Georgia Tech College of Engineering
School of Chemical and Biomolecular Engineering

Graduate Handbook

Revised: December 2025

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1. Introduction

The purpose of this handbook is to outline special regulations and policies relevant to the graduate programs in the School of Chemical & Biomolecular Engineering. Institute regulations and resources regarding graduate work at Georgia Tech can be found in the General Catalog available at http://www.catalog.gatech.edu, and the Office of Graduate and Postdoctoral Education at https://grad.gatech.edu/current-students.

2. Contact Information

If you have any questions or require further clarification regarding the contents of this handbook, please do not hesitate to reach out to the individuals listed below. They are available to provide additional information, guidance, or support to ensure you fully understand the policies, procedures, and expectations outlined within this document. We wish you every success in your graduate studies at ChBE!

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3. PhD Degree

The School of Chemical & Biomolecular Engineering offers programs of study leading to the degree of Doctor of Philosophy (PhD) in Chemical Engineering, PhD in Bioengineering, and PhD in Machine Learning. The degrees comprise research with a faculty advisor and coursework. PhD students are admitted directly into their PhD program and are classified as Graduate Research Assistants (GRAs), which means they are both students and Georgia Tech employees. The GT Graduate Student Employment Manual provides more detail on the nature of this employment.

Georgia Tech Graduate Student Employment Manual

The normal terms of support for GRA are contingent upon availability of funds and are based on satisfactory progress in coursework and research (discussed in the following sections). Students with external fellowships should notify the graduate office and see section 11 for more information.

MS degree students interested in moving to the PhD program should contact the ChBE Graduate Office.

The Institute requirements for the PhD degree are described in the General Catalog.

Requirements for the Doctoral Degree | Georgia Tech Catalog

3.1 Satisfactory progress for PhD students will be evaluated as follows:

(a) Satisfactory performance in a qualifying examination. Normally, this will be completed in the 2nd semester of residence.

(b) Submission of a satisfactory written thesis proposal and satisfactory oral defense of this proposal. This must be completed by the end of the 6th semester of residence. Failure to do so will also result in an "unsatisfactory" grade for research from which other consequences may follow (see Section 19 Dismissal Policy).

(c) Satisfactory completion of a Pre-Doctoral Review. This is generally completed at least 6 months before the dissertation defense. Failure to do so may also result in an "unsatisfactory" grade for research.

(d) Presentation of research results at the Fall Graduate Colloquium, normally in the beginning of the 4^{th} year.

(e) Submission of an acceptable dissertation, and satisfactory oral defense of this dissertation.

(f) Satisfactory completion of specified courses, including courses in a minor field of study.

(g) Satisfactory (S) grades in ChBE 9000 (research) credit hours.

These requirements are discussed more fully below. Additionally, a GT requirement for GRA employment is annual performance reviews by the thesis advisor.

3.2 PhD Oral Qualifying Examination

Students seeking a PhD degree in Chemical Engineering must pass the PhD qualifying examination, which is given twice a year - January and May. Students entering in the Fall semester must take the examination offered during the following January; students entering in the Spring or Summer semesters must take the examination by the following January. If a student does not take the PhD qualifying exam during the normal time period, they must complete the MS degree requirements and take the qualifying examination at the first opportunity after defending the MS thesis. A student failing the examination may retake the failed exam once, the next time that the exam is given.

The oral exam will require the student to review and critique a technical paper, which will be assigned to the student approximately one week before the exam. The student will be required to make a 10-minute oral critical analysis presentation of the paper at a scheduled time and to a committee of two or more faculty members. This will be followed by a question and answer session lasting no more than 45 minutes covering the paper and other fundamental aspects of chemical engineering, including Material and Energy Balances, Thermodynamics, Fluid Mechanics, Heat Transfer, Mass Transfer, Separations, Reactor Design, and Chemical Kinetics and Catalysis.

Students seeking a PhD in Bioengineering or Machine Learning take a different qualifying exam given by the faculty of the Bioengineering Program and Machine Learning Program, respectively.

3.3 Thesis Proposal and Oral Defense

The thesis proposal must be presented in writing to the Thesis Advisory Committee and must include the following:

- objectives and specific aims of the research
- thorough but concise review of the relevant literature
- significance of the proposed work and its scientific and societal impact
- preliminary work
- outline of the proposed methodology, risks associated with completion of the aims, and strategies to mitigate such risks
- timetable for completion of the thesis

The proposal should be **between 10 and 20 pages in length (single spaced, 12 point font, 1 inch margins, including Figures and Tables). A one page abstract is also required, as well as appropriate references (not subject to the page limit).**

The proposal must be defended orally before the Thesis Advisory Committee, whose members must receive the written proposal no later than two weeks prior to the oral examination. The student must also circulate to faculty and graduate students (via the Graduate Office) an announcement of the time and place of the thesis proposal defense.

This must be done at least two weeks prior the date of the defense. **The defense will consist of an oral presentation (~ 20 min) by the student**, followed by a question and answer session. The subject matter of the oral defense will be based on, but is not limited to, the research proposal.

The Thesis Advisory Committee will consist of the thesis advisor and at least four other members with knowledge of the research area. At least three committee members must be members of the School of Chemical & Biomolecular Engineering faculty, and at least one committee member must be a member of the faculty of another academic unit at Georgia Tech. BioEngineering and Machine Learning PhD students should refer to those programs for committee composition requirements.

In the case where a student has at least three co-advisors, a sixth committee member is required, and at least one of the non-advisor committee members must be a member of the School of Chemical & Biomolecular Engineering faculty. Given the additional scheduling constraints imposed by having a sixth committee member, the expectation that all committee members must participate in the thesis proposal defense is relaxed such that only five committee members must participate; of those five, at least three should be non-advisor committee members, even if this precludes all advisors from participating.

The Associate Chair must approve any non-GT faculty members of the Thesis Advisory Committee. A brief resume must be submitted to the Associate Chair for any committee member who is not a Georgia Tech faculty member at least 30 days prior to the proposal date.

The thesis proposal defense must be completed **no later than the end of the sixth semester at Georgia Tech. It is recommended that students who start in the fall complete their defense by end of the fifth semester to avoid scheduling issues during summer semester.** Possible outcomes of the proposal defense are pass, pass with conditions (such as modification of the proposal document or follow up presentation including new information, etc.), or fail (the committee decides whether a retake is to be allowed).

