

**The Johns Hopkins University  
Department of Electrical and Computer Engineering  
Electrical Engineering Program  
Graduate Advising Manual (Revised: September 5, 2007)**

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## **I. Introduction**

This manual can help you plan a program of graduate study leading to the MSE degree, Ph.D. degree, or both. Its pages are devoted to policies, rules, procedures (in italics), and suggestions about our program with the intention of providing useful information about these programs. However, uncertainty is implicit in any endeavor, and remaining questions should be addressed to your advisor or the department chair.

Having noted what this manual is about, it should be observed that the most important aspect of graduate study is seldom mentioned. A student entering our program is beginning a joint enterprise with other students and faculty that, at its best, is stimulating, enjoyable, and rewarding for all concerned. Advanced study, innovative fundamental research, and publication of results are the goals. The mechanics so emphasized here are in place to help you achieve these goals.

Note that all students who wish to be admitted to our graduate program leading to either a MSE or PhD must have a bachelor's degree or its equivalent upon entry.

## **II. MSE Degree Program**

Some students are interested solely in the MSE degree, while others may elect to receive an MSE on the way to the Ph.D. Either way, the requirements are the same, and involve the number and kinds of courses that must be taken, grade standards, and limits on transfer courses. Note that students enrolled solely in the MSE program are not guaranteed admission to the Ph.D. program on successful completion of their degree. The departmental requirements for the MSE degree subsume the university-wide requirements.

The requirements for the MSE degree in Electrical and Computer Engineering are as follows:

1. Eight one-semester graduate (400-799) courses approved by the advisor must be satisfactorily completed. These courses cannot include Independent Study, Dissertation Research, or Special Studies.
2. Further depth of understanding must be demonstrated by either satisfactorily completing two additional one-semester courses approved by the advisor, or by writing an MSE thesis acceptable to a member of the ECE faculty, or by completing a special project acceptable to a member of the ECE faculty and writing the corresponding report. Note that the MSE thesis must be submitted to the library and must follow the guidelines described in <http://www.library.jhu.edu/preservation/findit/cbo/guidelines.html>
3. A course (including independent study) is satisfactorily completed if a grade of A, B, C, or P is obtained. No more than one C grade can be counted toward the requirements and a D or F or second C grade results in probation. A second D or F or a third C grade

results in termination from the program.

4. At least six one-semester courses in the MSE program must be ECE-Department day-school courses that are not independent study.

5. WSE master's students may transfer in up to two courses from another institution which were completed after the undergraduate degree was conferred and not applied to a degree elsewhere.

6. Every graduate course designated Independent Study, Dissertation Research, or Special Studies counted toward the MSE degree must include a written report. A copy of the report will become a part of the student's permanent file.

7. Every student must register for a minimum of two semesters as a full-time, resident graduate student (not applicable to bachelor's/master's concurrent students).

8. Every student must be registered in the semester that degree requirements are met.

9. Every student must earn the master's degree within 5 consecutive academic years (10 semesters). Only semesters during which a student has a university-approved leave of absence are exempt from the ten semester limit; otherwise, all semesters from the beginning of the student's graduate studies--whether the student is resident or not—count toward the ten semester limit.

### III. Ph.D. Degree Program

The Ph.D. requirements apply to all part-time and full-time students in the program, however time limits are stated in the context of full-time graduate study. Time limits for part-time programs must be individually arranged.

The Ph.D. degree certifies that the holder has demonstrated research capability. Accordingly, the Ph.D. requirements are used as checkpoints leading the student through this research experience. Because students tend to spend more than ample time on the path to research, several requirements prescribe time limitations. The requirements stated below include university-wide requirements for the Ph.D.

To fulfill the requirements for the Ph.D. degree in ECE, the student must:

#### **1. Satisfy the University Ph.D. residency requirement and the Departmental course load requirements.**

- a) Residency: The University requires at least two consecutive semesters as a full-time resident graduate student.
- b) Coursework: All full-time students must satisfactorily complete at least three graduate courses per semester until they have a Research Sponsor. Until the Departmental Examination is passed, no more than one independent study course per faculty member can be counted toward these three courses.
- c) A course (including independent study) is satisfactorily completed if a grade of A, B, C, or P is obtained. A grade of D or F or a second grade of C results in probation. A second grade of D or F or a third grade of C results in termination from the program.

