# Missouri S&T
## University of Science & Technology

# Electrical & Computer Engineering

# Graduate Handbook

**July 2015**

# I. Message from the Chairman

On behalf of the Electrical and Computer Engineering (ECE) faculty and staff, I would like to welcome you to our department. While we continue to update this graduate handbook to reflect the most recent policies and procedures in our department, it is inevitable that you may have some questions or concerns that are not addressed in this document. I would encourage you to discuss these with the graduate secretary and/or the associate chair for graduate studies in the ECE department.

As our department has evolved over the past several years, we have developed research programs in new and exciting areas and we hope to continue in this direction. If you have questions regarding currently active research areas in the department you can obtain some general information by consulting the department's website (http://ece.mst.edu/). For more specific questions you may wish to contact the individual faculty members associated with these research areas.

Finally, welcome to Missouri S&T. I hope that your stay with us will be productive as you further your education in your chosen field.

Sincerely,
**Daryl G Beetner, PhD**
Chair, Electrical and Computer Engineering Department
Missouri University of Science and Technology

# II. General Information

The ECE department at Missouri S&T offers undergraduate and graduate education in two separate degree programs—electrical engineering and computer engineering.
General regulations and procedures for all graduate programs are governed by the University. The individual departments and degree programs may also impose additional requirements. Information contained in this document describes **the requirements and procedures specifically applicable to students in the electrical and computer engineering degree programs.** Different sets of rules and regulations may apply to students in other degree programs.

# III. Admissions

## III.A. Required Documentation

All of the documentation requested below should be sent to the Director of Admissions.  The mailing address is:

Director of Admissions
Missouri University of Science and Technology
106 Parker Hall
300 W. 13th Street
Rolla, MO 65409-1060

When all of the required documentation has been received by the Admissions office it will be forwarded to the department.  A recommendation will be made by the department.  The recommendation will be forwarded to the Office of Graduate Studies for approval.  Official notification of the outcome will be sent to the applicant from the Admissions office.

### III.A.1 Application Form and Application Fee

All graduate applicants must submit a completed application form and a $50 non-refundable application fee.  Graduate online application forms and instructions can be obtained at http://futurestudents.mst.edu/apply/

### III.A.2 Graduate Record Exam (GRE) Scores

All graduate applicants must submit a complete set of GRE scores (GRE-V, GRE-Q, and GRE-WR).  These reports should be sent directly from ETS to the Director of Admissions.  Information regarding the GRE can be found at http://www.gre.org

### III.A.3 Test of English as a Foreign Language (TOEFL) Scores

International applicants must submit TOEFL scores to the Director of Admissions.  TOEFL scores are not required from domestic applicants.  Information regarding the TOEFL can be obtained at http://www.toefl.org.  Recently the IELTS (International English Language Testing System) test has become widely available and is recognized by the department as an acceptable substitute for the TOEFL test.

## III.A.4 Letters of Recommendation

All applicants are encouraged to submit at least three letters of recommendation.  For international applicants and for all applicants for doctoral degrees, a minimum of three letters of recommendation is required.   Letters of recommendation should be sent to the Director of Admissions in sealed envelopes.

## III.A.5 Transcripts

All applicants must submit official transcripts from all colleges and universities attended. The transcripts should be sent directly from the colleges and universities to the Director of Admissions.  Where the colleges and/or universities use a system differing significantly from the 4 point GPA system used at S&T, it is helpful to include a statement of the grading scheme, class rank and any other information that can be provided by the college or university.

## III.A.6 Financial Statement

All international students must submit a financial statement showing sufficient resources to cover living and educational expenses for one year.  This requirement does not apply to domestic applicants.  More information can be found at
http://futurestudents.mst.edu/apply/international/applygrad/

## III.A.7 Statement of Purpose

All applicants are encouraged to submit a statement of purpose indicating their specific area(s) of interest in electrical and/or computer engineering, and outlining how the pursuit of an advanced degree will complement their overall career plan.  The statement of purpose is required for all international applicants.

## III.A.8 Resume

Resumes are not required from any applicant.  However, resumes can be useful in documenting significant industrial experience, post graduate training, publications, and other significant professional accomplishments.  Applicants are therefore encouraged to include resumes as part of their application package.

## III.A.9 Additional Information as Requested

In a few cases the department may request additional information from an applicant. Failure to comply with such requests can prevent the timely processing of the applicant's request for admission.