3.4 Admission to Candidacy

Four elements are required for admission to PhD Candidacy:

Part I Oral Qualifying Examination: A student must pass the exam on their first or second try. See Section 3.2 for more details.

Part II Thesis Proposal and Oral Defense: A student must pass the proposal defense. See Section 3.3 for more details.

Part III Research Evaluation: A satisfactory evaluation of the student's research progress and potential, performed by the research advisor, must be maintained (grade of "S" in ChBE 9000).

Part IV Course Work: An average GPA of 3.2 is required in core courses (ChBE 6100, 6200, 6260, 6300, 6500).

After successful completion of these elements, the student must file with the Graduate Office a formal statement (Request for Admission to PhD Candidacy) naming the Thesis Advisor and Thesis Advisory Committee, and setting forth the topic selected for research. After the Associate Chair and Dean of the Division of Graduate Studies have signed, the applicant to be formally admitted to PhD Candidacy.

3.5 Thesis Research

The thesis research must represent a significant contribution to fundamental knowledge in the field of Chemical & Biomolecular Engineering, and be publishable in a peer-reviewed research journal in the field. The student and their thesis advisor will normally formulate the thesis topic. The thesis advisor must be a member of the academic faculty of the School. In some cases, the student may conduct their thesis research under an advisor from another School. In this case, the student must have a Chemical & Biomolecular Engineering faculty member as a thesis co-advisor.

The committee's purpose is to help guide the student and their research; committee members can also serve as mentors or advocates for the student. Students are strongly encouraged to engage with their committee once per year, such as a single committee meeting, sharing a research product with the committee (e.g. published paper), or meeting one-on-one with committee members.

3.6 Course Requirements

PhD students in Chemical & Biomolecular Engineering must successfully complete the following courses (or their equivalents) with an average cumulative GPA of 3.0 or higher:

	Credits
ChBE 6001 Introduction to Research	1
ChBE 6003 Chemical Process Safety	1
ChBE 6100 Advanced Chemical Engineering Thermodynamics	3
ChBE 6200 Advanced Transport Phenomena, Fluid Mechanics, and Heat	3
ChBE 6260 Transport Phenomena-Mass Transfer	3
ChBE 6300 Kinetics and Reactor Design	3
ChBE 6500 Mathematical Modeling and Analysis of Chemical Processes	3
ChBE 6xxx ChBE Elective	3
Courses in Doctoral Minor field of study (see below)	9

The ChBE elective is a 6000 or higher level course in ChBE, separate from other degree requirements such as the Doctoral Minor.
Some electives outside of ChBE require permits from the school offering the course. See the ChBE Graduate Office if you need assistance.

Requirements for the PhD degree in Bioengineering are outlined on the website of the Bioengineering program: https://bioengineering.gatech.edu/index.php/prospective-students and for Machine Learning PhD students: https://ml.gatech.edu/phd/curriculum-overview

For all PhD programs within the School of Chemical & Biomolecular Engineering, the Associate Chair for Graduate Studies may waive up to three of the required ChBE core courses for students who have received an MS degree in Chemical Engineering. See also Transfer of Credit, section 8.

Note: In addition to degree-required courses listed above PhD students will also register for ChBE 9000 (thesis research), ChBE 8001/8002 (fall/spring seminar), CETL 8000 (spring first year), and ChBE 8902 (only when in teaching practicum) as part of program degree requirements. More info on each of these are in different sections of the handbook.

Doctoral Minor requirements: All students are required to demonstrate a mastery of some body of knowledge **outside their major**. This area of study is referred to as a minor program of study. The Doctoral Minor should consist of at least nine semester hours of work in related, cohesive courses chosen in consultation with the thesis advisor. The courses should be offered by Schools other than Chemical & Biomolecular Engineering (cross-listed courses offered by the School are acceptable, exception is made for courses in Data Science Certificate program). The proposed Doctoral Minor program of study should be approved by the ChBE Graduate Office **before the courses are taken** (Proposed PhD Minor Approval Form). At least two of these courses must carry graduate credit (6000 level), and one course may be at the 4000 level. All courses must be completed with a grade of B or better.

After completing the coursework for the minor, the student should complete the Request for Approval of Doctoral Minor form and submit it to the Graduate Office setting forth the list of courses (and grades received) for the minor. The approved minor form will then be submitted to the Dean of Graduate Studies.

Be sure to regularly check Degree Works for accuracy, especially prior to your final semester.

3.7 Professional Development

In addition to coursework and research, PhD in Chemical Engineering program requirements includes enriching elements for professional development. These include workshops, training, or classes to develop non-technical professional and teaching skills, and sharing your research publicly with the School.

3.7.1 Teaching Practicum

PhD students engage in teaching through the ChBE Teaching Practicum Program. In the second semester of their first year, PhD students enroll in the ChBE section of CETL 8000 to introduce them to foundational material in teaching, and to satisfy Georgia Tech

requirements for engaging with students in a teaching capacity. PhD students also participate in three semesters of teaching practicum, enrolling in ChBE 8902-TP for 2 credit hours (only in the semesters when doing the practicum), which is consistent with about 6 hours/week of effort. Completing three semesters of teaching practicum is a degree requirement. Students will be assigned to a course and instructor by the Associate Chair and are encouraged to make any requests when solicited each semester prior beginning of Phase I registration.

3.7.2 Professional Preparation Program

Candidates for the PhD degree must complete at least 10 Professional Preparation Units (PPU) by attending at least 3 Professional Preparation Activities during their time in the School. Professional Preparation Activities are workshops and courses designed to provide training and experience in skills that may not be an explicit focus of candidates' academic research but are critical for professional success beyond the PhD. A selection of workshops or courses will be offered every year (see link below), with an announcement to all graduate students sent at the beginning of the fall semester listing the expected offerings for that academic year and the number of Professional Preparation Units fulfilled by each respective offering. All required Professional Preparation Units must be completed before the Thesis Defense; students are encouraged to complete most before their Pre-Doctoral Review meeting. If students participate in Professional Preparation-related workshops or courses in other Units of the Institute, they may petition to have those efforts count toward their required Professional Preparation Units.
https://www.chbe.gatech.edu/graduate/professional-preparation

3.7.3 Fourth Year Colloquium

Every 4th year student must present a seminar to faculty and graduate students of the School as part of the Fall Graduate Colloquium, which occurs on Wednesday of the week prior to the start of fall semester classes. The purpose is to gain practice and preparation presenting your research to a diverse technical audience, learn about the research going on in the school, and lead to future research discussion or collaboration with colleagues. Colloquium is also an opportunity for new PhD students to learn about research in the School as they seek to find a lab to join. Colloquium is an in person event and virtual participation is not permitted. A student may request a deferral from the ChBE Graduate Office if they will be off campus for an internship, conference, or other unavoidable research related travel.