#### **2. Pass the Departmental Qualifying Examination before the beginning of the fifth semester of graduate study, and then select a Research Sponsor within six months.**

- a) Departmental Qualifying Examination: **The student must select and complete the examinations posed by three examiners eligible to supervise doctoral dissertations in the Department of Electrical and Computer Engineering (see list below), of which at least two must be regular, tenure track ECE faculty (see Section VIII.A).** The respective examiners grade completed examinations, and at the next ECE Department faculty meeting a collective decision is made on the student's performance. This decision involves the student's cumulative academic performance in the graduate program as well as performance on the examination. The Departmental Qualifying Examination cannot be taken more than twice. **The faculty eligible to supervise doctoral dissertations in the ECE Department is: Dr. Andreou, Baker, Bottomley, Brody, Byrne, Davidson, Diehl, Etienne-Cummings, Geman, Goutsias, Iglesias, Jelinek, Johnson, Kang, Kaplan, Karakos, Khudanpur, Khurgin, Martin, Meyer, Miller, Osman, Prince, Sova, Stuber, Thakor, Thomas, Tran, Tsui, Weinert, West and Winslow.** The fall and spring Qualifying Examinations are given over a period of seven days immediately preceding the start of classes.

b) Research Sponsor Selection: A student cannot have a Research Sponsor before passing the Departmental Qualifying Examination. **The Research Sponsor must be a member of the list of examiners given above.** Passing a particular examiner's Departmental Qualifying Examination implies that the examiner is willing to become the Research Sponsor of the student for at least six months. The Research Sponsor sets requirements for the remainder of the program. These may include a teaching requirement, particular coursework, a reading program, or a preliminary research project. Either the student or the Research Sponsor can discontinue the relationship for any reason. When a Student-Research Sponsor relationship is discontinued, a new Research Sponsor must be selected within one semester. Note that once the student chooses a research sponsor, the student must obtain a research sponsor form from the department office, have his/her sponsor sign the form, and then return it to the Graduate Program Coordinator (GPC, Ms. Felicia Roane).

c) A student can take the Departmental Qualifying Examination only if enrolled in the Ph.D. program and not on probation.

### **3. Take the Graduate Board Oral Examination within one year of passing the Departmental Qualifying Examination.**

a) Graduate Board Oral Examination: The purpose of the examination is to test the depth and breadth of the student's knowledge and reasoning abilities. The examination typically is based on the student's course background, but may include the proposed dissertation topic. The members of the GBO examination committee are selected by the candidate's department chair and approved by the Chair of the Graduate board. Although consultation with candidates and their faculty advisors regarding possible exam committee members is appropriate, selection of the committee is the department chair's responsibility and is not the candidate responsibility or prerogative. The Academic Program Coordinator finds a time, a date and a room for the examination, and completes the GBO report form. The ECE chair approves the members of the examination committee and signs the GBO report form. The GPC forwards the GBO report form and a copy of the student's current transcript to the Graduate Board. The Graduate Board chooses a committee chair from among the three committee members that are not from the ECE department, and sends an information packet, the student's current transcript and the GBO report form to the chairman of the examination committee. The Graduate Board also sends a copy of the signed GBO report form to the GPC. The GPC sends a confirmation letter to all the committee members, committee alternates and the candidate.

b) The possible outcomes of the GBO examination include: an unconditional pass, a conditional pass (with the requirements to be met written down on the report form), a fail (If the chair recommends a reexamination, he must indicate with whom and when. At least one person from the original committee must be on the next committee). Currently, the Graduate Board does not have limit on how many times a person can be retested. After the GBO examination, the chairman of the GBO committee submits the original signed GBO report form to the GPC. The GPC sends the GBO report form to the Graduate Board, places a copy of the GBO report form in the student file, and updates the ECE graduate student list.

c) The GBO examination committee consists of at least 5 committee members, the majority from outside the ECE department. Two alternates are also needed, one from ECE and one from outside the Department. At least one committee member from outside the department must be an associate professor or higher (to satisfy the requirement that the committee chair must be an associate professor or higher). Note that for GBO examination committee purposes, the research sponsor is counted as a member of the ECE department. The Graduate Board **MUST APPROVE** any committee member who is either from outside the university or who is from a NON-PhD sponsoring department, laboratory or institute within JHU. The department chair must provide a letter explaining and/or requesting this person and his/her curriculum vitae. At most one committee member must need approval by the Graduate Board. Note that a committee member that has a joint appointment in a JHU PhD sponsoring department does not need to be approved by the Graduate Board. For more information, consult the following website:  
<http://www.jhu.edu/gradbd/ProceduresFinalWeb.html#CompositionOfOral>

d) Note that the chair of the department is responsible for scheduling the exam and submitting the form entitled *Oral Examination for Degree of Doctor of Philosophy* to the Graduate Board Office. This form must be completed, signed by the chair, and submitted to the Graduate Board three weeks before the proposed examination date.