## III.A.10 Summary

| | Masters Degrees | | Doctoral Degrees | |
|---|---|---|---|---|
| | International | Domestic | International | Domestic |
| Application Fee* | Required | Required | Required | Required |
| Application Form | Required | Required | Required | Required |
| GRE Scores | Required | Required | Required | Required |
| TOEFL | Required | Not Required | Required | Not Required |
| Letters of Recommendation | Required | Encouraged | Required | Required |
| Transcripts | Required | Required | Required | Required |
| Financial Statement | Required | Not Required | Required | Not Required |
| Statement of Purpose | Required | Encouraged | Required | Encouraged |
| Resume | Encouraged | Encouraged | Encouraged | Encouraged |

*Table 1: A Summary of Customarily Required Application Documents*

*Note: Applicants are only required to pay the application fee one time. If, for example, a student applies for the MS program, completes the MS program, and then decides to continue for a PhD degree they will not have to pay another application fee although they will be required to submit a new application form.

## III.B Admission Guidelines

The admission guidelines listed below provide a rough indication of the department's expectations for incoming graduate students. The recommendations are not absolute. They are not necessarily intended to preclude the acceptance of students who may have specialized skills, training, or other accomplishments providing solid evidence of outstanding potential to contribute to the research mission of the department.

### III.B.1 Grades

The nominal GPA requirement for admission to the MS degree program in this department is an undergraduate GPA of **3.3** on a 4.0 GPA system. In evaluating academic performance from universities that may use other grading systems, the department may rely upon statistical data gathered in analyzing academic outcomes for recent graduate students and/or academic qualifications of recently accepted students from comparable institutions to the extent that such statistical data is available. The department will not offer graduate admissions to students who do not have the equivalent of a four year BS degree in engineering. As an example, we can not accept students who have only a diploma or an engineering technology degree.

## III.B.2 GRE Scores

In addition to campus requirements that the sum of GRE-V and GRE-Q scores be at least 1100 (**301** on new scoring system) and that the GRE-WR score be **4.0** (minimum of 3.5) the ECE department recommends a minimum GRE-V 420 (**148** on new scoring system), GRE-Q score of 760 (**160** on new scoring system), and WR Technical Writing **4.0.**

## III.B.3 TOEFL or IELTS Scores

Only international students are required to provide TOEFL scores.  The department has no particular preference for either the computer based TOEFL or the paper based TOEFL. However, at some test sites it is possible that the TOEFL is only offered in one of these two forms.  Minimum recommended scores set by the department are 237 on the computer based TOEFL, 580 on the paper based TOEFL, and **92** on the IBT (internet based testing) version of the TOEFL.  The recommended IELTS score is a minimum of **6.5.**

## III.B.4 Graduate School Grades

Students seeking admission to the PhD program should meet or exceed all of the guidelines for those seeking admission to the MS program and should have a graduate GPA in their proposed field of study (or closely related field) of 3.5 or better.

## III.B.5 Transferring into Electrical or Computer Engineering from Other Fields

Students applying for graduate studies with degrees in closely related fields may have additional conditions placed on their admission.  These conditions are generally imposed to make sure that students who do not have a traditional electrical or computer engineering degree will have sufficient background to have a reasonable chance for academic success in the department's two graduate programs. Specifically, students who wish to pursue a graduate degree in electrical engineering based on one or previous degrees in related subjects (e.g. physics, computer engineering, etc.) may be required to take courses as listed in the following table:

Essential Background Courses for Electrical Engineering

| All Subjects Below Are Required | Five of the Eight Subjects Below Are Required |
| --- | --- |
| Calculus (Math 2222) | Digital Logic (CpE 2210 & 2211) |
| Differential Equations (Math 3304) | Electromagnetics  or Devices (EE 3600 or 3250) |
| Statistics (Stat 3117) | Power Sys or Machines(EE 3500&3501 or 3540&3541) |
| Physics (Phys 2135) | Electronics (EE 3100 & 3101) |
| Fortran, Pascal, C, or C++ (CS 1570) | Additional Mathematics (like Math 3108) |
| Circuits (EE 2100 & 2120) | Additional Science/Engrg(like Chem 1&2 or McEng 2527) |
| Electronics (EE 2200) | Additional Electrical Engrg (like EE 3320 or 3420) |
| Linear Systems (EE 3400) | Additional Computer Engrg (like CpE 3150 & 3151) |

The corresponding table for students who wish to pursue a graduate degree in computer engineering is:

Suggested Background Courses for Computer Engineering

| All Subjects Below Are Highly Recommended | Five of the Eight Subjects Below Are Recommended |
|---|---|
| Calculus (Math 2222) | Discrete Mathematics (CS 1200) |
| Differential Equations (Math 3304) | Operating Systems (CS 3800) |
| Statistics (Stat 3117) | Computer Networks (CpE 5410) |
| Physics (Phys 2135) | Additional Mathematics (like Math 3108) |
| Pascal, C, or C++ (CS 1570 & 1580) | Additional Science/Engrg (like Chem 1&2) |
| Data Structures (CS 1510) | Additional Computer Engineering (like CpE 5110) |
| Circuits (EE 2100 & 2120) | Additional Electrical Engineering (like EE 2200) |
| Digital Logic (CpE 2210 & 2211) | Additional Computer Science (like CS 3200) |
| Computer Organization(CpE 3150 & 3151) | |

When students are required to take some combination of these background courses as a condition for their admission, they should realize that many, if not all, of the required background courses are undergraduate courses.  As such they will not count towards fulfilling the requirements for the MS or PhD degrees.

