

**Department of Chemical Engineering**

**Worcester Polytechnic Institute**

**Graduate Student Handbook**

## **Introduction**

This document outlines the administrative procedures and educational requirements for graduate study in Chemical Engineering at Worcester Polytechnic Institute. Graduate students should also refer to the current WPI Graduate Catalog for additional procedures, course descriptions, candidacy requirements, and an overview of the entire WPI Graduate Program.

The Chemical Engineering Department offers graduate programs leading to the Master of Science (with or without a thesis), and the Doctor of Philosophy. The goals and rules governing these programs follow.

## **Requirements for the Degree:**

### **Master of Science in Chemical Engineering: Thesis Option**

The program leading to an M.S. in Chemical Engineering is designed to provide a broad course work base in advanced topics in Chemical Engineering, and to train the student in conducting advanced research in a specialized area. Graduates of the program should be equally capable of doing industrial or governmental research and design and in proceeding on to a Ph.D. program.

Students must complete a minimum of 30 credit hours of work acceptable for graduate credit, including the submission of a thesis based on research conducted under the direction of a Faculty member in the department. The student must also give a satisfactory oral seminar presentation every year in residence.

### **Specific Requirements for the M.S. Degree:**

1. Not less than 18 credit hours (three credit hours per course) must be in graduate level courses or in advanced undergraduate level courses, which are approved by the advisor and the departmental Graduate Committee.
2. A minimum of 15 credit hours must be in graduate level courses.
3. A minimum of 15 course credit hours must be in Chemical Engineering.
4. A minimum of nine credit hours must be from the following graduate level Chemical Engineering core courses:

CHE 504      Mathematical Analysis in Chemical Engineering

CHE 509      Reactor Design and Kinetics

CHE 561      Thermodynamics

CHE 571      Transport Phenomena

5. A minimum of 12 credit hours of thesis research must be completed.
6. A written thesis must be approved by the Faculty advisor, Department Head, and Thesis Committee.
7. A Plan of Study must be submitted in accordance with the Institute's rules within the first semester of enrollment for full-time students and within the first year if part-time.
8. Each M.S. candidate is required to make one public presentation each year.
9. An oral presentation and defense must be made and final approval given by the research committee. Copies of the thesis must be given to research committee members and are to be available for circulation to the department Faculty at least one week before the defense. If, in the course of the defense, it becomes apparent that there are serious omissions or errors in concept, fact, or technique, then additional research may be required and the thesis must be revised and submitted to the research committee for reexamination.
10. The student, in consultation with the Advisor, will choose a Thesis Committee of at least four WPI Faculty members. The Thesis Committee must consist of the advisor, at least one other WPI Faculty member from the department, and at least one WPI Faculty member from outside the Chemical Engineering Department. Other qualified individuals from off campus organizations may be included as additional voting members.

### **Academic Standards:**

1. A grade of C or better must be attained in a course submitted for credit towards the fulfillment of these requirements.
2. If, after a student has taken four or more courses acceptable for graduate study, the Cumulative Quality Point Average (CQPA) for all such courses falls below 2.6 (A=4.0), the student will be ineligible for further study at WPI unless the department Graduate Committee recommends continuation for the next semester.
3. Additional WPI standards can be found in the WPI Graduate Catalog.

## **Requirements for the Degree:**

### **Master of Science in Chemical Engineering: Non-Thesis Option**

The non-thesis Master of Science program differs from the regular M.S. program in that it is especially suited for those students with general practice career goals and those not planning subsequent pursuit of the Ph.D. degree. It is particularly suited to students wishing to pursue advanced training in Chemical Engineering on a part-time basis. The Course M.S. program is considered to be a terminal professional degree, and it is designed to provide a broad base in advanced course work in Chemical Engineering. Although a thesis is not required for the degree, independent study under the direction of a Faculty advisor may be part of the program.

### **Specific Requirements for the Course M.S. Degree:**

1. Not less than 30 credit hours must be taken in graduate level courses, in advanced undergraduate level courses, or independent study which are approved by the advisor and the departmental Graduate Committee.
2. A minimum of 24 credit hours must be in graduate level courses.
3. A minimum of 21 course credit hours must be in Chemical Engineering.
4. A minimum of nine credit hours must be from the following graduate level Chemical Engineering core courses:  
  
CHE 504      Mathematical Analysis in Chemical Engineering  
  
CHE 509      Reactor Design and Kinetics  
  
CHE 561      Thermodynamics  
  
CHE 571      Transport Phenomena
5. A Plan of Study must be submitted in accordance with school rules within the first semester of enrollment for full-time students and within the first year if part-time.