#### **4. Submit a Preliminary Research Proposal before the end of the seventh semester of graduate study.**

The purpose of the preliminary research proposal is to ensure that the student is planning a research project that is both significant and realistic. A preliminary research proposal should contain the following:

a) Cover Page: **The cover page of the proposal should list the research sponsor and two other professors eligible to supervise doctoral dissertations in the Department of Electrical and Computer Engineering. These three faculty members form the Ph.D. Dissertation Proposal and Departmental Seminar Committee for the student. Note that a majority of the committee must be regular, tenure track ECE faculty.**

b) Description of proposed research: The description should state the objectives of the intended research, explain why the topic selected is of interest, present a brief overview of what has already been done in the area, indicate how the student plans to conduct the research, and should provide a rough timetable. There is a limit of ten (10) pages, single-spaced, 12pt text.

c) References, figures, etc.: maximum of five (5) pages.

The proposal must be submitted (Microsoft Word or PDF format) to the Graduate Program Coordinator (GPC, Ms. Roane) at least two weeks before presentation of the proposed research in the departmental seminar. The GPC will distribute (e-mail) the proposal to ECE faculty for comments. Also, in order to facilitate the production of the

poster announcing the seminar, the title, abstract (at most 500 words), date, time, and place of the seminar in Microsoft word format should be e-mailed to the GPC.

**5. Present a Departmental Seminar before the end of the seventh semester of graduate study.**

The Departmental Seminar is a public presentation of the student's proposed research. Its purpose is to provide an opportunity for the student to present the research to an audience unfamiliar with the student's work, (as opposed to a 20-minute conference talk to experts), similar to what might be experienced at a job interview. Also, it affords the student an opportunity to demonstrate how the proposed research is progressing. Finally, it provides an opportunity for others in the department to become familiar with the student's work. The members of the Ph.D. Dissertation Proposal and Departmental Seminar Committee are required to be present at the student's Departmental Seminar. Other faculty members and all graduate students are encouraged to attend. At the conclusion of the seminar, all ECE faculty members present meet to vote on whether the student has passed the proposal and seminar requirements. The faculty may take into consideration the knowledge displayed by the student of the proposed research and whether the successful completion of the proposed research would satisfy the dissertation requirement. A student may be requested to prepare another research proposal and/or seminar if the faculty decides that the research proposal and seminar requirement were not satisfied, or if the student makes a major change in research topic.

The seminars are held on Thursday afternoons at 4:00 p.m., and no ECE courses will be scheduled at that time. Students are responsible for booking their seminar with the ECE office well in advance of the date of the seminar. Students should give a title, abstract, and a copy of their research proposal to the ECE office at least two weeks before it is to be presented. The ECE office will distribute the proposal to ECE faculty for comments. Coffee and refreshments will be served in the Smith Lobby of Barton Hall prior to the seminar at approximately 3:45 p.m. In case of scheduling problems, the seminars can also be held on Friday mornings at 11:00 a.m.

Note: (1) At the end of each student's sixth semester, a letter is sent to them reminding them of this requirement. (2) Students must provide a list of their three Ph.D. Dissertation Proposal and Departmental Seminar Committee members to the department office at the start of their seventh semester. (3) Students must then schedule their Departmental seminar and present it during their seventh semester. (4) The Chair will schedule a seminar during the eighth semester for each student that fails to meet the requirements of items (2) and (3).

**6. Submit a Dissertation and successfully complete a Public Dissertation Defense.**

a) The guidelines for the preparation of dissertations can be obtained from:  
<http://www.library.jhu.edu/preservation/findit/cbo/guidelines.html>

**b) The dissertation must have two Dissertation Readers with the first reader being the Research Sponsor. The two readers must be eligible to supervise doctoral**

**dissertations in the Department of Electrical and Computer Engineering, and at least one reader must be regular, tenure track ECE faculty.** The two dissertation readers are responsible to write a letter to the Graduate Board recommending that the dissertation be accepted in conformity with the requirements for the degree Doctor of Philosophy. The Graduate Board **MUST APPROVE** any reader who is either from outside the university or who is from a NON-PhD sponsoring department, laboratory or institute with JHU. The department chair must provide a letter explaining and/or requesting this person and his/her curriculum vitae. Note that a reader that has a joint appointment in a JHU PhD sponsoring department does not need to be approved by the Graduate Board.

c) The student submits a copy of his Ph.D. dissertation, the dissertation readers' letter, the names of the Dissertation Committee proposed by his research sponsor (first reader), and an abstract of the dissertation (used for the defense announcement) to the Graduate Program Coordinator (GPC, Ms. Roane). The GPC informs the faculty by e-mail that the dissertation and readers' letter are available in the Department office (Barton 105), schedules the Dissertation Defense, and is responsible for producing and posting the announcement of the defense. Note that there will be a minimum of three weeks needed between this submission and the dissertation defense described next.