# III.B.6 Other Considerations & Conditional Admission:

When applicants meet all of the guidelines listed above and provide all of the information requested, the department will usually recommend admission.  When applicants do not meet these guidelines the department may consider other factors such as:

1. Specific skills, training, and/or experience relevant to departmental research projects.
2. Publications and/or presentations at conferences.
3. Recommendations from S&T ECE faculty, particularly when accompanied by offers of a research assistantship or other forms of financial support as appropriate.

In very rare cases the department may grant conditional admission to MS applicants.  In order to be considered for conditional admission a student who does not meet the normal admissions standards must provide verifiable and convincing evidence of their potential to succeed in our graduate program.  The decision to accept a student for conditional status is made by the Associate Chair for Graduate Studies and subject to approval by the Vice Provost of Graduate Studies.  If a student is accepted into the graduate program under conditional status, they are not allowed to hold an assistantship until they have qualified for regular status.  To qualify for regular graduate status in this department, a conditional status graduate student must:

　　　　a. Enroll only in courses approved by the Associate Chair for Graduate Studies each semester.

　　　　b. Have a graduate GPA of at least 3.2 at the end of the semester in which the student earned his $12^{th}$ graduate credit hour, with no grades below a B, even including any undergraduate courses the student is taking as remedial coursework.

　　　　c. Submit a new application for regular status graduate admission sometime between the end of the semester when the student earned their $12^{th}$ graduate credit hour and the sixth week of the following semester.

Assuming the student is in good status at the time this application is filed and assuming that they have met all of the conditions listed above they should be accepted as regular status graduate students automatically.  Upon being granted regular status they will have the same rights and privileges as those who are initially admitted in regular status. The maximum number of students simultaneously on conditional status is limited to the lessor of five students, or 5% of the total graduate student enrollment in the department.

In all cases, the responsibility for providing supporting documentation for additional considerations rests with the applicant.

# IV. Graduate Degrees

The ECE department offers master and doctoral degrees in electrical engineering as well as master and doctoral degrees in computer engineering.  The non-thesis option master's degree is based entirely on coursework while the thesis option master's degree is based on a combination of coursework and research.  The thesis option master's degree requires the student to find a faculty member willing to serve as both research supervisor and academic advisor.  This should be done as soon as possible so that the student and advisor will be able to formulate both a plan of study (coursework) and a research project.  Non-thesis master degree students must also have an advisor.  In this case the advisor's role is to assist the students in selecting courses consistent with their interests and abilities.  The advisor of a non-thesis master degree student is also responsible for ensuring the student's program of study meets the department's degree requirements and allows the student the opportunity to complete all degree requirements within a reasonable and customary time limit.

Non-thesis master degree students are assigned an initial advisor by the department.  Master degree students, both thesis and non-thesis option, may change advisors at any time with the consent of their old advisor, their new advisor, and in the case of thesis option students the consent of their advisory committee.  Procedures for changing advisors will be discussed in a later section.

The two types of doctoral degrees offered by this department are the Doctor of Philosophy (PhD) and the Doctor of Engineering (DE).  The primary difference between these two doctoral degrees is that the research portion of the DE degree is conducted as an internship with an industrial concern or government laboratory and is jointly supervised by an internship advisor employed by the cooperating organization and a faculty advisor employed by S&T.  In contrast, the research portion of the PhD degree is generally conducted on campus.

Students  who meet the normal graduate admissions criteria, but only wish to take an advanced 6xxx level course can be admitted as non-degree graduate students.

# V. Graduate Degree Requirements

Requirements for graduate degrees may originate at different levels. Requirements applying to all graduate degrees granted by S&T are set by the graduate faculty. Requirements applying to all graduate degrees granted in the department of electrical and computer engineering are determined by the faculty of the department. It is important to realize that a candidate for a graduate degree from this department must meet the requirements set at the campus (S&T) level AND the department (ECE) level.

