

RICE UNIVERSITY®

GEORGE R. BROWN SCHOOL OF ENGINEERING  
**DEPARTMENT OF BIOENGINEERING**

**2016 STUDENT HANDBOOK**  
GRADUATE DEGREE REQUIREMENTS AND PROCEDURES

EFFECTIVE: AUGUST 16, 2016

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## APPROVALS

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Professor, Physics & Astronomy  
Chair, Department of Bioengineering

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**Antonios Mikos, PhD**

Louis Calder Professor, Bioengineering  
Chemical and Biomolecular Engineering  
Chair, Graduate Academic Affairs Committee

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**Robert Raphael, PhD**

Associate Professor, Bioengineering  
Director of Graduate Study

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**Eric Richardson, PhD**

Lecturer, Bioengineering  
Director, MBE Program, Global Medical Innovation Track

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## TABLE OF CONTENTS

<b>General Guidelines (Applicable to All Graduate Students)</b> .....	1
Department Administration .....	1
Faculty .....	1
Student Responsibilities.....	1
Honor Code.....	2
E-mail as Formal Mode of Communication .....	2
Prerequisite Requirements .....	2
Course Registration .....	3
Atypical Registration Situations .....	3
Transfer Credit.....	4
Continuous Enrollment.....	4
Full-Time & Part-Time Study.....	4
Leaves of Absence .....	4
Vacation Time .....	5
Nonscheduled Absence.....	5
Exceptions to Academic Requirements .....	5
Grading Procedures .....	5
Inadequate Process & Possible Dismissal from the Graduate Program .....	6
Transfer between Programs .....	7
Outside Employment for Graduate Students .....	8
Grievances and Problem Resolution .....	8
Graduate Peer Mentoring Program .....	8
Title IX .....	9
<b>Degree Specific Guidelines</b>	
<b>Doctor of Philosophy (PhD) Degree</b> .....	10
PhD Curriculum.....	10
Transfer of Credit .....	10
Course Requirements.....	11
Selection of Principle Advisor .....	12
Financial Support.....	14
Thesis Committee & Proposal .....	15
Satisfactory Progress .....	16
Evaluations .....	17
Teaching Requirement.....	17
Internship Opportunity.....	19
Opportunity for Presentation of Research.....	19
Approval of Candidacy and Final Oral Examination.....	19
Time Boundaries.....	19
Oral Distertation .....	20
Graduation .....	20
Suggested Time Line for PhD Students.....	21
PhD Student Request to Switch Advisors.....	21
<b>Masters of Science (MS) in Bioengineering</b> .....	22
MS Curriculum.....	22
Transfer of Credit .....	22
Financial Support.....	22
Satisfactory Progress .....	23
Evaluations .....	23
Teaching Requirement.....	24
Opportunity for Presentation of Research.....	24
Approval of Candidacy and Oral Presentation .....	24

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Thesis Requirements.....	24
Acceptance of Thesis .....	25
Graduation .....	25
<b>Master of Bioengineering, Applied Bioengineering Track.....</b>	<b>26</b>
Requirements .....	26
Curriculum.....	26
Transfer of Credit .....	27
Satisfactory Progress .....	27
Graduation .....	27
<b>Master of Bioengineering, Global Medical Innovation Track .....</b>	<b>28</b>
Curriculum.....	28
Transfer of Credit .....	28
Satisfactory Progress .....	29
Graduation .....	29

## GENERAL GUIDELINES (APPLICABLE TO ALL GRADUATE STUDENTS)

### DEPARTMENT ADMINISTRATION

The **faculty body** is responsible for establishing and maintaining the academic policies of the department aligned with Rice University guidelines.

The **Department Chair** is primarily responsible for instituting strategic goals, the vision, and building culture that sets the direction of the department.

The **Executive Administrator** ensures the department's daily activities are executed by department staff and run smoothly.

### FACULTY

Faculty members have a myriad of responsibilities including the advisement and mentoring of students, research in their areas of interest and expertise, managing the financial aspects of their labs, and instruction at the undergraduate and graduate level.

The primary faculty contact for PhD students is their advisor. Students may also seek the guidance of Robert Raphael, PhD, Director of Graduate Study or Antonios Mikos, PhD, Chair of the Graduate Academic Affairs Committee (GAAC). The GAAC is responsible for program development and coordination of activities related to graduate programs, including assessment issues. Specific duties include the consideration of all proposed new courses, curricula modifications, and program activities. The Committee also facilitates resolutions to complaints involving academic or administrative decisions that interfere with the student's academic progress. Additionally the committee reviews student petitions. The Committee allows student representation through a member of the BIOE Graduate Student Association. Students must petition the GAAC for exceptions to academic requirements (course substitutions, transfer credits, waivers, etc.) Details of how to submit a petition are listed under the "Petitions" section of these guidelines.

The primary faculty contact for MBE, Applied Bioengineering track students is Robert Raphael, PhD, Director of Graduate Study. Dr. Raphael assists students in advising and other academic issues. He also facilitates resolutions to complaints involving academic or administrative decisions that interfere with the student's academic progress. Additionally he, and an ad hoc committee if necessary, reviews student petitions. Details of how to submit a petition are listed under the "Petitions" section of these guidelines.

The primary faculty contact for MBE, Global Medical Innovation track students is Eric Richardson, PhD, Director of MBE Program, Global Medical Innovation track. Dr. Richardson assists students in advising and other academic issues. He also facilitates resolutions to complaints involving academic or administrative decisions that interfere with the student's academic progress. Additionally he, and an ad hoc committee if necessary, reviews student petitions. Details of how to submit a petition are listed under the "Petitions" section of these guidelines.

### Academic Program Support Staff

The BIOE Academic Program Administrator oversees the academic administrative functions of the academic program. The following support personnel are available to assist students with administrative questions or concerns:

Gayle Schroeder, Academic Program Administrator  
BRC 135F ● [ges2@rice.edu](mailto:ges2@rice.edu) ● 713-348-5063  
(Undergraduate, PhD and MBE Program – Applied Bioengineering students.)

Peggy Scheier, Undergraduate Program Coordinator and Graduate Program Assistant ● [pms4@rice.edu](mailto:pms4@rice.edu) ● 713-348-3253  
(Undergraduate, PhD and MBE – Applied Bioengineering Students)

Sheretta Edwards, Program Coordinator (MBE Program, Global Medical Innovation Track)  
BRC 422 ● [sheretta@rice.edu](mailto:sheretta@rice.edu) ● 713-348-2871  
(MBE Program, Global Medical Innovation Students)

### STUDENT RESPONSIBILITIES

Students are responsible for meeting all program requirements of their individual program and the university requirements. In addition to being in agreement with the regulations stated in this handbook, students must be in agreement with the General Announcements (<http://ga.rice.edu/>) as well as the Code of Conduct (<http://www.students.rice.edu/students/Conduct.asp>). A student failing to meet department or university requirements is subject to dismissal from the program. In cases where there is conflicting information, university-wide regulations take precedence over department-wide regulations, which take precedence over research group-wide regulations. When in doubt, students should first seek help at the department level (academic program administrator) and then at the central administration level (Office of Graduate and Postdoctoral Studies).

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The policies outlined in this document pertain to graduate studies in the PhD, MD/PhD, MS, and MBE (Applied Bioengineering and Global Medical Innovation tracks) programs in the Department of Bioengineering. In case of error, omission, or conflict, policies of the Rice *General Announcements* supersede those stated within this handbook. If the policies of the program change during a student's tenure at Rice University, the student can elect to continue studies under the complete set of policies in place at the time of his or her matriculation or may choose to follow the updated policies in full. Students may not choose some regulations from one set of policies and some from another.

In rare cases, the faculty may apply a new regulation to all students who have not passed a specific milestone (e.g., candidacy) in their program if such a change will not materially affect the progress of the students. Students will be notified of such revisions.

The Graduate Academic Affairs Committee reserves the right to correct typographical errors in these policies at any time without giving students the above choices.

It is the student's responsibility to be familiar with the rules, procedures, and requirements of the Bioengineering Department, the Office of Graduate and Postdoctoral Studies, and Rice University. It is the ultimate responsibility of the student to know and follow all policies and timelines to allow for a timely graduation.

### **Honor Code**

Bioengineering graduate students are bound by the Honor Code. The *General Announcements* explains the honor code as follows:

*The honor system, one of the oldest and proudest traditions at Rice, is administered by the Honor Council, whose members are elected each year by the student body. Adopted by a student vote in 1916, the honor system has remained essentially the same since that time but for changes in the procedures and membership of the Honor Council.*

*Students take all written examinations and complete any specifically designated assignments under the honor system. By committing themselves to the honor system, all students accept responsibility for assuring the integrity of the examinations and assignments conducted under it. The Honor Council is responsible for investigating reported violations and for*

*conducting a hearing when the facts warrant. The Office of Student Judicial Programs, which reviews the results of the investigations and hearings, considers the council's recommendations when issuing penalties.*

*The Honor Council conducts an ongoing program to acquaint new students and faculty with the honor system. The Honor Code and other related information and resources are located at the homepage of the Honor Council: <http://honor.rice.edu/>.*

### **E-mail as a Formal Mode of Communication**

Recognizing the increasing need for electronic communication with students, the Department of Bioengineering recognizes and utilizes e-mail as an official means of communication with students. The Department of Bioengineering will routinely send official communications to students via their university e-mail address. Because e-mail is a primary mechanism for sending official communications to students, and certain communications may be time-sensitive, students should check their e-mail regularly. Failure to read official university communications sent to the student's official Rice e-mail address does not absolve students from knowing and complying with the content of said e-mails. Students are expected to communicate official business with the department using their Rice e-mail accounts. Gmail and other non-Rice email systems are not acceptable for official business.

### **Prerequisite Requirements**

The following prerequisites are required for students in all graduate programs of the Department of Bioengineering:

- Fundamentals of Systems Physiology (Rice equivalent courses: BIOE 322, BIOE 302, BIOE 381/ELEC 381, or ELEC 480)
- Cell Biology (Rice equivalent course: BIOC 341). It is recommended that students take this course as pass/fail.
- Statistics (Rice equivalent course: Any 400 level or above statistics course. PhD students should choose a course other than BIOE 439.)

If a student does not have evidence on their undergraduate transcript that they have received credit for these courses, they must take them as part of their program curricula. If not taken prior to matriculation, students are strongly encouraged to take prerequisite courses during their first semester, but must do so within the first two years of study.

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Prerequisite courses in a discipline other than bioengineering may be taken for a standard letter grade or pass/fail. Students taking courses as pass/fail should note that their work is graded using the standard letter grading system during the course of the semester. The student will receive a grade of “Pass” if he or she earns a grade of A, B, C, or D. If a student earns a grade of “F”, this will appear on their transcript as an “F” and will count toward their semester and cumulative GPA.

University policy does not allow graduate students to take a course offered by their home department on a pass/fail basis. All BIOE courses must be taken for a standard letter grade regardless of the reason for taking the course. (See grading procedures.)

### **Course Registration**

University policy requires students maintain their student status throughout their career at Rice University. PhD students are expected to register for “Graduate Research (BIOE 500)” during the summer semester unless special arrangements are made in advance with their advisor. MBE Students are not required to register for summer courses with the exception of GMI track students who are completing their internship during the summer. Students are responsible for registering for courses each semester. Students register by logging onto ESTHER using their student ID number and following the instructions under the registration tab.

First year students may not register prior to orientation. Time will be provided to register for courses at the end of the department orientation. Representatives from the GSA will be available to provide technical assistance and course recommendations. Academic advice will be provided by faculty advisors. If students require academic assistance/advising after their first semester, they should seek advice from their faculty advisor.

### **Atypical Registration Situations**

**Courses Requiring Special Registration:** There are instances when you will not be allowed to register via ESTHER.

Examples include:

- closed courses that have reached their maximum enrollment,
- closed courses requiring departmental or instructor permission,
- prerequisite override,
- audit, and
- late add

In such instances, students are required to submit a Special Registration form. The Special Registration form can be found at [http://registrar.rice.edu/online\\_forms/](http://registrar.rice.edu/online_forms/). Special registration must have the approval of the course instructor and the student’s advisor. PhD students who have not yet

been assigned an advisor during their first semester and all MBE students should submit forms to the BIOE Graduate Program Assistant who will assist in obtaining the signature of the BIOE Director of Graduate Study.) Once signed, the student will be notified to pick up the form and submit it to the Registrar. If the student is registering later than two weeks after the semester begins, they must also obtain approval from The Office of Graduate and Postdoctoral Studies (GPS). This must be done by the student, in person, prior to submitting the form to the Registrar’s Office.

