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# Department of Electrical Engineering Graduate Studies Handbook

## **Part 1: Academic Policies**

### ***I. Enrollment***

Once admitted, all degree and non-degree graduate students must enroll before each semester at the times and locations announced by the University Registrar. Enrollment dates are published in the Graduate School Calendar.

Any admitted student who fails to enroll for one semester or more must apply for readmission upon return. (See “Continuous Enrollment,” below.)

#### ***I.A Continuous Enrollment***

All students must enroll each semester in the academic year to maintain student status. Continuous enrollment is met normally by enrollment in the University and registration in a graduate-level course relevant to the student’s program. A student who is concurrently pursuing degrees in the Graduate School and in another school in the University meets the continuous enrollment requirement by registering for a course in either program. Any exception to this rule, including a leave of absence, must be approved by the Graduate School. (See “Leave of Absence,” below.)

Degree students who have completed the credit hour requirement for their degree must register for at least one credit hour per semester, including the final semester or summer session in which they receive their degree. These students may be considered full-time students whether or not they are in residence. Students not in residence and taking one credit hour pursuant to continuous enrollment requirements are charged a special registration fee.

A student who fails to enroll for one semester or more must apply for readmission upon return. Continuing degree-seeking students (i.e., degree students who are eligible to continue their studies in the fall semester) may have access to University facilities and services from May through August without registering and enrolling for academic credit in the Summer Session.

#### ***I.B. Leave of Absence***

For exceptional reasons and on the recommendation of the department, a student in good academic standing may request a leave of absence for a maximum of two consecutive semesters. A request for a leave of absence must be made before the semester in which the leave is taken, and all leaves of absence must be approved by the Graduate School. If, for some urgent reason, a student is allowed to leave the University after the beginning of the semester, the withdrawal procedure below must be followed. If at the end of the leave of absence period the student does not return, the student is considered terminated.

Application for readmission is required if the student wishes to return.

### ***I.C. Withdrawal from the Program***

To withdraw from the University before the end of the semester, a student must inform the department and the Graduate School as well as complete the notice of withdrawal in the Office of the Registrar, 105 Main Building.

Upon approval of the withdrawal, the University enters a grade of “W” for each course in which the student was registered. If a student drops out of the University without following the procedure described above, a grade of “F” is recorded for each course.

The credit for any course or examination will be forfeited if the student interrupts his or her program of study for five years or more.

The University reserves the right to require the withdrawal of any student when academic performance, health status or general conduct may be judged clearly detrimental to the best interests of either the student or the University community.

In the case of a medical leave of absence, clearance from the University Health Center is required prior to readmission.

## ***II. Academic Regulations***

### ***II.A. Full-time and Part-time Students***

A full-time student is one who is working full time towards his or her degree objective. This normally means that a full-time student is one who (1) registers for nine or more credit hours of required course work per semester in the academic year or six or more credit hours in the Summer Session or (2) is engaged in dissertation research with an advisor and is registered for a minimum of one credit hour. This second category includes both resident and nonresident students. (See “Continuous Enrollment.”)

A part-time student is any enrolled graduate student who does not fall within either of the preceding categories. For loan purposes, a half-time student is a part-time student who registers for at least six credit hours per semester in the academic year or three credit hours in the Summer Session.

All degree-seeking students are expected to maintain full-time status and to devote full time to graduate study. No degree student may hold a job, on or off campus, without the express permission of his or her department and the Graduate School.

### ***II.B. Registration Limitations***

During the academic year, a graduate student may not register for more than 12 credit hours of graduate courses, i.e., the 500-, 600- and 700-level courses, each semester. An exception to this is the first year of graduate study, during which a graduate student may

take up to 15 credit hours, of which 3 hours may be research. In the Summer Session, a graduate student may not register for more than 10 credit hours.

### ***II.C. Changes in Student Class Schedules***

A student may add courses only during the first seven class days of the semester. Students may add courses after this time only on recommendation of the department and with approval of the Graduate School.

A student may drop courses during the first seven class days of the semester. To drop a course after this period and up to the midsemester point (see the Graduate School Calendar for the exact date), a student must have the approval of the chair of the department offering the course, the student's advisor and the Graduate School. A course may be dropped after the midsemester point only in cases of serious physical or mental illness. Courses dropped after this date will be posted on the student's permanent record with the grade of "W."

A course taken for credit can be changed to an audit course after the midsemester point only in cases of serious physical or mental illness.

### ***II.D. Course Numbers***

No graduate credit is allowed for courses below the 400 level. The advanced undergraduate courses numbered 400 through 497 may, with the approval of the department chair and the Graduate School, be taken to satisfy up to 6 hours of graduate credit requirements.

Courses numbered 500 through 599 are first-level graduate courses into which qualified advanced undergraduates may be admitted with the permission of the instructor and the approval of the chair. Courses numbered 600 and above are advanced graduate courses open only to those who have completed the undergraduate and graduate prerequisites.

### ***II.E. Graduate Grades***

Listed below are graduate grades and the corresponding number of quality points per credit hour.

A	4
A-	3.667
B+	3.333
B	3
B-	2.667
C+	2.333
C	2
F	0
I	0 (Until Incomplete is removed)
NR	Not reported
S	0 Satisfactory

U	0 Unsatisfactory
V	0 Auditor (graduate students only)
W	0 Discontinued with permission

Quality point values are used to compute the student's G.P.A. The G.P.A. is the ratio of accumulated earned quality points to the accumulated earned semester credit hours. G.P.A. computation takes into account only those grades earned in Notre Dame graduate courses by students with graduate status at Notre Dame. For courses taken in a department or college in the University but outside the Graduate School, or taken outside the University, the grade will not be included in the G.P.A. computation.

The grades of C- and D are not awarded in the Graduate School.

A student receives the temporary grade of I when, for acceptable reasons, he or she has not completed the requirements for a 500- or higher-level graduate course within the semester or summer session. No grade of I can be given for courses below the 500 level or to graduating students in the final semester or final summer session of a terminal degree program.

