



Carnegie Mellon University
Mellon College of Science
Biological Sciences

M.S. in Biotechnology and Pharmaceutical Engineering

Student Handbook 2025–2026

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WELCOME

The directors and assistant directors of the Master of Science in Biotechnology and Pharmaceutical Engineering (MSBTPE) program, a joint offering from the Biological Sciences and Chemical Engineering Departments, would like to welcome you to the program and Carnegie Mellon University. The handbook will explain the MSBTPE program policies to students.

While this handbook is specific to your academic experience in the MSBTPE program, it is just one element of the [Graduate Student Handbook Suite](#). There are several other resources within the suite that you should consult when needed:

- [University-Wide Graduate Student Handbook \(Office of Graduate & Postdoctoral Affairs\)](#) (this is only for graduate students at CMU and covers academic and administrative policies at the university level)
- [The Word Student Handbook](#) (this is for all CMU students - undergraduates and graduates and focuses on university-wide policies that affect student life (student rights and responsibilities, community standards, and the student code of conduct, etc.)

MSBTPE MISSION STATEMENT

The MSBTPE program seeks to train the world's best Biotechnologists, Pharmaceutical Engineers, and Bioprocess Engineers at the master's level. The curriculum provides both breadth and depth of training in Biotechnology and Pharmaceutical Engineering. Interested students are also given opportunities to pursue research. Our graduates are prepared for rewarding jobs in industry or to pursue their doctoral degrees at top universities.

INTRODUCTION

Biological Sciences and the Chemical Engineering Departments have prepared this statement of policies and procedures to help answer questions that students may have as they enter the M.S. in Biotechnology and Pharmaceutical Engineering (MSBTPE) program. This document specifies the requirements for achieving good standing as a student; failure to meet any of these requirements may result in dismissal from the program.

The MSBTPE Steering Committee and Graduate Programs Offices in both departments provide ongoing guidance and support to students throughout their graduate careers. Your questions or concerns may be discussed with either the faculty of the MSBTPE Steering Committee or the Department Heads.

PROGRAM CONTACTS

MSBTPE STEERING COMMITTEE FACULTY

Whom to contact for what?

Co-director, MSBTPE, Biological Sciences

*Overall Program Management, Academic Integrity
Issues, Leave of Absence Approval*

Jonathan Minden, Ph.D.
MI 279
412-268-2669
minden@cmu.edu

Co-director, MSBTPE, Chemical Engineering

*Overall Program Management, Academic Integrity
Issues, Leave of Absence Approval*

James Schneider, Ph.D.
DH 3121
412-268-4394
schneider@cmu.edu

Assistant Director (Professional Issues), MSBTPE,
Biological Sciences

*International Student Issues, Oral Communication Skills,
Alumni Networking, Bioprocessing Optimization,
Entrepreneurship, Regulatory Compliance and Social
Events, Career Center and Industry Liaison, Diploma
Ceremony, Overall Program Management, CPT & OPT
authorization*

DJ Brasier, Ph.D.
MI 415A
412-268-1951
dbrasier@cmu.edu

Assistant Director (Academic Advising), MSBPTE,
Biological Sciences

*Academic Advising and Course Selection, Periodic
Academic Progress Checks, Change to P/F, Research
for Credit, Graduation Certifications, Student Life Issues,
Oral Communication Skills, Alumni Networking, Social
Events*

Natalie McGuier, Ph.D.
MI 315A/DH 2108
412-268-3543
nmcguier@cmu.edu

PROGRAM FACULTY

[Chemical Engineering Program Faculty link](#)

[Biological Sciences Program Faculty link](#)

PRIMARY SUPPORT STAFF

Director of Graduate Operations
(Biological Sciences Graduate Programs Office)

*Graduate Student Database Management, Pre- and Post-
Admission Procedures through Graduation, Biological
Sciences Graduate Ombudsperson, Graduation
Certifications, Diploma Ceremony, Orientation
Coordination*

Ena Miceli
MI 415
412-268-3012
emiceli@andrew.cmu.edu

Administrative Coordinator
(Chemical Engineering Department Academic Programs
Office)