d) The Dissertation Committee consists of at most five members, must include the two Dissertation Readers, and must include at least three regular tenure track ECE faculty members. As the members of the Dissertation Committee must be approved by a vote of the faculty, the chair polls the faculty by e-mail no sooner than two weeks after submission of the dissertation to the GPC. Any faculty member may request that the e-mail approach not be used, and that the proposed Dissertation Committee be placed as an agenda item at a meeting of the faculty. Once the Dissertation Committee has been approved, the GPC prepares the Doctoral Dissertation Defense Report Form.

e) The Dissertation Committee administers a Public Dissertation Defense no sooner than three weeks after submission of the dissertation, following which the Dissertation Committee votes on the acceptance of the dissertation. The chairman of the Dissertation Committee is responsible for getting the Doctoral Dissertation Defense Form from the GPC, completing the form and returning it to the GPC.

f) After the student completes the defense, the GPC prepares a "Certification for Advanced Degree" form, which is signed by the department chair and returned to the GPC. The GPC prepares a "Doctoral Dissertation Submission for Binding" form and the student has it signed by the appropriate library representative once he/she has submitted the dissertation for binding to the library. The completed form is returned to the GPC. The student completes an "Application for Graduation" form and returns it to the GPC. The GPC submits the Reader's Letter, Doctoral Dissertation Defense Report form, Doctoral Dissertation Submission for Binding form, Certification for Advanced Degree form, and a copy of the student GBO Report form to the Graduate Board, and submits the white copy of the "Application for Graduation" form to the Registrar's office.

#### **IV. Financial Aid**

The Graduate Admissions and Fellowships Committee in the Department makes decisions on financial aid. Among other actions, this committee awards teaching assistantships and Wolman Fellowships to newly admitted students based on merit. These assistantships and fellowships do not include support for the summer. The student is responsible for securing summer support. This can be accomplished by working on a summer research project with a faculty member who is willing to support the student. Students may be supported with departmental teaching assistantship funds for up to three semesters. The continuation of this support into the second year is contingent on the student's academic performance during the first year. The faculty periodically reviews students, and decisions for continued support are based on performance in course work and as TA's. After the third semester, students are expected to derive support from grants and contracts of their research sponsors. Other admitted students may be offered partial tuition awards depending on merit. Decisions by the Committee are made during the spring semester of each year.

The University, Department and Research Sponsor share in supporting the student during his/her stay. For a fully supported student, the University awards an 80 percent tuition fellowship. The remaining 20 percent and the student's salary are provided by the Department for up to three semesters; afterwards, that part is provided by the Research Sponsor. However, it should be noted that after the student's fifth year the University may reduce its tuition support. This can be avoided by arranging with the Research Sponsor and the Department Chairman to submit a request to the University to extend its 80 percent tuition support for one additional year. If this request is granted, then the student may continue his/her studies uninterrupted for one more year. The student should be aware that after the fifth year, special measures need to be taken in order to ensure continued financial support.

The full tuition and stipend awards made each year for teaching assistantships are generous and are considered to contain some element of fellowship support beyond compensation for assisting in a course.

Teaching assistantship positions left unfilled after the admission cycle may be assigned to current students. Priority is given to third year students who have previously been supported and then to all other current students who have previously been supported and then to all other current students. Decisions on the unfilled positions are made by the Department Chair in consultation with the Chair of the Admissions and Fellowships Committee. The decisions are made during the summer months. The abilities of students to teach effectively in particular courses are weighted heavily in the decisions. Further, the compensation for assisting in a course is determined by the number of hours needed to complete the work and is generally less than the full tuition and stipend awards made to incoming students.

## **V. Ethics**

Graduate students are expected to be aware of academic ethics and of actions that constitute unethical behavior. In brief, students must submit work that represents their own efforts. When ideas and/or results are drawn from other sources, those sources must be cited in the submitted work. Students may not collaborate or discuss solutions of any assignment prior to submission without explicit permission from the instructor. Use of email is to be strictly professional in nature. Unprofessional or inappropriate email will be considered a violation of University ethical policies.

Violations of academic ethics can have a severe impact on a student's program beyond the penalties described below. Those involved in unethical behavior will lose the confidence of the faculty and may be unable to find any faculty member willing to serve as their Research Sponsor.

Faculty members will usually deal directly with students suspected of unethical behavior in their courses and will assign an appropriate penalty. The penalty may be failure in the assignment or examination or failure in the course. Faculty and students may seek the assistance of the Department Chair when agreement on the charges and penalties cannot be reached. In all cases, a summary of the charges and penalties will be placed in the student's permanent file.

## **VI. Miscellaneous Information**

### **A. Academic Information**

Further academic information can be found in the JHU catalog. The ECE Office has other information that may be of interest to graduate students. This includes faculty vitas and files of previous Departmental Qualifying Examinations.