**Dropping Courses after Drop Deadline:** Graduate and Postdoctoral Studies approve dropping a course after the deadline only when a convincing case is made that the student encountered insurmountable problems that s/he made conscientious efforts to resolve. Requests to drop courses after the published deadline set by the Office of the Registrar must be submitted using a Special Registration Form. Once signed by the student’s instructor and advisor, the student must petition the Graduate Academic Affairs Committee (GAAC) for approval. The petition must specifically state a compelling reason why the request should be granted. If approved by GAAC, the petition will then be submitted to the Office of Graduate and Postdoctoral Studies for final approval. Because approval to “late drop” a course is not guaranteed, students should continue to attend the course until a final ruling is made. All petitions should be submitted to the BIOE Academic Program Administrator for inclusion on the GAAC agenda.

**Double-Booking/Overlapping Courses:** Double booking or overlapping of courses is prohibited by the department.

**Inter-institutional Courses:** Under certain circumstances, inter-institutional courses may be taken at participating institutions including Baylor College of Medicine, University of Texas Health Science Center at Houston, University of Texas Medical Branch at Galveston, and the University of Houston. The inter-institutional graduate student registration form and instructions can be found at [http://registrar.rice.edu/online\\_forms/](http://registrar.rice.edu/online_forms/). Courses taken through the inter-institutional program do not have equivalent courses at Rice, therefore, transfer credit (with no grade assigned) is applied to the student’s Rice transcript upon completion of the course. Since these courses are considered the same as courses taken at Rice, the transfer credits for inter-institutional courses are not counted against the maximum allowable transfer credits for the student’s program.

In order to qualify for an inter-institutional course, **all** of the following criteria must be met:

- Students must be registered **full-time at Rice** during the semester the inter-institutional course is taken. (Note: It is especially important that MBE students who wish to take inter-institutional courses do so during the fall and spring semesters only, when they

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are normally registered full-time at Rice. Inter-institutional courses will not be approved unless the student is registered full time at Rice during the semester they take the inter-institutional course.)

- Requested class must not be offered by Rice during the term taken.
- Requested class must be necessary for the completion of the graduate degree.
- Number of credits allowed per term/semester may vary depending on the policy of the host school.
- All approval signatures must be obtained.
- If a student is taking an inter-institutional course during their last semester before graduation, it is the student's responsibility to assure course credit will be transferred in time for Rice grade deadlines.

International students taking inter-institutional courses must check with OISS regarding additional paperwork. Most host schools will require a copy of I-20/DS02019, visa stamp, passport ID page, and I-94.

**Summer Registration:** Graduate students in the PhD program must register for summer research hours (BIOE 500).

Students planning to take BIOE 506 should be aware this course is not considered a research course. If a student wishes to complete a summer internship, they should register for BIOE 506 in the subsequent fall semester. If students choose to take non-research courses in the summer, tuition is charged to the student. Tuition waivers are not generally available and will not be approved for summer classes, even for students who receive full tuition waivers during the fall and spring semesters. Exceptional cases should be discussed with the BIOE Academic Program Administrator.

### **Transfer Credit**

Courses taken at another accredited college or university are not automatically approved for transfer credit. Transfer credit is only granted with the approval of the student's major department. Transfer credits are subject to the following restrictions and instructions:

- Courses must be from a regionally accredited U.S. institution or an international institution officially recognized by that country's Ministry of Education or equivalent.
- The minimum grade for transferred credits is a B- or equivalent.
- The major department must approve the credits. A petition must be submitted to the Graduate Academic Affairs Committee (GAAC) for this approval. The petition must include the following:
  - "Graduate Request for Transfer Credit" form
  - Course description or syllabus for the course you wish to transfer

- If the course has a Rice equivalent, documentation from the instructor of the course that the courses are essentially equivalent. (This may be in the form of an email to the student or directly to ges2@rice.edu.)

- If approved by GAAC, Students seeking transfer credit must submit the approved Graduate Request for Transfer Credit form to the Office of the Registrar.
- The course must be recorded on an official transcript sent directly from the original institution or hand-delivered by the student in an official sealed envelope to the Office of the Registrar.

The number and type of credits that may be transferred differ from program to program. Refer to the section on transfer of credits in the program specific guidelines to determine how many and what type of credits the individual programs allow.

### **Continuous Enrollment**

All graduate students are expected to maintain continuous enrollment as required by their program, unless an official leave of absence has been granted. Failure to register without a leave of absence granted by the Associate Provost constitutes *de facto* withdrawal. If a student later wishes to resume study, reapplication is required. Readmission is given only on the recommendation of the department and the approval of the Associate Provost.

### **Full-Time & Part-Time Study**

Students in the PhD or MS programs and MBE students in the Global Medical Innovation track are expected to enroll as full time students. MBE students in the Applied Bioengineering track are allowed to register as part-time.

Part-time MBE students in the Applied Bioengineering (AB) track must register for at least three hours each semester. All time boundary and degree requirements apply to part-time students. MBE students in the AB track who wish to become part-time in the upcoming semester must obtain written permission from the academic department before the semester begins. Students who wish to obtain part-time status after the semester has started must also obtain the approval of the Office of Graduate and Postdoctoral Studies. Consult the BIOE Academic Program Administrator to begin the transition to part-time study.

MBE students in the Global Medical Innovation (GMI) track are expected to register full-time due to the lock-step nature of the program. Students who wish to register on a part-time basis must have written permission from the Director of the MBE program before the semester begins. Students who wish to obtain part-time status after the semester has started must also obtain the approval of the



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Office of Graduate and Postdoctoral Studies. Consult the BIOE Academic Program Administrator to begin the transition to part-time study.

International students, in all programs, who wish to study part-time, should consult the Office of International Students and Scholars about the possible impact on their visa status of dropping below full-time.

### **Leaves of Absence**

A leave of absence (LOA) may be granted only by the Office of Graduate and Postdoctoral Studies and is granted only to students in good standing. Leave must be approved in advance of the academic semester in question. A leave of absence will not be granted after the student has registered for courses or after the registration period has passed. Normally, a leave of absence is granted for no more than two consecutive semesters. No work toward a degree may be done at Rice (or involve Rice faculty/facilities) during a student's leave of absence.

### **Vacation Time**

During the first semester of study, graduate students observe the same holiday schedule as other students engaged in course work. MBE students in both tracks observe the university holiday schedule throughout their studies. Students in the MBE GMI track may have a slightly altered schedule when participating in internships. Beginning in the second semester, PhD and MS students engaged in research receive two weeks paid vacation annually, in addition to designated staff holidays, including winter break when the university is officially closed.

Rice is not officially closed during spring break. PhD Students do not automatically receive spring break as time off. All requests for vacation time, including spring break, must be approved in advance by the student's advisor.

### **Nonscheduled Absence**

PhD and MS Students: Active participation in required academic activities, including laboratory work, is a basic condition of financial support. Absences, other than medical and family emergencies, must be approved by the student's advisor in advance. In the case of medical or family emergencies, notification is expected in as timely a manner as possible depending upon the specific situation.

Students who are not present and carrying out required academic activities for more than one week, without approval of the absence, will receive an immediate written warning.

Students who are absent from required academic activities for a contiguous two weeks without permission and without mitigating circumstances may be judged as making

inadequate academic progress and are subject to termination of financial support.

MBE Students (both tracks): Attendance at class meetings is essential to academic success. Students are expected to take personal responsibility for class attendance and bear the responsibility for the effect that absences may have upon performance and evaluation in the course with consequences up to and including dismissal from the program.

### **EXCEPTIONS TO ACADEMIC REQUIREMENTS**

PhD Program: Students must petition the Graduate Academic Affairs Committee for exceptions to academic requirements. It is strongly recommended that students obtain the support of their advisor and submit documentation (signature approval) of this support as part of their petition.

MBE Program, Applied Bioengineering Track: Students in the MBE Applied Bioengineering track must petition the Director of Graduate Study.

MBE Program, Global Medical Innovation Track: Students in the MBE Global Medical Innovation track must petition the Director, MBE Program, Global Medical Innovation track.

All petitions should be submitted to the BIOE Academic Program Administrator ([ges2@rice.edu](mailto:ges2@rice.edu), BRC 135F). The petition should, at minimum, include:

- Student's name
- Student's ID
- Specific exception requested
- Justification for the request
- Any applicable documentation to support the request.
- The student will be notified if additional information is required. Once a decision is made, the student will be notified. If a petition is time-sensitive, it will be handled on a case-by-case basis as deemed necessary by GAAC.
- No petition should be considered finalized until the student receives a written notice of the official decision of the Committee.

### **GRADING PROCEDURES**

Standard Letter Grade: Instructors are required to report a grade for all students whose names appear on the class roster. Students taking courses graded on a standard letter grade scale will receive a grade the following conventional symbols: A+, A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F. For information on the procedure used to calculate a student's grade point average (GPA), refer to the link: [http://ga.rice.edu/GR\\_grades/](http://ga.rice.edu/GR_grades/).

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**Pass/Fail Option:** Students may NOT take BIOE courses as pass/fail regardless of their reason for taking the course (e.g. to meet prerequisite requirement). However, students may take courses outside the Bioengineering department on a pass/fail basis. A student may later convert a pass/fail to a graded course by filing the appropriate paperwork with the Office of the Registrar, following the Registrar's guidelines, and by the deadline set by the Registrar. Students should be aware that while a grade of "pass" (P) does not affect their GPA, a grade of "fail" is registered as an "F" and does affect their GPA; therefore, it is important that students earn a passing grade in courses taken in this manner. Courses taken on a pass/fail basis cannot count toward the required number of credit hours "graded on a standard letter grade scale" required by the student's individual program.

**Satisfactory/Unsatisfactory:** BIOE 500, 504, 698, and 699 are graded as "satisfactory" (S) or "unsatisfactory" (U). Satisfactory grades will not count toward the total 30 hours of classes required for a standard letter grade, but will count towards the total 90 hours required for a PhD degree. While a grade of "S" or "U" does not affect their GPA, credit will not be awarded for the course if a grade of "U" is received.

MBE students should not take courses graded as satisfactory/unsatisfactory since these courses cannot be taken for a letter grade and will not count toward required hours for the MBE degree.

**Audit:** Currently enrolled students may audit one or more courses by securing permission of the instructor and by registering as an auditor with the Office of the Registrar. (This is done by completing a Special Registration form.) Students may audit courses at any time during their graduate program. There are no credit hours associated with audited courses, and auditing a course does not affect a student's GPA. Requests to audit a class or to change from audit to credit or vice versa must be done by the end of the second week of the semester. The grade designation "AUD" is used for students auditing a course, and specifically when the auditing student has met the audit requirements of the course as defined by the instructor. A grade designation of "NC" is given to students who do not meet the audit requirements.

### **INADEQUATE PROGRESS AND POSSIBLE DISMISSAL FROM THE GRADUATE PROGRAM**

#### **PhD and MS Students**

**Dismissal Due to Deficiencies in GPA:** Graduate students in the PhD and MS programs must maintain a grade of 3.2 or higher. If a student's GPA is below 3.2 the student will be placed on probation. The student may be dismissed from the program if their cumulative GPA falls below 3.2 for two consecutive semesters. Final decisions regarding dismissal will be made on a case-by-case basis after consideration by the student's advisor, the Director of Graduate Studies and

the Graduate Academic Affairs Committee in consultation with the Department Chair.

If the student's GPA falls below 2.33 for two consecutive semesters, including the summer semester, the student will be immediately dismissed without further warning in accordance with University policy.

**Inadequate Progress in Research:** Graduate Students in the PhD and MS programs earn research hours by registering for BIOE 500. If a student does not make adequate progress in research during a semester, the student will receive a grade of "unsatisfactory" in BIOE 500 and placed on probation during the subsequent semester and subject to continuous evaluation. If a student receives a grade of "unsatisfactory" in BIOE 500 for two consecutive semesters, the student will immediately be dismissed from the graduate program.

Students who are deemed as making inadequate progress towards meeting the goals of their program will be given written notice that they are on probation and may be considered for dismissal from their current research group and possibly the graduate program. This information will include clear expectations required to regain a satisfactory standing. The first written warning allows a specified time period of no less than three weeks to alleviate the deficiencies or problems resulting in the consideration of dismissal.

The student will be reevaluated at the end of the initial warning period. If the student's advisor determines adequate progress has been made toward correcting deficiencies, the advisor may consider the student in good standing and advise the student, in writing, they are no longer being considered for dismissal.