*DH MSBTPE building access and Chemical Engineering
faculty contact support*

Janet Latini
DH 1107
412-268-2230
jlatini@andrew.cmu.edu

OTHER SUPPORT STAFF

Communications Manager (BSC)

Matthew Salyers
MI 413A
412-268-6358
msalyers@andrew.cmu.edu

IT Support Consultant (BSC)

Ryan Parrotte
MI 411J
412-268-4535
ryanpar@andrew.cmu.edu

DEPARTMENTAL LEVEL CONTACTS

Interim Department Head, Biological Sciences Department	Gordon Rule, Ph.D. MI 246 412-268-1839 rule@andrew.cmu.edu
Department Head, Chemical Engineering Department	Carl Laird, Ph.D. DH 4210C claird@andrew.cmu.edu
Business Manager (BSC)	Amy Kapp MI 410 412-268-4182 akapp@andrew.cmu.edu

COLLEGE LEVEL CONTACTS

Dean, Mellon College of Science	Barb Shinn-Cunningham, Ph.D. 412-268-1789 mcsdean@andrew.cmu.edu
Dean, College of Engineering	William Sanders, Ph.D. sanders@cmu.edu
Associate Dean for Graduate Students, Mellon College of Science	Dejan Slepčev Associate Dean for Faculty and Graduate Affairs; Professor, Mathematical Sciences
Associate Dean for Community Engagement Mellon College of Science	Michael Young, Ph.D. 6122 Wean Hall 412-268-2545 michaely@andrew.cmu.edu
Associate Dean for Graduate and Faculty Affairs, College of Engineering	Lisa Porter, Ph.D. 145 Engineering Hall 412-268-4047 lporter@andrew.cmu.edu

UNIVERSITY LEVEL CONTACTS

Graduate Student Ombudsperson

Students may confer with the university graduate student ombudsperson on issues of process or other concerns as they navigate conflicts

5000 Forbes Ave

412-268-1018

ombudsperson@andrew.cmu.edu

Student Affairs Liaison

Supporting students to manage mental and physical health and other personal issues, including finding appropriate resources and help managing impact on coursework and life outside of classes.

John Hannon, Ph.D.

Warner Hall 300

412-268-2139

jfhannon@andrew.cmu.edu

SECTION 1. DEGREE ATTAINMENT

COURSES AND GRADES

COURSEWORK

Before beginning courses, all students must satisfactorily complete an academic integrity instructional module, as proscribed by the Steering Committee.

University's complete [Schedule of Classes](#)

To receive the M.S. degree, students must complete these requirements:

- A. At least 108 units of coursework, which includes courses in specific categories as listed below
- B. Average grade of B or above (GPA = 3.0) in those 108 or more units counted toward degree certification
- C. Minimum grade of a C or above (GPA = 2.0) in any course that shall count towards degree certification
- D. Full-time course registration (at least 36 units) for each semester in the program

Coursework consists of:

A) Foundation Courses (39-57 units)

Minimum C grade in each course counted toward graduation

- **03-622** Modern Biology (Fall, 9 units)
- **03-709** Applied Cell and Molecular Biology (Fall, 12 units)
- **03-604** Professional Skills (Fall, 3 units)
- **06-621** Material Balances in Bioprocesses (Fall, 9 units)
- **06-685** Bioseparations and Bioprocess Analytical Technologies (Spring, 12 units)
- **06-722** Bioprocess Design (Fall, 12 units)
- **03-776-A3** Molecular Techniques for Bioprocessing (Spring, 6 units)
- **06-775-A4** Analytical Techniques for Bioprocessing (Spring, 6 units)

The MSBTPE Steering Committee may waive 03-622 and/or 06-621. To have a course waived, the student must demonstrate proficiency in the course topics through a placement exam or an interview with an instructor. Placement exams may be offered before the start of the fall semester. If a student misses a placement exam due to illness or immigration delays, they must contact the committee before the start of classes to schedule a time to take the exam(s) before the end of the first week of classes. Because the total number of units required to graduate is 108, students who waive more than 9 units of foundation course must add a corresponding number of required depth course units (see below). This preserves the degree requirement at 108 units. Students who place out of a foundation course should take an appropriate course approved by the Steering Committee.

