Clemson University Photonics Program

Graduate Student Handbook

Version 5.0 (Revised September 2024)

Contents

General Information

Overview of Photonics Graduate Program

The Photonic Science and Technology program, jointly administered by the Holcombe Department of Electrical and Computer Engineering (ECE), faculty affiliated with the Center of Optical Material Science and Engineering Technologies (COMSET), and the Graduate School, offers interdisciplinary graduate degrees involving optics, engineering, physics, and materials science. The program prepares individuals with the fundamentals of the science and engineering of light and specific interactions targeted for relevance to the research areas of their home academic department(s) and collaborative co-advised graduate committees.

- COMSET affiliated faculty conduct a strong blend of both fundamental scientific research and applied research with impactful deliverables in wide-ranging areas including organic LEDs, specialty optical fiber, high-power lasers, light-emitting plastics, optical communications, environmental sensors and biosensors, and much more.
- Students can be advised by photonics faculty within ECE or faculty from other departments who are affiliated with COMSET.

The Photonics Graduate Program at Clemson University ("the Program") offers Master of Science (M.S.) and Doctorate of Philosophy (Ph.D.) degrees. The M.S. program includes a non-thesis option and a thesis option. The Ph.D. program is normally entered only after completion of an M.S. degree in the same major; however, highly qualified students may be allowed to enter the program directly after completion of a B.S. degree.

This handbook defines the requirements, policies, and procedures of the Photonics Graduate Program. The requirements specified herein are in addition to those described in the Clemson University Graduate School Admissions Policies and Academic Regulations. The Graduate School policies and regulations are specified in https://www.clemson.edu/graduate/students/policies-procedures/index.html on the Graduate School Web site. It is very important that each student familiarize himself or herself with all Graduate School and departmental requirements and information pertaining to the student's program of study. (Note in particular that the program may have additional requirements for a degree program beyond the requirements specified by the Graduate School.)

All new students are required to attend orientations held by the Graduate School to become acquainted with the instructional activities and research as well as with general regulations. Information from these orientations helps students to select specific research areas and allows them to make a more effective choice of advisory committee members. Dates and times of the orientation meetings are announced each semester.

We hope this handbook is useful both to graduate students and faculty. Any inconsistencies or omissions should be brought to the attention of the graduate program coordinator.

Personnel

The following link is a list of key faculty members involved with the graduate program along with their research interests. We encourage potential graduate students who are interested in our program to directly contact individual faculty members about the Research Assistants (RA) opportunities.

http://www.clemson.edu/centers-institutes/comset/faculty/

Contacts

Dr. Judson Ryckman, *Graduate Program Coordinator (207C Riggs Hall)*, is responsible for overseeing the photonics program, making admissions decisions and collecting recommendations from Photonics faculty regarding admissions, coordinating student recruitment activities, and coordinating Ph.D. comprehensive examinations.

Ms. Jennifer Gooch, *Graduate Student Services Coordinator* (102A Riggs Hall), assists the Graduate Program Coordinator with all aspects of Graduate Program administration. In general, she is the first person who a prospective student should contact with any questions regarding the Graduate Program. She coordinates all graduate students' applications and reviews of applications. She also coordinates the payroll for ECE graduate students. In addition, she assists in maintaining all records for the Graduate Program and has copies of all forms associated with the program.

Ms. Jeanine Hayes, *Graduate Student Services, Registration Coordinator* (102C Riggs Hall), maintains official copies of course syllabi, and maintains all records for the Graduate Program, including copies of all forms associated with the program. She prepares Graduate School forms (GS-5, GS-7) for students and distributes official notices of oral exams and thesis and dissertation presentations. She has copies of all documents associated with the Graduate Program. Maintains information for departmental assistantships.

Dr. Hai Xiao, *Chair of the ECE Department*, exercises the final authority on all matters involving resources available to graduate students and final approval on all assistantship and fellowship offers.

Prospective Graduate Students

Application Procedure and Requirements

To apply for our graduate program, please visit the Graduate School application at https://www.clemson.edu/graduate/admissions/apply/index.html.