3.8 Pre-Doctoral Review

Candidates for the PhD degree must complete a committee review between the Proposal Defense and the Thesis Defense. This review will usually occur 6-12 months before the Thesis Defense and will include a presentation (< 30 min) by the student of an outline for the completed PhD dissertation. The Pre-Doctoral Review Progress Report Form must be

submitted to the committee at least one week before the review. After the review, the Pre-Doctoral Review form must be signed by the committee and returned to the graduate office.

3.9 Degree Petition

Candidates for the PhD degree must file with the Registrar an Online Application for Graduation (OAG) in the semester prior to that in which graduation is expected. Any errors in this petition may delay the student's graduation until the following semester. Students who do not complete their requirements when anticipated must file a reactivation petition. This form is also due in the semester prior to the student's expected graduation date. Reactivation instructions may be obtained from the Office of the Registrar.

3.10 PhD Dissertation

Instructions concerning preparation of the dissertation are available from the Division of Graduate Studies and PhD candidates should familiarize themselves with these instructions: http://grad.gatech.edu/theses-dissertations. The format of the dissertation must be approved by the Division of Graduate Studies, and the student is required to submit the dissertation to the Graduate Division according to institute deadlines: http://www.grad.gatech.edu/theses-dissertations-deadlines. This must be done after a successful thesis defense and after approval by the Doctoral Examination Committee (usually the same as the Thesis Advisory Committee). The student and their thesis advisor are expected to publish the completed research in appropriate journal(s) as promptly as possible. If the thesis is submitted before any journal articles containing the same information, then an embargo form should be submitted.

3.11 Final PhD Examination

The thesis dissertation must be submitted to the Doctoral Examination Committee at least two weeks prior to the date of the oral defense. In addition, the student must provide the ChBE Graduate Office with an abstract, plus the date, time and place of the oral defense two weeks prior to the date of the defense. The examination will be conducted by the Doctoral Examination Committee chosen by the student and the thesis advisor, and approved by the ChBE Graduate Office and the Dean of Graduate Studies. This committee will consist of at least five faculty members, including at least three from the School of Chemical & Biomolecular Engineering and at least one faculty member from another academic unit at Georgia Tech. The Associate Chair must approve any non-GT faculty members of the Thesis Advisory Committee. A brief resume must be submitted to the Associate Chair for any committee member who is not a Georgia Tech faculty member at least 30 days prior to the defense date (only required for committee members not already approved for the proposal defense). It is typical for the Thesis Advisory Committee

members to serve on the Doctoral Examination Committee. In the case where a student has at least three thesis co-advisors, a sixth Doctoral Examination Committee member is required, and at least one of the non-advisor committee members must be a member of the School of Chemical & Biomolecular Engineering faculty. Given the additional scheduling constraints imposed by having a sixth committee member, the expectation that all committee members must participate in the Doctoral Examination is relaxed such that only five committee members must participate; of those five, at least three should be non-advisor committee members, even if this precludes all advisors from participating.

The examination will be announced throughout the School and will be open to the academic community. The student will be required to make an oral presentation of the final thesis lasting 30-45 minutes, and this will be followed by a public question and answer session and a closed examination session for the student and committee only.

The student must be registered during the semester in which the final doctoral examination is given.

If both the dissertation and examination are satisfactory, and there is compliance with requirements of residency and the minor field, then the candidate will be certified as qualified to receive the degree of Doctor of Philosophy.

3.12 Summary of Deadlines for PhD Students (Note: forms available at Important Graduate Student Forms | School of Chemical and Biomolecular Engineering)

1. *Admission to the Doctoral Program:* This occurs on admission to Graduate School or following satisfactory performance in the qualifying examinations.
2. *Class completion:* ChBE 6001 and 6003 must be taken during the first fall semester in residence. ChBE 6100, 6200, 6260, 6300, and 6500 should be taken (or transfer credit applied for) in the first offered semester.
3. *Qualifying Examination:* First January after start of PhD program. Retake is in May.
4. *Thesis Proposal Defense:* No later than the sixth semester of graduate study.
5. *Admission to Candidacy*: Upon completion of core classes, qualifying examination, satisfactory research, thesis proposal defense and approval of the thesis topic. Submit Proposed PhD Minor Approval Form.
6. *Approval of Minor:* Coursework for the minor must be completed one semester before graduation. Students must petition for formal approval of the minor course. This form is submitted to the ChBE Graduate Office for signature and then forwarded to Graduate Studies Office.
7. *Pre-Doctoral Review:* Completed during the period between the Thesis Proposal Examination and the Thesis Defense, and no less than 6 months before graduation.
8. *Fall Colloquium presentation:* Completed at the beginning of the 4th year of residence.

9. *Petition for Degree:* This must be submitted to the Registrar during the semester preceding the expected graduation date.

10. *Final Doctoral Examination:* The student must be registered during the semester in which the final examination is given. The dissertation approval form must be submitted following the examination. A copy of thesis must be submitted to the Doctoral Examination Committee at least **two weeks** prior to oral defense. The final copy must be submitted to the Graduate Division at least 15 days before the graduation date, according to the Institute deadline.

4. MS Degree (Coursework Option)

The School of Chemical & Biomolecular Engineering offers programs of study leading to the degree of Master of Science (MS) in Chemical Engineering (thesis or coursework option) and the Master of Science (MS) in Bioengineering (usually thesis option).

It is expected that most MS students in ChBE will be taking the coursework option. Students in the MS program cannot switch into the PhD program or take the qualifying exams without approval of the ChBE Graduate Office and securing GRA funding and a research advisor. Students are not encouraged to pursue the thesis option MS unless it is funded through a GRA and a research advisor has been found.

Students admitted to the thesis MS or PhD program who receive a stipend may not transfer into the coursework MS program without approval from the thesis advisor and the ChBE Associate Chair. Students who wish to earn a coursework MS while continuing to work on their PhD should discuss this option with their advisor and the ChBE Associate Chair.

4.1 Satisfactory progress for MS students will be evaluated as follows:

Satisfactory completion of core coursework by the end of the second semester in residence.

