



**DEPARTMENT OF  
BIOMEDICAL & CHEMICAL  
ENGINEERING**

**GRADUATE  
HANDBOOK  
2015-2016**

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**This handbook is intended as a guide to assist the BMCE graduate students as they progress through and complete their degree programs. It is not all-inclusive of University policies, and the information provided does not supersede the Academic Rules as provided in the online Course Catalog for 2015-2016 (<http://coursecatalog.syr.edu/index.php>). Please refer to the Course Catalog for additional information.**

## **POLICY ON ACADEMIC INTEGRITY**

### **Responsibilities of Students**

Students are obligated to fully inform themselves of their obligations and responsibilities in the conduct of their academic work, where work includes classroom/laboratory assignments, deliverables such as reports and term papers, as well as examinations. The expectations for individual and teamed student work differ between courses and programs. It is the student's responsibility to establish his/her obligations and be knowledgeable as to the performance standards expected in each course.

### **Academic Integrity**

At Syracuse University, academic integrity is expected of every community member in all endeavors. Academic integrity includes a commitment to the values of honesty, trustworthiness, fairness, and respect. These values are essential to the overall success of an academic society. In addition, each member of the university community has a right to expect the highest standards of academic integrity from all other community members. An individual's academic dishonesty threatens and undermines the central mission of the University. It is unfair to other community members who do not cheat, because it devalues efforts to learn, to teach, and to conduct research. Academic dishonesty interferes with moral and intellectual development, and poisons the atmosphere of open and trusting intellectual discourse. Syracuse University's academic integrity policy and procedures are administered by the Academic Integrity Office in the Division of Academic Affairs, and all schools and colleges.<sup>1</sup>

The presumptive penalty for any act of academic dishonesty by a graduate student is suspension or expulsion from the University. Accordingly, all academic dishonesty allegations involving graduate students must be referred to a hearing panel for resolution.<sup>1</sup>

## **POLICY ON AWARDING CURRICULAR PRACTICAL TRAINING FOR GRADUATE STUDENTS**

The faculty of the Department of Biomedical and Chemical Engineering has adopted the following policy with regard to the awarding of Curricular Practical Training (CPT) for graduate students in all Department programs. To be eligible for CPT, a student must:

- be in good standing with the Department and College;

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<sup>1</sup> See <http://academicintegrity.syr.edu/academic-integrity-policy/> for additional information and clarification.

- have a minimum overall grade point average (GPA) of 2.8;
- have completed at least 15 credits of coursework toward his/her degree.

A student will be allowed only one semester of CPT during his/her course of study, with the summer counting as a semester.

## **REGISTRATION, POLICIES, TUITION CREDITS, FORMS**

### **Course Registration Procedures**

Syracuse University's computerized registration system is accessed using the University portal, MySlice. You will need a Syracuse University computer account and password number to register for classes.

The MySlice portal is open for schedule adjustment until the last day to add a class. After the add deadline, you will be required to fill out an ADD/DROP Form (available in the Department office) to add a class. This is a hard-copy form that must be submitted to the Registrar's Office.

In order to drop a class after the financial and academic drop deadlines, you will also need to use the ADD/DROP Form, obtain the required signatures, and submit the form to the Registrar's Office for processing.

**Note:** The Time Schedule of Classes is no longer being printed and can only be accessed via MySlice.

### **Full-time Status**

A graduate student is considered to have full-time status if any of the following apply:

- Registration for 9 credits for the Fall, Spring or Summer semesters in an approved program;
- Appointment as a graduate assistant (teaching or research) or Fellow (i.e. Syracuse University Fellow, STEM, etc.);
- The student's academic unit certifies that the student is pursuing a full-time program as defined on the Certification of Full-time Status for Matriculated Graduate Students Form (CFTS; to download form see section Forms You May Need).

### **Registration for Teaching Assistants and Research Assistants**

All graduate students holding an assistantship in a given semester, be it a Teaching Assistantship (TA) or Research Assistantship (RA), **must be registered for classes by the first day of classes in EVERY semester during which they have an assistantship.** This means the registration must be complete by the first day of classes, not on the first day of classes. A graduate assistant who is not registered by the first day of the semester will not be allowed to work until he/she is registered as a full-time student.

Registration on or after the first day of classes is considered "late" registration. Students will be charged a late registration fee.

A student who has completed all of the coursework for his/her degree must register for GRD 998-Degree in Progress for zero credits every semester until degree completion to maintain official active student status (see below).

## **Reconfiguration of Tuition Reduction Credits**

If you have been awarded tuition reduction credits as part of a TA or RA, **please note the following**, as stated in your appointment letter:

*You will need to seek the permission of our academic department if you wish to reconfigure the scholarship to accommodate anticipated changes in credit loads.*

Requests for tuition reconfigurations must be made in writing before the affected semester has started. They will not be granted after a semester has begun. This applies to summer credits, as well. Requests made by email to the Department Chair and copied to the Graduate Secretary will be accepted.