If, at the end of the time frame allowed in the initial written warning, there is inadequate progress toward correcting the stated deficiencies, the student will be given a second written notification and additional time of no less than three weeks to attempt positive progress. The possibility of dismissal and the end of financial support must be clearly stated in this warning.

The student is encouraged to seek another advisor during the probationary periods in order to provide an option should corrective action not be successful and the student is dismissed from their current research group at the end of the probationary period.

If, after the two written warnings and the passage of the combined specified probationary periods of no less than six weeks, the student has not made significant progress toward correcting deficiencies and/or meeting the advisor's expectations, and the advisor is convinced that the student will be unable to achieve adequate progress despite

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intervention or additional time, the advisor may dismiss the student from their research group. The date of dismissal may correspond with the end date of the last probationary period or any date thereafter. The student will be notified in writing of the decision to be dismissed from the research group. The official date of dismissal will be included in this notification and the student will be advised that financial support will be ending as of the date of dismissal.

In cases of egregious failure to maintain satisfactory progress, a student's fellowship may be terminated during the semester in which the student is on probation. Decisions to reduce or terminate a student's stipend due to lack of progress will be made on a case-by-case basis. The Director of Graduate Study, the Graduate Academic Affairs Committee, the student's thesis advisor, and the department Chair will consider all the factors that may have affected a student's performance before reaching such a decision.

**Opportunity to Join a Different Research Group:** A student, having been given an opportunity to find another advisor during the probationary period, may change advisors if accepted into another research group.

A student dismissed due to inadequate progress may not change advisors more than twice. Students may not have a total of more than three advisors, including their initial advisor. If a student is unable to find another advisor, the student will be dismissed from the graduate degree program.

Dismissal normally coincides with the end or beginning of a semester. A dismissal from the graduate degree program that takes effect during the semester requires approval by the Dean of Graduate and Postdoctoral Studies in accordance with the *Guidelines for Dismissal, Petitions, Appeals, Grievances, and Problem Resolution*.

### **MBE Applied Bioengineering Track**

Graduate students in the MBE Applied Bioengineering track may be subject to dismissal from the program if their cumulative GPA is below 3.0 for two consecutive semesters. A final decision will be made by the Graduate Academic Affairs Committee in consultation with the Director of Graduate Study and the Department Chair.

If the student's GPA falls below 2.33 for two consecutive semesters, the student will be immediately dismissed without further warning in accordance with University policy. Students will be notified of their dismissal once final grades have been received and posted to their records.

### **MBE Global Medical Innovation Track**

Graduate students in the MBE Global Medical Innovation track may be subject to dismissal from the program if their cumulative GPA falls below 3.2 for two consecutive semesters. A final decision regarding dismissal will be

made by the Director of the MBE program, the Director of Graduate Study, and the Graduate Academic Affairs Committee in consultation with the Department Chair.

If the student's GPA falls below 2.33 for two consecutive semesters, the student will be immediately dismissed without further warning in accordance with University policy. Students will be notified of their dismissal once final grades have been received and posted to their records.

### **TRANSFER BETWEEN PROGRAMS**

Specific rules apply to students who request to be transferred between graduate programs.

#### **PhD to Master's (Thesis-based)**

Requests to change from a PhD to a Master's thesis program are only granted under special circumstances. Students who wish to change from a PhD to a Master's thesis program must obtain the permission of their advisor and then petition the Graduate Academic Affairs Committee in writing. Each request is considered on a case-by-case basis and must receive the approval of the student's advisor and the Chair of the Department.

#### **PhD to Bioengineering MBE Professional Master's Program (both tracks):**

Admission into a professional master's program (Applied Bioengineering or Global Medical Innovation track) is granted separately from admission into a research or thesis program. Students who wish to change from a thesis program to a professional degree program must petition the Graduate Academic Affairs Committee in writing. Students who change from the PhD to the MBE program must keep in mind that all academic requirements of the MBE program must be met. Upon recommendation of the department and approval by the Dean's office, the request is sent to the Office of Graduate and Postdoctoral Studies for consideration and a final decision

If approved, students who received tuition waivers while enrolled in the thesis program will be expected to repay tuition before their professional degrees are awarded.

Professional degree programs terminate when the degree is awarded. Students who wish to continue graduate study after completing a professional program must reapply for consideration of readmission into a research program.

#### **MBE (both tracks) to PhD**

Admission to the MBE program is granted separately from admission into a research or thesis (PhD) program and admission to the MBE program does not guarantee admission to the PhD program. A student working towards an MBE degree and anticipating graduation prior to the semester in which they would begin the PhD program may apply. Their application will be evaluated using the same criteria applied to all other PhD applicants.

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### **Transfer between MBE Tracks**

Due to the differences in the Applied Bioengineering (AB) and Global Medical Innovation (GMI) MBE tracks, it is difficult to switch from one track to the other. If a student requests a transfer from one track to another, he or she must keep in mind that many of the credit hours may not transfer between tracks since all requirements of the track to which the student transfers must be met. Each student request will be handled on a case-by-case basis and must be approved by the Director of the MBE program, the Director of Graduate Study and the Graduate Academic Affairs Committee. All requests should begin with a petition to the GAAC Committee. (Petitions should be submitted to the Academic Program Administrator).

### **Transfer to a Graduate Program in a Different Department**

If a student wishes to transfer to a graduate program in a different department, the student must be accepted into the other department's graduate program and must receive permission of both departments before the transfer can be approved. The student must petition the Graduate Academic Affairs Committee once approval is received from the department in which the student wishes to transfer. Final approval lies with the Office of Graduate and Postdoctoral Studies.

### **OUTSIDE EMPLOYMENT FOR GRADUATE STUDENTS**

#### **MBE Students**

##### **MBE Applied Bioengineering Track**

MBE students in the Applied Bioengineering track may accept outside employment on or off-campus without prior approval. The work performed must be incidental to work carried out in pursuit of the student's degree. Students are cautioned to balance their employment and academic activities so that they can appropriately meet their academic responsibilities. International students should check with OISS prior to accepting employment to assure they comply with immigration rules.

##### **MBE Global Medical Innovation Track**

MBE students in the Global Innovation Bioengineering track may accept employment on or off-campus without prior approval, however, students must keep in mind the requirements of this program and are cautioned to balance their employment and academic activities to assure employment does not interfere with the specific responsibilities of the GMI track. The work performed must be incidental to work carried out in pursuit of the student's degree. International students should check with OISS prior to accepting employment to assure they comply with immigration rules.

### **PhD and Master's Thesis Students**

PhD students receiving stipends from fellowships or assistantships may not accept any regular paid employment on or off campus without the explicit permission of the department. If permission is granted, full-time students whether receiving stipend support or not, may not accept paid employment in excess of 20 hours per week. Students must have completed at least one academic year and be in good standing to request approval for outside employment. To request approval, students must petition the Graduate Academic Affairs Committee. The student petition must include the written approval of the student's advisor before it will be considered by GAAC. Students must receive approval of GAAC prior to accepting a paid employment position on or off campus.

### **International Students**

In addition to adhering to the policies ruling their specific program, international students in all programs wishing to accept employment must consult the Office of International Students and Scholars about the possible impact working full or part-time will have on their visa status.

### **GRIEVANCES AND PROBLEM RESOLUTION**

Any student who has a conflict with a faculty member or a student colleague is first encouraged to seek to settle the conflict directly. Should this not be possible or should the conflict remain unresolved, the student may file a grievance with the Director of Graduate Study. Graduate student grievances and problem resolution at the department level will be handled by the Director of Graduate Study in consultation with the Graduate Academic Affairs Committee. If the student's advisor, members of his or her thesis committee, or other faculty involved in the conflict are members of this Committee they should recuse themselves during grievance procedures. Additional faculty members may be asked to serve in ad hoc positions to assure the student's grievance is heard by an adequate number of committee members.

Appeals, grievances, and problem resolution are determined in accordance with the *Guidelines for Dismissal, Petitions, Appeals, Grievances, and Problem Resolution* found at <http://graduate.rice.edu/dismissals/>.

### **GRADUATE PEER MENTORING PROGRAM**

The Bioengineering Graduate Student Association is dedicated to serving the needs of the graduate student population. Bioengineering GSA is happy to serve as a resource to help graduate students navigate their way through the BIOE graduate program. The BIOE GSA is a resource for peer mentoring.

A Peer Mentor is a student who unofficially serves as a resource, a helping hand, and sounding board to first year

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students. The job of peer mentors is to provide support, encouragement, and information to students in their department who are just beginning the graduate program. Peer mentors have had experience being in the program and engaging in graduate student research and courses and can serve as support for the students they mentor.

If a student wishes to create a relationship with a graduate student willing to serve as a peer mentor, he or she should contact the President of BIOE GSA who will assist the student in finding an appropriate mentor. Students are also encouraged to seek out unofficial mentoring opportunities within their labs or programs.

Mentors serve in an unofficial capacity and are not responsible or accountable for decisions of those seeking their assistance. All students are responsible for knowing the rules and regulations of the department.

Peer mentors provide a great service to their mentees while developing leadership skills that will enhance their own professional development. Graduate students in both the MBE and PhD programs are encouraged to seek out fellow graduate students to serve as their peer mentor, and to serve in this capacity themselves during their own academic career.

#### **TITLE IX:**

Rice encourages any student who has experienced an incident of sexual, relationship, or other interpersonal violence, harassment or gender discrimination to seek support. There are many options available both on and off campus for all graduate students, regardless of whether the perpetrator was a fellow student, a staff or faculty member, or someone not affiliated with the university.

Students should be aware when seeking support on campus that most employees are required by Title IX to disclose all incidents of non-consensual interpersonal behaviors to Title IX professionals on campus who can act to support that student and meet their needs.

The therapists at the Rice Counseling Center and the doctors at Student Health Services are confidential, meaning that Rice will not be informed about the incident if a student discloses to one of these Rice staff members. Rice prioritizes student privacy and safety, and only shares disclosed information on a need-to-know basis.

If you are in need of assistance or simply would like to talk to someone, please call Rice Wellbeing and Counseling Center, which includes Title IX Support at (713) 348-3311.

Policies, including Sexual Misconduct Policy and Student Code of Conduct and more information regarding Title IX can be found at [safe.rice.edu](http://safe.rice.edu).

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## DEGREE SPECIFIC GUIDELINES

### DOCTOR OF PHILOSOPHY (PHD) DEGREE

The Rice PhD bioengineering program is comprehensive and provides students with a fundamental understanding of the life and medical sciences, advanced analytical and engineering capabilities, and translational research. With this educational background, graduates will be well prepared to participate in independent or collaborative research and development endeavors in industry or academia. Students in the PhD program must enroll on a full-time basis.

Most formal courses should be completed in the first year of residence to allow students to commence thesis research by the end of their second semester. During the first semester, until students are assigned a faculty advisor, students are officially advised by the Director of Graduate Study and the Graduate Academic Affairs Committee. Once the student officially joins a lab, the student's advisor will take over the primary advising role. The student is responsible for completing the various phases of the graduate program within the prescribed time limitations.

### PHD CURRICULUM

#### Components of Curriculum

The PhD curriculum consists of foundation and advanced topic courses, which collectively, afford the student broad exposure to his or her chosen field of research interest.

Students must take a minimum of 30 credit hours of graduate level foundation, supporting, and advanced topics courses (graded using a standard letter grade mode.) (Exception: the required math course may be at the '400' level.)

A minimum of 15 credit hours of graduate level bioengineering courses must be included in the foundation, supporting, and advanced topics courses. Graduate level courses are numbered "500" or above.

#### Foundation Courses

The following foundation courses are required of all PhD students:

- BIOE 516 – Mechanics, Transport, and Cellular Signaling (3 credits)
- BIOE 517 – Instrumentation and Molecular Analysis (3 credits)
- BIOE 518 – Introduction to Computational Biology (3 credits)
- BIOE 519 – Biomaterials (3 credits)

- UNIV 594 – Training in the Responsible Conduct of Research (1 credit)
- BIOE 633 – Life Sciences Entrepreneurship (1.5 credits) or BIOE 690 – Professional Development for Bioengineering (3.0 credits)
- 400 level or higher mathematics (MATH), statistics (STAT) or computational and applied mathematics (CAAM) course (3 credits. BIOE 439 is meant for undergraduates only and may not be used to meet the math requirement.

#### Advanced Topic Courses

A large array of advanced specialty courses is available to BIOE graduate students. Each student should, in consultation with his or her thesis advisor, select the courses most appropriate for his or her research. Advanced topic courses may be used to meet the minimum of 15 credit hours of graduate level BIOE courses.