4.2 Degree requirements for MS in Chemical Engineering (coursework option) are as follows:

Credits	
ChBE 6003 Chemical Process Safety	1
ChBE 6100 Advanced Chemical Engineering Thermodynamics	3
ChBE 6200 Advanced Transport Phenomena, Fluid Mechanics, and Heat	3
ChBE 6260 Transport Phenomena-Mass Transfer	3

ChBE 6300 Kinetics and Reactor Design	3
ChBE 6500 Mathematical Modeling and Analysis of Chemical Processes	3
ChBE 6xxx Chemical Engineering Elective	3
Other Electives	12
TOTAL Credit Hours.....	31

It should be noted that:

- ChBE core courses are taught only once a year, generally in the Fall (ChBE 6003, 6100, 6260, 6300, 6500) and Spring (ChBE 6200) semesters
- All courses must be completed with a letter grade of A, B, or C.
- An overall GPA of 2.7 is required to graduate with an MS degree
- Electives may be at the 4000 or higher levels from any school, with a maximum of 6 credits at the 4000 level. Electives may not include special problem courses or courses required in the BSChBE curriculum.
- Electives can include special topics (8803) courses if the course meets 3 hours per week for the entire semester for lecture or discussion.
- Some electives outside of ChBE require permits from the school offering the course. See the ChBE Graduate Office if you need assistance.
- Research for credit can be performed with ChBE 8901/8902 Special Problems (usually 3 credit hours)
- In addition to degree-required courses listed above MS students are encouraged to attend seminar (see ChBE 8001/8002 fall/spring for time and location).
- In the last semester students need only apply for the credits they need to complete their degree; international students will need OIE permission for less than 12 credits through iSTART.gatech.edu.

Degree requirements for the MS degree in Bioengineering are outlined on the website of the Bioengineering program: https://bioengineering.gatech.edu/index.php/prospective-students.

4.3 Program of Study and Degree Petition

MS students are required to submit an approved program of study form to the Institute Graduate Studies Office no later than the last day of classes of the semester prior to that in which the student expects to graduate. Students whose programs are received later

than the institute deadline will have their graduation delayed by one semester. Be sure to regularly check Degree Works for accuracy, especially prior to your final semester.

Degree candidates must complete the Online Application for Graduation (OAG) with the Registrar in the semester prior to that in which graduation is expected. Any errors in this petition may delay graduation until the following semester. Students who do not complete their requirements when anticipated must file a reactivation petition. Reactivation instructions may be obtained from the Office of the Registrar.

4.4 Summary of deadlines for MS coursework candidates

First Semester:

(a) Petition for transfer credit.

Semester prior to graduation (likely First Semester):

(a) Check fulfillment of degree requirements on DegreeWorks;

(b) Submit Petition for a Degree, the Online Application for Graduate (OAG).

Second Semester:

(a) Complete core coursework.

Final Semester (likely Second Semester):

(a) Complete all coursework.

5. MS Degree (thesis option)

The School of Chemical & Biomolecular Engineering offers programs of study leading to the degree of Master of Science (MS) in Chemical Engineering (thesis or coursework option) and the Master of Science (MS) in Bioengineering (usually thesis option). Students generally should not pursue the thesis option MS unless it is funded through a GRA and a research advisor has been found.

5.1 Satisfactory Progress for MS Students (thesis option)

Satisfactory progress for MS students will be evaluated as follows:

(a) Satisfactory completion of core coursework by the end of the second semester in residence. (thesis and coursework options)

(b) Satisfactory progress in research. Research performance will be evaluated by the advisor (grade of “Satisfactory” in ChBE 7000 research credit hours) and includes initiation of research in the first semester of residence, submission of a thesis, and successful defense of the thesis, as well as any progress reports required by the advisor. The program should be completed in no more than six semesters.

5.2 Course Requirements

Courses required for the MS in **Chemical Engineering (thesis option)** are as follows:

Credits	
ChBE 6003 Chemical Process Safety	1
ChBE 6100 Advanced Chemical Engineering Thermodynamics	3
ChBE 6200 Advanced Transport Phenomena, Fluid Mechanics, and Heat	3
ChBE 6260 Transport Phenomena-Mass Transfer	3
ChBE 6300 Kinetics and Reactor Design	3
ChBE 6500 Mathematical Modeling and Analysis of Chemical Processes	3
ChBE 6xxx Chemical Engineering Elective	3
Other Elective	3
ChBE 7000 Master's Thesis	9
TOTAL Credit Hours.....	31

It should be noted that:

- ChBE core courses are taught only once a year, generally in the Fall (ChBE 6003, 6100, 6260, 6300, 6500) and Spring (ChBE 6200) semesters
- All courses must be completed with a letter grade of A, B, or C.
- An overall GPA of 2.7 is required to graduate with an MS degree
- Electives may be at the 4000 or higher levels from any school, with a maximum of 6 credits at the 4000 level. Electives may not include special problem courses or courses required in the BSChBE curriculum.
- Electives can include special topics (8803) courses if the course meets 3 hours per week for the entire semester for lecture or discussion.
- Some electives outside of ChBE require permits from the school offering the course. See the ChBE Graduate Office if you need assistance.
- In addition to degree-required courses listed above MS thesis students will also register for ChBE 6001 (intro to research to meet Institute RCR requirement), ChBE 7000 (thesis research), ChBE 8001/8002 (fall/spring seminar) as part of program degree requirements. More info on each of these are in different sections of the handbook.

Degree requirements for the MS degree in Bioengineering are outlined on the website of the Bioengineering program: http://www.bioengineering.gatech.edu/prospective-students.

5.3 MS Thesis

A candidate for the MS degree (thesis option) must present a treatise setting forth the results of an investigation completed by the student under the direction of a member of the faculty of the School (the thesis or research advisor). The subject of the investigation will be assigned to the student during the first semester, after the student has familiarized themselves with the research programs in the School. After completion of the investigation, the student must also present an oral defense of the thesis as part of the requirement for the MS degree. **The oral presentation should generally be 30-45 minutes in length.**

Students must file with the Graduate Studies Committee and the Dean of Graduate Studies a formal request for approval of their MS Thesis Topic, naming the Thesis Reading Committee (or Thesis Advisory Committee), and setting forth the topic selected for research, the purpose of the investigation and the steps proposed to conduct it.