### **B. Registration**

Graduate student registration forms must be initialed first by the advisor, and then by the GPC or department chair. International students (students that are not United States citizens or permanent residents) must obtain the signature of an advisor from the Office of International Student and Scholar Services. To avoid a late registration fee, it is wise not to wait until the last minute before seeking the advisor's approval.

### **C. Review of Graduate Students**

Periodically the ECE faculty meets to review the performance and progress of each Ph.D. student. While there are no specific grade requirements in the Ph.D. program, the depth and organization of the coursework program and the grades obtained in that program are major components of the review. Specific comments or criticisms are typically communicated to the student by letter from the department chair. The MSE students are reviewed each semester by the department chair, particularly in regard to the grade requirements, and specific matters are brought before the faculty for discussion and action.

### **D. Graduate Student Representatives**

Each year the ECE graduate students select a full-time Ph.D. student to serve as a departmental representative. The representative is invited to attend, in a non-voting capacity, all departmental faculty meetings, except portions where individual students or personnel matters are discussed. Also the graduate students each year select a representative to the university-wide Graduate Representative Organization (GRO).

### **E. Additional Jobs**

Apart from the graduate student support mechanisms discussed earlier, opportunities for part-time employment opportunities arise within the University, and in the Baltimore/Washington area. Normally, opportunities known to the department are posted and/or communicated informally. A wise student will let his advisor and other faculty members know of his interests. The faculty believes these additional jobs can cut heavily into the time, energies, and concentration available for the Ph.D. program if not appropriately moderated. Therefore, students should discuss their plans with their advisors. In addition, the following regulations have been adopted:

1) Full-time graduate students are permitted no more than 20 hours per week of additional employment.

2. Full-time graduate students enjoying nominally full support by the University are permitted no more than eight (8) hours per week of additional employment.

#### **F. Library Facilities**

The Milton S. Eisenhower Library makes available to the ECE Department a number of carrels (desks with lockers) each year. The assignment of carrels is made in August or September, and graduate students interested in obtaining a carrel should notify the Academic Program Coordinator. The Library also purchases books and journals based on departmental requests. Student requests for books or journals should be communicated to the advisor or directly to the faculty member designated for Library Liaison, Dr. Howard Weinert.

#### **G. Computer Facilities**

Hopkins Information Technology Services (HITS) provides email services through the Johns Hopkins Enterprise Mail (JHEM) server. A JHEM account can be activated once you have a J-Card. To activate your JHEM account, go to [jhed.jhu.edu](http://jhed.jhu.edu) and follow the instructions for first time logins.

The Krieger Computing Lab located in Krieger Hall is maintained by HITS. No account is required, just a student ID, for use of the 130 workstations which have basic office and imaging applications.

Departmental facilities include a CAD facility in Barton 120. Use of these facilities is limited to those needing the special software for their research and coursework. All graduate students in the department receive accounts for use during their enrollment in the ECE Department. Support questions concerning ECE computer equipment/services should be sent to [ecehelp@jhu.edu](mailto:ecehelp@jhu.edu).

#### **H. Graduate Student Offices**

These offices are assigned by the Faculty Space Committee. Typically, students can arrange mutually agreeable changes in assignments by first clearing them with the committee.

#### **I. Institute of Electrical and Electronics Engineers, Inc.**

Graduate students are invited to join the student chapter of the IEEE. Applications are available in the ECE Department office.

**J. 520.800 Independent Study Sections**

- |                     |                |               |
|---------------------|----------------|---------------|
| 1. Staff            | 12. Prince     | 23. Winslow   |
| 2. Andreou          | 13. Khudanpur  | 24. West      |
| 3. Goutsias         | 14. Osman      | 25. Glaser    |
| 4. Tran             | 15. Geman      | 26. Stuber    |
| 5. Etienne-Cummings | 16. Fichtinger | 27. Tsui      |
| 6. Miller           | 17. Sotiriadis | 28. Kaplan    |
| 7. Iglesias         | 18. Jelinek    | 29. Bottomley |
| 8. Davidson         | 19. Byrne      |               |
| 9. Kang             | 20. Cooper     |               |
| 10. Khurgin         | 21. Podrazik   |               |
| 11. Meyer           | 22. Atalar     |               |

**K. 520.801/802 Dissertation Research Sections**

- |             |                      |               |
|-------------|----------------------|---------------|
| 1. Staff    | 10. Etienne-Cummings | 19. Miller    |
| 2. Andreou  | 11. Cauwenberghs     | 20. Winslow   |
| 3. Khurgin  | 12. Davidson         | 21. Osman     |
| 4. Prince   | 13. Westgate         | 22. Bottomley |
| 5. Meyer    | 14. Goutsias         | 23. Geman     |
| 6. Iglesias | 15. Khudanpur        | 24. Stuber    |
| 7. Byrne    | 16. Jelinek          | 25. West      |
| 8. Tran     | 17. Joseph           |               |
| 9. Kang     | 18. Sotiriadis       |               |

**L. 520.809/810 Special Studies Sections**

- |            |             |
|------------|-------------|
| 1. Tran    | 3. Davidson |
| 2. Andreou | 4. Khurgin  |

## **VII. Notice of Nondiscrimination Policy Statement**

The University has adopted the following two statements of its nondiscrimination policy for inclusion in all publications distributed to students, including the catalogs and applications of the various divisions.