## V.A Programs of Study

Unlike undergraduate degrees which are highly structured and include many required courses, graduate degrees are often highly individualized to accommodate each student's research and academic interests. Therefore graduate degree seekers are required to submit a formal written program of study showing which courses they plan to take and when they plan to take the courses. For MS students (thesis and non-thesis options) this requirement is met by completing Form I, which is available at: http://grad.mst.edu/forms . For doctoral students the requirement consists of completing Form V, which is available at: http://grad.mst.edu/forms . Once the forms are completed they need to be approved by the student's advisor. In the case of MS thesis option and doctoral students the forms also need the approval of all members of the student's advisory committee. Students should save an electronic copy of this form to use for future updates. Students must obtain the signatures of their advisor(s) as well as the members of their thesis committee. The form should then be submitted to the department's graduate secretary who will obtain the remaining required signatures. If additional information or justification is required you and/or your advisor will be contacted.

The following sections will describe the requirements as they specifically apply to master and doctoral degrees

### V.A.1 First Master's Degree in Electrical or Computer Engineering

On Form I there must be at least one single subset of courses that satisfies all of the following requirements simultaneously:

1. The total number of credit hours in the subset must be greater than or equal to 30.
2. All 4xxx or 5xxx level courses must satisfy the requirements of Senior Elective F in the S&T undergraduate program (see the undergraduate handbook). None of the 4xxx level courses can be listed or co-listed as either EE or CpE courses.
3. There must be at least 6 credit hours of 6xxx level lecture courses for a thesis-option MS and at least 9 credit hours of 6xxx level lecture courses for a non-thesis option MS.

4. The maximum number of XX 5099 (thesis research) credit-hours in a non-thesis option MS degree is 0, however there may be a maximum of 4 credit hours of special problems and/or seminar courses.

5. For thesis-option MS programs the minimum number of thesis research credit hours is 6.

6. All 6xxx level courses must be technical courses in engineering, math, or science (specifically excluding social sciences).

7. At least 21 credits out of 30 credits of all lecture courses, at least half of the 6xxx level lecture courses, at least half of the thesis research and at least half of the special problems/seminars courses will be in the student's degree program. This requirement will be based on the number of credit hours rather than on the number of courses.

8. Thesis option MS students must have a thesis advisory committee chaired by their advisor and the committee must contain at least two other faculty members.  There is a requirement that the committee chair and at least one-half of the membership of the advisory committee be members (or associate members) of the S&T graduate faculty. Thesis option MS students in this department must also fill out a form announcing the date, location, abstract, etc. for their thesis defense at least one week in advance.  This form, available from the graduate secretary, will then be distributed electronically to all department faculty and graduate students.

9. There must be at least 21 hours of course work (specifically excluding XX 5099 courses).

10. Non-thesis students will be advised by the graduate coordinator.  Each non-thesis M.S degree seeking student, who is eligible for admission into the EE and CpE programs, will be assigned a primary and secondary emphasis area based on their undergraduate degree background from the list of emphasis areas published in the graduate program of the ECE department.  Out of the 21 course work credits (or seven 3-credit hour courses) that is required for the student's program, a non-thesis M.S degree seeking student may choose to take a minimum of 12 credit hours (or four 3-credit hour courses) from their primary and 9 credits (or three 3-credit hour courses) from their secondary emphasis area.  Alternatively, a M.S degree seeking student can take all 21 credit hours from a single emphasis area.  The remaining 9 credit hours for their degree can be taken from outside their program/department or within the program.   A non-thesis M.S degree seeking student can change their emphasis area after seeking approval from the ECE graduate coordinator. If a M.S degree student wishes to pursue courses in an area outside his/ her background, he/she will be required to take suitable remedial courses at the undergraduate and graduate levels prior to selecting graduate courses in that area. These courses must be prerequisites to the graduate course(s) the student wishes to enroll in. The courses taken prior to changing the emphasis area will be counted towards the out of program courses after obtaining approval from the graduate coordinator.   In the event that an emphasis area does not offer sufficient number of courses as mentioned above, then courses from other emphasis areas within the student's program will be permitted with the approval of the graduate coordinator.

## V.A.2 Second Master's Degree in Electrical or Computer Engineering

The second MS degree in electrical or computer engineering is intended for students who already have a MS degree in a field closely related to electrical and/or computer engineering. The minimum number of credit hours required for a second MS degree is 24. As in the case of a first MS degree the second MS degree can include research and coursework (thesis option) or coursework only (non-thesis option). Students who wish to obtain a second MS degree based on having a MS degree in a closely related field must apply specifically for admission as a second MS degree student. The following requirements would apply once the student has been accepted as a second MS degree student:

On Form I there must be at least one single <u>subset</u> of courses that satisfies <u>all</u> of the following requirements <u>simultaneously</u>:
1. The total number of credit hours in the subset must be greater than or equal to 24.
2. Requirements 2 through 8 as listed above for the first MS degree in Electrical or Computer Engineering.