The MS Thesis Reading Committee should consist of at least three faculty members, including at least two from the School of Chemical & Biomolecular Engineering. At least two of the members should also be from the program faculty of the degree that the student is seeking (Chemical Engineering or Bioengineering).

The format of the thesis is described in the **Manual for Graduate Thesis**, available from the Office of Graduate Education: http://grad.gatech.edu/theses-dissertations. The thesis must be submitted to the Thesis Reading Committee **at least two weeks prior to the date of the oral defense**. The MS thesis defense should involve the thesis advisor and Reading Committee. In addition, faculty and students in the School must be notified at least 14 days in advance as to the date, time, and place where the defense is to take place (provide this information to the Graduate Program Manager). After the student has satisfactorily defended the thesis, and made final corrections in accordance with suggestions by the Committee, they must present a final version of the thesis to the Committee and to the Dean of Graduate Studies according to the institute deadlines: http://www.grad.gatech.edu/theses-dissertations-deadlines.

5.4 Program of Study and Degree Petition

MS students are required to submit an approved program of study form to the Institute Graduate Studies Office no later than the last day of classes of the semester prior to that in which the student expects to graduate. Students whose programs are received later than the institute deadline will have their graduation delayed by one semester. Be sure to regularly check Degree Works for accuracy, especially prior to your final semester.

Degree candidates must complete the Online Application for Graduation (OAG) with the Registrar in the semester prior to that in which graduation is expected. Any errors in this petition may delay graduation until the following semester. Students who do not complete their requirements when anticipated must file a reactivation petition. Reactivation instructions may be obtained from the Office of the Registrar.

5.5 Summary of deadlines for MS thesis candidates

First Semester:

(a) Submit list of preferences for research project;

(b) Selection of an advisor;

(c) Petition for transfer credit.

Second Semester:

(a) Complete core courses.

Subsequent Semesters:

(a) Select a Thesis Reading Committee;

(b) Submit a Request for Approval of MS Thesis Topic;

(c) Complete all required courses.

Semester prior to graduation:

(a) Submit Approved Program of Study;

(b) Submit Petition for a Degree, the Online Application for Graduate (OAG).

Final Semester:

(a) Submit draft of thesis to Reading Committee **at least two weeks** prior to oral defense;

(b) Schedule an oral defense and submit a Notification of Thesis Defense to the School Graduate Office **at least two weeks** prior to defense;

(c) Submit final version of the thesis to the Graduate Division at least three weeks before the date of graduation, according to the Institute deadline.

6. GRA (PhD and MS thesis) Course Load Requirements

Students hired as a Graduate Research Assistant (GRA) are expected to register for 21 hours in the Fall and Spring semesters, and 16 hours in the Summer semester. These hours will normally consist of course credit hours, plus ChBE 7000 (Thesis MS) or ChBE 9000 (PhD) credit hours for research, ChBE 8001/8002 (Seminar in Fall and Spring only), and ChBE 8902 Teaching Practicum (2 credit hours only in semesters when assigned), and

core/elective/minor courses as appropriate. Students should use the Phase I registration period to register, and make changes if needed during Phase II. *All students should consult their thesis advisor before registration.*

In the event that the research is due to be completed before the end of a semester, then two options are available:

- The student may register as a full-time GRA and notify ChBE Finance Office of last day of employment.
- The student may register for one credit hour of ChBE 7000 or ChBE 9000, and pay the appropriate tuition and fees based on residency status. The student's advisor may elect to hire the student as a Graduate Assistant (GA), in which case the student would be paid on an hourly basis. This option may only be used once, in the student's final semester. Students should discuss this option with the ChBE Graduate Office.

If the thesis is defended and submitted to the Institute after the Institute thesis submission deadline for the current semester, but prior to the enrollment waiver deadline for the next semester (see http://www.grad.gatech.edu/theses-dissertations-deadlines for deadlines), then the student may apply for an enrollment waiver during the graduating semester. This must be done prior to the beginning of the graduating semester. Note that this waiver can be granted only if all degree requirements have been satisfied.

In all cases, the School Graduate Office must be informed of the date of completion so that the student's payroll status can then be changed accordingly.

7. GRA (PhD and MS thesis) Academic Advising

PhD and thesis MS students will be matched with a faculty thesis advisor. This relationship is central to the student graduate research experience. It is based on mutual respect and both partners, advisor and advisee, must contribute for it to succeed. Primary faculty advisors guide students in selecting courses and minors, designing and conducting research, teaching pedagogy (this role will also be filled by the faculty course instructor during teaching practicum semesters), navigating policies and degree requirements (the ChBE Graduate Office also fills this role), identifying opportunities (awards, conferences, etc.) and career options. Advising expectations should be discussed and reviewed to ensure mutual understanding including mode and frequency of communication and topics to be covered. Please see the GT Expectations of Advisors and Advisees for guidance.
Expectations of Advisors and Advisees | Georgia Tech Catalog

8. Transfer of Credit

Institute policies permit the transfer of a maximum of 9 hours of graduate-level course work from another US institution to apply towards a Master's Degree. The student must submit a request for credit to the Associate Chair accompanied by descriptive material

such as transcripts, syllabus, catalog descriptions and listings of textbooks used. The Georgia Tech equivalent for each course must also be provided. This should be done during the first two semesters that the student is at Georgia Tech and all credits should be requested at the same time.

9. Multidisciplinary Programs

The School of Chemical & Biomolecular Engineering participates in several multidisciplinary programs at the MS and PhD levels. Students who pursue these programs must meet the appropriate requirements. They should also consult with the advisor of the program before deciding on a proposed program of study.

Bioengineering M.S. and Ph.D. Program:

Laura Paige, laura.paige@bioengineering.gatech.edu

https://bioengineering.gatech.edu/prospective-students

Machine Learning (ML) Ph.D. Program:

Stephanie Niebuhr, stephanie.niebuhr@cc.gatech.edu

https://ml.gatech.edu/phd

Renewable Bioproducts Institute (RBI) Ph.D. Minor Program:

Dr. Carson Meredith, cmeredith@rbi.gatech.edu

https://research.gatech.edu/rbi/rbi-phd-minor

10. Graduate Certificate in Data Science for the Chemical Industry

This Graduate Certificate is designed to empower chemical engineers with essential data science skills tailored specifically to the needs and challenges of the chemical industry. Ph.D. and M.S. ChBE graduate students can pursue the certificate upon successful completion of two core courses, ChBE 6745 and ChBE 6476, and two electives. The core courses provide rigorous training in data analytics, machine learning, and their practical applications within chemical engineering contexts. The elective courses are selected from a diverse range of graduate-level offerings across the university. This flexible elective structure allows students to tailor the program to their specific interests and career goals. For more information, please refer to the program's website.