“The Johns Hopkins University admits students of any race, color, gender, religion, national or ethnic origin, age, disability, or veteran status to all of the rights, privileges, programs, benefits, and activities generally accorded or made available to students at the university. It does not discriminate on the basis of race, color, gender, religion, sexual orientation, national or ethnic origin, age, disability, or veteran status in any program or activity, including the administration of its educational policies, admission policies, scholarship and loan programs, and athletic and other university- administered programs or in employment. Accordingly, the university does not take into consideration personal factors that are irrelevant to the program involved”.

Policy on the Reserve Officer Training Corps. Present Department of Defense policy governing participation in university-based ROTC programs discriminates on the basis of sexual orientation. Such discrimination is inconsistent with the Johns Hopkins University nondiscrimination policy. Because ROTC is a valuable component of the university that provides an opportunity for many students to afford a Hopkins education, to train for a career, and to become positive forces in the military, the university, after careful study, has continued its ROTC program but encourages a change in federal policy that brings it into conformity with the university's policy.

Questions regarding access to programs following Title VI, Title IX and Section 504 should be referred to the office of Affirmative Action for the university, responsible for the coordination of equal opportunity programs, 205 Garland Hall, (410) 516-8075.

## **VIII. Electrical and Computer Engineering Personnel**

### **A. Electrical and Computer Engineering Faculty**

Andreas G. Andreou, Professor; Ph.D. Johns Hopkins. Micro and nanosystems technologies, sensory information processing, neural computation.

William R. Brody, Professor and President, Johns Hopkins University; Ph.D. & M.D, Stanford. Medical imaging, magnetic resonance imaging.

Frederic M. Davidson, Professor; Ph.D. Rochester. Quantum optics, optical coherence, optical communications.

Ralph R. Etienne-Cummings, Associate Professor; Ph.D., U Penn. Mixed signal VLSI, computational sensors, robotics, neuromorphic engineering.

John I. Goutsias, Professor; Ph.D. USC. Signal and image processing, modeling and computational analysis of cellular processes, bioinformatics.

Pablo A. Iglesias, Professor; Ph.D. Cambridge. robust control, systems biology, mathematical modeling of biological systems.

Frederick Jelinek, Julian Sinclair Smith Professor; Ph.D. MIT. Speech recognition, statistical methods, information theory.

Kristina Johnson, Professor and Provost, Johns Hopkins University; Ph.D. Stanford. Fourier optics, holography, optical signal processing, electro-optics

Jin U. Kang, Associate Professor; Ph.D., Central Florida. Opto-electronics, nonlinear optics, fiber optics and lasers.

Alexander E. Kaplan, Professor; Ph.D. USSR Academy of Sciences. "Extreme" nonlinear optics: super-powerful laser interactions with matter.

Sanjeev P. Khudanpur, Assistant Professor; Ph.D. Maryland. Information theory, statistical language modeling.

Jacob B. Khurgin, Professor; Ph.D. Polytechnic University. Quantum electronics, nonlinear optics.

Gerard G.L. Meyer, Professor and Chair; Ph.D. UC Berkeley. Parallel computing, computational methods, fault-tolerant computing.

Jerry L. Prince, William B. Kouwenhoven Professor; Ph.D. MIT. Image processing and computer vision with application to medical imaging.

Trac D. Tran, Associate Professor; Ph.D. Wisconsin - Madison. Filter banks, wavelets, multirate systems and applications.

Howard L. Weinert, Professor; Ph.D. Stanford. Statistical signal and image processing.

### **B. Associated Faculty: Joint, Secondary and Part-Time Appointments**

James K. Baker, Research Professor and Director of Research, COE in Human Language Technology; Ph.D. Carnegie-Mellon. Speech recognition, speech analysis.

Paul A. Bottomley, Russell H Morgan Professor; Radiology; Ph.D. University of Nottingham. Magnetic resonance imaging, metabolic MRI.

William J. Byrne, Associate Research Professor; Ph.D. Maryland. Large vocabulary continuous speech recognition.

Gregory Chirikjian, Professor, Mechanical Engineering; Ph.D. Cal Tech. Robotics, computational biology, statistics of biological macromolecules.