## **Registration for GRD 998 – Degree in Progress**

A student must register for GRD 998 – Degree in Progress for zero credits to maintain full-time status as an active graduate student every semester in which he/she is not registering for any other classes. Students must also be engaged in making progress towards completing degree requirements during every semester for which they register for this class. Do not register for GRD 998 if you are registered for any other class.

This registration requirement does not apply to the Summer sessions, unless the student plans to complete his/her degree during the Summer.

## **Registering for Correct Class Section**

There are several classes in the College that are cross-listed, meaning they are offered as courses in two different programs, such as CEN741/MAE746 and CEN561/BEN741. Make sure you register for the section for your degree program. If you register for the wrong section of a course, it cannot count toward the required number of Bioengineering (BEN) or Chemical Engineering (CEN) credit hours unless you petition to have it count and the petition is accepted.

## **Joint Graduate-Undergraduate (500-level) Courses**

Joint graduate and undergraduate courses are those numbered 500-599. These may be accepted for graduate credit at the discretion of the Department. For MS students, such coursework may not make up more than one-half (50%) of the Syracuse coursework for the degree. For Ph.D. students, such coursework may not make up more than one-third (33.33%) of that for a doctoral program. This information can be found in the Academic Rules in the Course Catalog at: [http://coursecatalog.syr.edu/content.php?catoid=4&navoid=395#Degree\\_And\\_Certificate\\_Programs](http://coursecatalog.syr.edu/content.php?catoid=4&navoid=395#Degree_And_Certificate_Programs).

For our 30-credit MS programs (thesis and non-thesis), no more than 15 credits can be at the 500-level. For our 36-credit MS program (BEN non-thesis with cognate field), no more than 18 credits can be at this level. For both 42-credit Ph.D. programs, no more than 14 credits can be at the 500-level. Students may be required to take additional classes at the 600+-level if they do not meet this requirement.

## **Courses That Do Not Count Toward Graduate Programs**

The following 500-level courses are for undergraduates only and will not count toward our graduate degree programs:

- CEN 542 – Heat & Mass Transfer Operations
- CEN 574 – Process Design
- CEN 575 – Process Control

The following course(s) cannot be taken as technical elective(s) for any degree program:

- SCM 656 – Project Management

## **Graduate Seminar Series**

The Department hosts graduate research seminars through the Fall and Spring semesters. These are generally held every Friday from 1:00-2:00 pm. Seminar notices are posted and announcements are also sent via email. All graduate students are expected to attend these seminars; all doctoral students are **required** to attend.

## **Minimum GPA to Continue Graduate Work**

Graduate students must earn at least a 2.8 GPA in the first 30 credits of graduate study at Syracuse University. The academic unit may recommend that the Graduate School cancel matriculation if this requirement is not met.

## **Programs of Study**

At the beginning of the semester in which a student plans to graduate, an approved Program of Study (POS) must be submitted to the Graduate School by the student. A POS is an official form on which is listed the sequence of courses to be counted toward a specific degree program. This form can be downloaded at: <http://graduateschool.syr.edu/policies-and-requirements/graduation-requirements/>. The Graduate Secretary should be contacted for assistance in filling out this form.

## **Graduation Dates for Graduate Students**

Graduate students at Syracuse University have four possible graduation dates each year: the end of the Fall semester, the end of the Spring semester, the end of June, and the end of August. The exact graduation dates vary every year based the calendar. The Graduation Dates and Related Processing Deadlines for each year can be found on the Graduate School's website at: <http://graduateschool.syr.edu/policies-and-requirements/graduation-requirements/> .

## **Registration for Completion of Degree**

A student must be registered as an active student in the semester during which he/she completes a degree. This also applies to students graduating in June or August.

## Documentation of All Prior Degrees

By the end of their first semester of study, all graduate students are required to submit acceptable documentation of all degrees earned prior to matriculation in their graduate program at Syracuse University. After completion of the first semester of graduate study, the Graduate School may prohibit further registration for any student who has not met this requirement. The hold on registration will only be released when this requirement has been met.<sup>2</sup>

The documentation referred to in the paragraph above is generally called Degree-Bearing Transcripts (DBT). All students must have Official DBT(s) on file with the University in order to receive any graduate degree at Syracuse University. For international students, the transcripts or degree certificates must state that the degree has been “awarded, conferred, or earned” in order to be accepted as an official DBT. International students are also required to submit eight semesters of mark sheets with their undergraduate Degree-Bearing Transcripts.

## Requests for Optional and Curricular Practical Training

It is the Department policy that all requests for Optional Practical Training (OPT) and Curricular Practical Training (CPT) by international students be submitted to the Department Chair only. Even though the sample letters for OPT and CPT from the Slutzker Center for International Services are entitled “Sample Advisor’s Letter...”, only the BMCE Department Chair will give approval for such requests. Do not ask your faculty advisor for either of these letters.