A student receiving an I must complete the course work for a grade prior to the beginning of the final examination period of the next semester in which the student is enrolled. If a student receives an I for a summer session course, he or she must complete the course work for a grade before the final examination period begins for the next semester or summer session (whichever comes first) in which the student is enrolled.

The University temporarily computes an I as the equivalent of an F in calculating the G.P.A. When the student fulfills the above requirements, the I is replaced by the new grade. Should the student not complete the course work as required, the I remains on the academic record and is computed in the G.P.A. as equivalent to an F.

The department and the Graduate School will review a student who receives more than one I in a semester or an I in two or more consecutive semesters, to determine his or her eligibility for continued support and enrollment.

The grades of S and U are used in courses without semester credit hours, as well as in research courses, departmental seminars, colloquia, workshops, directed studies, field education, and skills courses. These courses, if given the grade of S, do figure in a student's earned semester credit-hour total but do not figure in the computation of the G.P.A. A grade of U will not count toward the student's earned semester credit-hour total, nor will it figure in the computation of the G.P.A.

The grade of V has neither quality-point nor credit-hour value. It is the only grade available to the registered auditor who requests at the beginning of the semester that it be made part of his or her permanent record and who attends the course throughout the entire semester. The grade of V cannot be changed to a credit-earning grade.

The grade of W is given for a course that a student is allowed to drop after the midsemester point.

### ***II.F. Examinations***

Unexcused absence from a scheduled final examination results in an “F.” An absence excused in advance results in an “I” (incomplete).

### ***II.G. Academic Good Standing***

Continuation in a graduate degree program, admission to degree candidacy, and graduation require that the student be in academic good standing. This is defined as maintenance of at least a 3.0 (B) cumulative G.P.A. and a semester G.P.A. of at least 2.5. A student may be dismissed from the department or program if the G.P.A. in any one semester is below 2.5 or if the cumulative G.P.A. is below 3.0 for two consecutive semesters.

A student whose cumulative G.P.A. drops below 3.0 is not allowed to register for thesis or dissertation research credits until this deficiency is removed. Also, a student whose cumulative G.P.A. is below 3.0 is not allowed to defend his or her thesis. A student must be in academic good standing to be eligible for new or continued financial support.

### ***II.H. Director of Graduate Studies***

The Director of Graduate Studies advises all new graduate students concerning the various aspects of graduate study in the Department of Electrical Engineering. The Director of Graduate Studies also takes care of all procedural aspects of a student's program and is an ex-officio member of the Graduate Committee.

### ***II.I. Faculty Advisor***

Upon entry into our graduate program, each student will be assigned a temporary academic advisor from among the faculty in the student's technical area. This temporary advisor will assist the student during his/her first year in setting up a course plan and identifying research interests. Normally, graduate students will be required to identify a permanent faculty advisor by the end of his/her first year; it will be the responsibility of this faculty advisor to advise the student on academic matters, direct his/her research, and support the student financially during the student's graduate program. Failure to identify an academic advisor who can take on these responsibilities may be regarded as failure to make adequate progress towards the degree (see II.M. below) and be cause for a student to be terminated from the program.

If a student decides that he/she would like to change academic advisors after the first year, they are free to do so. However, it is the student's responsibility to make sure that the proposed new advisor is amenable to the change and is capable of supporting the student financially.

### ***II.J. Major Area***

The course work and research in Electrical Engineering can be divided into two broad areas:

- (ECS) Electronic Circuits and Systems: communication systems, control systems, signal and image processing.
- (EMD) Electronic Materials and: solid-state materials and devices, including optoelectronics.

Normally each student will select one of these areas as his/her major area of concentration.

### ***II.K. Qualifying Examination***

The Qualifying Examination is normally taken by all full time graduate students at the end of their first year of graduate study. The Qualifying Examination is offered twice each year, typically in January and May.

The purpose of this examination is to determine the student's potential and readiness to complete the M.S. and Ph.D. programs. The examination functions as both the Master's Comprehensive Examination and the written part of the Ph.D. Candidacy Examination.

The examination is written and closed book, consisting of thirteen (13) questions - eight (8) from the ECS area five (5) from the EMD area. The student may work any of these questions, but must specify which five (5) problems he/she chooses to have graded. The questions are designed to test the student's ability to reason through a problem and are based on undergraduate and first year graduate level courses. The student is given five hours to complete the examination.

A member of the faculty serves as the Examination Coordinator (EC) and is responsible for the administration of the examination. The EC chairs an examining board consisting of the Graduate Committee and the Area Committee chairs. This board receives and approves the questions. Notice of the examination date for each semester will be issued by the EC near the end of the previous semester.

After the students have taken the examination, each question is graded and an evaluation is forwarded to the EC. The EC compiles the results and reports them to the department faculty. The faculty as a whole determines whether the student has:

- (1) Demonstrated Ph.D. capability
- (2) Demonstrated M.S. capability
- (3) Failed to demonstrate graduate level capability.

This result is made available to the Graduate Committee to aid in its determination of the student's future status. The student may retake this examination a second time with permission of the department. Results of the examination are communicated to the student by a letter from the department chair.

The Qualifying Examination should be passed at the Ph.D. level by the end of the student's third semester in order for the student to receive continued financial support

from the department.

### ***II.L. Visitors at Oral Examinations***

All oral examinations in the department are open to all Electrical Engineering faculty. Faculty members who are not part of the examining board are free to ask questions of the candidate but do not vote in any recommendations arising from the examination.

### ***II.M. Progress Towards a Degree***

A student who commences on a degree program in electrical engineering is expected to demonstrate continuous progress toward that degree. This regulation is in addition to the constraints imposed by the graduate school. A student's advisor will monitor his or her continuous progress.

### ***II.N. Continuing Status***

Students who are admitted to the graduate program are assured of at least two semesters of graduate student status. During that time, they will take the Qualifying Examination. If they do not demonstrate graduate level capability on that examination, they must meet with the Graduate Committee to discuss the continuation of their graduate student status. Similarly, students who do not finish their M.S. program within four semesters must also meet with the Graduate Committee to discuss continuation.