#### Specialization Track

Students may elect a specialization track during their graduate studies. To fulfill the requirements of the track, students must take three supporting courses in the area of interest. The student must consult with his or her advisor regarding appropriate courses to support their chosen track. Six major tracks that reflect research interests within the Bioengineering Department are recognized:

- Translational Bioengineering Cancer Research
- Molecular, Cellular, and Tissue Engineering
- Bioimaging and Optics
- Biomaterials, Biomechanics, and Tissue Engineering
- Computational and Theoretical Bioengineering
- Nanobiology

#### Transfer of Credit

A minimum of 18 of the 30 required credit hours, graded using a standard letter grade mode, must be taken at Rice. Students may transfer a maximum of 12 credit hours from a different institution.

The courses must be chosen from those that normally satisfy requirements for the advanced degree. No course can be used to satisfy both an undergraduate and graduate degree requirement.

For specific instructions on how to transfer credits, refer to the "Transfer of Credit" in the general section of these guidelines.

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## Course Requirements

The university minimum requirement for the doctorate degree is 90 semester hours beyond the bachelor's degree.

PhD students entering Rice with a bachelor's degree must take at least 30 semester hours of graduate level foundation and advanced topics courses graded using a standard letter grade mode. Of these, 15 credit hours must be graduate level BIOE courses.

In specific instances, the Graduate Academic Affairs Committee may waive a course. Waived courses will count toward the required 30 credit hours; however, such courses do not count toward the required 15 BIOE credit hours. If a BIOE course is waived, another BIOE course must be taken to meet the minimum 15 credit hours requirement.

Students must earn a grade of B- (2.67) or above in all course work counted toward their coursework requirements. Courses in which a student receives a grade below a B- (2.67) may not be used to fulfill degree requirements.

As with all graduate students, the thesis advisor or thesis committee may require further course work if it is considered essential to the thesis research.

During their first semester in residence, all full-time PhD students must take a minimum of twelve credit hours including three advanced courses (9 credit hours) for a standard letter grade. (Courses taken on a "pass/fail" or "satisfactory/unsatisfactory" basis do not count toward this 9 credit hour requirement.)

Students in the MD/PhD program or students who have received credit for graduate courses taken during their MS studies may petition the Graduate Academic Affairs Committee to relax the requirement for registering for nine hours of advanced courses during the first semester.

PhD students entering Rice with a master's degree or students who have taken graduate level courses as an undergraduate may petition the Graduate Academic Affairs Committee (GAAC) to receive credit for graduate courses taken. To do this, students should submit a petition and copies of all relevant transcripts course descriptions to the Graduate Academic Affairs Committee. No course may be used to satisfy both an undergraduate and graduate degree requirement. Students must still take at least 18 credit hours of advanced courses at Rice, therefore, transferred credits cannot exceed 12 semester hours.

The following restrictions also apply:

- Each case must be individually approved by the Graduate Academic Affairs Committee based on the work done.

- A student may not count a course toward the PhD requirements if the course is substantially the same as one already counted toward the PhD degree requirements. The decision as to whether a course is "substantially the same" will be made by the Graduate Academic Affairs Committee.
- Students with an MS or MBE degree in bioengineering from Rice granted within three years prior to their entry into the PhD program may have all relevant courses taken during their MS or MBE work at Rice counted toward the 30 credit hours required for the PhD degree.
- MD/PhD students in the Medical Scientist Training Program may automatically waive up to 12 hours of credit based on their medical school education. These waived credit hours will be considered the same as courses taken at Rice for a standard letter grade when meeting the requirement of 30 credit hours. However, MD/PhD students must still meet the minimum requirement of completing 18 hours at Rice and 15 hours of BIOE courses as part of their degree requirements. To officially waive the 12 courses, students must submit a petition to GAAC. MD/PhD students must still meet the minimum university requirements (90 semester hours including research hours).

After the first semester, departmental policy requires that full-time students be registered for a minimum of 12 credit hours each fall and spring semester. If hours are needed in addition to course work, the student should register for BIOE 500 "Graduate Research". Students may register for between 1 and 15 credit hours per semester during the terms they are engaged in research. Students are expected to fulfill the research requirements as defined by their advisor to earn a "satisfactory" grade in BIOE 500. The guidelines for determining the number of credit hours is: 0.5 semester credit hours equals 1.5 contact hours per week. Students must register for minimum of six credit hours of BIOE 500 during the summer semester to receive a stipend.

### BIOE 506

BIOE 506 (Independent Graduate Research) is meant for MBE Students. However, in exceptional cases PhD students who have taken all foundation, advanced, and optional track courses as well as any courses required by their advisor may still need 1 to 1.5 credits to meet the requirement of 30 credit hours graded using a standard letter grade scale necessary to meet candidacy requirements. With prior approval of their advisor, students may earn these minimal credits by registering for the thesis research course, BIOE 506.

PhD students may take BIOE 506 (Graduate Independent Study) for a maximum of one to two (1-2) credit hours towards their PhD degree. The independent research project

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must be unrelated to their thesis research project. It is the student's responsibility to locate a faculty member willing to mentor them in the independent study course. This mentor may be the student's primary advisor or a different faculty member. PhD students must have the approval of their advisor prior to registering for BIOE 506. The student must produce a final project in the form of a paper, design project, exam, or other project goal as defined by the mentor. BIOE 506 must be taken for a standard letter grade. The mentor must confirm the student met the requirements and submit a letter grade for the student.

To register for BIOE 506, the student must submit a Special Registration form plus an additional permission form providing mentor contact information, a brief description of the project, and approval of the student's advisor prior to enrolling in the course. Permission forms may be obtained by emailing [ges2@rice.edu](mailto:ges2@rice.edu). The original permission form and a copy of the Special Registration form should be submitted to BIOE Academic Program Administrator (email: [ges2@rice.edu](mailto:ges2@rice.edu) or hand delivered).

It is the responsibility of the student to assure his or her mentor submits a grade for the course. If a grade is not received by the grade submission deadline, the student will receive a grade of incomplete until the grade is received. If the grade is not received by the deadline for resolving incomplete grades, the student will receive a failing grade.

### **SELECTION OF PRINCIPAL ADVISOR**

#### **Laboratory Rotations**

The key for successful PhD graduates is the relationship with their research advisor. To facilitate learning about various research projects and lab environments, first-year PhD students are required to participate in laboratory rotations. The purpose of lab rotation is to assist the first-year students in choosing an advisor and a lab for conducting thesis research. Rotations should also encourage cohesion within the department and students should use this opportunity to explore research options other than their declared area of interest.

#### **Rotation Process:**

Students must register for BIOE 504 "Graduate Lab Rotation" during their first semester. BIOE 504 is a three (3) credit hour course. This course gives the student the opportunity to experience different research projects while allowing the faculty to assess the interests and aptitude of the students. This course is graded as "Satisfactory/Unsatisfactory." Students must successfully complete a minimum three lab rotations to receive satisfactory credit for BIOE 504 and to be allowed placement with an advisor.

Research presentations will take place during orientation to introduce students to bioengineering research in the

department. Students will be provided a list of advisors within the Department of Bioengineering who expect to accept students into their labs and students should rotate within these labs. However, students may elect to rotate in a laboratory as a way to broaden their background in an area of bioengineering or develop a new collaboration.

Students must complete a minimum of three laboratory rotations in three different labs of about 3 weeks each. Students shall spend enough time in the lab to understand the research projects and approaches and to interact with lab members and the advisor. Specific dates and rotation requirements will be determined by the advisor. The deadline for completing all rotations will be published early in the semester.

Students who early matriculate, or who work in labs as temporary employees in the summer, may NOT count this work as one of their official rotations.

Students may choose their first two rotations. The third rotation requires the approval of the Director of Graduate Studies. Prior to beginning the third rotation, the student must submit the "Third Rotation Request Form" listing the choice for their third rotation. Students must list at least three possible advisors in whose lab they may wish to rotate. Labs in which a student has already rotated should not be included. Students will be notified of the deadline for submitting rotation form(s) and will be notified of approval of the third rotation within a reasonable time.

Students are strongly encouraged to discuss lab rotations with potential advisors before completing their third rotation request. To facilitate and optimize the rotation experience for both the student and the faculty, it is important that the student and advisors meet prior to the start of any rotation to discuss expectations, goals, requirements and laboratory guidelines. It is the student's responsibility to arrange to meet with the advisor to discuss what is expected during the rotation period. During this meeting, the advisor should make clear his/her expectations for the rotation. In general, the student should expect to spend approximately nine (9) hours in the lab per week for each rotation.

As part of the lab rotation grade, students are required to submit a lab rotation assessment form at the end of each official rotation. Failure to submit a minimum of three lab rotation assessment forms will result in a grade of "unsatisfactory" and may prevent the student from choosing an advisor.

Students are expected to choose advisors within the Department of Bioengineering; however, students may choose to complete one rotation outside the Bioengineering department. The mentor for this rotation must be a faculty member whose primary appointment is in a department at Rice University or, if external to Rice, a faculty member at



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another institution who holds an adjunct faculty position with the Department of Bioengineering.

Although strongly discouraged, rotations may be carried out concurrently. It is important that students actively engage in the lab during the rotation period. Suggested activities include attending lab meetings, interacting with graduate students and post-docs, and discussing research with the faculty member.

Rotation Waivers: Student must complete rotations unless they fall into one of the two categories listed below:

- An MD/PhD student who has selected a thesis advisor in the department of Bioengineering and started their thesis research may submit a rotation waiver request. MD/PhD students who have not selected a thesis advisor must complete at least two laboratory rotations and submit a waiver request for the third
- A student recruited on behalf of a specific faculty member with this arrangement stipulated in the student's official admission offer letter. (Unofficial agreements between advisors and students do not exempt students from the requirement of completing three rotations with three different advisors.)

Once the student completes all lab rotations:

- The student should submit the "Advisor Selection" form with a ranked list of desired research projects and advisors by the published deadline
- Students must choose a minimum of three projects under the direction of at least two different advisors. (Lab rotation forms should be submitted for each project to assure proper credit is documented.)
- Students may include laboratories that were not among the labs in which they rotated, however, they should not include an advisor on their ranked list unless he/she has discussed research opportunities with the advisor.

The following rules apply:

1. All PhD students are expected to choose a primary advisor in the Bioengineering Department.
2. Students may, in special circumstances, request an advisor in another department at Rice. If a student requests a primary advisor in a department other than Bioengineering, the advisor should be one who works collaboratively with the Department of Bioengineering and holds an adjunct or joint appointment within the department.

3. Students may, in special circumstances, choose an advisor who does not hold a primary position in a department at Rice University (external advisor). However, if they choose such an advisor, the student must have a co-advisor within the Department of Bioengineering who is willing to provide financial support should the relationship with the external advisor end. If a student chooses an external advisor, the student must obtain permission from the Bioengineering co-advisor prior to submitting the Advisor Selection form.
4. Students who are approved to have an advisor outside of the Department of Bioengineering are expected to follow all procedures and meet all degree requirements of the Department of Bioengineering. Students with advisors who do not hold primary positions at Rice University should be aware that the advisor may have additional expectations.
5. In addition to receiving the approval of the GAAC, MD/PhD students must receive the approval the Baylor Medical Scientist Training Program of their choice of advisor and must provide proof of acceptance to the Bioengineering Academic Program Administrator prior to final approval of their Rice advisor.
6. The selection process is coordinated by the Director of Graduate Study and the Graduate Academic Affairs Committee in an effort to match the needs of the students to those of the faculty and with available funded research projects.
7. Several factors are considered during the matching process, including funding, available space, academic standing, rotation performances, and the relationship between the student and the potential advisor.
8. Once all students have submitted their Advisor Selection form and, after consultation with the requested advisors, final approval of the student's advisor is given by the Director of Graduate Study or the Chair of the Graduate Academic Affairs Committee.
9. Most students will be notified of the assignment of his/her advisor before the end of the fall semester. In special circumstances where a student cannot be placed with an advisor by this deadline, the student will be notified of the delay and efforts to assign an advisor will be handled on a case-by-case basis.
10. Although the department will provide guidance, it is the ultimate responsibility of the student to find

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an advisor who is willing to accept him or her into their lab. Students who do not have an assigned advisor by the end of the fall semester should make finding an advisor one of their top priorities. In all cases, a student should have been accepted by an advisor no later than the end of their first semester (December 31<sup>st</sup>). Satisfactory progress in the department requires that students begin full time work on their graduate research during their second semester. If they are not accepted into a lab by the end of the first semester this requirement is not met and they may be considered for dismissal from the graduate program.