## Forms You May Need

- ADD/DROP Form – obtain in the BMCE Main Office.
- Certification of Full-Time Status for Matriculated Graduate Students Form (CFTS) – download at: [https://www.syr.edu/gradschool/pdf/FTS\\_%20Certification\\_October\\_2013.pdf](https://www.syr.edu/gradschool/pdf/FTS_%20Certification_October_2013.pdf) .
- Graduate Enrollment Internal Admission Application (to pursue concurrent degrees, to complete one degree and pursue another, to be admitted to the doctoral program in the same program in which you are currently pursuing an MS degree) – download from the Graduate School’s website at: <http://www.syr.edu/gradschool/em/graduate-admissions-forms.html>.
- Graduate Program/Plan Transfer Form (to change from PhD to MS in same program; change to different program, same college; changed to different program, different School/College) – download from the Graduate School’s website at: <http://www.syr.edu/gradschool/em/graduate-admissions-forms.html>.
- Petition to Faculty – download from the University Registrar’s Office at: <http://www.syr.edu/registrar/forms/index.html>.
- Program of Study – download from the Graduate School’s website at: <http://graduateschool.syr.edu/wp-content/uploads/2015/05/Program-of-Study-Fill-in.pdf>
- Proposal for Independent Study (also used for Experience Credit) – download at: <http://www.syr.edu/registrar/forms/index.html>.
- Request for Examination Form (required of all students defending a Master’s thesis or Doctoral dissertation; must be submitted to the Graduate Enrollment Management Center (GEMC) at least three full weeks prior to the defense) – download from the Graduate

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<sup>2</sup> <http://www.syr.edu/gradschool/em/pdfs/Graduate%20Checklist%20Item%20for%20transcripts.pdf>

School's website at: <http://graduateschool.syr.edu/policies-and-requirements/graduation-requirements/>

### **Graduate Secretary's Hours**

Note that the Graduate Secretary's normal work hours are 8:30 am - 3:30 pm, Monday through Friday during the academic year, and 8:00 am - 3:00 pm, Monday through Friday during the summer. Please plan accordingly if you need assistance with paperwork or have questions/concerns about your program.

### **BMCE Degree Completion Checklist**

This checklist is included on page 15 of this handbook. At the beginning of the **academic year**, **not the semester**, in which the student expects to complete his/her degree requirements, he/she should refer to this checklist and complete it. All parts of the checklist should be completed **BEFORE** the Request for Examination Form is submitted to the GEMC.

## **GRADUATE DEGREES OFFERED**

### ***Bioengineering***

- Master's of Science (MS) in Bioengineering  
(30 or 36 credit program thesis or non-thesis options)
- Doctor of Philosophy (PhD) in Bioengineering  
(42 credit program)

### ***Chemical Engineering***

- Master's of Science (MS) in Chemical Engineering  
(30 credit program, thesis or non-thesis options)
- Doctor of Philosophy (PhD) in Chemical Engineering  
(42 credit program)

## DESCRIPTION OF DEGREES

### MASTER'S OF SCIENCE (MS) DEGREES

#### *Bioengineering*

MASTER'S DEGREE PROGRAMS – REQUIREMENTS					
Total Credit Hours	Cognate Field	Thesis	Project Course	Independent Study	Degree Awarded
<i>Master's of Science (MS) –Three Plans</i>					
Plan 1 – 30	No	Yes	No	No	MS
Plan 2 – 30	No	No	Yes	No	MS
Plan 3 – 36	Yes	No	Yes	No	MS

### DEGREE REQUIREMENTS EFFECTIVE JUNE 2009

#### *Master's of Science with Thesis (Plan 1)*

- **30 total credits**
  - 15 credits of Bioengineering (BEN) courses
  - 3 credits of Ethics (Bio-ethics or engineering ethics);
  - 6 credits of thesis;
  - remaining 6 credits selected from science, technology, engineering, or mathematics (STEM) courses;
  - student must complete a thesis and defend it in an oral examination (see below);
  - no more than 50% of coursework at 500-level;
  - minimum GPA of 3.0 for coursework included on the Program of Study for the degree;
  - minimum GPA of 2.8 for all credits earned.

#### *Master's of Science Non-Thesis (Plan 2)*

- **30 total credits**
  - 15 credits of Bioengineering (BEN) courses,
  - 3 credits of Ethics (Bio-ethics or engineering ethics);
  - 3 credits of MS Project (see below);
  - remaining 9 credits selected from science, technology, engineering, or mathematics (STEM) courses;
  - student must complete an oral comprehensive examination as part of the M.S. project course (see below);
  - no more than 50% of coursework at 500-level;
  - minimum GPA of 3.0 for coursework included on the Program of Study for the degree;
  - minimum GPA of 2.8 for all credits earned.