### **Academic Standards:**

1. A grade of C or better must be attained in a course submitted for credit towards the fulfillment of these requirements.
2. If, after a student has taken four or more courses acceptable for graduate study, the Cumulative Quality Point Average (CQPA) for all such courses falls below 2.6 (A=4.0),

the student will be ineligible for further study at WPI unless the department graduate committee recommends continuation for the next semester.

3. Additional WPI standards can be found in the WPI Graduate Catalog.

## Requirements for the Degree:

### **Master of Science in Chemical Engineering: Professional Engineering Option**

The Professional Engineering option is well suited for students seeking an industrial career. The degree is designed to help students gain detailed knowledge and practice in an industrially relevant focus area. Students must choose a concentration for their degree, and currently the department offers a bioengineering concentration and advanced process engineering concentration. This is primarily a course-based masters, but students are required to complete a Graduate Qualifying Project (GQP). The GQP provides a capstone experience in applying chemical engineering skills to real-world problems. GQPs are carried out in cooperation with an industrial partner and with the approval and oversight of a faculty member in Chemical Engineering. Students interested in this degree should contact the Professional Engineering Program Director.

### **Specific Requirements for the Professional Engineering M.S. Degree:**

1. Not less than 30 credit hours must be taken in graduate level courses, in advanced undergraduate level courses, or independent study which are approved by the advisor and the departmental Graduate Committee. A summary of course requirements are given in Table 1.
2. A minimum of nine credit hours must be from the following graduate level Chemical Engineering core courses:  
  
CHE 504      Mathematical Analysis in Chemical Engineering  
  
CHE 509      Reactor Design and Kinetics  
  
CHE 561      Thermodynamics  
  
CHE 571      Transport Phenomena
3. A minimum of six credits of chemical engineering electives must be taken. These may be at the graduate or advanced undergraduate level.
4. Students pursuing the Bioengineering concentration must take CHE 521: Biochemical Engineering, while students in the Advanced Process Engineering concentration must take CHE 565: Advanced Process Engineering.
5. A minimum of six credits of concentration electives must be taken. Table 2 lists approved courses for these electives. Students can choose additional courses to fulfill their concentration requirement as new courses become available, as long as they receive approval, in advance, from the Professional Engineering Program Director.

6. A minimum of six credits in CHE: 590 Graduate Qualifying Project (GQP) must be taken.
7. A Plan of Study must be submitted in accordance with school rules within the first semester of enrollment for full-time students and within the first year if part-time.

**Table 1. Professional Engineering Option Credit Distribution**

<b>Bioengineering Concentration</b>	<b>Credits</b>	<b>Advanced Process Engineering Concentration</b>	<b>Credits</b>
3 Core Courses in CHE	9	3 Core Courses in CHE	9
2 Chemical Engineering Electives <sup>1</sup>	6	2 Chemical Engineering Electives <sup>1</sup>	6
Concentration:		Concentration:	
CHE 521: Biochemical Engineering	3	CHE 565: Advanced Process Engineering	3
2 Concentration Courses	6	2 Concentration Courses	6
CHE 590: GQP	6	CHE 590: GQP	6
<b>Total</b>	<b>30</b>	<b>Total</b>	<b>30</b>

<sup>1</sup>Students may choose to take one of these courses in the topic of innovation to gain additional experience in business and for preparation for the GQP, including ETR 500. Entrepreneurship and Innovation. Students should get approval from the Faculty Director for course substitution.