## V.A.3 Doctoral Programs

All doctoral programs in this department require the completion of a dissertation. Oversight for the dissertation is the responsibility of the student's advisor together with an advisory committee. The advisory committee for a doctoral student should include at least 5 faculty members (one of whom is the advisor). The advisor will act as chair of the advisory committee.

### V.A.3.a BS →PhD

The majority of graduate students accepted into the PhD program already have a relevant MS degree, either from S&T or elsewhere. Typically this MS degree will be in electrical engineering, computer engineering, or a closely related field. Occasionally students who are exceptionally well qualified by virtue of outstanding academic accomplishments, research potential, and/or relevant experience will request and be granted direct admission to the PhD program with only a BS degree. Programs of study for doctoral students without a relevant MS degree are as follows:

On Form V there must be at least one single <u>subset</u> of courses taken for graduate credit that satisfies <u>all</u> of the following requirements <u>simultaneously</u>:

1. The total number of credit hours in the subset must be greater than or equal to 90.  All 4xxx level courses must satisfy the requirements of Senior Elective F in the S&T undergraduate program (see the undergraduate handbook).
 All 6xxx level courses must be technical courses in engineering, math, or science (specifically excluding social sciences).
2. Excluding all credit hours attributable to thesis credit, the number of remaining credit hours of graduate coursework must equal or exceed 54 and at least half of these credit hours should be attributable to courses taken in the degree program.
3. The total number of credit hours taken as PhD thesis research (6099) must equal or exceed 36, and at least half of these credit hours should be taken in the student's degree program (i.e. EE 6099 for electrical engineering students and CpE 6099 for computer engineering students).
4. Students are encouraged, but not required, to take at least 15 credit hours of 6xxx level coursework.
5. Students are encouraged, but not required, to take at least 12 hours of courses outside their major area.

# V.A.3.b MS →PhD

Subject to approval by a doctoral candidate's advisory committee, it is possible to receive some credit for a MS degree in a relevant field.

On Form V there must be at least one single <u>subset</u> of courses taken for graduate credit that satisfies <u>all</u> of the following requirements <u>simultaneously</u>:
1. The total number of credit hours in the subset must be greater than or equal to 60.  All 6xxx level courses must be technical courses in engineering, math, or science (specifically excluding social sciences).
2. Excluding all credit hours attributable to thesis credit, the number of remaining credit hours of graduate coursework must equal or exceed 30 and at least half of these credit hours should be attributable to courses taken in the degree program.
3. The total number of credit hours taken as PhD thesis research (6099) must equal or exceed 30, and at least half of these credit hours should be taken in the student's degree program (i.e. EE 6099 for electrical engineering students and CpE 6099 for computer engineering students).
4. Students are encouraged, but not required, to take at least 15 credit hours of 6xxx level coursework.
5. Students are encouraged, but not required, to take at least 12 hours of courses outside their major area.
6. The MS degree, when listed on Form V, should simply be listed as a single 30 credit hour course.

### V.B. Modifications to a Previously Approved Program of Study

#### V.B.1 Master's Degrees

Once the Form I program of study has been approved, students can modify the program by submitting a Form I-A.  This form can be submitted as needed to add courses, delete courses, change courses, etc. subject to approval of their advisor and (in the case of thesis-option students) thesis committee.  Students can use Form I-A to change their advisor and/or to replace members of their advisory committee (in the case of thesis option students).  Changing advisors requires the approval of both the old and new advisors.  Similarly, the replacement of advisor committee members requires the approval of both former and proposed committee members.  Students who change advisors and/or committee members should realize that their new advisors and committee members have the right to request the addition or deletion of specific courses from the previously approved Form I.  Responsibility for assuring that the program of study, as modified, still meets all of the requirements enumerated above rests with the student, the advisor, and (for thesis option students) the advisory committee.

#### V.B.2 Doctoral Degrees

Once the Form V program of study has been approved, students can modify the program by submitting a Form V-A.  This form can be submitted as needed to add courses, delete courses, change courses, etc. subject to approval of their advisor and thesis committees.  Doctoral students can use Form V-A to change members of their advisory committee and/or change their advisor.  Changing advisors requires the approval of both the old and new advisors.  Similarly the replacement of advisor committee members requires the approval of both former and proposed committee members.  Students who change advisors and/or committee members should realize that their new advisors and committee members have the right to request the addition or deletion of specific courses from the previously approved Form V.  Responsibility for assuring that the program of study, as modified, still meets all of the requirements enumerated above rests with the student, the advisor, and (for thesis option students) the advisory committee.