Graduate Certificate in Data Science for the Chemical Industry | School of Chemical and Biomolecular Engineering

To start the certificate, please submit the Graduate Stand Alone Certificate form.

Graduate Stand-Alone Certificate Form | Registrar's Office | Georgia Tech

11. ChBE Policy on PhD Fellowship Stipends

A graduate student who is supported on a fellowship should not receive a lower compensation compared to ChBE's Graduate Research Assistant compensation. The net compensation, after taking into account student fees and health insurance rates, should be matched with funds provided by the research advisor.

A graduate student who competes for and wins a prestigious individual fellowship (e.g., NSF Graduate Research Fellowship or NIH F31 Fellowship) should see a modest benefit to their net compensation. The research advisor should provide this additional compensation from their funds.

- At the current time, ChBE sets the increment to be $2000/year during the fellowship, but reasonable adjustment for inflation may be considered in the future.
- If a fellowship student's net compensation is already at least $2000 greater than the GRA amount, no extra adjustment is required.

A graduate student who receives a fellowship for which faculty did most or all of the work to obtain the fellowship through development of training programs (e.g., NIH T32 Fellowship, GAANN) should not receive additional net compensation. The student, however, will receive the other non-compensation-based benefits of the fellowship.

If a fellowship is specified to be a topping fellowship, then the entire amount will be provided to the student according to the terms of the fellowship.

12. Graduate seminars

The Graduate Seminar courses, ChBE 8001/8002 (fall/spring), are designed to keep students informed of new developments in Chemical Engineering throughout the world. Graduate students (MS Thesis and PhD; CHE, ML, and BioE) must register for and attend seminars when in residence. MS Coursework students are encouraged to attend. Attendance at a minimum of approximately 70% of seminars is required. Students should consult the Canvas page for the course for specific seminar requirements each semester and instructions on how to sign in. Students not meeting the minimum requirements will earn a "U" unsatisfactory grade for ChBE 8001/8002.

Students should not register for the seminar in the following situations:

- a conflict exists with a course the student is taking
- a conflict exists with teaching practicum duty

- the student is defending their thesis that semester (this exception is only offered once, if the defense does not happen in the intended semester, seminar must be attended in the next)
- the student plans to be out of town more than 30% of the semester due to research or visa-related problems

In these situations, the student should send a notice to the Associate Chair for Graduate Studies for approval.

13. Graduate Student Leave

Time-Off Policy

Earning a graduate research degree requires significant personal effort and motivation. Graduate students may take 12 business days of vacation and the 13 Institute administrative holidays (includes winter holiday week but not academic breaks such as fall or spring break, see current list at: Payroll – Human Resources) during each 12-month period of residency. We respect the desire of students to celebrate different holidays. Students may request to work on Institute holidays (while observing safety guidelines of not working alone and other lab-specific requirements) and use the holiday time at a different date. Students must request and receive advance approval from their thesis advisor for vacation and any special leave, including working on Institute holidays in exchange for alternate dates.

Bereavement Leave Policy

A student should be granted bereavement leave, defined as leave to grieve the death of a loved one. The leave should reflect the nature of the loss, distance to be travelled, personal responsibilities of the student, or other factors. It is suggested that 5 business days could be appropriate for loss of a close family member or friend, while 2 business days could be appropriate in other cases. A plan should be discussed with and approved by the thesis advisor in advance. If needed, students or advisors may contact the Associate Chair for Graduate Studies for assistance. Bereavement leave is not to be deducted from vacation time, but vacation time may be combined with bereavement leave with prior advisor approval.

Parental Leave Policy for Graduate Research Assistants

A ChBE GRA who becomes a parent can take 6 weeks of paid time off after the birth, adoption or fostering of a child. Students who are expecting a child should discuss the need for parental leave with their faculty advisor at least **4 months** before the expected birth, or as soon as possible for adoption or fostering. The faculty advisor may request one-half of the time off (up to 3 weeks) to be paid by the School using suitable foundation funds. This request must be made in writing to the Associate Chair for Graduate Studies

at least one month in advance of the expected date of arrival. In addition to the paid time off, it is possible to arrange to have unpaid time off through discussions with the thesis advisor and Associate Chair.

14. Travel

Travel for conferences, experiments or collaborations can enrich the research training experience. Students should discuss travel with their advisor and use funds responsibly when making decisions about travel spending. Travel funds are available through various sources on campus (see links below) and students should seek to use these when possible. All employees should ensure before entering data into Workday that they are linked to their supervisors. Once the link has been entered, then all employees will need to electronically submit a Spend Authorization (SA) allowing approval to travel on Georgia Tech business and providing an Institute Worktag applicable to the travel. The SA is approved by the student's advisor and then submitted to the advisor's faculty support coordinator (FSC) for processing. Once approval has been received, then the student is authorized to make the trip and claim appropriate expenses following Institute guidelines. The GT travel policies are at the link below. Please note that airfare must be booked through GT system and not directly by the student. There are frequent changes to GT travel policy so familiarizing yourself with the guidelines before planning and making the trip is advisable. To file travel expense reports, the employee will claim expenses and download appropriate receipts as soon as possible upon return (current GT policy is <10 days). This process also follows the same approval channels. Please note: if changes/corrections are made, employees may have to re-certify their expenses again. Non-travel related reimbursements are handled in a similar method. Students should seek guidance from the FSC for their lab for help with travel related processes. The ChBE Student Travel Policy is being updated and will be placed here when available.

Travel | Policy Library

Student Government Association Conference Funds

15. Internships

Students are encouraged to take advantage of internship opportunities. Planning for an internship must be done in consultation with your research advisor. In addition, students should register during the term(s) that they are away at their internship. The procedures for registering with the co-op office can be found at the link below. Students should plan internships to start and end in concurrence with either Fall, Spring or Summer terms' starting and ending dates. If a student starts or ends an internship after a semester has started, that can disrupt hiring and pay as GRA in the preceding or following semester. Thus, it is very important to plan internships in advance and make every effort to have them coincide with the semester start and end dates. The Teams page below is a ChBE resource that lists internship opportunities shared with the School.