The Graduate Committee may make recommendations to the Department Chairman and the Graduate School concerning a student's status and financial support. These recommendations are based on a student's course grades, graduate examinations, and other factors. The department will not continue financial support for any student not making satisfactory progress towards a degree.

## ***III. Financial Support***

### ***Graduate School Financial Support Policy***

Full-time, degree-seeking graduate students in good academic standing may be eligible for financial support supplied by the University.

Financial support from the university comes in two broad classes:

- Graduate assistantships and university fellowships. This support comes from the Graduate School but is allocated by the department. Graduate students supported by a graduate assistantship should expect to spend at least 12 hours a week assisting in teaching courses. This usually takes the form of running laboratory sections, recitation sections, and/or grading. Graduate students supported by university fellowships may or may not be required to carry out teaching duties, depending on the specifics of the fellowship.

- Research assistantships. These are a form of support provided by individual faculty members who obtain grants from external agencies (e.g., National Science Foundation or NASA) to carry out research projects. Students are expected to work with the faculty member in performing research as part of their training. Research assistants are normally expected to be working on their research projects year-round. Vacation times need to be coordinated with the research director.

Graduate assistants, research assistants, and fellows who receive a full stipend should not be employed elsewhere on campus. (Exceptions must be approved by the Graduate School.)

During their first year of studies, graduate assistants and research assistants are restricted to a maximum load of 15 credit hours of course work per semester. Subsequently, the maximum load is 12 credit hours of course work per semester.

New graduate students admitted with support (either GA, RA, or a fellowship) can be assured of support for two semesters. Support in the summer must normally come from a research assistantship in association with a faculty member. It is the student's responsibility to make such arrangements with a faculty member able to provide support. A small number of teaching graduate assistantships may also be available in the summer.

The Qualifying Examination should be passed at the Ph.D. level by the end of the student's third semester in order for the student to receive continued financial support from the department.

A graduate student cannot receive more than eight years of financial support from the Graduate School or from funds allotted by the Graduate School to departments.

#### ***Compliance with Federal Aid Regulations***

Recipients of federal financial aid must comply with the standards of progress set by their respective departments for their particular programs of study. When failure to maintain progress results in the possible loss of financial aid eligibility, the Office of Financial Aid will notify students in writing. Appeals indicating any mitigating circumstances must be made in writing to the associate director of financial aid.

## ***IV. Academic Integrity***

### ***Graduate School Policy***

Integrity in scholarship and research is an essential characteristic of our academic life and social structure in the university. Any activity that compromises the pursuit of truth and the advancement of knowledge besmirches the intellectual effort and may undermine confidence in the academic enterprise. A commitment to honesty is expected in all academic endeavors, and this should be continuously emphasized to students, research assistants, associates, and colleagues by mentors and academic leaders.

The procedures for ensuring academic integrity in the Graduate School are distinct from those in the Undergraduate Code of Honor.

Violations of academic integrity may occur in classroom work and related academic functions or in research/scholarship endeavors. Classroom-type misconduct includes the use of information obtained from another student's paper during an examination, plagiarism, submission of work written by someone else, falsification of data, etc. Violation of integrity in research/scholarship is deliberate fabrication, falsification, or plagiarism in proposing, performing, or reporting research or other deliberate misrepresentation in proposing, conducting, reporting, or reviewing research. Misconduct does not include errors of judgment, errors in recording, selection, or analysis of data, differences in opinions involving interpretation, or conduct unrelated to the research process. Misconduct includes practices that materially and adversely affect the integrity of scholarship and research.

Any person who has reason to believe that a violation of this policy has occurred shall discuss it on a confidential basis with the department chair or director of the appropriate institute. If a perceived conflict of interest exists between the chair/director and the accused, the next highest academic officer shall be notified of the charge. The chair/director shall evaluate the allegation promptly. If it is determined that there is no substantial basis for the charge, then the matter may be dismissed with the fact of dismissal being made known to the complainant and to the accused if he or she is aware of the accusation. A written summary of charges, findings, and actions shall be forwarded to the vice president for graduate studies and research as a matter of documentation. Otherwise, the chair will select an impartial panel consisting of three members, one of whom may be a graduate student, to investigate the matter. The chair will inform the accused of the charges. The panel will determine initially whether to proceed directly to a hearing to further investigate the case, or to dismiss the charges. If the panel decides to proceed directly to a hearing, the hearing will be held within 10 days of the original notification. If the panel decides that further investigation is necessary, it shall immediately notify the chair. If it decides that a hearing is not warranted, all information gathered for this investigation will be destroyed. The utmost care will be taken to minimize any negative consequence to the accused.

The accused party must be given the opportunity to respond to any and all allegations and supporting evidence at the hearing. The response will be made to the appointed panel. The panel will make a final judgment, recommend appropriate disciplinary action, and report to the chair in writing. The report will include all of the pertinent documentation and will be presented within 30 days after meeting with the accused. Copies of the report are to be made available to the accused, the chair, and the vice president. If a violation is judged to have occurred, this might be grounds for dismissal from the University; research/scholarship violations might be reported to the sponsor of the research effort (e.g., NSF, NIH, Lilly Foundation, etc.), if appropriate.

If the student chooses to appeal, he or she must address the appeal in writing to the vice president for graduate studies and research within 10 days. The student has the right to appear before the vice president or his or her delegate. The vice president may decide to appoint an ad hoc committee to handle this appeal, if deemed necessary.

Violations of academic integrity by individuals who are not students are governed by different rules; students who are working on externally sponsored programs may also be covered by sponsor-mandated rules. Contact Dr. Richard A. Hilliard, director of research compliance, (574) 631-5386, for further information.