### **FINANCIAL SUPPORT**

Full-time first-year students are considered full time first semester of study if they are enrolled in three or more (9 credit hours) advanced courses for purposes of meeting financial support guidelines, however, the Bioengineering department requires that first semester BIOE students take a minimum of twelve credit hours graded using a standard letter grade scale their first semester to meet academic requirements. Financial support is dependent upon satisfactory performance, reasonable progress toward degree requirements, and the availability of funds. Student stipends are subject to all of the usual federal taxes.

The Department funds students for the first semester (4.5) months of study. In most cases this covers the period from August 16 to December 31. Advisors become responsible for financial support of students the first day of the second semester of study. Advisors are expected to pay 100% of the student's stipend unless that stipend is funded by an external fellowship, scholarship, training grant, or other source of external funding which covers all or a portion of the student's stipend. Students are required to notify the Department of Bioengineering of any external fellowships or scholarships they receive immediately upon receiving the award including awards received prior to matriculation.

### **Support limitations:**

The normal limit of financial support for graduate students is ten semesters (excluding summers). Students, who anticipate taking longer than 10 semesters for completion of the PhD degree must consult with their advisor. The advisor may require the student to submit an additional progress report providing the following: (a) summary of work accomplished since the presentation of the thesis proposal, (b) specific information on research work remaining to be done and (c) estimated time to completion.

The advisor, in consultation with the thesis committee, shall consider the student's progress, exceptional circumstances which justify continued funding, and the availability of funding when making a decision regarding whether the

student's funding should be continued for a specific period. Continued support should be reevaluated annually or more often as appropriate.

Students whose funding has been terminated may continue to register and work on research projects as long as they continue to make acceptable progress toward the degree requirements. If a student fails to continue to make acceptable progress he or she is subject to dismissal from the program (See section on "Dismissal from Graduate Program.")

### **External Fellowships/Scholarships:**

Students are encouraged to seek external fellowships and awards. The Office of Proposal Development (<http://opd.rice.edu>) offers an extensive array of proposal development services when developing and writing proposals for federal agencies and other entities to seek funding for the research projects. Students should take advantage of their services.

If a student receives an external award, the following apply:

- If the total amount of the fellowship, including stipend, insurance, etc. is below the current stipend offered by the Department of Bioengineering, the student's fellowship is supplemented to equal the current Rice stipend level and the student is provided an additional \$4000 annual supplemental stipend during the period of the fellowship. These supplements are paid by the department during the first semester (4.5 months) of study. The advisor becomes responsible for the supplemental payments beginning the second semester of study, or, for students who receive awards after the first 4.5 months, on the date the fellowship/scholarship becomes effective. The fellowship/scholarship must be competitive and designated for the graduate stipend.
- If the total amount of the fellowship, including stipend, insurance, etc. is above the current stipend offered by the Department of Bioengineering, the student is provided an additional \$4000 annual supplemental stipend during the period of the fellowship. This \$4000 annual supplemental stipend is offered regardless of the amount of the stipend provided by the external funding. No additional stipend independent of the amount of the fellowship will be offered. This supplement is paid by the department during the first semester (4.5 months) of study. The advisor becomes responsible for the supplemental payments beginning the second semester of study, or, for students who receive awards after the first semester, on the date the fellowship/scholarship becomes effective.

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If a student's fellowship/scholarship ends or is revoked during the student's studies at Rice, assuming the student is achieving satisfactory performance, reasonably progressing toward their degree, and funds are available, the student will receive financial support (department stipend and associate tuition waiver) at the level provided by Rice at the time. The student will no longer receive the \$4000 supplemental stipend. The department will pay the stipend during the first 4.5 months of study. The advisor will become responsible beginning the second semester of study.

#### Training Grants

If a student is awarded a training grant for an amount below the current level of support offered by the Department of Bioengineering, the student's grant is supplemented to equal the current stipend level. This supplement is paid by the department during the first 4.5 months of study. The advisor becomes responsible at the beginning of the second semester of study, or, for students who receive training grants after the first 4.5 months, on the date the training grant becomes effective. If a student's training grant ends or is revoked during the student's studies at Rice, assuming the student is achieving satisfactory performance, reasonably progressing toward their degree, and funds are available, the student will receive financial support (department stipend and associate tuition waiver) at the level provided by Rice at the time. The department will pay the stipend if the student is in the first 4.5 months of study; the advisor is responsible beginning the first day of the second semester of study.

#### Extenuating Circumstances

Situations where the advisor may not have adequate funding to support supplemental stipends will be resolved on a case-by-case basis in consultation with the Chair of the Department.

#### **THESIS COMMITTEE AND PROPOSAL**

The department of Bioengineering does not require a qualifying exam. Successful presentation of a thesis proposal is required in lieu of such an exam.

PhD students must have completed the following before the beginning of their fifth semester in residence (excluding summers):

- Selected a thesis committee,
- Prepared a thesis proposal, and
- Defended this proposal in a meeting of their committee.

#### **Thesis Committee**

The thesis committee is composed based upon the following rules:

- The thesis committee must be made up of at least three members.

- Two members, including the committee chair, must be members of the Bioengineering faculty with their primary appointment in the Bioengineering Department. Faculty whose primary appointment is in another department but who hold joint appointments in the Department of Bioengineering may serve in the capacity of a Bioengineering faculty member. (Adjunct faculty members do not fulfill this requirement.)
- The third member must be a faculty member whose primary appointment is in another department within the university. Faculty whose primary appointment is within the Department of Bioengineering but who hold joint appointments with other departments may not serve in the capacity of an outside member. Such faculty, however, may serve as "additional" members of the Committee.
- Students must choose a Thesis Director and Committee Chair. In most cases, the director and chair are the student's advisor. However, under some circumstances, this is not possible. The Committee Chair and Thesis Director need not be the same person, however, the Chair, must be either a tenured or tenure-track member of the Bioengineering Department or a research faculty member of the Bioengineering Department.
- Additional members of the committee, who may or may not meet the above criteria, may be selected with the approval of the department chair. These members are in addition to the three required members.
- Rules regarding the members of the thesis committee are governed by the *General Announcements* and will not be waived.

#### **Thesis Proposal**

Students must submit their thesis proposal prior to the beginning of their fifth semester (excluding summers). The thesis proposal is a written summary of research progress up to that point and future research plans. The proposal defense should be viewed as an opportunity to assess the student's progress and knowledge of the research field, to assure the student has developed a coherent research plan, and to provide the student with input from the members of the committee in time to incorporate useful suggestions in the thesis research.

This document should contain (at a minimum) the following sections:

- Abstract (not to exceed 250 words)
- Background with extensive literature survey
- Problem statement
- Research plans and methodology
- Any results obtained up to that point, and
- Proposed time-line for completion of thesis research

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The length and breadth of the thesis proposal should be discussed with the student's advisor. The advisor may, within reason, require additional information be included. Portions of manuscripts or reports to sponsors (if available) can be incorporated in the thesis proposal.

The thesis proposal must be distributed to the members of the thesis committee at least one week before the scheduled meeting.

### **Oral Defense**

All members of the student's thesis committee should be physically present at the oral defense. In rare circumstances, where a member cannot be present it is acceptable, with the prior approval of the student's advisor, for the member to be present via technologies such as videoconference or skype. It should be noted on the thesis proposal form that the committee member participated in the thesis defense via electronic means.

### **Thesis Proposal Results**

The Committee may make one of three decisions regarding the thesis proposal, "pass without reservations", "pass with reservations", or "failed."

- **Pass without Reservations:** Student will continue research based upon their thesis proposal
- **Pass with Reservations:** Committee members must, within one week, provide the student an explanation of deficiencies and the student should be given the opportunity to rectify identified deficiencies. A time table for correcting deficiencies will be set by the committee. If the student fails to correct deficiencies within a reasonable time frame, they will be required to redefend the entire proposal or be subject to dismissal from the program.
- **Fail:** If a student fails the thesis proposal, the committee may, by unanimous vote, allow the student to redefend within a reasonable time frame. Students are allowed to re-defend only once. If a student fails the thesis proposal the second time, the student is subject to dismissal from the program.

The thesis proposal defense should be documented using the "Thesis Proposal Defense Forms." Forms should be requested by emailing [ges2@rice.edu](mailto:ges2@rice.edu) at least one week in advance of the thesis proposal. After the thesis defense is completed, the original forms should be submitted to the BIOE Academic Program Administrator in BRC 135F by either the advisor or the student at the advisor's discretion. The original forms will be filed in the student's record. The Director of Graduate Studies will be notified of any students who pass with reservations or fail their thesis proposal.

### **Thesis Proposal Extension**

Students who are unable to defend their thesis proposal before the beginning of their fifth semester must request an extension by submitting a petition to the Graduate Academic Affairs Committee. The extension form may be obtained by emailing [ges2@rice.edu](mailto:ges2@rice.edu).

The petition should include the following:

- Current Time boundary
- Requested time boundary (cannot be more than one semester, not including summer semester)
- Reasons that resulted in student needing an extension
- List of tasks/milestones to be completed that will result in meeting the requested new time boundary
- Additional factors that the student considers relevant
- Approval (signature) of student's advisor

### **SATISFACTORY PROGRESS**

PhD students are expected to make continuous and satisfactory progress towards fulfilling their degree requirements. Students who fail to meet any of the requirements for satisfactory progress will receive letters of warning. Satisfactory progress is defined as, and includes, the following:

- PhD students must have at least nine (9) semester hours of graduate degree courses, graded using a standard letter grade mode, excluding course taken on a "pass/fail" or "satisfactory/unsatisfactory" basis, by the end of the first semester in residence.
- After the student's first semester in residence, students must begin work on their thesis research on a full-time basis.
- After the student's first year in residence, they must make an annual oral presentation of their research. This will ideally be in the form of a research talk at local, national, or international meetings. Students also have an opportunity to present during the GSA "Breakfast Club" and the annual graduate symposium. Poster presentations do not fulfill this requirement. Students must list their oral presentations on their Progress Reports and should inform the GAAC if they have not been given a chance to present their research, so that additional opportunities can be arranged.
- Students must submit progress reports by the deadlines noted in the "Progress Reports" section of these guidelines.
- Students must submit and successfully defend their thesis proposal before the beginning of their fifth semester in residence (excluding summer semesters).

- Students must petition for candidacy prior to the beginning of their ninth semester.
- Students must maintain a GPA of 3.2 or better. Graduate students in the PhD program whose cumulative grade point average for the most recently completed semester falls below 3.2 are placed on probationary status. The periods of probation extends to the end of the next semester in which the student is enrolled. Satisfactory/Unsatisfactory grades cannot be used to end probationary status.
- Once a student is placed on probationary status they have one semester (excluding summer semester) to improve their grades. If their GPA remains below 3.2 for two consecutive semesters, the advisor has the prerogative to immediately dismiss the student or the student's stipend may be suspended and student may become responsible for tuition costs until the student's cumulative GPA is once again above 3.2. Decisions to dismiss a student or reduce or terminate a student's stipend will be made on a case-by-case basis. The Graduate Academic Affairs Committee, the thesis advisor, and the Director of Graduate Study will consider all the factors that may have affected a student's performance before reaching such a decision. The Department Chair will be advised of all potential action prior to final actions of the involved parties.
- If the student's GPA falls below 2.33 for two consecutive semesters (including the summer semester), the student will be immediately dismissed without further warning in accordance with University Policy.
- Students will be notified of their status once final grades have been received and posted in their records
- Research courses are graded as "satisfactory/unsatisfactory". Students should review their progress with their advisor on a routine basis. When a student is found to be having problems that impeded satisfactory research, the student and advisor should develop a plan of action to correct deficiencies. This plan should be documented in writing and become a part of the student's record. (Send copy to [ges2@rice.edu](mailto:ges2@rice.edu).) Students who receive a grade of "unsatisfactory" in a research course will be placed on probation during the following semester. If a student received a grade of "unsatisfactory" in two consecutive semesters, the student is subject to dismissal from the program.

### **Progress Reports & Evaluations**

The purpose of the progress report is to ensure that graduate students and their advisors are communicating regularly regarding the student's progress on thesis research and the students overall development. PhD

students are required to submit semiannual progress reports during the entirety of their graduate career. Submission of progress reports is one criteria used to determine satisfactory performance.