General | Internship Opportunities for ChBE Graduate Students | Microsoft Teams

https://career.gatech.edu/graduate-internship-program/

16. Responsible Conduct of Research (RCR) Training

Georgia Tech requires all new graduate students to be trained in the principles of Responsible Conduct of Research (RCR) if they will perform research (PhD and MS thesis). Training must be completed in two phases, via completion of on-line CITI modules within 60 days of starting at Georgia Tech, and via in-person training during the first fall semester at Georgia Tech.

Phase 1: Complete the on-line CITI modules within 60 days of starting at Georgia Tech as a graduate student. Print and maintain a copy of your completion certificate in the event your name does not appear in the Institute's CITI report. Online Training | Responsible Conduct of Research

Phase 2: Complete the degree requirements by registering and passing ChBE 6003 and ChBE 6001. If any lectures designated "RCR" in either course is missed, it must be made up by the end of February with your advisor. Your advisor will certify to the departmental compliance committee that the missed information has been addressed. If a failing grade is received in ChBE 6001 or 6003, the student must retake and pass ChBE 6001.

NOTE: Failure to meet RCR compliance may result in registration holds and loss of GRA status.

The RCR coverage areas for "in-person" training are:

A. Conflict of interest – personal, professional, and financial

B. Policies regarding research with human subjects, vertebrate animals used in laboratory research, and biological, chemical and radiation safety

C. Mentor/mentee responsibilities and relationships

D. Collaborative research including collaborations with industry

E. Peer review

F. Data acquisition and laboratory tools; data management, sharing and ownership

G. Research misconduct and policies for handling misconduct

H. Responsible authorship and publication

I. The scientist as a responsible member of society, contemporary ethical issues in biomedical research, and the environmental and societal impacts of scientific research

By attending the RCR lectures presented in ChBE 6003 and 6001, you will have completed research requirements for RCR training. Academic requirements will be satisfied by

receiving passing grades in ChBE 6003 and ChBE 6001. Failure to pass these courses may jeopardize graduate student status at Georgia Tech.

17. Safety

Graduate students are required to familiarize themselves with the Environmental Health & Safety website and to abide by safety rules in the laboratory. Failure to follow safe practices could result in dismissal from the program. Students must register for and pass ChBE 6003 as well as complete any training specific to your research area. Required training should be discussed with your advisor and your lab's safety officer.

It should be noted that GRAs are covered by State Workers Compensation for injuries sustained while carrying out their duties. Therefore, (as soon as is practical after receiving any emergency treatment) your advisor, the ChBE administrative office, and the ChBE Safety Committee must be informed of the injury and a report filed with the State Department of Administrative Services (DOAS) via the ChBE Facilities Office (Curtis Burnett). A report of injury must be filed via Curtis Burnett even if the injury does not require immediate medical attention.

https://ehs.gatech.edu/sites/default/files/documents/2024-10/injury_reporting_instructions_revised_2023-01-27.pdf

It is highly encouraged to report "near-misses" so that learnings can be shared with others to prevent future accidents. This can be done without fear of repercussions. The link for "near-miss" reporting and other important safety information is found at the website below.

Laboratory Safety | School of Chemical and Biomolecular Engineering

18. Purchasing and Procurement

Purchase order request forms and instructions for Workday ordering system, for both internal services and external vendors, can be obtained from the school's website or in ChBE administrative offices. The forms should be completed by the user with approval from the thesis advisor, indicating the estimated cost and **source of funds** (Georgia Tech worktag). The request should then be forwarded to the assigned thesis advisor's faculty support coordinator (FSC) for processing/ordering. No student should make commitments for purchases directly with vendors. The approval of the purchase order administered through the FSC will generate a purchase order number which is a requirement for all orders. For equipment purchases, quotes can be obtained from vendors and attached to the purchase order request forms. The Institute's preferred method of purchasing is the use of Workday for approved vendors. Each FSC is authorized and trained to purchase using the system. Students should keep in mind responsible use of research funds and be aware that all ordering is subject to auditing and oversight by the appropriate private, state, or federal funding agency.

19. Dismissal Policy

A graduate student appointed as a GRA at the MS (thesis option) or PhD level is expected to carry out research as part of their degree requirements. (A GRA may not transfer to the MS (non-thesis option) without approval of their thesis advisor and the Associate Chair for Graduate Studies.) The GRA appointment will normally be for one semester, with renewal subject to satisfactory progress towards the intended degree, including satisfactory progress in research. Research duties and research progress will be determined by the faculty/research advisor and should be communicated to the student through regular meetings. Unsatisfactory performance in research could lead to loss of research supervision, as well as non-renewal of the GRA appointment. This applies even if the student's GPA meets or exceeds the minimum set by the School. An unsatisfactory, or "U", grade in research (ChBE 9000 for PhD, ChBE 7000 for MS) will place a doctoral student on academic warning at the Institute level. If a "U" is received in ChBE 9000/7000 in two consecutive semesters the student will be placed on academic probation. This is in addition to other conditions related to GPA, like not meeting the minimum satisfactory scholarship requirement in other classes. A student with a deficiency (including a "U" grade) must repeat the course and pass it before credit is allowed.

Students who do not make satisfactory progress in their research must receive advising on their degree progress from their research advisor and at least one other source, typically a dissertation committee member or the Associate Chair for Graduate Studies. After these meetings, a student whose research performance is determined to be unsatisfactory will receive a letter or e-mail from their research advisor listing all deficiencies and outlining a performance improvement plan required to continue working with the advisor. This will be communicated to the student at least one month before the end of the semester, and a copy will be provided to the Associate Chair for Graduate Studies for inclusion in the student's file. The performance improvement plan must be accomplished before the end of the semester in order to prevent dismissal from the advisor's research group and/or loss of GRA status. The GRA appointment will not normally be terminated before the end of a semester.

If a student's GPA is less than 3.2 in the core courses (ChBE 6100, 6200, 6260, 6300, 6500) and/or the student fails the qualifying exam twice, the School is no longer obligated to provide a GRA. At their discretion, the advisor may continue GRA support as funds allow while the student works to meet academic requirements.

A student who no longer has an advisor may seek another advisor with help from the Associate Chair for Graduate Studies. A PhD student who cannot find a new advisor after one term must leave the School or may opt to transfer to the MS (coursework option) program and finish this degree at their own expense. If there are extenuating circumstances, the Associate Chair for Graduate Studies may extend this period for one

additional term at their discretion. A graduate student who is dismissed by the Institute for academic or disciplinary reasons will not normally be readmitted to the School.