## ***V. Policies on Harassment and Other Aspects of Student Life***

### ***Graduate School Policy***

Sexual and discriminatory harassment are prohibited by the university. Definitions and policies regarding sexual harassment, discriminatory harassment and other aspects of student life and behavior are described in du Lac, which is the University's description of student life policies and procedures. Students in the Graduate School must abide by those portions of du Lac which explicitly refer to graduate students or to the Graduate School. Copies of du Lac are mailed to all continuing students at the beginning of the fall semester, and may be obtained from the Office of Residence Life, 315 Main Building.

The Vice President for Graduate Studies and Research has appointed an academic counselor in the Graduate School to be available to graduate students who want to discuss confidentially problems they are having in their programs. The counselor can help a student decide how to resolve the problem. The Graduate School's academic counselor for is Dr. Barbara M. Turpin, associate dean.

### ***Discriminatory Harassment***

#### ***I. Policy***

The University of Notre Dame believes in the intrinsic value of all human beings. It is, moreover, committed to the full peaceable participation of all its members in the educational endeavor it fosters. This is the reason that the University prohibits discriminatory harassment as defined below. The University is also committed to the free expression and advocacy of ideas; it wishes to maintain the integrity of this commitment as well. For this reason, cases of verbal harassment are defined here with great caution. Harassment in general is prohibited elsewhere in the University's regulations.

#### ***II. Definition*** (For purposes of this policy):

##### ***A: Harassment***

Harassment is any physical conduct intentionally inflicting injury on the person or property of another, or any intentional threat of such conduct, or any hostile intentional, and persistent badgering, addressed directly at another, or small group of others, that is intended to intimidate its victim(s) from any University activity,

or any verbal attack, intended to provoke the victim to immediate physical retaliation.

***B: Discriminatory Harassment***

Conduct as described in A., above, constitutes discriminatory harassment, if, in addition, it is accompanied by intentionally demeaning expressions concerning the race, gender, religion, sexual orientation, or national origin of the victim(s).

***III. Prohibition***

All discriminatory harassment is prohibited.

***IV. Administration of Policy***

It is appropriate to report any allegation of discriminatory harassment to the authorities of the University. The ways available for doing this are as follows:

***A. Students***

An alleged incident of discriminatory harassment by a student toward another student that occurs outside a residence hall is to be reported to the Office of Residence Life and shall be handled in the same manner as other violations of University rules and regulations. (See section of du Lac entitled University Disciplinary Procedures.) Likewise, any alleged incident of discriminatory harassment by a student toward a faculty member or staff member is to be reported to the Office of Residence Life. Any alleged incident of discriminatory harassment by a student toward any other student that occurs in a residence hall is to be reported first to the Rector and in consultation with the Office of Residence Life, a determination shall be made as to whether the allegation should be handled at the hall level or whether the matter should be referred to the Office of Residence Life.

***B. Faculty***

An alleged incident of discriminatory harassment by a faculty member is to be reported to the chair of the academic department, or, in cases involving the chair, to the dean of the college. If the matter cannot be resolved at the department or college level, it is to be referred to the Provost's Office.

***C. Staff***

An alleged incident of discriminatory harassment by a staff member is to be reported to the Director of Human Resources, and shall be handled by the Office of Human Resources in the same manner as any other violation of University rules and regulations as outlined in the University Human Resource Manual.

***D. Administration***

An alleged incident of discriminatory harassment by an administrator is to be reported to the appropriate superior officer of the person involved.

### ***E. Ombudsperson***

Notwithstanding the above, a person alleging discriminatory harassment may choose to report the incident to the University ombudsperson. This is to be a member of the University community selected by the President, in consultation with the other officers of the University, for that task. The ombudsperson, after taking information of the incident, is to help the complainant handle the matter, either by informal conciliation, or by helping the complainant proceed with the reporting procedure described above. [Note: Prof. John Borkowski is currently the University ombudsperson.]

## ***V. Existing University Rules and Regulations***

This policy is intended to be an addition to existing University rules and regulations and does not alter or modify any existing University rule or regulation.

## **Sexual Harassment**

### ***I. Policy***

The University of Notre Dame prohibits sexual harassment by all faculty, staff and students. Sexual harassment by any faculty, staff or student is a barrier to the educational, scholarly and research purposes of the University of Notre Dame and is a violation of law and University policy. The University of Notre Dame affirms its commitment to maintaining a learning and working environment which is fair, respectful and free from sexual harassment. To these ends, the following sexual harassment policy has been adopted.

### ***II. Definition***

The determination of what constitutes sexual harassment will vary with the particular circumstances, but may be described generally as: Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature when:

1. submission to or rejection of such conduct is made either explicitly or implicitly a term or condition of instruction, employment, or participation in other University activity
2. submission to or rejection of such conduct by an individual is used as a basis for evaluation in making academic or personnel decisions affecting an individual; or
3. such conduct has the purpose or effect of unreasonably interfering with an individual's performance or creating an intimidating, hostile, or offensive University environment.

### ***III. Administration of Policy***

#### ***A. Students***

An alleged incident of sexual harassment by a student toward any other student or faculty or staff member, should be reported to the Vice President for Student Affairs and shall be handled by the Office of Residence Life in the same manner as any other violations of University rules and regulations.

#### ***B. Faculty***

Any incident of sexual harassment by a faculty member toward any student, staff personnel or other faculty member shall be reported to the Provost's Office, and shall be handled by the Provost's Office. If a formal charge is to be filed, it shall be administered in the same manner as a charge for Serious Cause for Dismissal as outlined in the Academic Articles.

#### ***C. Staff***

Any incident of sexual harassment by a staff member toward a student, faculty member or other staff member, shall be reported to the Director of Human Resources, and shall be handled by the Human Resources Office in the same manner as any other violation of University rules and regulations as outlined in the University Human Resources Manual.

#### ***D. Confidentiality***

Sexual harassment is a particularly sensitive issue which may affect any member of the University community. The right to confidentiality of all parties involved in a sexual harassment charge shall be strictly adhered to insofar as it does not interfere with the University's legal obligation to investigate allegations of sexual harassment when brought to the University's attention, and to take corrective action.