Reports are on a calendar year basis and cover the time frames, January to June and July to December. First year students are expected to complete a progress report for their first semester covering the time frame, August 16 to December 31.) Students submit progress reports using a standardized progress report form. The first section is to be completed electronically by the student who then submits the form electronically, along with an updated copy of their curriculum vitae to their advisor (and thesis committee if chosen) no later than January/July 15<sup>th</sup>. The advisor completes the second section and returns the form to the student electronically by January/July 25<sup>th</sup>. The student reviews the feedback and submits the form to the Bioengineering Office (BRC 1030) no later than January/July 31<sup>st</sup>. It is the student's responsibility to coordinate with their advisor to assure the progress report is submitted by the deadline.

If the advisor (or committee as appropriate) feels it necessary, a meeting will be arranged to further discuss the student's progress with the student and make any recommendations to the student prior to the submission of the final progress report. If improvements are recommended, deficiencies should be placed in writing and a time line to meet recommended milestones included with the progress report.

### **Yearly Advisor/Committee Meetings.**

PhD students in their first two years meet with their advisor as deemed necessary. Once a student picks the members of their thesis committee, the committee should meet with the student on an annual basis, or more often as deemed appropriate by their advisor or thesis committee.

### **TEACHING REQUIREMENT**

Teaching is a graduate degree requirement. Students will not have teaching responsibilities during their first semester in residence. After their first semester students may be asked to spend the equivalent of eight hours per week on teaching assignments. Teaching assignments may involve tutoring, leading recitation sections, grading papers, or supervising work in the undergraduate laboratory. Each teaching assignment is given a point value of 0.5 to 2.0 based on the course requirements. Students must complete a total point value of two and one half (2.5) teaching assignments.

Students are expected to complete their teaching assignments during the second through fourth semesters. In cases where TA responsibilities conflict with the Bioengineering Colloquia (BIOE 698 or BIOE 699), the colloquia should be postponed for the semester.

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Teaching responsibilities may be assigned for a maximum of classes equaling a total of 2.5 teaching assignments. Exceptions to this rule may be granted only in special circumstances and each exception must be approved in advance by the Graduate Academic Affairs Committee.

Students planning to pursue an academic career are encouraged to request more involved teaching assignments.

Procedure:

Prior to the beginning of each semester the Associate Chair and the Director of Graduate Study will determine the number of teaching assistant positions required for the semester based upon class size and course requirements.

Instructors will provide a list of specific qualifications to assist in make appropriate TA assignment selections. The students will be required to complete the TA application and submit it to the Director of Graduate Study. Incomplete applications will not be accepted.

The Director of Graduate Study in consultation with the Associate Chair will review the applications using a specific matching process to assure appropriate assignments are made.

Once the matching process is completed and approved by the Director of Graduate Study and the Associate Chair, instructors will be notified of the TA assignments. Instructors will be given a brief review period during which they may voice their concerns. Final approval rests with the Director of Graduate Study and the Associate Chair.

Students and instructors will be notified of the course to which the student has been assigned once the TA assignments are finalized.

The following apply:

Teaching assistant positions will be filled according to the specific requirements of the course, as defined by the instructor, and the qualifications of the student.

Students and instructors may not make arrangements outside of the official TA matching process. An effort will be made to match students with their primary course choice, however, preference is given to the needs of the instructor; therefore, a preferred course cannot be guaranteed.

Registering for courses which conflict with a TA assignment after assignments are made is not allowed.

Students will not be assigned more than one teaching assignment during a semester. Exceptions to this rule

require advance approval of the Director Graduate Study or the Associate Chair.

Students may not TA a course in which they are concurrently enrolled.

Student Responsibilities:

TAs should follow an appropriate code of conduct. This includes acting in a trustworthy and responsible manner, treating others with respect, treating students fairly, and limiting their interactions and relations with students in the class to a professional nature while serving as a TA.

TAs are responsible for knowing the contents of the Honor Code TA Handbook. The TA Honor Code handbook can be found at the following link: <http://honor.blogs.rice.edu/files/2010/12/TA-Handbook-rev.-2010.pdf>. TAs should refer to the handbook in cases of suspected violations of the Honor Code and are expected to follow the appropriate procedures in such cases.

TAs must meet with the course instructor prior to the beginning of the teaching assignment to discuss expectations and deadlines.

It is the TA's responsibility to disclose any possible conflicts of interest to the instructor. This includes, but is not limited to, disclosure of personal relationships with members of the class. When in doubt about a possible conflict of interest, the student TA should discuss the specific situation with the instructor.

TAs are expected to attend scheduled classes for the course for which they are serving as a TA unless specified otherwise by the instructor.

The number of hours required for teaching assignments varies depending upon the course, however, TAs should expect to devote approximately eight (8) hours per week to TA responsibilities. Students should discuss specific requirements with the instructor prior the class beginning.

TAs responsibilities vary depending upon the class; TAs are expected to fulfill all reasonable requests made by the instructor. Serious conflicts should be discussed with the Director of Graduate Study depending upon the course level.

TAs are expected to work collaboratively with other TAs and graders as necessary.

All TAs whose stipend is paid in full or part by the Dean's office must attend the TA workshop organized by the Dean's office.

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Instructors are expected to provide TAs sufficient instructions the beginning of the TA assignment so that the TA knows the instructor's expectations.

The TA's performance will be evaluated by the instructor at the end of their teaching assignment. If a student receives an unsatisfactory rating, the semester will not count towards the required TA assignments. It is the student's responsibility to fully understand the expectations of the instructor.

Official documentation of teaching assignments will be recorded in the student's record. \

### **INTERNSHIP OPPORTUNITY**

In addition to course work, PhD students are encouraged to participate in an optional three- to six-month internship experience. Well received by bioengineering graduate students, the internship program provides an opportunity to gain real-world exposure and/or learn new techniques and tools to apply to their research or gain substantial teaching experience.

Students may choose to intern in industry, clinical labs, government national labs, international labs, or teaching institutions. The internship training program for each student is managed through collaborative interaction between the advisor, the host, and the bioengineering program. Students must notify their advisors of potential internship opportunities in a timely manner, preferably before the beginning of semester(s) that will be affected by the internship.

Generally, students participating in internships do not receive a graduate student stipend during the time of the internship. Details of financial arrangements should be discussed with the student's advisor and finalized prior to the internship. The BIOE Academic Program Administrator should be notified no less than three weeks prior to the beginning of the internship in order to assure time to make necessary revisions to payroll. If appropriate documentation is not received in time to make adjustments to the student's payroll, the student will be responsible for repaying any overpayment he or she may receive. The student should provide the BIOE Academic Program Administrator documentation (offer letter, evaluation) of the internship so that it may be documented in the student's record.

Decisions regarding stipends from external fellowships during an internship is based upon the requirements of the fellowship/training grant and are made on a case-by-case basis. If a student has received an external fellowship or training grant, it is the student's responsibility to assure that the internship does not conflict with guidelines and requirements of the fellowship or grant.

PhD students must register for BIOE 500 during the time they are completing an internship.

### **OPPORTUNITY FOR PRESENTATION OF RESEARCH**

Students will be expected to present their research in an official forum at least once annually. This can be at a national or international conference, during the BIOE GSA "Breakfast Club" or at the annual Graduate Symposium. Other opportunities may be approved on a case-by-case basis. (Poster presentations do not fulfill this requirement.) Students should document presentations as part of their progress report.

### **APPROVAL OF CANDIDACY AND FINAL ORAL EXAMINATION**

The attainment of candidacy marks the completion of all requirements for the degree other than those related to research leading to the writing, submission, and defense of the thesis.

### **TIME BOUNDARIES**

PhD students must be approved for candidacy before the beginning of the ninth semester of their enrollment at Rice. Students will not be allowed to enroll in a graduate program after their eighth semester unless they have been approved for candidacy.

- A student's individualized time boundaries are available in Esther. Students who are approaching or who have passed their deadline to candidacy, and who have not met all requirements for candidacy must submit an extension of candidacy request. Extensions are approved on a case-by-case basis by the Office of Graduate and Postdoctoral Studies.
- The Office of Graduate and Postdoctoral Studies will impose a \$125 reinstatement fee on students who are allowed to continue but who have exceeded their time boundaries without prior approval.

All PhD students must submit a petition for approval of candidacy. Petitions should be submitted to the BIOE Academic Program Administrator. When submitting the candidacy form, students are not required to submit the three requested attachments; these will be added by the department before forms are submitted for approval.

Candidacy information may be found on the website for the Office of Graduate and Postdoctoral Studies at the following website: <http://graduate.rice.edu>.

The candidacy form can be found at: <http://gpsdocs.rice.edu/forms/DoctoralCandidacyPetitionForm.pdf>.

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Students may take the final oral examination in defense of their thesis only after the Dean of Graduate and Postdoctoral Studies approves their candidacy. Final approval of candidacy will come from the Associate Provost and is valid for four years.

### **Oral Dissertation**

PhD students are required to complete their program, including thesis defense, within 10 years of initial enrollment in the degree program. The time boundaries include any period in which the student was not enrolled or enrolled part time, for whatever reason. A student who fails to meet any university time to degree deadline may result in the student not being able to continue in their degree program.

After a student's candidacy has been approved and upon completion of his or her research project, the student must schedule, in coordination with his or her research advisor, a public oral examination of the defense of his or her thesis. Oral examination of the doctoral degree must be announced at least two weeks in advance. Oral examination announcements are to be submitted to the Office of Graduate and Postdoctoral Studies by entering the information into the online Graduate Students Thesis Defense Announcement form. This form can be found at <http://events.rice.edu/rgs>. (Refer to the GPS website: <http://graduate.rice.edu/thesis/> for specific information regarding scheduling requirements.) Exceptions to this policy are granted only in very rare circumstances and must be approved by GPS.

PhD students must conclude an original investigation that is formalized in an approved thesis. The completed thesis must be submitted in either final or advanced draft form to the members of the thesis committee at least two weeks before the oral examination. A copy of the final draft or completed thesis must also be submitted to the department at least two weeks before the oral examination. This copy may be submitted electronically to [ges2@rice.edu](mailto:ges2@rice.edu).

All oral thesis defenses must take place on the Rice University campus. The candidate and all thesis committee members must be physically present. In exceptional cases, appeals to this requirement can be made in writing to the Dean of Graduate and Postdoctoral Studies. Such appeals must be submitted and a decision rendered prior to the date of the thesis defense.

In the course of the examination, the thesis committee members may recommend revisions or additions, which

must be incorporated in the final thesis, which is then signed by all committee members.

Should a candidate fail, the committee chair may schedule a second examination. As per university rules, students who fail a second time will be dismissed from the university.

Students who wish to have their degree conferred in the same semester in which they defend, must comply with deadlines for filing their applications for degree conferral and thesis defense. These deadlines can be found at <http://registrar.rice.edu/calendars/>.

### **Acceptance of Thesis**

No later than six months from the date of the examination, candidates who successfully passed the oral examination in defense of their thesis must submit their thesis to the Office of Graduate and Postdoctoral Studies. A student's thesis must be submitted electronically. Refer to the Graduate and Postdoctoral Studies website <http://graduate.rice.edu/thesis/> for specific instructions regarding how to submit the thesis. Final approval of the thesis is by the Associate Provost.

If the thesis is not ready for final signatures by the end of the six-month period, the "pass" may be revoked and an additional oral defense must be scheduled. Extensions of this six-month period for completion without reexamination will be granted only in rare circumstances. Application for an extension without reexamination must be made by the candidate with the unanimous support of the thesis committee, endorsed by the school dean, and approved by the Office of Graduate and Postdoctoral Studies.

### **GRADUATION**

Student degrees are conferred at the end of the semester in which they defend their thesis, including a newly created end-of-summer degree conferral. Students who defend their thesis in the summer, by the deadline set by The Office of Graduate and Postdoctoral Studies, may have their degrees conferred in August. All degree candidates are required to apply for degree conferral with the Office of the Registrar during the semester in which they wish to graduate, prior to the deadline set by the Registrar's Office. Students should refer to [registrar.rice.edu](http://registrar.rice.edu) for additional information regarding deadlines.

Commencement happens only once per year. Students may participate in commencement if they defended after the thesis submission deadline for the prior year's commencement.