Admission is based on the applicant's record of academic performance, standardized test scores, and letters of reference. Each applicant should highlight relevant work experience and detail academic goals and research interests in a written statement of purpose. Information on required undergraduate prerequisite courses can be found at undergraduate prerequisite requirements.

Students who seek admission for the fall semester are encouraged to apply no later than the preceding February 1; students who seek admission for the spring semester are encouraged to apply no later than the preceding October 1; students who seek admission for the first summer session are encouraged to apply no later than the preceding December 1. The department will review applications after these recommended dates, but failure to meet these dates may significantly reduce applicants' opportunities for financial assistance.

Required application material includes the following items:

- On-line application, including Personal Statement/Statement of Purpose
- Transcripts of prior and current undergraduate and graduate course work
- Results from the Graduate Record Examination (GRE) General Test
    - GRE recommended for application to the M.S. or Ph.D. program
    - With the consent of the program coordinator, GRE can be waived for the students with extensive research experiences
- Results from the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) (for applicants whose native language is not English)
- A minimum of two Letters of Recommendation (three Letters are highly encouraged)
- A summary of related research and work experience

Completed applications will be reviewed as they are received, and there is no application deadline. Applicants are strongly encouraged to complete applications by the dates listed above, however. Failure to provide a completed application by the specified dates will significantly reduce an admitted applicant's opportunity for financial support, and it may delay the student's entrance until a later semester.

Financial Aid

Admission to the photonics graduate program is considered separately from offers of financial aid (graduate assistantships or fellowships). Graduate research assistantships are awarded by individual faculty members.

Accepted applicants with strong academic credentials may also be considered for a fellowship. The College of Engineering, Computing, and Applied Sciences fellowships and the Clemson University recruitment fellowships are all supplemental; they can only be awarded in conjunction with an assistantship offer. All qualified accepted applicants are considered automatically for supplemental fellowships; the applicant does not need to apply for consideration. A variety of fellowships funded by external organizations are also available (e.g., DOE, NDSEG, NSF, and SMART fellowships). Students should apply directly to the organization awarding an external fellowship.

Federal loans are another option for some graduate students in electrical and computer engineering. For more details on financial aid, please visit the Clemson University Financial Aid website.

Current Graduate Students

Selecting an Advisor

Each graduate student is admitted with a faculty advisor based upon the student's expressed interests. The initial academic advisor for each entering M.S. student is the program coordinator; the initial academic advisor of each entering Ph.D. student is the faculty member who has agreed to advise the student. The initial academic advisor should be consulted in selecting courses for the first semester of study. It is possible to change the advisor after admission into the program.

After the first semester of study, the student should select a faculty member as the permanent academic advisor for the student's program of study. The academic advisor will serve as the chair of the student's advisory committee; thus, the selected advisor's research interests and expertise should relate closely to the student's focus area of study. The advisor serves as the student's first and primary contact for planning the student's program of study and selecting courses. The advisor and the rest of the advisory committee should be determined by the end of the student's second semester of study. (Refer to M.S. committee details or Ph.D. committee details as appropriate.)

Course Selection

The student should meet with his or her initial academic advisor prior to the first semester of study to select courses for the first semester. Once the student has selected a permanent academic advisor, the student and the advisor should meet for an initial discussion of the student's program of study; this should be followed by a meeting at least once per semester to discuss courses for the subsequent semester. The courses should be chosen so as to make significant progress towards meeting the requirements of the student's degree program. The requirements are given in later sections of the Handbook.

The student should work with his or her academic advisor to complete a GS-2 (Graduate Degree Curriculum) form. The form should list exactly those courses that are to be used to satisfy the requirements for the degree as well as the membership of the student's faculty advisory committee. The composition of the committee depends on whether the student is enrolled in the M.S. program or the Ph.D. program; details are provided in later sections of the Handbook.

The courses listed on the GS-2 form must be approved by the student's advisory committee. The student must first select an advisory committee. Once this is decided, the student must submit the GS-2 Committee Selection in iRoar. The courses listed on the GS-2 Plan of Study form must be approved by the student's advisory committee. Once the student and the committee agree upon the courses to be included on the GS-2, the student must complete the GS-2 Plan of Study in iRoar. Automated notifications will be sent to the Graduate Student Services Coordinator and each committee member in turn (not all at once) for approval.

