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.

<table>
<thead>
<tr>
<th>Group 1: Systems in CS</th>
<th>Group 2: Theoretical CS</th>
<th>Group 3: Artificial Intelligence</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.820, 6.824, 6.829, 6.830,</td>
<td>6.840 (see note below),</td>
<td>[6.345 xor 6.863 xor 6.864],</td>
</tr>
<tr>
<td>6.375, 6.823, 6.836, 6.858,</td>
<td>6.841, 6.845, 6.850,</td>
<td>[6.866 xor 6.869],</td>
</tr>
<tr>
<td></td>
<td>(Any 1 or 2 subject allowed)</td>
<td>6.832,</td>
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<tr>
<td></td>
<td></td>
<td>[6.831* xor 6.839*],</td>
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<td></td>
<td></td>
<td>[6.874 xor 6.878]</td>
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<tr>
<td></td>
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<td>(*see note below)</td>
</tr>
</tbody>
</table>

| Group 4: System Science and    | Group 5: Circuits and Electronic | Group 6: Information Science    |
| Control Engineering            | Systems                        | and Communication              |
| 6.241,                         | 6.334, 6.336, 6.374, 6.775      | 6.262, 6.267, 6.436,           |
| [6.251 xor 6.255],             | (Any 1 or 2 subject allowed)    | [6.437 xor 6.438],            |

| Group 7: Bioelectrical         | Group 8: Electromagnetics       | Group 9: Physical Science and   |
| Engineering                   |                                | Engineering                    |
| (Any 1 or 2 subject allowed)  | 6.641, 6.561, 6.685            | (Any 1 or 2 subject allowed)    |
|                                | (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  Fall 6.845- Quantum Complexity Theory**
Spring 6.841- Advanced Complexity Theory**  Fall 6.852 – Distributed Algorithms
Fall 6.854 – Advanced 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