**Table 2: Possible Concentration Courses**

<b>Bioengineering</b>	
BCB 501. Bioinformatics	BME 523. Biomedical Instrumentation
BCB 502. Biovisualization	BME/ME 550. Tissue Engineering
BCB 503. Biological and Biomedical Database Mining	CH 538. Medicinal Chemistry
BCB 504. Statistical Methods in Genetics and Bioinformatics	CH 540. Regulation of Gene Expression
BB 505. Fermentation Biology	MTE 555/ME 4860. Food Engineering
BB 509. Scale Up of Bioprocessing	BB 565. Virology
BB 560. Methods of Protein Purification and Downstream Processing	BB 575. Advanced Genetics and Cellular Biology
BB 562. Cell Cycle Regulation	BME 552 / ME 552. Tissue Mechanics
	CE 562. Biosystems in Environmental Engineering
<b>Advanced Process Engineering</b>	
CHE 504. Mathematical Analysis in Chemical Engineering <sup>2</sup>	MTE 555/ME 4860. Food Engineering
CHE 506. Kinetics and Catalysis <sup>2</sup>	MTE 558. Plastics
CHE 507. Chemical Reactor Design <sup>2</sup>	MTE 5844. Corrosion and Corrosion Control
CHE 573. Separation Processes <sup>2</sup>	ME 516. Heat Transfer
CHE 531. Fuel Cell Technology	ME/AE 5220. Control of Linear Dynamical Systems
DS 501. Introduction to Data Science	ME/AE 5221. Control of Nonlinear Dynamical Systems
FP 521. Fire Dynamics I	SD 550. System Dynamics Foundation: Managing Complexity
FP 553. Fire Protection Systems	SD 553. Model Analysis and Evaluation Techniques
FP 554. Advanced Fire Suppression	SYS 501. Concepts of Systems Engineering
FP 555. Detection, Alarm and Smoke Control	SYS 502. Business Practices
FP 573. Industrial Fire Protection	SYS 510. Systems Architecture and Design
FP 575. Explosion Protection	SYS 512. Requirements Engineering
MFE 510/ME 542. Control and Monitoring of Manufacturing Processes	SYS 520. System Optimization
MFE 520/MTE 520/ME 543. Design and Analysis of Manufacturing Processes	SYS 521. Model-Based Systems Engineering
MFE/MTE/ME 5420. Fundamentals of Axiomatic Design of Manufacturing Processes	SYS 540. Introduction to Systems Thinking

<sup>2</sup>Can be used to satisfy concentration requirements if not taken as part of the core.  
concentration requirements.

### **Academic Standards:**

1. A grade of C or better must be attained in a course submitted for credit towards the fulfillment of these requirements.
2. If, after a student has taken four or more courses acceptable for graduate study, the Cumulative Quality Point Average (CQPA) for all such courses falls below 2.6 (A=4.0), the student will be ineligible for further study at WPI unless the department graduate committee recommends continuation for the next semester.
3. Additional WPI standards can be found in the WPI Graduate Catalog.

## **B.S. - M.S. Program**

Outstanding WPI undergraduates who wish to continue their studies toward a Master's Degree at WPI can transfer up to four graduate level courses (12 credit hours) and up to two undergraduate courses with **A** grades for a maximum total of four courses, all to be approved by the department Graduate Committee for graduate credit.\* Currently, CHE 3501 is the only undergraduate CHE course permitted for such transfer. The student must inform the instructor at the beginning of the course that graduate credit will be desired. The overall requirements are then similar to the stand alone M.S. program.

Students are referred to the current Graduate Catalog and should contact the CHE Graduate Coordinator for further information on this program and are encouraged to include graduate level courses in their undergraduate program.

\*To avoid confusion, students are encouraged to obtain approval prior to taking these courses.

## **Requirements for the Degree:**

### **Doctor of Philosophy in Chemical Engineering**

#### **I. Objectives:**

- a.) The successful doctoral candidate should be capable of independently making an original contribution in Chemical Engineering.
- b.) The candidate should be able to express ideas clearly and logically both orally and in writing, and should be able to answer questions posed during presentations.
- c.) The candidate should be able to see the broad implications of the research being pursued and the concepts employed.
- d.) The candidate should be able to meet an unfamiliar problem with competence utilizing whatever engineering, scientific, and mathematical "tools" are appropriate.
- e.) The candidate should be intellectually curious and should develop that curiosity into understanding of areas beyond the major field.

All doctoral candidates are encouraged to obtain at least one semester of experience as a teaching assistant by arrangement through the advisor and Department Head.

#### **II. Course Requirements:**

The program leading to a Doctor of Philosophy Degree in Chemical Engineering must satisfy college requirements as described in the Graduate Catalog and must also include:

- a.) A total of 90 credit hours after the B.S., including at least 30 in research.
- b.) A minimum of 9 credit hours of appropriate courses (approved by the advisor and the department Graduate Committee) outside the Chemical Engineering Department.
- c.) Twelve credit hours of graduate level Chemical Engineering core courses:  
  
CHE 504      Mathematical Analysis in Chemical Engineering  
  
CHE 509      Reactor Design and Kinetics  
  
CHE 561      Thermodynamics

- d.) A satisfactory oral seminar presentation during each year of residence at WPI.