Registration

Information on graduate student registration can be found at the Registrar's web site and in the Graduate School Webpage. Pre-registration is required for all graduate students. The information obtained from pre-registration is essential to plan graduate course offerings properly. Failure on the part of students to pre-register may result in course cancellations and the inability to offer desired courses. Students are strongly encouraged to register early to ensure that courses are not canceled.

Conduct of Graduate Students

Please be familiar with the following Clemson University and College of Engineering and Science policies regarding the conduct of graduate students. Photonics graduate students are expected to understand and abide by these policies.

Clemson University Academic Integrity Policy

Clemson University Anti-Harassment and Non-Discrimination Policy

Clemson University Student Code of Conduct

College of Engineering, Computing, and Applied Sciences on Alcohol: Alcoholic beverages are prohibited for any activity held in a College of Engineering and Sciences facility unless prior approval has been granted through University-defined procedures. Under no circumstance should alcohol be made available to or consumed by anyone under 21 years of age.

Miscellaneous Information

Students with Disabilities: Requesting Accommodations

Graduate students with disabilities requesting accommodations should make an appointment with Accessibility Services to discuss specific needs within the first month of classes. Accommodations are not retroactive and new Faculty Accommodation Letters must be presented each semester. Accommodation for graduate program events other than courses should be discussed with the SDS office and the Graduate Program Coordinator at least one month in advance of the event.

Thesis Guide

The Graduate School's Thesis and Dissertation Guide should be read by all students before writing a thesis or dissertation.

Graduate Academic Programs

Requirements of the Clemson University Graduate School

All degree requirements of the Clemson University Graduate School must be met in addition to the requirements specified in this Handbook. See the Graduate School Website for further information.

Photonics Program Curriculum

For the MS program, students may write a thesis or follow a non-thesis option. The thesis option requires a total of 30 credit hours (six of which must be research credits) and the submission and defense of a master's thesis. For the non-thesis option, 30 credit hours of coursework must be completed.

The PhD program requires at least 24 credit hours of graduate coursework and 36 research credit hours. Specially qualified candidates with a BS degree may apply for direct entry to the PhD program.

MS thesis and PhD students are required to take at least 18 credit hours of core coursework. Non-thesis MS students are required to take at least 24 credit hours of core coursework.

Core Courses:

- BIOE 6310 – Medical Imaging
- BIOE 6710 – Biophotonics
- CH 8050 – Theoretical Inorganic Chemistry
- CH 8140 – Analytical Imaging
- ECE 6080 – Silicon Photonic Integrated Circuits
- ECE 6330 – Optical Fiber Communication Systems
- ECE 6320 – Instrumentation
- ECE 6340 – Optoelectronics and Photonics
- ECE 8300 – Electromagnetics I
- ECE 8330 – Fourier Optics and Optical Signal Processing
- ECE 8360 – Lasers and Detectors
- ECE 8370 – Advanced Fiber Optics
- ECE 8380 – Advanced Photonic Sensors
- MSE 6240 – Optical Materials and Their Application
- MSE 8250 – Solid State Materials Science
- PHYS 6320 – Optics

Additional Course Options:

Subject to enrollment, Photonics and Applied Electromagnetics faculty offer ECE 6930 and ECE 8930 Selected Topics or ECE 8920 Special Problems courses dealing with advanced topics. These courses may be used to satisfy one or more of the core course requirements subject to approval of the student's advisory committee. Before taking courses, each student's proposed selection of courses must be approved by the student's advisor and the other members of the advisory committee.