## VI. Graduate Degree Procedures

A description of the common specific steps required to complete the requirements for a graduate degree in all departments can be found in the Graduate Catalog.  The following describes how these procedures are followed in the electrical and computer engineering department.

## VI.A Master's Degree (Non-thesis Option)

1. An acceptable program of study (Form I) must be submitted and approved within the first six weeks of the semester in which the student completes their fifteenth credit hour. Failure to comply with this requirement may cause the Office of Graduate Studies to issue a hold on the student's registration. Once a hold has been issued, the student will not be allowed to register for courses.

Form I must be approved by the student's advisor. The form should then be forwarded to the graduate secretary to obtain department approval from the Associate Chair for Graduate Studies. After receiving department approval it will be forwarded to the Office of Graduate Studies for final approval. This requirement will be considered to be fulfilled after it receives approval from the Office of Graduate Studies.

2. Subsequent changes in an approved program of study will be noted on Form I-A, approved by the advisor, and forwarded to the graduate secretary to receive approval from the Associate Chair for Graduate Studies and the Office of Graduate Studies.

3. Within the first four weeks of the final semester, the student should ensure that all degree requirements will be fulfilled by the end of the semester. At this time the student should fill out an application for graduation. Complying with this requirement will allow adequate time for the faculty to approve the granting of the degree and will also enable the student to participate in the next graduation ceremony. Failure to comply with this requirement may delay granting the degree. Graduation ceremonies are held at the end of the Fall and Spring semesters. Students who complete their degrees during the summer session and meet these requirements will be invited to participate in the graduation ceremony held at the end of the next Fall semester.

Occasionally students fill out their application for graduation and, due to unforeseen circumstances, are unable to complete their degree requirements by the end of the semester. In these cases the student will need to fill out a new application for graduation for the subsequent semester. International students who determine that they will not be able to fulfill their degree requirements after applying for graduation should contact the International Affairs Office as soon as possible to avoid any adverse consequences regarding their immigration status.

## VI.B Master's Degree (Thesis Option)

1. An acceptable program of study (Form I) must be submitted and approved within the first six weeks of the semester in which the student completes their fifteenth credit hour. Failure to comply with this requirement may cause the Office of Graduate Studies to issue a hold on the student's registration. Once a hold has been issued, the student will not be allowed to register for courses.

Form I must be approved by the student's advisor and their advisory committee. The advisory committee is chaired by the student's advisor. The minimum number of advisory committee members (including the advisor) is three. The advisor and at least half of the remaining committee members must be members of the graduate faculty. A list of members of the graduate faculty can be found at
http://gradfac.mst.edu/graduatefaculty/membership/gradfaclist/.
As long as requirements are met there is nothing to preclude the advisory committee from including members who are primarily affiliated with other universities, corporations, or governmental organizations particularly when these additional members can provide expertise in the area of the student's research.

2. Subsequent changes in an approved program of study will be noted on Form I-A, approved by the advisory committee, and forwarded to the graduate secretary to receive approval from the Associate Chair for Graduate Studies and the Office of Graduate Studies.

3. Within the first four weeks of the final semester, the student should ensure that all degree requirements will be fulfilled by the end of the semester. At this time the student should fill out an application for graduation. Complying with this requirement will allow adequate time for the faculty to approve the granting of the degree and will also enable the student to participate in the next graduation ceremony. Failure to comply with this requirement may delay granting the degree. Graduation ceremonies are held at the end of the Fall and Spring semesters. Students who complete their degrees during the summer session and meet these requirements will be invited to participate in the graduation ceremony held at the end of the next Fall semester.

Occasionally students fill out their application for graduation and, due to unforeseen circumstances, are unable to complete their degree requirements by the end of the semester. This situation occurs most often for thesis option students who are unable to complete and defend their thesis prior to the deadlines set by the department. In these cases the student will need to complete a new application for graduation for the subsequent semester. International students who determine that they will not be able to fulfill their degree requirements after applying for graduation should contact the International Affairs Office as soon as possible to avoid any adverse consequences regarding their immigration status.

## VII. Major Exams

In addition to the exams given as part of the formal coursework required for graduate degrees there are several major exams required for students pursuing advanced degrees in this department. The required exams depend on the degree being sought and in the case of master's degree students whether the degree is thesis or non-thesis option.