#### ***E. Resolution***

A sexual harassment charge may result in a finding that no action is warranted, or may be handled by: 1) informal resolution, 2) reprimand, 3) disciplinary sanction, or 4) termination or expulsion.

#### ***F. Non-Retaliation***

Any attempt by a member of the student body, staff or faculty to penalize in any way, a person bringing a sexual harassment charge, or any other form of retaliation, is prohibited and will be treated as a separate incident to be reviewed in its own right.

### ***G. Protection of the accused***

(a) In cases under III(B.) or III(C.) during the investigation and before formal charges, the accused will be informed of the allegations, the identity of the complainant, the facts surrounding the allegations, and given the opportunity to respond.

(b) In the event the allegations are not substantiated, all reasonable steps will be taken to restore the reputation of the accused if it was damaged by the proceeding.

(c) A complainant found to have been intentionally dishonest in making the allegations or to have made them maliciously is subject to the full range of the University's disciplinary procedures from official reprimand to dismissal.

### ***IV. Consensual Relationships***

Because of the unique relationships between student and faculty members, with the faculty member serving as educator, counselor and evaluator, and the possibility of abuse of this relationship or the appearance of abuse, the University views it as unacceptable if faculty members (including all those who teach at the University, graduate students with teaching responsibilities and other instructional personnel) engage in amorous relations with students enrolled in their classes or subject to their supervision, even when both parties appear to have consented to the relationship. In keeping with this philosophy of the University, if charges of sexual harassment are made, it shall not be a defense to allege that the relationship was consensual.

## **Part 2: Degree Programs**

### ***I. Requirements for the Research Master of Science Degree in Electrical Engineering***

#### ***I.A. Course-work Requirement***

The M.S. program requires a minimum of thirty (30) semester hours of credit, of which a minimum of eighteen (18) hours must be course credits, and a minimum of six (6) hours must be awarded for research towards an M.S. thesis. Up to nine (9) semester hours of course credit may be taken from departments other than the Department of Electrical Engineering. The course work should be designed to prepare the student adequately for work in the major area of specialization. Advanced undergraduate courses, numbered 400 to 497, may be taken for up to six (6) credit hours.

#### ***Transfer Credits***

The department may accept course work completed at another accredited university toward meeting its degree requirements. A student may transfer credits earned at another accredited university only if:

1. the student is in degree status at Notre Dame;
2. the courses taken are graduate courses appropriate to the Notre Dame graduate program and the student had graduate student status when he or she took these courses;
3. the courses were completed within a five-year period prior to admission to a graduate degree program at Notre Dame or while enrolled in a graduate degree program at Notre Dame;
4. grades of "B" (3.0 on 4.0 scale) or better were achieved; and
5. the transfer is recommended by the Director of Graduate Studies and approved by the Graduate School.

These five requirements also apply to the transfer of credits earned in another program at Notre Dame.

The student must petition the Graduate Committee for transfer of credits. The University considers a request for credit transfer only after a student has completed one semester in a Notre Dame graduate degree program and before the semester in which the graduate degree is conferred. The university of origin must submit two transcripts directly to the Notre Dame Graduate School. Credits not earned on the semester system, such as trimester and quarter-hour credits, will be transferred on a pro-rata basis.

A student transferring from an unfinished master's program may not transfer more than six (6) semester course credit hours into either a Notre Dame master's or Ph.D. program. If the student has completed a master's degree, he or she may transfer up to nine (9) semester credit hours to a Notre Dame master's program.

Occasionally, a student may need to do dissertation research at another institution. Normally, the student would register for the appropriate number of credit hours of research at Notre Dame. If the student does not enroll at Notre Dame and expects to count research hours earned elsewhere toward the Notre Dame degree, the student must have the approval of the department and the Graduate School in advance. The university requires similar prior approval for formal courses taken elsewhere and applied to the degree program. Twenty-four credit hours, including research credit hours, is the maximum acceptable for transfer into a Notre Dame doctoral program

No grades of transferred courses are included in the student's G.P.A.

### ***I.B. Foreign Language Requirement***

The Department of Electrical Engineering has no foreign language requirement.

### ***I.C. Residency***

The minimum residency requirement for the master's degree is registration in full-time status for one semester during the academic year or for one summer session.

#### ***I.D. Degree Eligibility***

Failure to complete all requirements for the master's degree within five years results in forfeiture of degree eligibility. A master's program that is pursued during the summer and the academic year must also be completed within five years. A student attending Summer Session only must complete all requirements within seven years.

#### ***I.E. Advisors and Thesis Directors***

Every graduate student must have a faculty advisor. The advisor will assist the student in choosing courses and in choosing a thesis topic; the advisor is also responsible for financially supporting the student. If a student wishes to change advisors, it is permitted with the proviso that the proposed new advisor must agree to the change and be able to meet all responsibilities with respect to the student. Changing advisors more than once is discouraged.

Any student who is working on an MS thesis in the Electrical Engineering Department must have either a thesis advisor or co-advisor who is a regular teaching-and-research faculty member in the department. If two or more people share the responsibility of thesis advisor, they shall each be known as thesis co-advisors and each shall sign the final thesis document. If a thesis involves work outside the department, it must be directed, at least in part, by a faculty member from the department.

#### ***I.F. Admission to Candidacy***

To qualify for admission to M.S. candidacy, a student must be in a master's degree program. He or she must have been enrolled in the program without interruption and maintained a minimum cumulative G.P.A. of 3.0 in approved course work. A student who seeks admission to candidacy in a research master's program must also demonstrate research capability and receive departmental approval of his or her thesis proposal.

Admission to candidacy is a prerequisite to receiving any graduate degree. It is the student's responsibility to apply for admission by submitting the appropriate form to the Graduate School office through the department chair. The applicable deadline is published in the Graduate School Calendar.