Recent examples of selected topics courses that can be substituted for the core course requirements, and that have been offered within the last four years, include:

ECE 6930 Selected Topics (Fiber Optics)
ECE 8930 Selected Topics (Advanced Fiber Optics)
ECE 8930 Selected Topics (Advanced Optical Communication Systems)
ECE 8930 Selected Topics (Advanced Photonic Sensors)
ECE 8930 Selected Topics (Fiber Lasers)
ECE 8930 Selected Topics (Laser Diodes)
ECE 8930 Selected Topics (Measurement and Instrumentation)
ECE 8930 Selected Topics (Quantum Microwave Engineering)
ECE 8930 Selected Topics (Organic and Hybrid Electronics: Foundations to Applications)

Master of Science Program

M.S. Advisory Committee

Each M.S. student must have an advisory committee of at least three Clemson University faculty members. A majority (more than 50%) of the committee members must be Photonics faculty affiliated with ECE and/or COMSET. One of the Photonics faculty on the committee must serve as the student's academic advisor and as the chair of the committee. A committee member from outside the Photonics faculty may serve as a co-chair of the committee with the approval of the Dean of the Graduate School.

The student's academic advisor is his/her first contact in planning a program of study. The advisor, along with the student's advisory committee, will serve the following functions:

Work with the student to determine course selection for each semester.
Approve the student's program of study (specified in the GS-2 form).
Supervise the thesis research (if the thesis option is chosen).
Administer the final examination (if the thesis option is chosen).
Initiate recommendations for awarding the degree.

M.S. Plan of Study

The student's planned program of study, documented on the GS-2 form, must be submitted no later than the mid-term of the second semester of the program. If circumstances necessitate later changes to the plan a revised GS-2 form must be completed in iRoar.

Summary of M.S. Degree Requirements

The requirements of the M.S. degrees are as follows:

- Complete the graduate course-work requirements specific to the thesis option or the non-thesis option as detailed below.
- Complete a written M.S. thesis (thesis option only).
- Pass the final examination (thesis option only).

Click here for Graduate School deadlines.

Each student's program of study, as specified by the GS-2 form, must satisfy one of the following two options.

Thesis Option

The M.S. thesis (required of each M.S. student electing the thesis option) must demonstrate mastery of available scholarship in the presentation of a substantive idea or problem solution in the major field of the student.

The GS-2 form for the thesis option must include a minimum of 30 credit hours of graduate-level course work at the 6000-level, 8000-level, or 9000-level, including the following:

- Exactly six (6) credit hours of Photonics 8910 (M.S. Thesis Research)
- A minimum of 24 credit hours of letter-graded course work (at least 18 credit hours must be from the core coursework listed above).
- At least one-half of the 24 credit hours of letter-graded course work must be at the 8000-level or 9000-level.

A student electing the thesis option in the M.S. program must write a thesis that is approved by the student's advisory committee and the Graduate School. The student must also take a final examination administered by his/her advisory committee. At a minimum, the student must pass an examination consisting of an oral defense of the student's thesis. The advisory committee has the option of administering an additional written and/or oral examination on coursework.

[Note: Each M.S. student receiving a graduate teaching assistantship or a graduate grading assistantship is required to select the thesis option. An M.S. student supported as a graduate research assistant is almost always required by his or her advisor to select the thesis option as well. M.S. students anticipating entry into the Ph.D. program are strongly encouraged to consider selecting the thesis option.

Non-Thesis Option

The GS-2 form for the non-thesis option must include a minimum of 30 credit hours of graduate-level course work at the 6000-level, 8000-level, or 9000-level, including the following:

- At least 24 credit hours must be from the core coursework listed above.
- At least one-half of the 30 credit hours of letter-graded course work must be at the 8000-level or 9000-level.

No thesis or engineering report is required with the non-thesis option, and there is no final examination.

Transferring Coursework

A maximum of one third (1/3) of the required graded coursework may be transferred to an Photonics graduate program. All transfer coursework must be approved by the student's advisor and advisory committee prior to being included on the GS-2. Coursework eligible for

transfer must be: from a regionally accredited institution, graded with a B or higher, and is subject to the Graduate School's six-year time limit for validity. Please note all limitations for transfer work set forth by the Graduate School apply as detailed in the Graduate School Policies and Procedures Handbook. An official transcript must be available prior to transferring the coursework. Coursework applied towards the requirements of a prior degree earned by the student cannot be used for transfer credit. (If requested by the Department, the student must be able to provide verification of eligibility for each course requested for transfer.)