**SUGGESTED TIME LINE FOR PHD STUDENTS**

DEGREE PROGRESS										
TASKS	YEAR/Semester									
	ONE		TWO		THREE		FOUR		FIVE	
	1 Fall	2 Spring	3 Fall	4 Spring	5 Fall	6 Spring	7 Fall	8 Spring	9 Fall	10 Spring
Rotations	■									
Advisor Selection	■									
Core Courses	■	■	■	■						
Attend Bioengineering Colloquia	■	■	■	■	■	■				
Teaching Assistant Positions		■	■	■						
Present Annual Oral Presentation of Research		■	■	■	■	■	■	■	■	■
Preparation of Research Proposal			■	■						
Choose Thesis Committee			■	■						
Thesis Proposal		■	■	■						
Research		■	■	■						
Achieve Candidacy						■	■	■		
Thesis Defense								■	■	■

**PHD STUDENT REQUEST TO SWITCH ADVISORS**

Since switching advisors will likely affect progress toward the degree and/or any financial support arranged by the previous advisor, students should not consider switching advisors except in exceptional circumstances. However, the department recognizes that in rare circumstances a student may feel their interests could be better served by working with a different advisor. Requests to voluntarily switch advisors will be handled on a case-by-case basis. In such cases the department will make every effort to assist the student, however, the student bears the ultimate responsibility of finding a new advisor.

**Procedure**

Students should first discuss issues with their current advisor in an attempt to resolve any concerns or problems. If the student feels issues are insurmountable, he/she is encouraged to request the guidance of the Graduate

Academic Affairs Committee or the Director for Graduate Study

If the student still wishes to switch advisors, the student should speak with an advisor whose research interests are in line with their interests, who is willing to serve as the student’s advisor, and who has funding to support the student. If the student finds another faculty member willing to serve as his or her advisor, the student must submit a petition to the Graduate Academic Affairs Committee (GAAC) for approval of the switch in advisors. This petition must have the endorsement of the new advisor. If the Committee approves the switch, the Bioengineering Academic Program Administrator will process the paperwork required to switch advisors. Students may not initiate the process to change advisors more than twice nor have total of more than three advisors, including their initial advisor, during their tenure as a student.

## **MASTER OF SCIENCE (MS) IN BIOENGINEERING**

New students interested solely in the M.S. degree are admitted and only under special circumstances. M.S. students must satisfy the departmental and university course requirements, fulfill the teaching requirement, complete a research project, write a thesis and successfully defend their work in a public oral examination.

### **MS CURRICULUM**

#### **Components of Curriculum**

The MS curriculum consists of two components: foundation and advanced topic. Collectively these courses afford the student broad exposure to his or her chosen field of research interests.

- Complete a minimum of 30 credit hours of study (including thesis research hours).
- Complete a minimum of 18 credit hours of graduate level foundation, supporting (track) and advanced topics courses (graded for a standard letter grade).
- A minimum of 24 of the 30 required credit hours must be taken at Rice.

The university minimum for the master's degree is 30 semester hours beyond the bachelor's degree. MS students must earn the additional credit hours they need for graduation by registering for the thesis research course, BIOE 500. Students may register for between 1 and 12 credit hours per semester during the terms they are engaged in research.

Departmental policy requires that full-time students be registered for at least 9 credit hours each semester. If hours are needed in addition to course work, the student should register for BIOE 500, "Graduate Research." Students are expected to fulfill the research requirements as defined by their advisor to earn a "satisfactory" grade in BIOE 500.

Students should carefully consider their course choices to assure they meet the degree requirements for their specific program. In the case of MS students, all course work must be completed by the deadline for candidacy.

**Foundation and Advanced Topic Courses:** MS students must take at least 18 semester hours of foundation and advanced courses. Courses used to meet this requirement must be at the 500 level or above.

A large array of advanced specialty courses is available to BIOE graduate students. Each student should select the courses most appropriate for his or her research work with the help of the thesis advisor and the Graduate Academic Affairs Committee. Advanced topic courses may be used to meet the minimum of 18 credit hours of graduate level courses. Advanced topic courses must be graduate level and

graded using a standard letter grade scale (courses graded as "pass/fail" or "satisfactory/unsatisfactory" cannot be used to meet this requirement.) All courses must be in the relevant field.

### **Course Requirements**

All coursework must be at the graduate level except where specifically exempted for a course taken to meet a prerequisite requirement

Students must receive a grade of B- (2.67) or above in all course work counted toward their coursework requirements. Courses in which a student receives grade below a B- (2.67) may not be used to fulfill the coursework.

As with all graduate students, the thesis advisor or thesis committee may require further course work if it is considered essential to the thesis research.

### **Transfer of Credit**

A minimum of 24 of the 30 required credit hours must be taken at Rice. Students may transfer a maximum of 6 credit hours from a different institution. The courses must be chosen from those that normally satisfy requirements for the advanced degree. No course can be used to satisfy both an undergraduate and graduate degree requirement.

Transfer of credit must follow institution guidelines. For specific instructions on how to transfer credits, refer to the "Transfer of Credit" in the general section of these guidelines.

### **Financial Support**

MS students are governed by the financial support rules as the PhD program. Students who receive a stipend in support of their graduate work are expected to devote full-time to their studies and are not to take outside employment. Full-time for first-year students during their first semester of study is considered to consist of three or more (9 credit hours) advanced courses. Financial support is dependent upon satisfactory performance, reasonable progress toward degree requirements, and the availability of funds. Student stipends are subject to all of the usual federal taxes.

The normal limit of financial support for graduate students in the M. S. program is six semesters (excluding summers). Students who anticipate taking longer than six semesters for completion of the M.S. degree must consult with their advisor. The advisor may require the student to submit an additional progress report providing the following: (a) summarization of work accomplished since the presentation of the thesis proposal, (b) specific information on research work remaining to be done and (c) estimated time to completion

The advisor, in consultation with the thesis committee, shall consider the student's progress, exceptional circumstances

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which justify continued funding, and the availability of funding when making a decision regarding whether the student's funding should be continued for a specific period. Continued support should be reevaluated annually or more often as appropriate.

Students whose funding has been terminated may continue to register and work on research projects as long as they continue to make acceptable progress toward the degree requirements. If a student fails to continue to make acceptable progress he or she is subject to dismissal from the program (See section on "Dismissal from Graduate Program.")

### **SATISFACTORY PROGRESS**

MS students are expected to make continuous and satisfactory progress towards fulfilling their degree requirements. MS students will submit the same progress reports and those required of PhD students. Once the thesis proposal is approved, the student will have yearly evaluation meeting with his or her thesis committee. Students will be provided a written assessment of their academic progress at least every six months or more often as deemed appropriate by their advisor or thesis committee. The student's signed progress report with any comments from the advisor/thesis committee will serve as this written assessment. A copy of the written assessment should be submitted to the BIOE Academic Program Administrator for inclusion in the student's record.

Students who fail to meet any of the requirements for satisfactory progress will receive letters of warning. Satisfactory progress is defined as, and includes, the following:

- MS students must have at least 12 semester hours of graduate degree courses (graded using a standard letter grade scale, excluding course taken on a "pass/fail" or "satisfactory/unsatisfactory" basis) by the end of the first semester in residence.
- After the student's first semester in residence, students must work on their thesis research on a full-time basis.
- Students must maintain a GPA of 3.0 or better.
- Graduate students in the MS program whose cumulative grade point average (excluding the summer semester) falls below 3.0 are placed on probationary status.

Students will be notified in writing of their probationary status. The periods of probation extends to the end of the next semester in which the student is enrolled (excluding summer semester).

Once a student is placed on probationary status they have one semester (excluding summer semester) to improve their grades. If their GPA remains below 3.0 for two consecutive semesters, the student's stipend will be suspended and the student will become responsible for tuition costs until the student's cumulative GPA is once again above 3.0. Decisions to reduce or terminate a student's stipend will be made on a case-by-case basis. The Graduate Academic Affairs Committee, the thesis advisor, and the department chair will consider all the factors that may have affected a student's performance before reaching such a decision.

If the student's GPA remains below 3.0 for more than two semesters, the advisor has the prerogative to immediately dismiss the student.

If the student's GPA falls below 2.33 for two consecutive semesters (including the summer semester), the student will be immediately dismissed without further warning in accordance with the policy of Graduate and Postdoctoral Studies guidelines for dismissal. Satisfactory/Unsatisfactory grades cannot be used to end probationary status. Students will be notified of their status once final grades have been received and posted in their records.

### **EVALUATIONS**

All MS students are evaluated using both student-generated progress reports and yearly evaluations by the student's advisor.

#### **Progress Reports**

The purpose of the progress report is to ensure that graduate students and their advisors are communicating regularly regarding the student's progress on thesis research and the students overall development. M.S. students are required to submit semiannual progress reports during the entirety of their graduate career. Submission of progress reports is one criteria used to determine satisfactory performance.

Reports are on a calendar year basis and cover the time frames, January to June and July to December. First year students are expected to complete a progress report for their first semester covering the time frame, August 16 to December 31.) Students submit progress reports using a standardized progress report form. The first section is to be completed electronically by the student who then submits the form electronically, along with an updated copy of their curriculum vitae to their advisor (and thesis committee if chosen) no later than January/July 15<sup>th</sup>. The advisor completes the second section and returns the form to the student electronically by January/July 25<sup>th</sup>. The student reviews the feedback and submits the form to the

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Bioengineering Office (BRC 1030) no later than January/July 31<sup>st</sup>. It is the student's responsibility to coordinate with their advisor to assure the progress report is submitted by the deadline.

### **TEACHING REQUIREMENT**

If the M.S. students receive departmental support during the MS study, the student must fulfill the teaching requirement as described in under *Teaching Requirement* for Ph.D. Candidates. If the student receives no departmental support the student is not required to fulfill a teaching requirement.

### **OPPORTUNITY FOR PRESENTATION OF RESEARCH**

Students are encouraged to discuss specific opportunities to present their research with their advisors. The GSA sponsors a Breakfast Club which offers an opportunity for peer reviewed research presentations. The department will provide additional opportunities for poster sessions during the year.

### **APPROVAL OF CANDIDACY AND FINAL ORAL PRESENTATION**

Candidacy marks the midpoint in the course of graduate education. Achieving candidacy of the MS signals that a graduate student has completed required course work and TA assignments, demonstrated the ability for clear oral and written communication and shown the ability to carry out scholarly work in his or her subject area.

### **Time Boundaries**

MS students must be approved for candidacy before the beginning of the fifth semester of their enrollment at Rice. Students will not be allowed to enroll in a graduate program after their fourth semester unless they have been approved for candidacy.

A student's individualized time boundaries are available in Esther. Students who are approaching candidacy or who have passed their deadline to candidacy and who have not met all requirements for candidacy by the beginning of the fifth semester of their enrollment, must request for an extension of candidacy. Extensions are approved on a case-by-case basis by Graduate and Postdoctoral Studies.

The Office of Graduate and Postdoctoral Studies will impose a \$125 reinstatement fee on students who are allowed to continue but who have exceeded their time boundaries without prior approval.

All M.S. students must submit a petition for approval of candidacy through the department chair to the Office of Graduate and Postdoctoral Studies. Students must file their applications before November 1 for December conferral and on or before February 1 for May conferral. In order to meet

departmental deadlines, petitions should be submitted to the department via the Academic Program Administrator at least one week prior to the deadlines listed above.

Students may take the final oral examination in defense of their thesis only after the dean of Graduate and Postdoctoral Studies approves their candidacy. Final approval of candidacy will come from the Associate Provost and is valid for two years.

After a student's candidacy has been approved and upon completion of his or her research project, the student must schedule, in coordination with his or her research advisor, a public oral examination of the defense of his or her thesis. Oral examination of the master's degree must be announced at least one week in advance. Oral examination announcements are to be submitted to the Office of Graduate and Postdoctoral Studies by entering the information into the Graduate Students Thesis Defense Announcement form at <http://events.rice.edu/rgs>. (Refer to the Graduate and Postdoctoral Studies website: <http://graduate.rice.edu/thesis/> for specific information regarding scheduling requirements.)

### **THESIS REQUIREMENTS**

The student must complete original work reported in a thesis and successfully defend his/her work in a public oral examination.

The thesis committee is composed of at least three members. Two members, including the committee chair, must be members of the Bioengineering faculty with their primary appointment in the Bioengineering Department (Adjunct faculty members do not fulfill this requirement.) The third member must be a faculty member whose primary appointment is in another department within the university.

Students must choose a Thesis Director and Committee Chair. The Committee Chair and Thesis Director need not be the same person; however, the Chair must be either a tenured or tenure-track member of the Bioengineering Department or a research faculty member of the Bioengineering Department. The Thesis Director should be the student's thesis advisor.

Additional members of the committee, who may or may not meet the above criteria, may be selected with the approval of the department chair. These members are in addition to the three required members.

The completed thesis must be submitted in either final or advanced draft form to the committee members at least one week before the thesis defense. A copy must also be provided to the department (BIOE academic program administrator) at least one week before the thesis defense. This copy may be submitted electronically to [ges2@rice.edu](mailto:ges2@rice.edu). In the course of the examination, the

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thesis committee members may recommend revisions or additions, which must be incorporated in the final thesis, which is then signed by all committee members.