The program for each student who does not have an M.S. in Chemical Engineering should be such that the student can receive an M.S. degree en-route to the Ph.D. For students already holding an M.S. degree, the minimum course requirements in several categories are as follows:

- e.) For a student holding an M.S. in Chemical Engineering from WPI with thesis - a minimum of three post M.S. graduate level CHE courses (9 credit hours) must be taken.
- f.) For a student holding a Course M.S. in Chemical Engineering from WPI, a minimum of 30 course credit hours total must be taken. Since these credits were required for fulfillment of the M.S. degree, the course requirement has been satisfied, with the possible exception of (b) above.
- g.) For a student holding an M.S. in Chemical Engineering from another school - a minimum of two courses (6 credit hours) per semester must be taken at WPI until the written qualifying examination is passed.
- h.) For a student holding an M.S. or Ph.D. degree in a field other than Chemical Engineering, appropriate courses can be transferred toward the Ph.D. requirements subject to approval of the department Graduate Committee.

### **III. Academic Standards:**

1. A grade of C or better must be attained in a course submitted for credit towards the fulfillment of these requirements.
2. If, after a student has taken four or more courses acceptable for graduate study, the Cumulative Quality Point Average (CQPA) for all such courses falls below 2.6 (A=4.0), the student will be ineligible for further study at WPI unless the department graduate committee recommends continuation for the next semester.
3. Additional WPI standards can be found in the WPI Graduate Catalog.

## **IV. Qualifying Examination:**

The qualifying examination consists of a Written Examination and a Research Proposition. The purpose of the examination is to determine the student's technical ability in the field of Chemical Engineering and the ability to propose and conduct original independent research. The Written Examination is taken between the first and second semester, and the Research Proposition is presented by the end of the fifth semester in residence at WPI. It is the responsibility of the student to take the examination at these times. Missing an examination date will count as an automatic failure unless the Graduate Committee has approved a petition, in advance of the examination, excusing the student from taking the exam at that time. The Graduate Committee will inform students who do not successfully pass either part of the examination if they can continue in the PhD program. If they are allowed to continue, they must retake the exam at the earliest opportunity (usually in May after the second semester). A student may not take any part of the exam more than twice.

Following successful completion of both parts of the qualifying examination, the student becomes a full participant in the doctoral program. Students seeking degrees at a particular commencement must officially apply for candidacy with the Committee on Graduate Study and Research prior to the deadline date listed in the Graduate Catalog. Specific candidacy requirements are described in the Graduate Catalog. Forms for the Application for Degree may be obtained from the departmental Graduate Secretary.

### **Written Examination**

Students wishing to pursue the Ph.D. degree are required to take a one-day written qualifying examination between the students' first and second semesters covering the broad basics of Chemical Engineering. The purpose of the examination is to determine the ability of the student to analyze and solve basic Chemical Engineering problems. Areas covered include: thermodynamics, transport phenomena, and kinetics/reactor design. Sample copies of previous examinations are available in the department graduate office for student perusal. Students who do not pass the Written Examination the first time will be given an opportunity to re-take the examination in May after their second semester.

### **Research Proposition**

The Research Proposition consists of a written Research Proposal and an Oral Presentation. Students will start working on their thesis research topic soon after they are assigned a Research Advisor. By the end of their fifth semester in residence at WPI, students will present a seminar describing their research findings to date and their Thesis Research Proposition. The committee must fill out a "Progress Report" and indicate a pass/fail/conditional pass, as well as provide feedback and direction to the student. A copy of the "Progress Report" will be given to the student and also sent to the departmental Graduate Committee. The Dissertation Committee will evaluate the oral presentation and written proposition. The following guidelines should be followed:

1. The student, in consultation with the Advisor, will choose a Dissertation Committee

of at least four WPI Faculty members. The Dissertation Committee must consist of the advisor, at least one other WPI Faculty member from the department, and at least one WPI Faculty member from outside the Chemical Engineering Department. Other qualified individuals from off campus organizations may be included as additional voting members.