### **Master's of Science Non-thesis with Cognate Field (Plan 3)**

- **36 total credits** (minimum of 24 credits of technical coursework and 12 credits of tailored concentrations)
  - 24 credits of technical coursework must include:
    - 15 credits of Bioengineering (BEN) courses,
    - 3 credits of Ethics (Bio-ethics or engineering ethics);
    - 3 credits of MS Project (see below);
    - remaining 3 credits selected from science, technology, engineering, or mathematics (STEM) courses.
  - 12 credits of tailored concentrations in areas such as Technology Transfer and Law (College of Law), Engineering Management (College of Engineering and Computer Science), or a customized sequence of courses of a non-technical nature;
  - student must complete an oral comprehensive examination as part of the M.S. project course (see below);
  - no more than 50% of coursework at 500-level;
  - minimum GPA of 3.0 for coursework included on the Program of Study for the degree
  - minimum GPA of 2.8 for all credits earned.

### ***Chemical Engineering***

The Master's of Science degree can be earned according to one of two plans.

### **Master's of Science with Thesis (Plan 1)**

- **30 total credits:**
  - 24 credit hours of coursework, including at least 12 credits in chemical engineering (CEN);
  - 6 credit hours of thesis;
  - student must complete a master's thesis and defend it in an oral examination (see below);
  - no more than 50% of coursework at 500-level;
  - minimum GPA of 3.0 for coursework included on the Program of Study for the degree;
  - minimum GPA of 2.8 for all credits earned.

### **Master's of Science Non-Thesis (Plan 2)**

- **30 total credits:**
  - at least 15 credits of coursework in chemical engineering (CEN);
  - 3 credits of MS project (see below);
  - student must complete an oral comprehensive examination as part of the M.S. project course (see below);
  - no more than 50% of coursework at 500-level;
  - minimum GPA of 3.0 for coursework included on the Program of Study for the degree;
  - minimum GPA of 2.8 for all credits earned.

## GENERAL INFORMATION FOR MS DEGREE PROGRAMS

**Residence Time:** The MS degree typically requires three to four semesters to complete.

**MS Project Class (Bioengineering and Chemical Engineering):** Effective Fall 2014, all non-thesis Master's students (plan 2 and 3 in Bioengineering, and plan 2 in Chemical Engineering) will be required to take the M.S. Project course. The successful completion of this course is a degree completion requirement, replacing the Independent Study requirements. The project course will be optional for thesis students, on a space-available basis, with permission of the instructor.

**Comprehensive Examination (Bioengineering and Chemical Engineering):** Effective Fall 2014, the Comprehensive Examination will be the culminating event of the M.S. Project courses in Bioengineering and Chemical Engineering. Students will prepare and present the products/outcomes of their projects to the departmental faculty and respond to questions from the faculty. The Comprehensive Examination will occur once a year toward the end of the semester in which the M.S. Project courses are offered. The examination committee will be composed of at least three department faculty, but all faculty are invited, and the examination will be scheduled to maximize faculty participation. The examination committee will meet separately to determine if the student has passed the examination, and the student will be informed of the decision. Students are required to submit an electronic copy and a printed copy on standard-size paper of presentation materials to the Graduate Secretary prior to the presentation.

**Thesis Defense Requirements:** Completion of the MS degree with thesis requires a written MS thesis and an oral defense. Students must submit a Request for Examination Form to the GEMC **at least three full weeks prior** to the oral defense. The thesis document must be delivered to the MS Thesis defense committee **at least two weeks prior** to the date of the oral defense.

Defenses must comply with the requirements of the Graduate School as described under Degree and Certificate Programs in the Graduate Course Catalog (<http://coursecatalog.syr.edu/content.php?catoid=4&navoid=395>). The MS Thesis defense committee consists of at least four members. The committee must include the thesis advisor, no fewer than two additional tenured or tenure-track members of the BMCE faculty, and the Chair of the Oral Examination Committee. If a proposed committee member is not a full-time or adjunct faculty member at Syracuse University (e.g. from SUNY-ESF, Upstate Medical University, etc.), the student must petition the Department to allow this person to serve as a committee member. The Chair of the Oral Examination Committee must be a Syracuse University tenured or tenure-track faculty member outside the department and program.

All students must submit two copies of the final version of the thesis, with the signed title page, to the Department in fulfillment of the requirements for the MS degree.