Master's students must defend their thesis before the end of the eighth semester of their enrollment and complete the program within five years of initial enrollment. A student who does not meet these deadlines will be dropped from Rice.

#### **ACCEPTANCE OF THESIS**

No later than six months from the date of the examination, candidates who successfully passed the oral examination in defense of their thesis must submit their thesis to the Office of Graduate and Postdoctoral Studies. A student's thesis must be submitted electronically. Refer to the Graduate and Postdoctoral Studies website <http://graduate.rice.edu/thesis/> for specific instructions regarding how to submit the thesis.) Final approval of the thesis is by the Associate Provost.

M.S. students in the BIOE program are expected to complete their degrees in two to three years. Students must defend their thesis by the end of the eighth semester (not counting summers) of enrollment. Failure to defend by this time will result in the student being dropped from the graduate program.

#### **GRADUATION**

All degree candidates are also required to apply for degree conferral with the Office of the Registrar during the semester in which they wish to graduate. If students defend their thesis during the summer or fall semester (prior to the deadline), they should request their degree to be conferred in December. If the student defends during the spring semester (prior to the deadline), they should request spring degree conferral. Commencement happens only once per year. Students may participate in commencement if they defended after the thesis submission deadline for the prior year's commencement.

## PROFESSIONAL MASTER'S DEGREES: MASTER OF BIOENGINEERING

### APPLIED BIOENGINEERING TRACK

The Master of Bioengineering (MBE) Applied Bioengineering Track is a non-thesis degree that provides students with greater depth in their bioengineering training to advance their career objectives. Students may enroll on a full-time or part-time basis. It is expected that most student will complete their degree within two to four semesters.

The Applied Bioengineering track gives applicants the flexibility to craft their own curriculum depending on their interests and career goals. The Bioengineering department offers graduate-level courses in Biomaterials and Drug Delivery, Biomedical Imaging and Diagnostics, Computational and Theoretical Bioengineering, Tissue Engineering and Biomechanics, and Systems and Synthetic Biology.

All professional masters' students are required to complete their program within five years of initial enrollment. This time boundary includes any period in which the student was not enrolled or enrolled part time, for whatever reason.

Should MBE Applied Bioengineering students need academic guidance, please see the Director of the MBE program, Director of Graduate Study or the Chair of the Graduate Academic Affairs Committee.

### REQUIREMENTS

Requirements for the MBE degree include the successful completion of 30 credit hours of graduate level courses including:

All course work must be at the 500 level or above with the exception of the math course (see math requirements below).

- 15 credit hours of graduate level bioengineering courses,
- 9 credit hours of graduate level professional development electives chosen from a specific list of approved courses.
- 3 credit hours of graduate level general electives,
- 3 credit hours of a MATH, STAT, or CAAM course at the 400 level or above.

### CURRICULUM

Complete thirty (30) credit hours of courses including fifteen (15) Bioengineering graduate (500) level credit hours

Professional Development Electives: Nine (9) credit hours of professional development electives must be taken from the approved list of electives:

- BIOE/BIOC 594 – Responsible Conduct of Research
- BIOE 633 – Life Science Entrepreneurship or MGMT 734 – Technology Entrepreneurship
- ENGI 515 – Leading Teams and Innovation
- ENGI 505 – Engineering Project Management and Ethics
- ENGI 510 – Technical and Managerial Communications
- ENGI 523 – Engineering Economics
- ENGI 529 – Ethics and Engineering Leadership
- ENGI 545 – Structured Problem Solving
- ENGI 610 – Management for Science and Engineering
- BIOE 627 – Medical Technology Design Seminar 1
- BIOE 628 – Medical Technology Design Seminar 2

### General Elective

Three (3) credit hours of approved graduate level electives may be from another department in the School of Engineering, but must be relevant to the degree and approved by the MBE Program Committee in advance).

### Math Requirement

400 level or higher mathematics (MATH), statistics (STAT) or computational and applied mathematics (CAAM) course (3 credits). Exceptions:

- BIOE 439 is meant for undergraduates only and may not be used to meet the math requirement.

### Graduate Colloquia

MBE students are encouraged but not required to attend Graduate Colloquia (BIOE 698/BIOE 699). Since this course is graded on a satisfactory/unsatisfactory basis and cannot be counted toward the 30 required credit hours and official registration into course requires that students attend ALL lectures and meet all other course requirements, MBE students are discouraged from officially registering. These seminars are open to all students regardless of registration status, therefore, MBE students are invited to attend, as guests, all lectures of interest to them.

### BIOE 506

MBE students may take BIOE 506 (Graduate Independent Study) for a maximum of one to six (1-6) credit hours towards their MBE degree. Students interested in graduate independent study typically take 1-3 credit hours per semester. It is the student's responsibility to locate a faculty

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member willing to mentor them in the Independent Study course.

- The student must produce a final project in the form of a paper, design project, exam, or other project goals as defined by the instructor.
- BIOE 506 must be taken for a standard letter grade. MBE students may use internships to meet the requirements of BIOE 506.
- If the student is using an internship to fulfill the requirements of BIOE 506, the student must submit written proof of the internship offer, including the name and contact information of their supervisor, prior to the first day of the internship.
- The student must submit a Special Registration form plus an additional permission form providing mentor contact information, a brief description of the project, and approval of the student's advisor prior to enrolling in the course. Permission form may be obtained by emailing [ges2@rice.edu](mailto:ges2@rice.edu). Special Registration form should be submitted to the Registrar; with a copy of the registration form and the original permission form submitted to the BIOE Academic Program Administrator either in person or via email (PDF).
- It is the responsibility of the student to assure his or her mentor submits a grade for the course. If a grade is not received, the student will receive a grade of incomplete until the grade is received. If the grade is not received by the end deadline for resolving incomplete grades, the student will receive a failing grade.

#### **TRANSFER OF CREDIT**

- A minimum of 24 of the 30 required credit hours must be taken at Rice. Students may transfer a maximum of 6 credit hours from a different institution.
- The courses must be chosen from those that normally satisfy requirements for the advanced degree. No course can be used to satisfy both an undergraduate and graduate degree requirement.
- For specific instructions on how to transfer credits, refer to the "Transfer of Credit" in the general section of these guidelines.
- Students who completed their undergraduate degree at Rice within the last three years may petition the Graduate Academic Affairs Committee to allow up to 21 credit hours of graduate level courses taken as an undergraduate, which were not used to satisfy undergraduate degree requirements, to count toward their graduate degree. The courses must be chosen from those that normally satisfy requirements for the advanced degree. No course can be used to satisfy both an undergraduate and a graduate degree requirement.

#### **SATISFACTORY PROGRESS**

MBE students must maintain a cumulative GPA of 3.0 or higher.

Courses in which the student receives a grade below a B- (2.67) may not be used to fulfill the coursework requirement.

The Office of Graduate and Postdoctoral Studies requires that students be provided a written assessment of their academic progress at the end of each semester. In the case of MBE students, the student's transcript meets this requirement. Should a student wish a more detailed assessment they are encouraged to speak to their course instructors or Director of Graduate Study.

Graduate students in the MBE program whose cumulative grade point average falls below 3.0 are placed on probationary status. The department will notify students in writing of their probationary status.

The period of probation extends to the end of the next semester in which the student is enrolled. Once students are placed on probationary status, they have one semester to improve their grades. If the next semester again results in probationary status, (cumulative GPA less than 3.0 or two consecutive semesters below 3.0) the student may be dismissed from the program without further notice. Decisions regarding dismissal will be determined by the Director or Graduate Study with the approval of the Chair of the Department. Students whose GPA falls below 2.33 for two consecutive semesters (including the summer semester), will be immediately dismissed without further warning in accordance with the policy of Graduate and Postdoctoral Studies guidelines for dismissal.

Students will be notified of their status and/or dismissal once final grades have been received and posted to their records.

#### **GRADUATION**

All professional master's students are required to complete their program within five years of initial enrollment. This time boundary includes any period in which the student was not enrolled or enrolled part time, for whatever reason. All degree candidates are also required to apply for degree conferral with the Office of the Registrar during the semester in which they wish to graduate. Commencement is held during spring semester only. Students who complete their degrees in the summer or fall semester may participate in commencement the following spring. Degree conferrals take place in May, August, and December.

## GLOBAL MEDICAL INNOVATION TRACK

As the medical technology industry becomes increasingly global with an emphasis in cost-effective health care solutions and clinical outcomes, Rice University seeks to prepare engineers for this new and changing environment.

The MBE Global Medical Innovation track will prepare engineers for careers in medical technology through education in innovation, emerging-market design projects and internships.

The Rice MBE track in Global Medical Innovation program specifically targets students who have an undergraduate degree in engineering (mechanical, electrical, chemical, or bioengineering/medical) or a related field, and who are interested in pursuing a career in the private, public, or non-profit sectors of medical technology.

### CURRICULUM

The GMI track curriculum consists of:

- 6 credit hours of Medical Technology Design (BIOE 527, 529)
- 6 credit hours of Medical Technology Implementation (BIOE 528, 530)
- 3 credit hours of industry seminar series (BIOE 627 and 628)
- 6 credit hours of an internship or independent study course, which may be completed during the summer (BIOE 600), or during the fall and spring semesters (BIOE 506). This will be considered on a case-by-case basis, and the student is responsible for obtaining and selecting an internship that best aligns with their career goals.
- 3 credit hours of a graduate level professional development elective chosen from a specific list of approved courses
- 3 credit hours of a graduate-level MATH, CAAM, or STAT elective (400 level courses may be considered, BIOE 539 may count toward this requirement), and
- 3 credit hours of a graduate-level BIOE elective.
- All students must maintain an average GPA of 3.20 or higher.

### Transfer of Credit

A minimum of 24 of the 30 required credit hours must be taken at Rice. The courses must be chosen from those that normally satisfy requirements for the advanced degree. No

course can be used to satisfy both an undergraduate and graduate degree requirement.

Student in the GMI track may transfer a maximum of 6 credit hours from a different institution to meet the math or elective requirement only.

Students may not transfer credits to substitute for BIOE 527, 528, 529, 530, 627, or 628, .

Transfer of credit must follow institution guidelines. To obtain transfer of credit, the procedure below must be followed:

- Refer to the “Transfer Credit” section of the general guidelines to assure you meet these requirements.
- Find the Rice course most aligned with the course you wish to transfer. Provide a description and, if available, the syllabus of the course to the instructor teaching the possible equivalent Rice course and request the instructor evaluate the course to determine if the course you wish to transfer is equivalent to the Rice course.
- Complete the Request of Transfer Credit form (found at register.rice.edu.). Attach the decision of the instructor and submit both for consideration by the Director of the Global Medical Innovation track of the MBE program. A copy of the petition must be submitted to the GMI track coordinator and the BIOE Academic Program Administrator, the Director of the Global Medical Innovation track of the MBE program will make the decision regarding departmental approval. If he determines the courses are equivalent, the Transfer of Credit form will be approved and returned to the student who may then submit it to the Office of the Registrar.
- Request that the institution from which you received credit send a copy of your transcript directly to the Office of the Registrar.

### Graduate Colloquia

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### **SATISFACTORY PROGRESS**

MBE-GMI students must maintain a cumulative GPA of 3.20 or higher.

Courses in which the student receives a grade below a B- (2.67) may not be used to fulfill the coursework requirement.

The Office of Graduate and Postdoctoral Studies requires that students be provided a written assessment of their academic progress at the end of each semester. In the case of MBE students, the student's transcript meets this requirement. Should a student wish a more detailed assessment they are encouraged to speak to their course instructors, the Director of the MBE Global Medical Innovation track, or the Director of Graduate Study. Graduate students in the MBE-GMI program whose cumulative grade point average falls below 3.20 are placed on probationary status. The department will notify students in writing of their probationary status.

The period of probation extends to the end of the next semester in which the student is enrolled. Once students are placed on probationary status, they have one semester to improve their grades. If the next semester again results in probationary status, (cumulative GPA less than 3.20) the student may be dismissed from the program without further notice. Decisions regarding dismissal will be determined by the Director of the MBE Global Medical Innovation track of

the MBE program in consultation with the Director of Graduate Study, and with the approval of the Chair.

Students whose GPA falls below 2.33 for two consecutive semesters (including the summer semester), will be immediately dismissed without further warning in accordance with the policy of Graduate and Postdoctoral Studies guidelines for dismissal.

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