M.S. Coursework Expiration

All coursework for the M.S. degree must be completed in the six (6) calendar years prior to graduation as per Graduate School policy. Any course work completed before this time window may not be applied towards the requirements of the degree except under special conditions defined by the Graduate School.

Doctorate of Philosophy Program

There are two circumstances in which a student can enter the Ph.D. program in photonics. In one circumstance, the student enters the Ph.D. program with a prior M.S. degree. In the other circumstance, the student enters the Ph.D. program with only a prior B.S. degree. (Direct entry to the doctoral program from the baccalaureate is permitted only for students with an exceptionally strong academic record and exceptional potential for research as determined by the Photonics faculty during evaluation of the student's application.)

Ph.D. Advisory Committee

Each Ph.D. student must have an advisory committee of at least four tenured or tenure-track Clemson University faculty members. A majority (more than 50%) of the committee members must be Photonics faculty affiliated with ECE and/or COMSET. One of the Photonics faculty on the committee must serve as the student's academic advisor and as the chair of the committee. A committee member from outside the Photonics faculty may serve as a co-chair of the committee with the approval of the Dean of the Graduate School.

The student selects the academic advisor, also chair of the committee, who, in consultation with the student, selects the additional committee members. Keep in mind that faculty members must consider their existing workloads before consenting to serve.

A student's academic advisor is his/her first contact in planning a program of study. The advisor, along with the student's advisory committee, will serve the following functions:

- Work with the student to determine course selection for each semester.
- Approve the student's program of study (specified in the GS-2 form).
- Supervise the dissertation research.
- Administer the Comprehensive Exam.
- Administer the final examination .
- Initiate recommendations for awarding the degree.

Ph.D. Plan of Study

The student's planned program of study, documented on the GS-2 form, must be submitted no later than the beginning of the fourth semester of the program. If circumstances necessitate later changes to the plan a revised GS-2 form must be completed in iRoar.

Summary of Ph.D. Requirements

The requirements of the Ph.D. Program are as follows:

- Satisfy any undergraduate course deficiencies specified at the time of admission.
- Complete the graduate course-work requirements.
- Pass the Ph.D. Comprehensive Examination.
- Complete a written Ph.D. dissertation.
- Pass the final examination.

Each student's program of study, as specified by the GS-2 form, must satisfy one of the following two program options:

Entry to the Ph.D. Program with a Prior Master's Degree

Completion of the Ph.D. degree with a prior M.S. degree requires a minimum of 42 credit hours of graduate-level course work at the 6000-level, 8000-level, or 9000-level, to be documented on the GS-2 form, including the following:

- At least 18 credit hours of Ph.D. Dissertation Research
- A minimum of 24 credit hours of letter-graded course work (at least 18 credit hours must be from the core coursework listed above).

The student must pass the Ph.D. Comprehensive Examination and write a dissertation that is approved by the student's advisory committee and the Graduate School.

The student must pass a final examination administered by his/her advisory committee, which includes at a minimum an oral defense of the student's dissertation. The advisory committee has the option of administering an additional written and/or oral exam on coursework, however.

Direct Entry to the Ph.D. Program after the Bachelor's Degree

Completion of the Ph.D. degree directly from a prior B.S. or equivalent degree requires a minimum of 60 credit hours of graduate-level course work at the 6000-level, 8000-level, or 9000-level, to be documented on the GS-2 form, including the following:

- At least 36 credit hours of Ph.D. Dissertation Research
- A minimum of 24 credit hours of letter-graded course work (at least 18 credit hours must be from the core coursework listed above).

The student must pass the Ph.D. Comprehensive Examination and write a dissertation that is approved by the student's advisory committee and the Graduate School.

The student must pass a final examination administered by his/her advisory committee, which includes at a minimum an oral defense of the student's dissertation. The advisory committee has the option of administering an additional written and/or oral exam on coursework, however.