2. A date for the oral presentation shall be set with the department seminar coordinator. The presentation is not to exceed 45 min. The presentation may be part of the regular department seminar (CHE 501/502).
3. Copies of the written proposition are to be distributed to the Dissertation Committee members and made available to all other CHE Faculty no later than one week prior to the oral presentation.
4. The candidate alone must write the proposition although he or she is encouraged to discuss it with the Dissertation Committee.
5. The proposition should include and emphasize the following:
  - a. A clear statement of the problem, its importance and objectives.
  - b. A literature review relating objectives to the current status of the field.
  - c. A description of the work accomplished so far along with a justification of the planned theoretical and experimental approaches.

## **V. Committee Meetings for Ph.D. Students**

In addition to the Qualifier Exam, all students must meet with their research committee on a yearly basis in order to show sufficient progress towards completion of the Ph.D. Committee Meetings should occur in the second and fourth years of the student's residence (see timeline below). The committee must fill out a "Progress Report" and indicate a pass/fail/conditional pass, as well as provide feedback and direction to the student. A copy of the "Progress Report" will be given to the student and sent to the departmental Graduate Committee. Committee Meetings will consist of an oral presentation only (no written document), and do not require departmental attendance other than the committee, and can occur at the convenience of the student and committee by the end of the designated year.

Students who fail to pass a Committee Meeting will be given a second opportunity within three months to address concerns of the committee. Students who fail the Committee Meeting a second time will not be in good standing within the department, and will be ineligible for a Chemical Engineering Ph.D. as well as departmental funding (e.g. TA position).

**Ph. D. Timeline**

<b>Year</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Milestone</b>	Qualifier Exam	Committee Meeting	Research Proposition	Committee Meeting	Ph. D. Defense

## Ph. D. Graduate Student Progress Report

**Student:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Research Advisor:** \_\_\_\_\_

**Committee Members:** \_\_\_\_\_, \_\_\_\_\_,

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Pick one:**     Research Proposition

Yearly Committee Meeting

The student (circle one):    Successfully,    Conditionally,    Unsuccessfully

                  completed the activity noted above.

**Committee Signatures:** \_\_\_\_\_, \_\_\_\_\_,

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Comments:** (committee summary & suggestions, student's progress, modifications to Plan of Study, etc.)



## **VI. Dissertation Defense:**

After the research has been completed and the thesis has been given preliminary acceptance by the advisor and research committee, an oral presentation and defense must be made and final approval given by the research committee. Copies of the thesis must be given to research committee members and are to be available for circulation to the department Faculty at least one week before the defense. If, in the course of the defense, it becomes apparent that there are serious omissions or errors in concept, fact, or technique, then additional research may be required and the dissertation must be revised and submitted to the research committee for reexamination.

A manuscript based on the dissertation research and suitable for submission to a technical journal must be submitted to the advisor. This is a departmental requirement prior to the receipt of the Ph.D. degree.

## **VII. Departure Prior to Dissertation Completion:**

Occasionally graduate students have left the department prior to completion of all their degree requirements. In such instances, long time intervals have sometimes elapsed before thesis or manuscript submission. Accordingly, the department has adopted the guideline that an M.S. or Ph.D. thesis cannot be submitted for a degree beyond three years after the student is no longer actively pursuing the research. Exceptions may be only granted upon petition to the department Graduate Committee which a.) demonstrates extenuating circumstances and b.) proves that the research is still of value to the profession.

## **Rules Governing the Assignment of Research Advisor**

### **I. Student Responsibilities:**

In order to equitably distribute graduate students to Faculty members conducting research, the Chemical Engineering department has established a policy regarding thesis advisor selection. New or currently unassigned students are required to follow the procedure described below in choosing an advisor. In addition to satisfying equitable student distribution, this procedure is designed to allow students to become familiar with department Faculty members and their research interests and for Faculty to meet new students.

1. Each student makes appointments to discuss the research interests with all Chemical Engineering Faculty conducting graduate research. A list of those Faculty supervising graduate students is attached.
2. Following the interview, Faculty should initial the form next to their name.
3. After seeing all the Faculty, all students must submit this form to the Graduate Committee with the name of the professor with whom they would most like to work. A second and third choice must also be submitted.
4. This procedure, including notification of official advisor assignments, will be completed within the first four weeks of the semester, if possible.