#### ***I.G. Master's Comprehensive Examination***

The Qualifying Examination given to all graduate students at the end of their first year functions as the Master's Comprehensive Examination for students in the M.S. program in electrical engineering. A student must demonstrate M.S. capability on the Qualifying Examination to obtain the Master's Degree. One retake of the exam is possible if approved by the department.

### ***I.H. Thesis Requirement***

To receive a research M.S.E.E., students must write a thesis under the guidance of a faculty advisor and register for a total of six (6) credit hours of thesis research. In addition, no later than one semester before he/she expects to graduate, the student must submit a Thesis Advisor Certification to the Graduate Committee. The thesis advisor and the student are then responsible for choosing an Oral Thesis Defense examining board, which is comprised of the thesis advisor plus two readers.

Readers are appointed from among the regular teaching and research faculty of the student's department. The appointment of a reader from outside the student's department must have the Graduate School's prior approval. The thesis director may not be one of the official readers.

The thesis should follow the guidelines in the Graduate School's Guide for Formatting and Submitting Dissertations and Theses, available at the Graduate School office. The thesis director indicates final approval of the thesis and its readiness for the readers by signing the thesis.

The candidate then delivers signed copies of the completed thesis to the two official readers appointed by the department. Each reader must unconditionally approve the thesis and the department should promptly report the results to the Graduate School.

Upon acceptance of the thesis by the Oral Thesis Defense examining board, the student must successfully pass the Oral Thesis Defense. This examination is conducted as a thesis defense and may include general questions on the candidate's major area.

After successfully passing the Oral Thesis Defense, the candidate should deliver two clean copies signed by the thesis director to the Graduate School office on or before the date specified in the Graduate School Calendar. There it will be verified for compliance with the style manual. The candidate then should deliver the verified copies and the Graduate School approval form to the Hesburgh Library, where he or she pays the binding costs.

Students should be cognizant of deadlines for graduation established by the Graduate School and the department.

Should a student and advisor decide to microfilm a thesis, information concerning the University Microfilms International Master's Publishing Program may be obtained from the Graduate School office.

## ***II. Requirements for the Non-research Master of Science Degree in Electrical Engineering***

### ***II.A. Course-work Requirement***

The non-research M.S. program requires a minimum of thirty (30) semester hours of course credit. No more than nine (9) semester hours of course credit may be taken from

departments other than the Department of Electrical Engineering. The course work should be designed to prepare the student adequately for work in the major area of specialization. Advanced undergraduate courses, numbered 400 to 497, may be taken for up to six (6) credit hours.

### *Transfer Credits*

The department may accept course work completed at another accredited university toward meeting its degree requirements. A student may transfer credits earned at another accredited university only if:

1. the student is in degree status at Notre Dame;
2. the courses taken are graduate courses appropriate to the Notre Dame graduate program and the student had graduate student status when he or she took these courses;
3. the courses were completed within a five-year period prior to admission to a graduate degree program at Notre Dame or while enrolled in a graduate degree program at Notre Dame;
4. grades of "B" (3.0 on 4.0 scale) or better were achieved; and
5. the transfer is recommended by the Director of Graduate Studies and approved by the Graduate School.

These five requirements also apply to the transfer of credits earned in another program at Notre Dame.

The student must petition the Graduate Committee for transfer of credits. The University considers a request for credit transfer only after a student has completed one semester in a Notre Dame graduate degree program and before the semester in which the graduate degree is conferred. The university of origin must submit two transcripts directly to the Notre Dame Graduate School. Credits not earned on the semester system, such as trimester and quarter-hour credits, will be transferred on a pro-rata basis.

A student transferring from an unfinished master's program may transfer no more than six (6) semester course credit hours into either a Notre Dame master's or Ph.D. program. If the student has completed a master's degree, he or she may transfer up to nine (9) semester credit hours to a Notre Dame master's program.

Occasionally, a student may need to do dissertation research at another institution. Normally, the student would register for the appropriate number of credit hours of research at Notre Dame. If the student does not enroll at Notre Dame and expects to count research hours earned elsewhere toward the Notre Dame degree, the student must have the approval of the department and the Graduate School in advance. The University requires similar prior approval for formal courses taken elsewhere and applied to the degree program. Twenty-four credit hours, including research credit hours, is the maximum acceptable for transfer into a Notre Dame doctoral program

No grades of transferred courses are included in the student's G.P.A.

### ***I.B. Foreign Language Requirement***

The Department of Electrical Engineering has no foreign language requirement.

### ***I.C. Residency***

The minimum residency requirement for the master's degree is registration in full-time status for one semester during the academic year or for one summer session.

### ***I.D. Degree Eligibility***

Failure to complete all requirements for the master's degree within five years results in forfeiture of degree eligibility. A master's program that is pursued during the summer and the academic year must also be completed within five years. A student attending Summer Session only must complete all requirements within seven years.

### ***II.E. Advisors***

Every graduate student must have a faculty advisor. The advisor will assist the student in choosing courses and meeting department requirements.

### ***II.F. Admission to Candidacy***

To qualify for admission to candidacy, a student must be in a master's degree program. He or she must have been enrolled in the program without interruption and maintained a minimum cumulative G.P.A. of 3.0 in approved course work.

Admission to candidacy is a prerequisite to receiving any graduate degree. It is the student's responsibility to apply for admission by submitting the appropriate form to the Graduate School office through the department chair. The applicable deadline is published in the Graduate School Calendar.

### ***II.G. Master's Examination***

The Qualifying Examination given to all graduate students at the end of their first year of studies functions as the Master's Comprehensive Examination for students in the M.S. program. A student must demonstrate M.S. capability on the Qualifying Examination to obtain the Master's Degree. One retake of the exam is possible if approved by the department.

## ***III. Doctor of Philosophy Degree Requirements***

The Degree of Doctor of Philosophy is conferred only in recognition of proficiency and high attainment in advanced scholastic endeavor and independent investigation. It is not conferred merely for the completion of a required number of courses but for

demonstrated independence, initiative, and exceptional ability in study and thought.