Earning an M.S. Degree While Enrolled in the Ph.D. Program

A student who has entered the Ph.D. program directly after the Bachelor's Degree may earn an M.S. degree in the same major en route to the Ph.D. The student must satisfy all the requirements of the M.S. degree with the thesis option (including 6 credits of research). A special form, the GS2-14 (Master's En Route to Ph.D. Degree Curriculum) form must be submitted before receipt of the en route M.S. degree. (A separate GS-2 form is required for the Ph.D. degree following receipt of the M.S. Degree.) If a direct-entry Ph.D. student receives an en route M.S. degree, the remaining requirements for the Ph.D. program (beyond the requirements for the M.S. degree) are the normal direct-entry Ph.D. degree requirements minus the 24 hours of letter-graded course work used to satisfy the M.S. degree requirements. Ph.D. students interested in earning an M.S. degree en route should discuss the option with their academic advisor and the Graduate Student Services Coordinator.

A student who has entered the Ph.D. program directly after the Bachelor's Degree and wishes to earn an M.S. degree with the non-thesis option must request a change of program to the M.S. degree program in the major. If the student later wishes to re-enter the Ph.D. program, he or she must submit a new application for admission into the program. If the student is admitted into the Ph.D. program again after having received an M.S. degree in the major, the remaining requirements for the Ph.D. program are the requirements for a student entering the program with a prior M.S. degree.

Ph.D. Candidacy Requirements

A student in the Ph.D. program is classified as a "candidate for the doctorate" (or is "admitted to candidacy") upon successful completion of the Comprehensive Examination for the degree and acceptance of the GS5-D (Doctoral Candidacy) form by the Graduate School. Once admitted to candidacy, the student has five years to complete all the requirements for the doctorate.

Ph.D. Qualifying Examination

This program does not presently require completion of a separate qualifying exam. In lieu of this exam, students are asked to form their advisory committee and submit a GS-2 form detailing their plan of study. This form should be submitted before the completion of the third semester of enrollment. See *Course Selection* (above) for additional details.

Ph.D. Comprehensive Examination

The student's advisory committee administers this exam. The content and scope of the exam are at the discretion of the committee. The exam may be written or a combination of written

and oral. This exam must be completed at least six months before the student is eligible to graduate. The GS5-D (Doctoral Candidacy) form is required for documentation of the completion of the requirement. Further details may be found in the Graduate School Policies and Procedures Handbook.

Ph.D. Dissertation

The Ph.D. dissertation must constitute an original, unique, substantive contribution to scholarship in the major field of the candidate.

Transferring Coursework

A maximum of one third (1/3) of the required graded coursework may be transferred to a Photonics graduate program. All transfer coursework must be approved by the student's advisor and advisory committee prior to being included on the GS-2. Coursework eligible for transfer must be from a regionally accredited institution, graded with a B or higher, and is subject to the Graduate School's six-year time limit for validity. Please note all limitations for transfer work set forth by the Graduate School apply as detailed in the Graduate School Policies and Procedures Handbook. Coursework applied towards the requirements of a prior degree earned by the student cannot be used for transfer credit. (If requested by the Department, the student must be able to provide verification of eligibility for each course in which transfer credit is requested.)

Appendix A – Bachelor-to-Graduate Program

The Photonics program also offers a Bachelor-to-Graduate program, where undergraduate students enrolled in Clemson's B.S. program for CpE or EE (ECE) can earn a M.S. in Photonic Science and Technology (PST). The requirements for entry into this program are identical to those for the B.S./M.S. program in ECE.

Application to the Bachelor to Graduate Program

A student must satisfy the following criteria in order to apply for the program:

1. Current enrollment in the B.S. program in CpE or EE at Clemson.
2. One to two semesters of course work remaining in the B.S. program.
3. Minimum overall GPR of 3.4 or higher at the end of the junior year of the program.

A student must take the following steps to apply for the program:

1. Complete and submit the GS6Bachelor-to-Graduate form (Bachelor-to-Graduate Request for Combined Education Plan). The form is available on the Graduate School's website, and application details are available in the Academic Regulations section of the Graduate School Announcements.
2. Specify the undergraduate department and major on the GS6Bachelor- to-Graduate form. (E.g. Department: Holcombe Department of Electrical and Computer Engineering, Major: CpE or EE.) And also specify the graduate department and major. The PST program is administered by the Holcombe Department of Electrical and Computer Engineering, while the major listed should read 'Photonic Science and Technology'. Indicate the focus area in parenthesis after the EE or CpE 'major.' The focus areas in the list below are the only options for the Combined BS/MS program.