For information on the formatting of the final thesis document for submission to the Graduate School, see <http://graduateschool.syr.edu/policies-and-requirements/graduation-requirements/>

## DOCTOR OF PHILOSOPHY (PHD) DEGREES

PHD DEGREE PROGRAMS – REQUIREMENTS					
Required Coursework	Transferable from MS	Thesis Credits	Thesis Required	Dissertation Credits	Residence Time
<b>Bioengineering</b>					
<b>42-credit program, effective June 2009</b>					
36 credits as described below	Up to 30 credits, including thesis credits	Up to 6 transferable from MS	No	0	At least 3 years, post-baccalaureate
<b>Chemical Engineering</b>					
<b>42-credit program, effective June 2009</b>					
24 credits in CEN	Up to 30 credits, including thesis credits	Up to 6 transferable from MS	No	0	At least 3 years, post-baccalaureate

### **Bioengineering**

The requirements for the PhD degree in Bioengineering, are:

- **42 total credits including:**
  - at least 36 credits of coursework;
    - 15 credits of Bioengineering (BEN) courses,
    - 3 credits of ethics
  - 18 credits of science, technology, engineering, or mathematics (STEM) technical electives, to be chosen in consultation with the dissertation advisor.
  - 6 credits of thesis or additional technical electives.
  - up to 6 credits of thesis can be transferred from the MS;
  - successful completion of the Qualifying and Candidacy examinations;
  - student must complete a dissertation and defend it in an oral examination, but no dissertation credits are required;
  - no more than 33.3% of coursework at 500-level;
  - minimum GPA of 3.0 for coursework included on the Program of Study for the degree;
  - minimum GPA of 2.8 for all credits earned.

Required coursework can include Independent Study credits. Those entering the program post-BS degree can take up to 6 credits. Those entering the program, post-MS degree, can take up to 3 credits. **The independent study cannot be supervised by the dissertation advisor.**

**Note:** A student must be enrolled for at least three academic years of full-time graduate level study beyond the baccalaureate degree.

## Chemical Engineering

The requirements for the PhD degree in Chemical Engineering, are:

- **42 total credits**, including at least 24 credits in chemical engineering (CEN);
- successful completion of the Qualifying and Candidacy Examinations;
- student must complete a dissertation and defend it in an oral examination, but no dissertation credits are required;
- no more than 33.3% of coursework at 500-level;
- minimum GPA of 3.0 for coursework included on the Program of Study for the degree;
- minimum GPA of 2.8 for all credits earned.

Required coursework can include Independent Study credits. Those entering the program post-BS degree can take up to 6 credits. Those entering the program, post-MS degree, can take up to 3 credits. **The independent study cannot be supervised by the dissertation advisor.**

**Note:** A student must be enrolled for at least three academic years of full-time graduate level study beyond the baccalaureate degree.

## PHD EXAMINATIONS – THE GRADUATE PATHWAY

### Timing

The Department has standardized the milestone requirements with regard to the timing of examinations for the 42-credit doctoral programs in Bioengineering and Chemical Engineering.

#### Timing – Post BS

Milestones	Bioengineering (BEN) & Chemical Engineering (CEN)
<i>Qualifying Exam</i>	Within 1 <sup>st</sup> month of 4 <sup>th</sup> semester of study
<i>Candidacy Exam</i>	By end of 5 <sup>th</sup> semester of study
<i>Dissertation Defense</i>	By end of 4 <sup>th</sup> year of study

#### Timing – Post MS

Milestones	Bioengineering (BEN) & Chemical (CEN) Engineering
<i>Qualifying Exam</i>	Within 1 <sup>st</sup> month of beginning of 3 <sup>rd</sup> semester of study
<i>Candidacy Exam</i>	By end of 4 <sup>th</sup> semester of study
<i>Dissertation Defense</i>	By end of 3 <sup>rd</sup> year of study

## Description of Examinations

The Department has standardized how examinations are to be conducted for the 42-credit doctoral programs in Bioengineering and Chemical Engineering.

### Qualifying Examination (formerly the Screening Examination)

<b>Milestones</b>	<b>Bioengineering (BEN) &amp; Chemical Engineering (CEN)</b>
<b>Prerequisites</b>	Minimum 3.0 GPA in graduate coursework
<b>Mechanism</b>	Critical analysis of a research publication assigned by the Committee chair in consultation with the student's advisor and other committee members.
<b>Faculty Participation</b>	Committee consisting of at least 3 BMCE faculty, assigned by the Graduate Program Director, evaluates student performance based on technical content of written and oral presentation. The dissertation advisor is a non-voting member of committee.
<b>Voting</b>	Examination Committee votes on outcome of the oral examination. All BMCE faculty votes on passing to candidacy examination, based on examination results and review of the student's academic and research records.
<b>Outcomes</b>	<p><i>Pass</i>  <i>Conditional pass, with revisions to report</i>  <i>Fail (may retake exam once within 6 weeks of first exam)</i></p> <p>Outcome of oral examination will be communicated to the student by the committee at the time of the examination.            Decision to continue to candidacy will be communicated to the student after the faculty vote.</p>