20. Useful Resources for Graduate Students

ChBE graduate students have access to a wide range of resources designed to support academic success, professional development, and personal well-being at both the School and Institute levels. Key resources include:

20.1 Computer Facilities and Use

Graduate students will be given accounts to access all computer facilities in the School, including the student computer lab in Ford ES&T L2232. They are reminded that all computer use in the School is subject to the Institute "acceptable computer use" policies, which can be found at https://policylibrary.gatech.edu/information-technology. School policies may be found at http://chbe.gatech.edu/computer-lab-policy.

20.2 Forms

Required forms can be found at: Important Graduate Student Forms | School of Chemical and Biomolecular Engineering

20.3 Systems and Applications

Buzzport is a website that provides easy access to information and services to students, faculty, and administrative staff at Georgia Tech. BuzzPort | Georgia Tech

Canvas serves as the Learning Management System (LMS) for both undergraduate and graduate students. It is used for course management, communication, and access to course materials. Graduate students use it to track grades, access assignments, and connect with instructors and classmates both for classes in which they are enrolled and for classes in which they serve as teaching assistants. Digital Learning

Degree Works provides a comprehensive set of web-based academic advising, degree audit, and transfer articulation tools to help students and advisors negotiate curriculum requirements. Be sure to check Degree Works very carefully (don't just scan green checkmarks) to be sure all requirements are met and listed correctly. See Janice Whatley with questions or concerns. Degree Audit | Registrar's Office | Georgia Tech

OSCAR (Online Student Computer Assisted Registration) is the system used by graduate students for various administrative tasks, including course registration, applying to graduate, checking application status and managing financial aid information. Essentially, it's a centralized portal for managing your student record and interacting with the university. OSCAR | Student Information System | Georgia Tech

Workday is the system used by students, faculty and staff for travel authorization requestions and expense, reports, ordering, and other financial related tasks. https://wd5.myworkday.com/gatech

OneUSG is the system used by graduate students, faculty and staff to manage payroll decisions, such as direct deposit and tax withholdings, obtain tax forms including W-2, and change personal information, including address. University System of Georgia Faculty and Staff Portal

20.4 Resources for Health Problems, Stress, and Major Life Events

During graduate school some students may experience health problems (sickness, injury, mental health, etc.), legal problems, or upsetting major life events, such as the death of a family member. In addition, some students find that they are unable to cope effectively with the stresses they encounter while in graduate school. Students in these situations are encouraged to take advantage of on- or off-campus resources for managing either general stress or specific problems. The following is a list of some available resources for graduate students:

Center for Mental Healthcare and Resources www.counseling.gatech.edu 404-894-2575

> If you are experiencing a crisis that requires immediate attention you may speak with a counselor at any time 24 hours a day, 7 days a week. All students, including graduate students, currently registered in a degree-seeking program are eligible for services at the Counseling Center. Call or visit the counseling center at Suite 238, Smithgall Student Services Building, 353 Ferst Dr NW. After business hours (M-F 8am-5pm), please call either 404-894-2575 and select the option to speak to the after-hours counselor. Professional counselors are available to consult confidentially with students about any issue, whether personal or school-related. Other mental health services include workshops, peer coaching, testing and assessment, and consultations. **In case of an emergency you should call the GT police at 404-894-2500 or 911 if off campus.**

Dean of Students www.deanofstudents.gatech.edu 404-894-6367

> The Dean of Students office advocates for students in handling missed classes and making up work due to sickness, injury, and other adversities. If you experience a problem that interferes with classes for more than a few days, you should contact the Dean of Students office for advice and assistance.

National Graduate Crisis Line *1-800-GRAD-HLP* (800-472-3457)

> An off-campus, non-profit center for graduate students in crisis that is available 24/7.

988 Suicide and Crisis Line (text 988 or 988 Suicide & Crisis Lifeline | Federal Communications Commission)

A national suicide prevention lifeline with voice, text, and chat options in English and Spanish.

Student Temporary Assistance and Resources (STAR) for services like the food pantry, emergency funds, and temporary housing in case of housing or food insecurity.

In certain cases, a health problem or life event may be so significant that it prevents a student from making progress in classes or research. In these cases, it may make sense to consider a leave of absence, and students should discuss the situation candidly with their advisor, the ChBE Associate Chair for Graduate Studies, and/or the Dean of Students.

21. Health and Well Being

Wellness is about maintaining an overall quality of life and the pursuit of optimal emotional, mental, physical, and interpersonal health. Wellness is not the absence of disease, illness, or stress but the presence of purpose in life, active involvement in satisfying work and play, joyful relationships, a healthy body and living environment, and happiness.

Ten Tips for Better Mental Health

1. **Build Confidence** - identify your abilities and weaknesses together, accept them, build on them and do the best you can with what you have.
2. **Accept Compliments** - many of us have difficulty accepting kindness from others but we all need to remember the positive in our lives when times get tough.
3. **Make Time for Family and Friends** - these relationships need to be nurtured; if taken for granted they will dwindle and not be there to share life's joys and sorrows.
4. **Give and Accept Support** - friends and family relationships thrive when they are "put to the test." Just as you seek help when you are having a tough time, a friend or family member might come to you in their time of need.
5. **Create a Meaningful Budget** - financial problems are big causes of stress, especially in today's economy. Over-spending on our "wants" instead of our "needs" can compound money worries. Writing down where your money is going helps you keep a closer eye on your finances.
6. **Volunteer** - being involved in community gives a sense of purpose and satisfaction that paid work cannot. Find a local organization where your life skills can be put to good use.
7. **Manage Stress** - we all have stressors in our lives but learning how to deal with them when they threaten to overwhelm us will help to maintain our mental health.

8. **Find Strength in Numbers** - sharing a problem with others who have had similar experiences may help you find a solution and will make you feel less isolated. Even talking about the situation with people who have not experienced what you are going through is a good way to gain outside perspective.
9. **Identify and Deal with Moods** - we all need to find safe and constructive ways to express our feelings of anger, sadness, joy and fear. Channeling your emotions creatively is a wonderful way to work off excess feelings. Writing (keeping a journal), painting, dancing, making crafts, etc. are all good ways to help deal with emotions.
10. **Learn to Be at Peace with Yourself** - get to know who you are, what makes you really happy and learn to balance what you can and cannot change about yourself.