Note: The Professional Skills course should be taken during a student's **first semester**. This Pass/Fail course must be passed to complete the MSBTPE degree.

B) Elective Biological Science Courses (at least 24 units)

At least 24 units of graduate-level elective courses must be taken from Biological Sciences, 03-XXX listed

courses.

C) Elective Chemical Engineering Courses (at least 12 units)

At least 12 units of graduate-level elective courses must be taken from Chemical Engineering, 06-XXX listed courses.

D) Additional Graduate-Level Elective Course (12-21 units)

Additional Graduate-Level Elective Courses (12-21 units – depending on whether more than 9 units of foundation courses are waived, see above)

These may be courses from either the Biological Sciences or the Chemical Engineering departments. Other department courses may be used with permission from the Academic Advisor.

For A, B, C, and D above, there is a Minimum C grade in each course counted toward graduation.

Also, students should note that many courses (including some from host departments) require prerequisite knowledge. Students should consult with their Academic Advisor for all course information.

Other notes:

- **Course 42-684**
 - 42-684, Principles of Immunoengineering and Development of Immunotherapy Drugs, may be counted as a Chemical Engineering (06-XXX) elective if the course is not otherwise offered under a 06-XXX course number.
- **Research**
 - Up to 12 units of research (06-600 or 03-699) with a faculty advisor may be counted toward the depth credits. Research should be approved by the Assistant Director (Academic Advising). Research taken as 06-600 or 06-700 will count toward the Chemical Engineering (06-XXX) requirement in the depth category; research taken as 03-699 or 03-700 will count as biology 03-XXX depth coursework. Students may take as many units of research credit as they wish, and all units will be reflected on their transcripts. However, a maximum of 12 units of 600-level research (06-600 and/or 03-699) can count toward graduation.
- **Honors Thesis**
 - Students who write an honors thesis (see "Graduation Honors and Awards") may enroll in 03-700 or 06-700. Students require written approval from the full MSBTPE Steering Committee to enroll in these courses. Students may take as many units of thesis research credit as they like, and all units will be shown on the transcript. However, a maximum of 12 units of thesis research (06-700 and/or 03-700) can count toward graduation (in addition to the 12 units of 600-level research, which can be counted).
- **Unlisted Courses**
 - Any course not listed above will need **written approval** from the Assistant Director (Academic Advising). Course requests will be evaluated based on relevance to program educational goals and absence of equivalent pre-approved courses.

- **CMU Undergraduate Students**

- CMU undergraduate students enrolling for a continuing M.S. can use relevant courses from their undergraduate years to count toward the M.S. degree. The courses used toward an M.S. degree CANNOT be counted toward undergraduate degree certification. Undergraduate degree advisors need to verify and sign the [Declaration of Carry-Over Credit form**](#) confirming no double counting.

Important Coursework Rules

- All student course selections are subject to the approval of the MSBTPE Steering Committee.

First Semester

- All coursework must count toward degree completion. Any exceptions require written permission from the Assistant Director for Academics.
- Students may not audit a course during their first semester of the program.

Second Semester

- Students must enroll in 36 units of coursework.
- Every course requires written permission from the Assistant Director for Academics.
- Students may take additional courses that don't count toward the degree. Exceptions require approval of the Assistant Director for Academics.

Third Semester

- All course requirements must be fulfilled by the end of the students' third semester.
- In addition to completing all remaining degree requirements, students may take other courses that don't count toward their degree with permission from the Assistant Director for Academics.

Enrollment Status

- Students must maintain full-time enrollment in the program (minimum 36 units per semester - the only exception allowed is if CMU Student Affairs and/or a medical provider request that a student be allowed to take a reduced course load).

Internships

- If a student completes a Biotechnology and Pharmaceutical Engineering internship, then they may receive three units of depth credit for each term for (03-690A).