### Candidacy Examination (formerly Proposal Defense (BEN) and Oral Comprehensive Exam (CEN))

<b>Milestones</b>	<b>Bioengineering (BEN) &amp; Chemical Engineering (CEN)</b>
<b>Recommendations</b>	Student, <i>in consultation with advisor</i> , should form committee several months in advance of the examination. This committee should ultimately be the Oral Examination Committee for the Dissertation Defense, minus the Committee Chair.
<b>Pre-approval</b>	Approval of student's advisor is required to initiate examination.
<b>Documents Required</b>	<p><u>Candidacy Examination Form</u>: Student must obtain this form from the Graduate Secretary and submit it to the Secretary in order to schedule the examination. This must be done at least two weeks before the examination is to be held. This form must include the title and abstract of the proposal, names of the committee members, and the advisor's signature. The Graduate Program Director's signature is required, effectively assigning the committee. The Program Director also assigns a committee chair for the examination.</p> <p><u>Proposal</u>: A written proposal must be circulated to the committee no later than <u>2 weeks prior to the examination</u>. The student should ask the committee members if a hard-copy or electronic copy is preferred. The proposal is limited to 15 pages excluding the title page, single-spaced, Times New Roman 12 pt. font, with at least 1 inch margins in all directions. The page limit includes all figures and tables. Additional pages are only allowed for references. No appendices may be included. A</p>

	hard-copy of the proposal must be submitted to the Graduate Secretary for review before the two-week deadline for submission to the examination committee. Any proposal that does not meet these requirements will be returned for revision before it can be circulated to the examination committee. Students should discuss the content of the proposal with their advisors. As a general guideline, the proposal may include the following: Introduction, Hypothesis (or motivating need if it is not a hypothesis-driven project), Research Objectives, Work done to Date, and Research Plan.
<b>Committee Requirements</b>	Committee must have at least 5 members including the dissertation advisor, at least 3 of which must be BMCE tenured or tenure-track faculty members.
<b>Faculty Participation</b>	The examination is open to all faculty members.
<b>Voting</b>	After the presentation, the committee meets in executive session and votes. The student is informed of the result of this vote immediately afterward. <u>Candidacy Examination Outcome Form</u> : This form is prepared at the time of the examination by the committee and will include the date of the examination, the names of the committee members, the results of the members' votes, and whether the student passes or fails the examination. It will be signed by the examination chair. The student will receive a copy and with the original retained in the student's records.
<b>Outcomes</b>	<p><i>Pass</i></p> <ul style="list-style-type: none"> <li>• <i>Student enters candidacy, with oversight of the dissertation work turned over to the committee.</i></li> </ul> <p><i>Fail</i></p> <ul style="list-style-type: none"> <li>• <i>Further refinement of proposal is necessary.</i></li> <li>• <i>Exam must be repeated for student to enter candidacy.</i></li> </ul>

### *Dissertation Defense*

<b>Milestones</b>	<b>Bioengineering (BEN) &amp; Chemical Engineering (CEN)</b>
<b>Preparation of Dissertation</b>	It is recommended that the student meet with the examination committee to review dissertation progress 3-6 months in advance of the request for the dissertation defense.
<b>Request for Exam</b>	Request for Examination Form must be submitted to the GEMC <b><u>at least three full weeks prior</u></b> to the oral defense.
<b>Distribution of Dissertation</b>	Must be delivered to oral defense committee at least 2 weeks prior to the date of the defense.
<b>Committee Requirements</b>	6 members are required: <ul style="list-style-type: none"> <li>• Research advisor;</li> <li>• 4 tenured/tenure-track faculty from SU or other institutions if appropriate (by petition);</li> <li>• Committee chair – must be tenured/tenure-track SU faculty member from outside of BMCE.</li> </ul>
<b>Nature of Exam</b>	The examination is open to all students and faculty.
<b>Voting</b>	All committee members vote.
<b>Outcomes</b>	Candidate must pass oral defense in order to complete the Ph.D. degree.

Defenses must comply with the requirements of the Graduate School as described under Degree and Certificate Programs in the Graduate Course Catalog (<http://coursecatalog.syr.edu/content.php?catoid=4&navoid=395>).

For information on the formatting of the final dissertation document for submission to the Graduate School, see <http://graduateschool.syr.edu/policies-and-requirements/graduation-requirements/>.

## BMCE DEGREE COMPLETION CHECKLIST

**Check that you have done the following BEFORE you schedule your defense:**

- Undergraduate and/or MS Degree-Bearing Transcript submitted to the University.
- Program and degree are accurate in MySlice. Are you in the correct program for the degree you wish to receive?
- Expected grad term is correct in MySlice. Go online and File a Diploma Request with the Registrar.
- Program of Study submitted to the Department for approval and then to the Graduate School. Total credits to be counted for the degree program are correct.
- Approved documentation for substituted courses/and or waived courses (petitions) must be on file with the Department and the GEMC Degree Certification Office.
- Required courses or documented substitutions appear on your transcript.
- Transfer credits: Have you petitioned to transfer credits, including those from a Master's degree, toward your degree? Transfer credits accepted by Syracuse University must appear on your transcript.
- Class registration: You **MUST BE** registered in the semester in which you are graduating. This includes summer graduation dates. If no coursework is required, have you registered for GRD 998-Degree in Progress for zero credits?
- All coursework was completed by the graduation date. (If a grade is posted beyond the graduation date, there must be written confirmation from the instructor that the work was **completed and submitted by the graduation date.**)
- Exit requirement (final project, comprehensive exam, thesis defense, dissertation defense) was **completed by the graduation date.**
- Program GPA 3.0 or better. Calculate Program GPA using credits on the Program of Study only.
- Overall GPA 2.8 or better.