## Faculty - Graduate Student Interview Form

<i>Faculty</i>	<i>Office Number</i>	<i>Interview Day and Time</i>	<i>Initial</i>
<b>Camesano, T.</b>	GP4002		
<b>Clark, W. M.</b>	GH124		
<b>Datta, R.</b>	GH014A		
<b>Deskins, A.</b>	GH119		
<b>DiBiasio, D.</b>	GH125		
<b>Dixon, A. G.</b>	GH224A		
<b>Kazantzis, N.K.</b>	GH224B		
<b>Roberts, S. C.</b>	GH125		
<b>Stewart, E. J.</b>	GP4038		
<b>Timko, M. T.</b>	GH123		
<b>Wilcox, J.</b>	GH129		
<b>Young, E. M.</b>	GP4037		
<b>Zhou, S.</b>	GP4001		

Student Name \_\_\_\_\_ Date \_\_\_\_\_

Faculty Advisor \_\_\_\_\_

Choice & Project: 1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

## **Faculty Responsibilities:**

1. If the number of new graduate students is high enough, each Professor will submit to the Graduate Committee a list of three choices of students, in order. Each Professor will also disclose the support available for new students.
2. The Head of Department will inform the Graduate Committee of the department's teaching needs and of any preferences regarding TA assignments to fulfill these needs.
3. The Graduate Committee will try, as far as possible, to match graduate students and professors in accordance with the submitted preference. A student not on a professor's list will, if necessary, be assigned to that professor subject to the agreement of the professor. The following priorities shall be adhered to in this allocation:
  1. Contract research.
  2. An equitable distribution to new (untenured) Faculty. Assignment of department supported students will be limited to one per Faculty when possible. Exceptions may occur when external funding for continuing qualified Ph.D. students has expired, (see section on Financial Support) with the approval of the Department Head and Graduate Committee.
4. The Graduate Coordinator will review advisor assignments with the Department Head prior to informing individual students. Any adjustments to the assignments will be made through a joint meeting of the Department Head and Graduate Committee.

## **Rules Governing** **Financial Support for Graduate Students**

It is the goal of the Chemical Engineering Department and its Faculty to provide financial support for full-time graduate students maintaining satisfactory progress for the duration of their degree program. However, sources of funding change, and the responsibilities associated with different funding sources are different. The department has, therefore, established some guidelines for the most common situations.

### **I. Students Pursuing Master's Degrees**

1. Students who have received any department or Institute support (teaching assistantship, fellowship, etc.) are required to complete an M.S. Degree with a thesis.
2. Students who have received support from external funding agencies (government, industrial, etc.) are required to complete an M.S. Degree with a thesis, unless the principal investigator for the project notifies the Graduate Committee otherwise.
3. Students pursuing the Course M.S. Degree cannot receive departmental financial support.

***Exception:*** Outstanding students who are pursuing a Ph.D. program may find that they will complete the course work associated with a Course M.S. Degree on the way to a Ph.D. Since these students most likely have received financial support in some form, they may obtain the Course M.S. Degree provided they have filed a Plan of Study for the Course M.S. Degree that is approved by the student's Ph.D. advisor and the CHE Graduate Committee. A student has to have passed the Ph.D. Qualifying Examination to do this.

## **II. Students Pursuing the Ph.D. Degree**

Candidates for the Ph.D. Degree funded from external sources may see this funding source end prior to completion of the degree. In order to provide for this event, the department has adopted the following policies:

1. Students who have passed the written Ph.D. Qualifying Exam and have their external funding source terminated are entitled to, as a minimum, a waiver of tuition. In most cases, funding beyond this level will be provided in the form of a teaching assistantship. The level of this funding, including the tuition waiver, will be determined by the Graduate Committee and Department Head based on the following:
  - a. The availability of departmental funds.
  - b. The student's making satisfactory progress.
  - c. The recommendations of departmental Faculty familiar with the student's work.
  - d. The Ph.D. advisor's continuing effort to secure funding for that student from external sources.

## **III. Department and Institute Supported Students (M.S. and Ph.D.)**

The granting and continuation of departmental support is not automatic. To provide for equity in its distribution, the department has adopted the following policy:

All department and Institute supported and non-supported students will be reviewed near the end of each academic year (review procedure to be established by the Faculty). The Graduate Committee will then recommend support or not, and the level of support, to the Department Head. Their recommendations for support or lack of support for the entire list of qualifying graduate students must be approved by majority vote of the CHE Faculty.

## **Courses Acceptable for Graduate Credit**

In order to eliminate confusion, and to provide a simple, rational basis for decision-making, the Graduate Committee would like to inform all graduate students and their advisors of the procedure that should be followed when seeking graduate credit for courses other than CHE graduate courses.