COURSE REGISTRATION

In the first fall semester, students are pre-enrolled for the foundation courses. In subsequent semesters, students register online for their classes; information is available at www.cmu.edu/hub/registration. Students register online at www.cmu.edu/hub/sio with an Andrew ID.

- Students must register for at least 36 units per semester to be full-time
- Students are advised to take no more than 48 units in any semester.
- Students who need assistance registering for oversubscribed courses in the Mellon College of Science should contact the Assistant Director (Academic Advising); students who need assistance in registering for oversubscribed classes in the School of Computer Science should contact the Assistant Director of Internship and Job Placement.

CHANGING PROGRAMS & MULTIPLE ENROLLMENTS

If an MSBTPE student accepts another program's offer to begin before matriculation in the MSBTPE program, the MSBTPE committee reserves the right to nullify the MSBTPE offer.

Additionally, our program is a full time program and we reserve the right to disallow students from simultaneous enrollment in a second MS program.

GRADES & ACADEMIC STANDING

To be in good academic standing, a student must maintain a B average (GPA = 3.0) in the coursework that will be counted towards the degree. No grade lower than C in any courses shall be used for completion of degree requirements.

PROGRAM ACADEMIC PROBATION

Suppose the MSBTPE Steering Committee determines that a student is making inadequate progress. In that case, it will notify the student in writing of the deficiencies and the consequences of failing to correct them. Any student whose cumulative QPA is at or below 3.0 or otherwise not making satisfactory progress toward their degree, at any time during or at the end of the semester, will receive a letter from the program placing them on academic probation. Under most circumstances, students will be given one semester to earn a B average in the courses to be counted toward the degree. Students who don't earn the minimum required grades in any class (C or higher in classes counting toward the degree) will also be placed on academic probation. Academic probation will end only when the student returns to a B average and fulfills the other requirements laid out in the terms of their probation. Failure to return to good academic standing after one semester will result in dismissal from the program or other actions as decided upon by the Steering Committee.

ACADEMIC INTEGRITY FOR PROGRAM

BTPE course instructors set specific policies for every assignment in their course. Instructors typically state in their syllabus what types of collaboration are allowed or not allowed on different assignments. However, **students are responsible** for making sure they understand what kind of collaboration is allowed or not. If you are not 100% certain about what is permitted on an assignment, do not start working on it until you have contacted the instructor to clarify. Unintentional violations of course policy **are treated as violations of academic integrity** and can result in course-level and program-level penalties.

In addition to any course-level actions taken by instructors (e.g., giving the student a failing grade on the assignment or failing the entire course without the option to withdraw), the program co-directors will impose penalties for academic integrity violations. Program level consequences may include any or all of the following: probation (see "Grades" below); suspension for one or more semesters;

dismissal from the program; required additional training on academic integrity; or other action as decided upon by the administration of the program.

The program administration will determine the consequences for violations of academic integrity or other program policies on a case-by-case basis, considering a variety of different factors, including:

- The severity of the violation, including factors such as the number of assignments in question, the weight of those assignments in the course, the type of violation, fraction of the assignment in question that violated course policy, overall impact of the violation on the academic environment in the course, impact of the violation on the academic environment in the program and university in general, and other factors determined by the two program co-directors.
- Whether a student has had an academic integrity violation in the past
- Lying about the facts of the violation or fabricating evidence to cover up a violation

In most cases, two violations (and in some cases, a single violation that is severe or when the student lies about the facts of the case) are grounds for dismissal from the MSBTPE program.

Students may appeal whether a violation occurred and course and/or program level outcomes following University procedures: <http://www.cmu.edu/academic-integrity>.

Note that university policies about academic integrity are subject to change, and students should review current procedures each semester.

SECTION 2: ACADEMIC ADVISING

ORIENTATION

For incoming graduate students, there are two orientations. Both events occur in the weeks preceding the start of the fall semester.

The University-wide orientation, organized by the Office of Graduate Education and Postdoctoral Affairs, introduces students to university resources and services, including information on activities to do before and after arrival on campus, resources for living in Pittsburgh, and key dates and deadlines.