**Once all the above is done:**

- Request for Examination Form submitted to the GEMC.

# BIOMEDICAL AND CHEMICAL ENGINEERING FACULTY AND THEIR RESEARCH/TEACHING INTERESTS

## *Full-time Faculty*

- JESSE Q. BOND Assistant Professor; Ph.D., Chemical Engineering, University of Wisconsin-Madison, 2009. Catalysis; sustainability of transportation fuels and chemical products.
- KATIE D. CADWELL Assistant Professor; Ph.D., Chemical Engineering, University of Wisconsin-Madison, 2007. Engineering education.
- RUTH CHEN Professor of Practice, Ph.D. Environmental Toxicology, University of Michigan, 1984. Environmental toxicology, environmental risk assessment, energy and environmental economics, risk management decision making.
- MANDY B. ESCH Assistant Professor; Ph.D., Biotechnology & Biophysics, Julius Maximilians University, Würzburg, Germany, 2001. Nanobiotechnology, body-on-a-chip devices, tissue engineering, tissue scaffold engineering.
- JEREMY L. GILBERT Professor; Affiliate Professor of Mechanical, Aerospace and Manufacturing Engineering; Adjunct Research Professor of Orthopedic Surgery, SUNY Upstate Medical University; Ph.D. Metallurgical Engineering and Materials Science, Carnegie Mellon University, 1987. Biomaterials/tissue engineering; corrosion and electrochemistry; multi-phase systems; nanotechnology.
- JULIE M. HASENWINKEL Associate Professor and E&CS Associate Dean for Student Affairs; Ph.D., Biomedical Engineering, Northwestern University, 1999. Biomaterials/tissue engineering; nerve regeneration; rheology; drug delivery; nanotechnology.
- JAMES H. HENDERSON Associate Professor & Bioengineering Graduate Program Director; Ph.D., Mechanical Engineering, Stanford University, 2004. Biomaterials/tissue engineering; mechanobiology; regenerative medicine.
- IAN D. HOSEIN Assistant Professor, Ph. D. Materials Science and Engineering, Cornell University, 2009. Directed assembly of materials; sustainable energy production and storage; colloids.
- GEORGE C. MARTIN Professor; Ph.D., Chemical Engineering, University of Minnesota, 1976. Physical properties of polymers; polymer and composites processing; thermosetting polymers.
- PATRICK T. MATHER Stevenson Professor of Biomedical and Chemical Engineering & Director of the Syracuse Biomaterials Institute; Professor of Physics; Ph.D. Materials, University of California at Santa Barbara, 1994. Biomaterials/tissue engineering; complex fluids, soft condensed matter, rheology; corrosion and electrochemistry; drug delivery; molecular biotechnology; nanotechnology.
- SHIKHA NANGIA Assistant Professor; Ph.D., Chemistry, University of Minnesota, 2006. Multiscale modeling; nanomedicine; cancer drug delivery; catalysis.
- DACHENG REN Associate Professor & Chemical Engineering Graduate Program Director; Ph.D., Chemical Engineering, University of Connecticut, 2003. Biomaterials; microbial control; systems biology; molecular biotechnology; corrosion and electrochemistry; sustainable energy production.

- ASHOK SANGANI Professor; Ph.D., Chemical Engineering, Stanford University, 1982. Complex fluids, soft condensed matter, rheology; molecular biotechnology; multi-phase systems; mathematical and numerical analysis.
- PRANAV SOMAN Assistant Professor; Ph.D., Bioengineering, Penn State University, 2009. Additive manufacturing of synthetic and naturally-derived biomaterials.
- RADHAKRISHNA SURESHKUMAR Distinguished Professor and Department Chair; Professor of Physics; Ph.D. Chemical Engineering, University of Delaware, 1996. Complex fluids, soft condensed matter, rheology; multi-phase systems; nanotechnology; sustainable energy production; systems biology/metabolic engineering; mathematical and numerical analysis.
- LAWRENCE L. TAVLARIDES Professor; Ph.D., Chemical Engineering, University of Pittsburgh, 1968. Indoor air quality/environmental engineering; multi-phase systems; sustainable energy production.
- ANGELA L. ZACHMAN Assistant Professor; Ph.D., Biomedical Engineering, Vanderbilt University, 2014. Engineering education.