### ***III.A. Course-work Requirement***

A minimum of thirty-six (36) semester hours of course credit is required. No more than ten (10) semester hours of courses numbered 400 to 497 may count toward degree credit. Students are encouraged to pursue course work outside the department whenever such study supports their program in the major area.

A Master's Degree earned elsewhere within the last five years counts for a maximum of twenty-four (24) credit hours towards the course work and residency requirements. The student must petition the Graduate Committee for transfer of credits.

### ***Transfer Credits***

The department may accept course work completed at another accredited university toward meeting its degree requirements. A student may transfer credits earned at another accredited university only if:

1. the student is in degree status at Notre Dame;
2. the courses taken are graduate courses appropriate to the Notre Dame graduate program and the student had graduate student status when he or she took these courses;
3. the courses were completed within a five-year period prior to admission to a graduate degree program at Notre Dame or while enrolled in a graduate degree program at Notre Dame;
4. grades of "B" (3.0 on 4.0 scale) or better were achieved; and
5. the transfer is recommended by the Director of Graduate Studies and approved by the Graduate School.

These five requirements also apply to the transfer of credits earned in another program at Notre Dame.

The student must petition the Graduate Committee for transfer of credits. The University considers a request for credit transfer only after a student has completed one semester in a Notre Dame graduate degree program and before the semester in which the graduate degree is conferred. The university of origin must submit two transcripts directly to the Notre Dame Graduate School. Credits not earned on the semester system, such as trimester and quarter-hour credits, will be transferred on a pro-rata basis.

A student transferring from an unfinished master's program may transfer no more than six (6) semester course credit hours into either a Notre Dame master's or Ph.D. program. If the student has completed a master's or Ph.D. program, he or she may transfer up to nine (9) semester credit hours to a Notre Dame master's program and up to twenty-four (24) semester credit hours to a Notre Dame Ph.D. program.

Occasionally, a student may need to do dissertation research at another institution. Normally, the student would register for the appropriate number of credit hours of research at Notre Dame. If the student does not enroll at Notre Dame and expects to count research hours earned elsewhere toward the Notre Dame degree, the student must have the approval of the department and the Graduate School in advance. The university also requires prior approval for formal courses taken elsewhere and applied to the degree program. Twenty-four (24)1 credit hours, including research credit hours, is the maximum acceptable for transfer into a Notre Dame doctoral program

No grades of transferred courses are included in the student's G.P.A.

### ***I.B. Foreign Language Requirement***

The Department of Electrical Engineering has no foreign language requirement.

### ***III.C. Residency***

The minimum residency requirement for the Ph.D. degree is three years in resident study and full-time status for four consecutive semesters (including the summer session).

### ***III.D. Degree Eligibility***

The student must fulfill all doctoral requirements, including the dissertation and its defense, within eight years from the time of matriculation. Failure to complete any of the Graduate School or departmental requirements within the prescribed period results in forfeiture of degree eligibility.

### ***III.E. Advisors and Dissertation Directors***

Not later than one semester after passing the Qualifying Examination, the student submits a Dissertation Advisor Certification to the Graduate Committee. The student must assume the initiative in seeking a faculty member who is willing to serve as Advisor and to assist him in planning his or her research program.

Any student who is working on a doctoral degree in the Electrical Engineering Department must have either a Thesis Advisor or a Thesis Co-Advisor who is a regular teaching-and- research faculty member in the department. If two or more people share the responsibility of Thesis Advisor, they shall each be known as Thesis Co-advisors and each shall sign the final thesis document. Thus, if a thesis involves work outside of the department, it must be directed, at least in part, by a faculty member from the department.

### ***III.F. Examination Requirements***

Each Ph.D. student must pass three examinations to fulfill the department requirements for graduation -- the Qualifying Examination, the Oral Candidacy Examination, and the Dissertation Defense. The Qualifying Examination is used to determine whether the student has the potential and required background for obtaining the Ph.D. Degree. The

Oral Candidacy Examination is administered to determine whether the student has depth in his research area and has identified a viable dissertation topic. At the Dissertation Defense, the student defends his or her dissertation before an oral examining board.

### ***Qualifying Examination***

The student must demonstrate Ph.D. capability on the Qualifying Examination described in Section II.K. The Qualifying Examination functions as the Written Doctoral Candidacy Examination when passed at the Ph.D. level.

### ***Oral Candidacy Examination***

In addition to passing the Qualifying Examination at the Ph.D. level, a student seeking the Ph.D. degree must pass the Oral Candidacy Examination to become a Ph.D. Candidate. The purpose of this examination is to determine if the student has depth in his/her major area, has identified a viable dissertation topic, performed the appropriate literature search, and proposed a reasonable set of research goals. Typically, this examination is taken during the fifth semester, after the completion of all course work. It *must* be taken before the end of the eighth semester or the student will no longer be eligible for any kind of support from the Graduate School – including tuition waivers.

The student must prepare a written Dissertation Proposal which summarizes the background of the research topic together with the proposed plan of investigation. This proposal is distributed, at least one week prior to the examination, to the five members serving on the Oral Candidacy examining board.

A board of at least four voting members nominated by the department and appointed by the Graduate School administers the oral part of the examination. Normally, this board has the same membership as the student's dissertation committee. Board members are chosen from the teaching and research faculty of the student's department. The Graduate School should be consulted before the department or the student invites a faculty member outside the student's department to be a board member. A faculty member appointed by the Graduate School from a department other than the candidate's department chairs the examination board. This chair represents the Graduate School and does not vote.

Please see the Graduate Coordinator to complete the required forms and to reserve a time and place for your Oral Candidacy Examination. It is imperative that the completed PhD Oral Candidacy Examination form is received in the Graduate School no later than 10 business days prior to the examination. This allows the Graduate School time to find an outside chair person for the exam. If this requirement is not met, the responsibility of finding an outside chair person falls upon the department and/or advisor.