The Departmental Orientation introduces them to departmental faculty, research, administration, policies, and services.

ADVISING FOR COURSEWORK

Before each semester, each student must submit their plan for the coming semester to the MSBTPE Steering Committee. All changes must be approved by the Assistant Director (Academics).

ADVISING FOR PROFESSIONAL DEVELOPMENT

As part of 03-604, students will have opportunities to develop their professional skills during their first semester. In subsequent semesters, students are encouraged to meet with the Assistant Director (Internship and Job Placement) to advise on further professional development.

MONITORING PROGRESS

Students with specific concerns about their progress are urged to speak with the Assistant Director (Academic Advising) as early as possible. The Assistant Director (Academic Advising) and members of the MSBTPE Steering Committee meet with the student at least twice a year, providing guidance and monitoring the student's overall progress. In addition, the Assistant Director (Academic Advising) meets with the student as and when needed to discuss progress and resolve issues.

NOTIFICATION AND CONSEQUENCES OF INADEQUATE PROGRESS TOWARD THE DEGREE

Suppose the MSBTPE Steering Committee determines that a student is not making adequate progress. In that case, it will notify the student in writing of the deficiencies and the consequences of failing to correct them. Any student whose QPA is at or below 2.0 after one term or 2.5 after two or more terms is placed on academic probation. The probation terms include conditions that must be met to be removed from probationary status, and consequences for not meeting these terms will be outlined in the probation letter. The committee and the student will then formulate a plan to address those deficiencies, including milestones. Consequences of continued failure to make satisfactory progress or not being in good academic standing will be determined by the Steering Committee.

STUDENT RIGHTS IN ACADEMIC CONFLICTS

A student wishing to appeal a departmental disciplinary decision should first speak with the faculty member directly involved in the decision. A student who is uncomfortable approaching the faculty

member may discuss the matter with the Director of Graduate Operations (Biological Sciences Graduate Programs Office), who serves as the Graduate Ombudsperson for Biological Sciences. Suppose the conflict cannot be resolved on this level. In that case, the student is referred to the Program Co-Directors or the relevant Department Head(s) who may, with the student's permission, meet with both the student and the faculty member involved. The student may also continue to meet with the Director of Graduate Operations (Biological Sciences Graduate Programs Office), who serves as the Graduate Ombudsperson for Biological Sciences.

The student may also meet with the MCS Ombudsperson. The Mellon College of Science Grievance Procedures are available at <http://www.cmu.edu/mcs/policies/grievance.html>.

A student not satisfied with the achieved resolution may file a formal written appeal to both the Associate Dean for Graduate Affairs and the Dean of the Mellon College of Science. The policies and procedures governing this process are explained in The Word/Student Handbook section entitled "Academic Standards and Actions."

SECTION 3: PROFESSIONAL DEVELOPMENT, RESEARCH, AND INTERNSHIPS

PROFESSIONAL SKILLS COURSE

Professional Skills (06-604) meets weekly. This course offers students the opportunity to learn about available resources on campus and outside, share knowledge, and hone their professional skills. The primary goal is to position students for an on-time graduation and to empower students with the important tools necessary to find an internship, secure a job, or pursue a Ph.D.

All students will need to register for 06-604, a 3-unit course, and complete it with a passing grade during their first semester. This course contributes towards the units for graduation certification and the 36 units required for a student to be considered full-time. As a pass/fail course, it is not factored into a student's QPA. NOTE: This is the only course that a student may count toward graduation with a "pass" grade aside from 3 more units of seminar (next section), which may count toward depth.

SEMINARS, INVITED TALKS, AND JOURNAL CLUB

Each semester, all students may register for and attend the weekly seminars (*Graduate Research Seminar 03-655*, 1 unit; and/or *Graduate Seminar 06-800*, 1 unit). Graduate students are strongly urged to meet the speakers to broaden their knowledge of cutting-edge science and to make valuable contacts; the faculty host can arrange individual or small group meetings for interested students.

Note: The above seminar courses are pass/fail; however, students may apply up to 3 units of seminars toward the graduation units. These courses are very beneficial for current research and networking. We encourage students to enroll in these courses, particularly if they are interested in pursuing a Ph.D. or other advanced degree.