### ***Part-time Faculty***

- SHELLEY STEVENS Part-time Assistant Professor; Ph.D. Upstate Medical University, 2007. Tissue engineering.
- KENT OGDEN Part-time Associate Professor; Medical Physicist, Department of Radiology, SUNY Upstate Medical University; Ph.D., Medical College of Wisconsin, 1999. Diagnostic radiology, biophysics.
- DAVID E. QUINN Part-time Assistant Professor; BS Rochester Institute of Technology, 2008. Analytical Algorithm & Embedded System Developer, Welch Allyn Inc., current. Medical device development; NIBP algorithm development and technology.
- DANA RADCLIFFE Part-time Assistant Professor; Ph.D. Syracuse University, 1996. Ethics and public policy, management ethics, leadership.

### ***Affiliate Faculty***

- ANDRIA COSTELLO STANIEC Associate Professor, Department of Civil and Environmental Engineering; Ph.D., California Institute of Technology, 1999. Environmental microbiology.
- MARTIN FORSTNER Assistant Professor, Physics; Ph.D., University of Texas, Austin, 2003. Biophysics; experimental soft condensed matter; biophotonics.
- YAN-YEUNG LUK Assistant Professor, Department of Chemistry; Ph.D. University of Chicago, 2001. Bio-organic and chemical biology, nanomaterials, biosurfaces.
- JUNTAO LUO Assistant Professor, Department of Pharmacology, SUNY Upstate Cancer Research Institute, SUNY Upstate Medical University; Ph.D. Nankai University, Tianjin, China. Nanomedicine, drug delivery, drug discovery, cancer imaging and cancer treatment.
- M. CRISTINA MARCHETTI Professor and Chair, Department of Physics; Ph.D. University of Florida, 1982. Soft condensed matter physics; superconductivity and vortex matter; nonequilibrium statistical physics.

- BANDARU V. RAMARAO Adjunct Professor; Ph.D. Chemical Engineering, Clarkson University, 1986. Fluid particle separation.
- SURESH SANTANAM Associate Professor; Associate Director, Syracuse Center of Excellence in Environmental and Energy Systems; Sc.D., Air pollution control, Harvard University, 1989. Air pollution, hazardous waste management.
- FREDERICK W. WERNER Adjunct Professor; Research Professor of Orthopedic Surgery, SUNY Upstate Medical University; MS, Cornell University, 1975. Biomechanics, prosthesis design and evaluation.

### ***Research Faculty***

- JÜRGEN BABIRAD Research Professor; MSA, Notre Dame University, 1982. Rehabilitation technology and assistive technology.
- BART FARELL Research Associate Professor; Affiliate Member, Institute for Sensory Research; Ph.D., McGill University, 1977. Visual psychophysics, functional imaging of brain activity.
- ERIC B. FINKELSTEIN Research Assistant Professor; Laboratory Facility Manager, Syracuse Biomaterials Institute; Ph.D., SUNY Upstate Medical University, 2002. Vascular cell biology, biomaterials, cell-material interactions, tissue engineering, engineered vascular networks.

### ***Emeriti Faculty***

- GUSTAV A. ENGBRETSON Professor Emeritus; Member, Institute for Sensory Research; Research Associate Professor of Cellular and Developmental Biology and Ophthalmology, SUNY Upstate Medical University; Ph.D., Zoology, University of Oklahoma, 1976. Vision neuroscience.
- JOHN C. HEYDWEILLER Professor Emeritus; Ph.D., Chemical Engineering, Kansas State University, 1977. Mathematical and numerical analysis.
- PHILIP A. RICE Professor Emeritus and Research Professor; Ph.D., Chemical Engineering, University of Michigan, 1963. Bioreactors, transport in biological systems, heat and mass transfer with phase change.
- KLAUS SCHRODER Professor Emeritus and Research Professor; Ph.D., University of Gottingen, 1954. Metal physics, magnetic and electrical properties of materials.
- ROBERT L. SMITH Professor Emeritus; Director, Institute for Sensory Research; Ph.D., Syracuse University, 1973. Auditory electrophysiology.
- CHI TIEN Distinguished Professor Emeritus, Ph.D., Northwestern University, 1958. Fluid-particle technology, heat transfer, fixed-bed processes.
- JOZEF J. ZWISLOCKI Distinguished Professor Emeritus, Founder, Institute for Sensory Research; Professor, Communication Sciences and Disorders; Research Professor of Otolaryngology and Communication Sciences, SUNY Upstate Medical University; Member, National Academy of Science; Sc.D., Federal Institute of Technology, Zurich, 1948. Auditory biophysics and psychophysics.

\*(See Department website, <http://eng-cs.syr.edu/our-departments/biomedical-and-chemical-engineering/> for additional information, including recent publications and research projects.)

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