A. Brinton Cooper III, Associate Research Professor; Ph.D. Johns Hopkins. Error control coding, coded wireless and optical communication.

Christopher Diehl, Assistant Research Professor and Senior Professional Staff APL; Ph.D. Carnegie Mellon. Machine learning, computer vision, sensor networks.

Yamac Dikmelik, Assistant Research Scientist; Ph.D. Johns Hopkins University. Photonics, non-linear optics, terahertz spectroscopy.

Donald Geman, Professor, Applied Mathematics and Statistics; Ph.D. Northwestern University. Computer vision, computational biology, statistical learning.

Robert E. Glaser, Lecturer (part-time); Ph.D. Johns Hopkins. Advanced digital logic systems.

Gregory Hager, Professor, Computer Science; Ph.D. Pennsylvania. Robotics, vision-based interaction and visual tracking.

Roger Hammons, Assistant Research Professor and Senior Professional Staff APL; Ph.D. University of Southern California. Communication, coding, network engineering.

Robert E. Jenkins, Senior Lecturer; M.S., Maryland. Digital systems, spacecraft systems and space technology.

Damianos Karakos, Assistant Research Professor; Ph.D. University of Maryland, College Park. Statistical methods in language and speech, information theory.

Mark N. Martin, Assistant Research Professor and Senior Professional Staff APL, Ph.D. Johns Hopkins. Low power VLSI, CMOS Device Physics, Radiations Effects.

Michael I. Miller, Herschel and Ruth Seder Professor of Biomedical Engineering, Ph.D. Johns Hopkins. Image understanding, computer vision, medical imaging.

Paul A. Morton, Adjunct Associate Research Scientist; Ph.D. University of Bath. Nanophotonic devices, photonic integration.

Nael F. Osman, Associate Professor, Radiology; Ph.D. Johns Hopkins. Image and multi-dimensional signal processing, medical imaging.

Louis J. Podrazik, Lecturer (part-time); Ph.D. Johns Hopkins. Parallel computer architectures and algorithms, fault tolerant design.

Theodore O. Poehler, Research Professor and Vice Provost for Research; Ph.D. Johns Hopkins. Quantum electronics, solid-state physics.

Philippe Pouliquen, Assistant Research Scientist; Ph.D. Johns Hopkins. VLSI design, low power sensors.

Raymond Sova, Assistant Research Professor and Principal Professional Staff APL; Ph.D. Johns Hopkins. Laser communications, R-F photonics.

Kim Strohhahn, Assistant Research Professor and Principal Professional Staff APL; Ph.D. Iowa State. Radiation hardened electronics.

Matthias Stuber, Associate Professor, Radiology; Ph.D. ETH Zurich. High resolution coronary MRI, MR myocardial tagging, High field MRI.

Nitish Thakor, Professor, Biomedical Engineering; Ph.D. University of Wisconsin, Madison. Biomedical sensors and VLSI systems, neuroengineering.

Michael E. Thomas, Research Professor and Principal Professional Staff APL; Ph.D. Ohio State. Propagation of light, applied spectroscopy and lasers.

Benjamin Tsui, Professor, Radiology, Ph.D. U. of Chicago. Image reconstruction, quantitative SPECT and PET imaging, structural X-ray analysis

Rene Vidal, Assistant Professor, Biomedical Engineering; Ph.D. UC Berkeley. Image analysis and computer vision, identification and control of hybrid systems.

James E. West, Research Professor; electroacoustics, physical acoustics, and architectural acoustics.

Raimond Winslow, Professor, Biomedical Engineering; Ph.D. Johns Hopkins. Systems biology and bioinformatics.

### **C. Miscellaneous Appointments**

Aaron Carass, Associate Research Engineer  
Clyde Clark, Visiting Scholar  
Marc Cohen, Fellow-by-Courtesy  
Moise H. Goldstein, Professor Emeritus  
Willis Gore, Professor Emeritus  
Richard I. Joseph, Jacob Suter Jammer Professor Emeritus  
C. Harvey Palmer, Professor Emeritus  
Wilson J. Rugh, Edward J. Schaefer Professor Emeritus  
Chul-Gyu Song, Visiting Associate Professor  
Sudhir B. Trivedi, Fellow-by-Courtesy  
Roger Westgate, Professor Emeritus  
Li Xiaolu, Visiting Scholar

### **D. Postdoctoral Fellows**

Sandra De Keijzer  
Keith Hall  
Junghoon Lee  
Vijay Parthasarathy  
Francisco Tejada  
Jacob Vogelstein  
Sergei Volkov