Invited talks from outside speakers and alumni are arranged throughout the year. The talks will be announced via email and listed on the departmental calendar, located on the Bio Sci webpage.

RESEARCH

Students interested in conducting research for academic credit take *M.S. Thesis Research 03-700 or 06-600*, under the guidance of a Biological Sciences faculty mentor or a Chemical Engineering faculty mentor, respectively.

- Up to 12 units of 06-600 or 03-700 may be counted toward the degree without written approval from the MSBTPE advising committee.
- Students may be eligible for "Research Honors."

Typically, students contact faculty directly to learn about available research opportunities. To register for this class, please contact the Assistant Directors (Academic Advising & Internship), who will assist with registration.

Students are strongly advised to wait until their second semester to begin research.

Some faculty members may be willing to pay for research assistantships. You can receive either research credit or pay for research in a given semester, but not both.

Summer research in a lab requires you to either be paid (as a CMU employee) or to register for a course. Most students prefer to be employed, but if you want to get course credit for summer research, please ask the program advisors.

INTERNSHIPS

Students often secure internships in industry or academia during the summer between their first and second years and less often during the academic year. The internship must be relevant to Biotechnology and Pharmaceutical Engineering. Students must contact the Assistant Director (Internships and Job Placement) in late fall to plan an internship.

REGISTRATION FOR INTERNSHIPS

- **Summer off-campus internships:** Register for **03- 600R** (3 units, no tuition).
- **Fall or spring internships:** Register for **03-600A** (3 units, tuition charged).
- **Paid on-campus summer research:** Also register for **03-600R** after discussing with the Assistant Director.

Important: Written approval is required from the Assistant Director before registering for 03-600R or 03-600A.

International students

If doing a **paid summer internship off-campus**, you must apply for:

- **CPT** (Curricular Practical Training) or
- **Pre-Completion OPT** (Optional Practical Training)
— through the **Office of International Education (OIE)**.
- You are **not eligible for CPT** until the summer after your **first full academic year**.
- The internship must be relevant to your program.

For **CPT**, you'll need:

- An **offer letter** with dates, hours, and pay
- **Approval from the Assistant Director**
- **CPT is faster** to process. **OPT can take up to 90 days to process.**
- **Do not accept or sign an offer** until you have checked with **OIE** and the **Assistant Director**.

SUMMER COURSES

Students registering for summer courses must pay summer tuition (including *Biotechnology and Pharmaceutical Engineering Internship 03-690*). Before registering for these summer courses, students should check with Assistant Directors about tuition.

ENGLISH LANGUAGE PROFICIENCY

Graduate students are required to have a certain level of fluency in English before they can instruct in Pennsylvania, as required by the English Fluency in Higher Education Act of 1990. Through this Act, all higher education institutions in the state are required to evaluate and certify the English fluency of all instructional personnel, including teaching assistants and interns. The full university policy can be reviewed at: <https://www.cmu.edu/policies/faculty/evaluation-certification-english-fluency-instructors.html>.

Language Support in the Student Academic Success Center will rate the fluency of all instructional personnel to determine at what level of responsibility the student can T.A. Language Support in the Student Academic Success Center helps T. A.s who are non-native English speakers develop fluency and cultural understanding to teach successfully at Carnegie Mellon. Visit the Student Academic Success Center website for additional information: <https://www.cmu.edu/student-success/>.

Because the Department of Biological Sciences believes that excellent English skills are essential, we strongly recommend that students whose native language is not English achieve a PASS by the end of their second year.

PASS/FAIL COURSES

Students may elect to take a course Pass/Fail, with a petition and **approval** from the Assistant Director (Academic Advising). Pass/Fail courses are strongly discouraged and are not counted toward the degree in the student's program of study. Such a petition must provide a compelling reason for taking a course Pass/Fail and defend why that will not impact the student's program of study (i.e., a medical hardship in completing a course).