1. All courses at the 500 level or above, taken under graduate student status, are automatically acceptable for graduate credit by the CHE department in accordance with the rules for each graduate degree.
2. If a graduate student wishes to take an undergraduate course for graduate credit, he or she should petition the department Graduate Committee before taking the course, to verify that the course will be acceptable. Note that it is not enough for the department offering the course to count it for graduate credit - the CHE department reserves the right to make its own decisions.
3. If a graduate student wishes to count a graduate course taken under undergraduate status, a petition should be filed with the Graduate Committee. In this case, the petition may be submitted after the course is taken.

## **Guidelines for Graduate Assistants**

### **I. Teaching Assistants (TA)**

1. TA's will be assigned to specific undergraduate courses on a term-by-term basis. The TA should report to the professor in charge of their assigned course on the first day of their assignment.
2. TA duties will include: assisting the Faculty in laboratory courses, grading laboratory reports, homework assignments, and exams. Occasionally, TA's may be asked to conduct a lecture or conference in the absence of the Faculty member in charge. It is a department practice that TA's will not be used in the classroom on a regular basis.
3. It is the responsibility of the TA to be familiar with the course material and with the operation of the course. This will, at a minimum, require close communication with the professor in charge, and may require that the TA attend some or all of the lectures/conferences. It is the responsibility of the Faculty to inform the TA of their specific duties in a timely fashion so that they may be adequately prepared.
4. All TA's will have desk space held in the TA room (GH 012). All office hours for all courses will be conducted in this room. The TA staff will meet each term to organize office hours so that each course is adequately covered and that in addition, at least one TA is in the room during normal school hours.
5. A Teaching Assistant load should be 1/2 a normal academic load. This is usually 20 hrs./week. Some courses will require significant preparation when school is not in session. TA's are required to report one week prior to the start of a new term and two weeks prior to the start of a new academic year.

### **II. Research Assistants (RA)**

1. RA's will report to their Faculty advisors on the first day of their assignment.
2. RA's will be responsible for conducting research related to the project to which they are assigned. The specifics of these duties will be communicated to the student by the Faculty advisor.



### **III. General**

1. All funded students (TA, RA, fellowship, etc.) are regarded as WPI staff members and are expected to be present during undergraduate school vacations and term breaks. Absences must be approved by the Department Head for TA's and the specific research advisor for RA's.
2. Continuation of support for all funded students depends upon the satisfactory performance of their assigned duties as well as their academic work. TA's are evaluated on a semester basis via a form completed by the professor to whom they are assigned. (Also, see II. under Rules Governing Financial Support for Graduate Students). RA's are evaluated by their project advisor.

#### **Guidelines for Graduate Seminars**

It is important that graduate engineers develop an ability to present their work to an appropriate audience in a clear, concise, and interesting manner. Consequently, all graduate students are required to register for CHE 501 and CHE 502 each year in residence, to present one semester each year, and to attend all seminars of other students. Students, particularly Ph.D. candidates, who present unacceptable seminars must demonstrate improvement. Participation in graduate seminars is included as a degree requirement for chemical engineers in order to provide students with an opportunity to develop and refine their ability to make such presentations. All graduate students are expected to attend all departmental seminars and colloquia.

All graduate students are required to attend all safety training sessions when they are scheduled. Exceptions will be handled by the Campus Safety Officer (D. Messier) or the Graduate Coordinator.

## **Patents and Secrecy of Research**

The receipt of research grants by the department from both industrial and government sponsors has caused patent and secrecy questions to be raised. Certain sponsors are entitled to an equity and patent position in work done for them. Although inventions seldom result from thesis work it is conceivable that patentable information will occasionally be obtained and that claims will be made to this information by sponsors on the basis of expertise provided or of financial support.

The prime motivation for our academic research is obtaining new and significant information for scholarly purposes - specifically publication. The method of funding of research, however, is highly variable and a complete and general formula covering the divulgence of information and the equity position of Worcester Polytechnic Institute, staff, sponsors, inventors, and outside agencies cannot be projected a priori.

Policy on secrecy is complicated even further by the fact that it is expected and desired that there will be a free and mutual exchange of information and ideas among all of us. There will undoubtedly be interrelationships among projects. We shall expect, however, that if proprietary information is made available, or, if for some other reason data cannot be revealed, that each student will honor the need for secrecy as presented by his professor.

The official WPI patent policy is available in a separate document, which may be obtained from the Office of Graduate Studies and Research.