### **E. Department Staff**

|  |                             |
|--|-----------------------------|
| Candace Abel, Administrator                        | cabel@jhu.edu               |
| Laura Libertini, Administrative Coordinator        | libertini@jhu.edu           |
| Justin Martin, Assistant System Administrator (PT) | jmartin@ecemail.ece.jhu.edu |
| Cora Mayenschein, Budget Specialist                | coram@jhu.edu               |
| Brian O'Reilly, Senior System Administrator (PT)   | ecehelp@jhu.edu             |
| Ethel Peterson, Administrative Secretary           | ethelp@jhu.edu              |
| Felicia Roane, Graduate Program Coordinator        | froane@jhu.edu              |
| Barbara Sullivan, Administrative Coordinator       | bsullivan@jhu.edu           |

## **IX. ECE Master of Science in Engineering Graduation Process**

1. The candidate gets the “Certificate of Departmental Approval, Master of Science in Engineering Degree Program in Electrical and Computer Engineering” form, the “G.W.C. Whiting School of Engineering Application for Graduation” form, and a copy of his/her transcripts from the ECE Department website or the ECE Dept. office or his/her advisor.

2. The student fills out the “Certificate of Departmental Approval, Master of Science in Engineering Degree Program in Electrical and Computer Engineering”, has it approved and signed by his/her advisor and gives the form to the Graduate Student Coordinator (GSC, Ms. Roane).

If Option B, Completion of a special project report is chosen, the candidate gives a copy of the report to the GSC, who makes a copy of the title page for the WSE Graduate Committee, and files the report in the candidate’s departmental file.

If Option C, Written master’s essay is chosen, the student must complete the “Masters Essay Submission for Binding Form”, and take his/her essay to the library with the binding form. The binding form, first signed by the advisor and then by a library representative, is returned to the GSC. Note that the essay must follow the University rules on essays, that is, non-acidic paper, etc. (see <http://milton.mse.jhu.edu:8001/library/pres/guide.html>)

3. The candidate completes the “G.W.C. Whiting School of Engineering Application for Graduation” form, and returns it to the GSC (yellow copy is kept by the Department, pink and white copies go to the registrar’s office)

4. The GSC completes the “Certification of Completion of Departmental Requirements for Masters Degree in Engineering” and has it signed by the Department Chair.

### **Documentation submitted to the WSE Graduate Committee by the GSC:**

- “Certificate of Departmental Approval Master of Science in Engineering Degree Program in Electrical and Computer Engineering” form
- “Certification of Completion of Departmental Requirements for Masters Degree in Engineering” form
- Title page of special project report or master’s essay, if applicable
- “Masters Essay Submission for Binding” form, if applicable
- The student’s transcript

### **Deadlines for Terminal MSE**

**End of August:** If MSE paper work is submitted by that deadline, the student need not register for classes for the Fall semester and may request an interim certificate in December.

**Beginning of September:** Student must register for classes if MSE paper work has not been submitted. If the student intends to submit MSE paper work by the mid-October deadline, the student may request a tuition waiver.

**Mid October:** If MSE paper work is submitted by this deadline, the student is entitled to a tuition refund and may request an interim certificate in December.

**Mid January:** If MSE paper work is submitted by this deadline, the student need not register for classes for the Spring semester

**Early April:** Deadline to submit MSE paper work in order to get a degree in May

## X. Ph.D. Degree Requirements Summary

To fulfill the requirements for the Ph.D. degree in ECE, the student must:

1. Satisfy the University Ph.D. residency and the Department course load requirements
2. Pass the Departmental Qualifying Examination and select a Research Sponsor
  - Departmental Qualifying Examination: The student must select and complete the examinations posed by **three examiners eligible to supervise doctoral dissertations in the ECE Dept., of which at least two must be regular, tenure track ECE faculty.**
  - Research Sponsor Selection: **The Research Sponsor must be eligible to supervise doctoral dissertations in ECE.**
3. Pass the Graduate Board Oral Examination
4. Submit a Preliminary Research Proposal that **lists the research sponsor and two other professors eligible to supervise doctoral dissertations in ECE.** These three faculty members form the Ph.D. Dissertation Proposal and Departmental Seminar Committee for the student. **Note that a majority of the committee must be regular, tenure track ECE faculty.**
5. Successfully present a Departmental Seminar.
6. Submit a Dissertation and successfully complete a Public Dissertation Defense.
  - The dissertation must have two Dissertation Readers with the first reader being the Research Sponsor. **The two readers must be eligible to supervise doctoral dissertations in the Department of Electrical and Computer Engineering, and at least one reader must be regular, tenure track ECE faculty.**
  - The Dissertation Committee administers a Public Dissertation Defense and votes on the acceptance of the dissertation.
  - The Dissertation Committee **must be approved by a vote of the faculty**, consists of at most five members, must include the two Dissertation Readers, and **must include at least three regular tenure track ECE faculty members.**