Each application to the Bachelor-to-Graduate program will be evaluated by the Photonics faculty, the administering ECE Department, and the Graduate School to determine the applicant's suitability for the program. The applicant will be informed by the Graduate School of the resulting admission decision. (An applicant who is not accepted into the Bachelor-to-Graduate program can still submit an application in his or her senior year for standard admission into the M.S. or Ph.D. program upon graduation.)

Students admitted to the Bachelor(ECE)-to-Graduate(PST) program are considered to have gained *provisional* admission into the M.S. or Direct Entry Ph.D. program in PST.

Additional Requirements to be met for Full Admission into the Graduate Program

1. Each student admitted into the Bachelor to Graduate program must provide the graduate school with Graduate Record Examination (GRE) scores no later than the mid- term date of the semester in which the student will complete the requirements for the B.S. degree. (Earlier submission of the scores is encouraged so that the student will be considered for opportunities for financial support during in the Graduate program – see the ECE Department's Web site for recommended dates for submission of graduate application material.)

2. Each student admitted into the Bachelor to Graduate Program must complete the B.S. degree in ECE with a minimum GPR that depends on the student's selected focus area. (The minimum GPR for each focus area is at least 3.4.)

Graduate-Level Course Work taken Prior to Completion of the B.S. Degree

Each student admitted to the Bachelor to Graduate program is eligible to apply up to nine credit hours of 6000-level and 8000-level ECE course work towards the technical-elective requirements of the B.S. degree in CpE or EE. The same credit hours will also be applied towards the course requirements of the M.S. degree in PST. Several conditions and restrictions apply.

1. Only the 6000-level and 8000-level courses approved for the student's M.S. program may be applied towards the graduate degree requirements.

2. For questions on what 6000 and 8000 level courses are applicable to the technical depth requirement of the B.S. program, see the technical electives list provided by the department or speak with the Undergraduate Student Services Coordinator.

3. Students must have instructor approval to take an 8000 level course as an undergraduate student.

4. Graduate-level course work taken prior to the completion of the B.S. degree can be applied only towards the requirements of the M.S. degree with the thesis option or towards the Ph.D. It *cannot* be applied towards the requirements of the M.S. degree with the non-thesis option. (For details on the requirements of the M.S. thesis option, please refer to the M.S. thesis requirements in the ECE Graduate Student Handbook.)

Other Policies Regarding the Bachelor to Graduate Program

1. In the event that a student participating in the Bachelor to Graduate program does not subsequently qualify for full admission into the graduate program, the 6000- level and 8000-level course credits earned by the student prior to completion of the B.S. degree are still applicable to the requirements of the B.S. degree.

2. If a student participating in the Bachelor to Graduate degree program is subsequently admitted to the Ph.D. program in PST under the direct-entry option, the 6000- and 8000-level courses that were to be applied towards the requirements of the M.S. degree may be applied towards the requirements of the Ph.D. degree instead.

3. No student can hold a graduate assistantship prior to completion of the B.S. degree, including students enrolled in the Bachelor to Graduate program. Opportunities for financial support for Bachelor to Graduate students after completion of the B.S. degree depend on the availability of funds in alignment with departmental policies.

Below please find a list of example courses that are eligible for dual use toward the graduate degree and toward the B.S. degree. These courses match those listed under the ECE graduate program's focus area in Photonics, Electronics and Quantum Systems.

ECE 6040, ECE 6060, ECE 6080, ECE 6320, ECE 6330, ECE 6340 ECE 6360, ECE 6370, ECE 6460, ECE 6580, ECE 6590
ECE 8090, ECE 8120, ECE 8230, ECE 8290
ECE 8300, ECE 8330, ECE 8360, ECE 8370, ECE 8400