At the Oral Candidacy Examination, the student will begin the proceedings with a presentation outlining the contents of the dissertation proposal. members of the examining board will then question the student on the contents of his/her

presentation and related areas.

After completion of the examination, the chair calls for a discussion followed by a vote of the examiners. On a board of four, three positive votes are required to pass. A passing vote means that the examining board feels the student has acquired the proper background and that it approves the Dissertation Proposal. If the department chooses to have five members, four positive votes are required to pass. The chair should, before the examination begins, ask the candidate's advisor to confirm departmental regulations for conduct of the examination and voting procedures. The chair sends a written report of the overall quality of the oral examination and the results of the voting immediately to the Graduate School. The Graduate School officially notifies the student of the results of the candidacy examination.

In case of failure in either or both parts of the doctoral candidacy examination, the department chair, on the recommendation of a majority of the examiners, may authorize a retake of the examination. An authorization for retake must be approved by the Graduate School. A second failure results in forfeiture of degree eligibility and is recorded on the candidate's permanent record.

### ***III.G. Admission to Candidacy***

Admission to candidacy is a prerequisite to receiving any graduate degree. To qualify for admission to doctoral candidacy, a student must:

1. be in a doctoral program;
2. have been continuously enrolled in the program;
3. complete the departmental course work requirement with a cumulative average of 3.0 or better;
4. pass the written and oral parts of the doctoral candidacy examination (passing the written part is equivalent to passing the qualifying examination at the Ph.D. level.)

It is the responsibility of the student to apply for candidacy admission by submitting the appropriate form to the Graduate School office through the Department Chair or the Director of Graduate Studies. Consult the Graduate School Calendar for the appropriate deadlines.

### ***III.H. The Doctoral Dissertation***

The dissertation is prepared under the guidance of the student's dissertation advisor. The department chair or director of graduate studies will appoint a dissertation committee consisting of the dissertation director and three readers. Normally, the committee is drawn from the membership of the student's oral candidacy board. The three readers should come from among those participating in the Oral Candidacy Examination. It is expected that they will be consulted frequently by the student throughout the research period either individually or as a group.

The Graduate School must be consulted before the department invites a committee member from outside the teaching and research faculty of the student's department.

The candidate delivers typed copies of the finished dissertation, signed by the director, to the department chair for distribution to the three readers. The dissertation should follow the guidelines in the Graduate School's Guide for Formatting and Submitting Dissertations and Theses, even if the candidate has previously published the substance of the dissertation in scholarly journals. The Guide is available at the Graduate School office.

Readers normally have two to four weeks to read the dissertation, decide whether it is ready to be defended, and so indicate on the appropriate form to the Graduate School. Reader approval of the dissertation for defense does not imply reader agreement or support; it implies reader acknowledgment that the dissertation is an academically sound and defensible scholarly product. Only a dissertation which has been unanimously approved for defense by the three readers may be defended.

Please see the Graduate Coordinator to complete the required forms and to reserve a time and place for your Doctoral Dissertation. It is imperative that the completed Defense of the Doctoral Dissertation and Reader's Report on Doctoral Dissertation forms are received in the Graduate School no later than 10 business days prior to the examination. This allows the Graduate School time to find an outside chair person for the exam. If this requirement is not met, the responsibility of finding an outside chair person falls upon the department and/or advisor.

Even though the dissertation has been approved for defense, revisions may be required. If defects in the dissertation come to light at the defense, the candidate may be asked to revise the dissertation before it is accepted by the Graduate School and the degree is conferred. In that case, it will be the responsibility of the dissertation director, or such person as the committee may appoint, to report to the Graduate School that such revisions have been completed satisfactorily.

### ***III.I. Defense of Dissertation***

At least four weeks before the Defense of his or her Dissertation, it is the candidate's responsibility to obtain verbal consent from three faculty members (other than the candidate's Thesis Advisor) from the five-member Oral Candidacy examining board who are to serve as readers, and to deliver a copy of the dissertation to each member. (The readers, chosen by the student, are officially nominated by the department and appointed by the Graduate School). If the readers give unanimous approval to the dissertation, the candidate presents the results of his or her research at the Dissertation Defense. The defense is chaired by a faculty member who is appointed by the Graduate School from a department other than the candidate's department. This chairman represents the Graduate School and does not vote. The defense board consists of four voting members, including the Dissertation Advisor and the three official readers. At least three votes out of four are required to pass. The chairman sends a written report of the examination's overall quality and of the voting results promptly to the Associate Dean of the Graduate School.

### ***III.J. Final Submission of Dissertation***

To receive the degree at the next commencement, the doctoral candidate who has successfully defended his or her dissertation must submit it to the Graduate School on or before the deadline published in the Graduate School calendar. Candidates should be cognizant of deadlines for graduation established by the Graduate School and the department.

To be accepted by the Graduate School, the dissertation should be prepared according to the formatting guidelines published in the Graduate School's Guide for Formatting and Submitting Dissertations and Theses, even if the candidate has previously published the substance of the dissertation in scholarly journals. The guide is available at the Graduate School office and on the Graduate School Web site at <http://graduateschool.nd.edu>.

When the dissertation is given to the readers, the candidate should also give a complete copy to the Graduate School, where it will be reviewed for compliance with the style manual. This copy may be submitted electronically as a PDF or delivered as a printed document.

After successfully defending the dissertation and making any necessary changes, the candidate must present the document to the Graduate School for final approval and submission.

The student may submit the dissertation electronically by uploading one complete PDF copy to the Hesburgh Library's Electronic Dissertation and Thesis database, and providing one signed title page and any other necessary forms to the Graduate School.

Alternatively, the candidate may present two clean, printed copies of the dissertation, each signed by the dissertation director. The candidate pays the binding costs for the two official copies required by the Graduate School and for any additional copies required by the department or for personal use.

The Graduate Council requires that all doctoral dissertations be microfilmed by ProQuest Information and Learning. Microfilming costs are also paid at the Graduate School office, which handles this publication requirement for the candidate.

Revised  
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