## VII.A. Master's Degree Thesis Defense

All thesis option master's degree candidates must defend their thesis in an oral thesis defense examination conducted by their advisory committee.  The student will be responsible for distributing copies of their thesis to the advisory committee and will arrange a time and place for the oral thesis defense.  Students should contact the graduate secretary to arrange for an official department announcement to be made at least seven days in advance of the exam.  Committee members should be provided with a written copy of the thesis at least seven days in advance of the exam.  The chair of the advisory committee will submit a Graduate Form II for approval to the graduate secretary.

## VII.B. Master's Degree Comprehensive Exam

The electrical and computer engineering department no longer require master's degree students to pass a comprehensive exam although this exam may still be required in other departments.

## VII.C. PhD Qualifying Exam

All doctoral students are required to pass a qualifying exam.  Students seeking a doctoral degree in electrical engineering must pass the electrical engineering qualifying exam.  Similarly, students seeking a doctoral degree in computer engineering must pass the computer engineering qualifying exam.  These exams are offered only once in the fall semester and once in the spring semester.  The Office of Graduate Studies requires that the qualifying exam be passed by the end of the second semester after completing the MS degree.  Students who fail the qualifying exam in their first attempt will have a second opportunity to take the exam during the following semester.  If they do not to take the exam during the following semester or if they do not pass it, they will no longer be a candidate for a doctoral degree in their degree program.  A more detailed explanation of the exam contents and requirements may be obtained from the graduate secretary.

## VII.D. PhD Comprehensive Exam

All doctoral students are required to pass a comprehensive exam after the completion of all formal coursework (exclusive of thesis research) listed on their Graduate Form V.  The comprehensive exam is determined by the student's advisory committee.   Students need to prepare and submit a "Request for Comprehensive Exam" form at least two weeks prior to the proposed date of the exam.  The request form must be approved by the student's advisory committee, the department and the Office of Graduate Studies.  A period of at least 12 weeks must elapse between the comprehensive exam and the thesis defense.

## VII.E. PhD Dissertation Defense

All doctoral degree candidates must defend their thesis in an oral thesis defense examination conducted by their advisory committee. The student will be responsible for distributing copies of their thesis to the advisory committee and will arrange a time and place for the oral thesis defense. Students should contact the graduate secretary and the Office of Graduate Studies to arrange for an official department announcement to be made at least seven days in advance of the exam. Committee members should be provided with a written copy of the thesis at least seven days in advance of the exam. After the dissertation the chair of the advisory committee will submit the Graduate Form VII and rubric packet for to the graduate secretary for department approval.

## VIII. Frequently Asked Questions

*How do I get a graduate teaching assistantship?*
Most graduate teaching assistantships in this department involve teaching undergraduate laboratory courses. A few involve teaching undergraduate lecture courses. Students who wish to receive these appointments should contact the Associate Chair for Laboratory Development. In accordance with Missouri state statutes, international students are generally not eligible to be considered for a graduate teaching assistantship during their first semester. The relevant Missouri state statute can be found at:
http://www.moga.mo.gov/mostatutes/stathtml/17000000121.html

*As part of my master's degree I took several additional courses beyond the minimum requirements for my degree. Can I count these courses to fulfill the requirements for my PhD degree at S&T?*
The basic premise for counting courses is that one course can only count towards one degree. For a master's degree, all of the courses shown on your Form I (and subsequent Form I-A's) are considered to be course requirements for your MS degree and therefore can not be used to fulfill course requirements for any other degree. However, if you have not finished your master's degree you may want to consider submitting a Form I-A to remove extra courses from your Form I so that these courses will no longer be considered to be part of your MS degree requirements.
In this case it may be possible to count the extra courses towards fulfilling your PhD coursework requirements if you decide to continue your studies for a PhD at S&T. However, it is important to understand that the removal of courses from a program of study requires the approval of your advisor and advisory committee (for thesis option students). It also requires the approval of the Associate Chair for Graduate Studies and the Office of Graduate Studies. Accepting these extra courses towards the fulfillment of your PhD degree requirements also depends on approval by the advisor and advisory committee, the Associate Chair for Graduate Studies, and the Office of Graduate Studies.

International students who wish to remove courses from one degree to apply towards another degree should discuss the implications of this change with the International Affairs Office. This change could conceivably affect the I-20 status of an international student. Therefore the International Affairs Office has requested two additional requirements for international students who wish to remove courses from their program of study. The policy of the International Affairs Office is:

    1. An international student may only remove courses from their program of study when they are in the last semester of the MS program

    2. The courses being removed from the program of study are courses being taken during the current semester. Courses can not be removed retroactively.

***Is there any time limit on completing a PhD degree?*** The university requires that all of the graduate credit for a PhD degree must be obtained within a continuous 8 year period preceding the degree's conferral. Otherwise it is necessary for the advisor to submit a formal written request for an extension and the request must be approved by the Associate Chair for Graduate Studies and the Office of Graduate Studies. In the case of PhD candidates who already have a master's degree or who have passed the qualifying exam, the time limit is reduced from eight to six years.