Taking a course for credit indicates an intellectual commitment to the material and may be viewed more positively by other professors and potential employers than a Pass. Potential employers gain more information about a student's ability from seeing a letter grade on a transcript than from a P. Except for 06-602 Bioprocessing Optimization, Entrepreneurship, and Regulatory Compliance in Biotechnology and Pharmaceutical Engineering, Pass/Fail courses cannot be used to satisfy any MSBTPE program requirements or to satisfy any prerequisites.

The student must complete the [Pass/Fail Approval Form](#)** during the registration ADD period (the first two weeks of each semester) and receive permission from the Assistant Director (Academic Advising) and the Department Head (Biological Sciences). Switching a course to Pass/Fail mid-semester will generally only be approved under special circumstances.

- Prerequisites may not be taken Pass/Fail.
- Classes taken Pass/Fail may not be used to fulfill graduation requirements, except for seminar courses and 06-604.
- Pass/Fail status is irrevocable.

TRANSFERRING COURSES

The MSBTPE program does not accept transfer credits.

CMU undergraduate degree holders, please refer to the **carry-over course** credit details.

SECTION 4: GRADUATION AND AWARDS

RESEARCH HONORS

The directors of the MSBTPE program confer awards for academic achievement, research honors, professional honors, and outstanding leadership at graduation. Students maintaining a GPA of 4.0 or higher will receive an award for academic achievement. Students with substantial research accomplishments, such as a publication or honors thesis, will receive an award for research achievement. Students who make substantial contributions to the MSBTPE community, such as serving as a GSA representative or organizing social events, will receive an award for leadership.

Suppose you are interested in completing a research-based thesis. In that case, you are required to: (1) complete 12 or more units of independent research study with a faculty advisor (with MSBTPE Advising committee approval), and (2) write and defend a master's thesis. If you satisfy the above requirements, you qualify for Research Honors.

Full research honors requirements are available from the Assistant Director (Academics). The final thesis should have the following sections:

1. Title page & Dedication/Acknowledgements
2. Abstract (1 page)
3. Introduction chapter (4 or more pages):
 - a. Separate from the introduction sections in other chapters
 - b. This is a place for the student to put the entire thesis in context
4. 1 or more additional chapters (20 or more pages each).
 - a. Chapter format should be consistent and may match the format of any journal article in the field of study.
5. Bibliography (pages are enumerated but do not count toward page total). This may be a standalone bibliography for the whole thesis, or each chapter may have its own bibliography.

GRADUATION CEREMONIES

MSBTPE students are certified for graduation by the Department of Biological Sciences in the Mellon College of Science.

Carnegie Mellon University holds graduation ceremonies in May only. Since there are no commencement ceremonies in August or December, we encourage students to participate in the May events. The Graduate Programs Office will contact students who graduate in December regarding commencement in February.

There are two May graduation ceremonies for the M.S. Biotechnology and Pharmaceutical Engineering program. The Master's Diploma Ceremony and Reception are held on Friday, Commencement weekend. The University Commencement is held on Sunday. Students who graduated the previous December and those receiving their degrees in May or August are eligible and strongly encouraged to participate.

SECTION 5: COMPLIANCE ISSUES

ENVIRONMENTAL HEALTH AND SAFETY TRAINING

Department of Biological Sciences BTPE graduate student must complete Laboratory Safety, Hazardous Waste Management, and Biological Safety training presented by Environmental Health & Safety during the Departmental Graduate Student Orientation. Graduate students must receive training before beginning regular coursework. Radiological Safety Training, Compressed Gas Cylinder Training, and Bloodborne Pathogen Training may be required.

ANIMAL TRAINING

Animal training is required for any individual listed on an animal protocol. Currently, training is offered through the University of Pittsburgh Animal Research Protection Office and All necessary approvals must be completed before research studies involving laboratory animals can begin.

For more information on training, please get in touch with the IACUC at 412-383-2008 or iacuc@pitt.edu.

Below are the contents of the [University-Wide Graduate Student Handbook \(Office of Graduate & Postdoctoral Affairs\)](#) (this is only for graduate students at CMU and covers academic and administrative policies at the university level).

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