Systems in CS **(*not offered FT16 and ST17)**

Fall 6.820 – Foundations of Program Analysis*
Spring 6.824 – Distributed Computer Systems Engineering
Fall 6.829 - Computer Networks
Fall 6.830 - Database Systems
Spring 6.375 – Complex Digital Systems Design** (not offered FT15 and ST16)
Spring 6.823 – Computer System Architecture
Spring 6.836 - Multicore Programming
Fall 6.858 – Computer Systems Security
Spring 6.831 - User Interface Design and Implementation

Group 2: Theoretical CS **(**not offered FT15 and ST16)**

Fall 6.840 – Theory of Computation
Spring 6.841- Advanced Complexity Theory**
Spring 6.850 – Geometric Computing*
Fall 6.854 – Advanced Algorithms**
Fall 6.845- Quantum Complexity Theory**
Fall 6.852 – Distributed Algorithms
Spring 6.856 – Randomized Algorithms**
Spring 6.875 – Cryptography and Cryptanalysis

Group 3: Artificial Intelligence

Spring 6.345 – Automatic Speech Recognition**
Fall 6.863 – Natural Language and the Computer Representation of Knowledge**
Fall 6.864 – Advanced Natural Language Processing
Fall 6.866 – Machine Vision**
Fall 6.869 – Advances in Computer Vision
Spring 6.437 – Inference and Information
Fall 6.438 – Algorithms for Inference
Fall 6.867 – Machine Learning
Fall 6.832 – Under-actuated Robotics
Spring 6.831 – User Interface Design and Implementation
Spring 6.839 – Advanced Computer Graphics
Spring 6.874 – Computational Systems Biology
Fall 6.878 – Advanced Computational Biology: Genomes, Networks, Evolution

Group 4: System Science and Control Engineering

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 6.450 - Principles of Digital Communication I
Fall 6.453 - Quantum Optical Communication* (not offered FT16/ST17)

Group 7: Bioelectrical Engineering

Fall 6.521 - Cellular Biophysics
Spring 6.522 - Quantitative Physiology: Organ Transport Systems
Fall 6.551- Acoustics of Speech and Hearing

Group 8: Electromagnetics

Fall 6.631 – Optics and Photonics
Spring 6.632 – Electromagnetic Wave Theory
Spring 6.634 - Nonlinear Optics
Spring 6.641 - Electromagnetic Fields, Forces, and Motion** (not offered FT15 and ST16)
Fall 6.561 - Fields, Forces, and Flows in Biological Systems
Fall 6.685 - Electric Machines* (not offered FT16/ST17)

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
Fall 6.774 - Physics of Microfabrication: Front End Processing** (not offered FT15/ST16)
Spring 6.777 - Design and Fabrication of Microelectromechanical Systems