***Can I use correspondence or extension courses to fulfill some or all of my PhD coursework requirements?*** While correspondence and extension courses may, to a limited degree, be used to satisfy MS degree requirements, this type of coursework can not form part of the PhD degree.

***I am currently an undergraduate international student at S&T. Do I still need to submit 3 letters of recommendation to apply for a master's degree in EE or CpE?*** Yes.

***I am currently enrolled as a graduate student in another department at S&T. What do I need to do to transfer into the ECE department as a graduate student in either CpE or EE?*** Each department has different admissions requirements. Therefore in order to transfer into the ECE department at S&T a student must submit a new graduate application with all of the supporting documentation. Usually the admissions office retains copies of the supporting documentation (e.g. GRE scores, transcripts from previous universities, letters of recommendation, etc.) and will forward these to the ECE department. Students who wish to transfer into the ECE department at S&T from another department at S&T must meet all of the normal admission requirements including GPA, test scores, adequacy of background courses etc. In addition, for students who have completed one or more semesters at S&T, an official S&T transcript must be included with the application. Finally, students who are transferring from another department must provide an additional letter from their previous department indicating: i). The student requesting the transfer is currently in good standing in their current department; and ii). The current department approves their request to transfer. This letter should be provided by the graduate coordinator of their previous department. It should be addressed to the ECE Associate Chair for Graduate Studies and should be included in a sealed envelope with the application.

*Are international graduate students eligible to participate in co-op assignments with companies or laboratories (federal or state)?*  An international student who wishes to take a co-op (CPT) assignment may do so if they provide:
　　1. A letter signed by the advisor indicating that they approve the CPT request.
　　2. A copy of the offer letter from the sponsoring organization.
　　3. An additional letter (if necessary\*) including the following four items:
　　　　a. A statement that the CPT assignment will be directly related to the student's area of study (specifically electrical engineering for EE students or computer engineering for CpE students). For example, a telemarketing job would NOT be considered acceptable.
　　　　b. A statement of the job title.
　　　　c. A statement of the work location.  This must be a physical address as opposed to a correspondence address.  A post office box, for example, would be unacceptable.
　　　　d. A statement of the start and stop dates.
　　\*If the offer letter includes all items listed above (a through d), an additional letter is not required.
International students should also register with the COER (Career Opportunities and Employer Relations) Office before leaving for their co-op assignment so that they can officially be shown on the university records as being enrolled in a course.

*Do Computer Engineering faculty members count as out of department members on an EE graduate student's PhD advisory committee (conversely, do Electrical Engineering faculty members count as out of department members on a CpE graduate student's PhD advisory committee)?*  No.  This was considered when the Computer Engineering program first started and it was decided that the ECE department would require at least one faculty member from another department.

*Can I list a course on my Form I, Form I-A, Form V, or Form V-A for which I have received a grade of F?*  No!!!!!  If you know that you have received an F in a course and you put it on your program of study (Forms I, I-A, V, and/or V-A) then you will have to retake the course before you can be considered to have completed your degree requirements.  Some graduate courses are offered infrequently and some may even be offered only once.  This can then significantly delay your degree completion date.  Also you should avoid including any course on your program of study if you are currently taking it and are in jeopardy of failing it by the end of the semester.

*I am an international student and have completed my bachelor's degree at S&T (or another American undergraduate university).  Do I still have to submit TOEFL scores?*  Yes.  The TOEFL test is required for non-native English speakers.

***I was on a 25% appointment during the spring semester and would like to know if this entitles me to an out-of-state differential fee waiver during the following summer semester.*** If a student was on appointment for at least 25% for the previous spring semester and is likely to be on appointment in the upcoming fall semester, the student is allowed an out-of-state fee waiver for the summer. If the student is completing in the summer and not returning in the fall, the student is still entitled to an out-of-state waiver for the summer if the student had an appointment in the previous spring.

***Professor X, in another department has offered me an assistantship to work on a project in her department and to complete a thesis under her supervision. Can I accept this offer and still graduate with a master degree in electrical (or computer) engineering?*** Yes, this is possible. First you would have to find a faculty member in the department who is willing to be your co-advisor. The number of credit hours of 490 taken in this department should be equal to or greater than the number of credit hours taken in Professor X's department. However at least half of all lecture courses, at least half of the 400 level lecture courses, at least half of the thesis research and at least half of the special problems/seminars courses will be in your degree program. This requirement will be based on the number of credit hours rather than on the number of courses.

Rev. 07/27/15
lg