



VANDERBILT  
UNIVERSITY

# **Graduate Student Handbook**

*Department of Chemical and  
Biomolecular Engineering*

**Academic Year: 2022-23**

<b>I. INTRODUCTION.....</b>	<b>3</b>
<b>II. Ph.D. PROGRAM .....</b>	<b>4</b>
Course Requirements .....	4
Selection of a Research Advisor .....	5
Continuing Committee .....	5
Regular Committee Meetings and Progress Reports .....	6
Ph.D. Program Examinations .....	7
Dissertation Registration and Binding.....	10
<b>III. M.S./M.E. PROGRAMS .....</b>	<b>12</b>
M.S. Program for Chemical Engineering Graduates .....	12
M.S. Program for Non-Chemical Engineering Graduates.....	13
M.E. Program for Chemical Engineering Graduates.....	13
<b>IV. TYPICAL COURSE SCHEDULE FOR ChBE GRADUATE STUDENTS .....</b>	<b>14</b>
M.S. Program in Chemical Engineering.....	14
Ph.D. Program in Chemical Engineering .....	14
<b>IV. PROCEDURES IN THE ChBE DEPARTMENT .....</b>	<b>15</b>
Keys.....	15
Financial Aid Restrictions.....	15
Business Cards .....	16
Course Registration .....	16
Photocopying and Facsimile Service .....	17
Shop Facilities .....	17
Purchase Order Requisitions.....	17
<b>V. TRAVEL AND EXPENSE REIMBURSEMENT .....</b>	<b>19</b>
Travel Process .....	19
Safety, Security, and Insurance .....	19
Concur set-up: Initial Actions Required .....	19
Expense Reimbursements .....	19
Basics.....	20
COA/Project.....	20
Itemization.....	20
Meals .....	20
Hotel/Lodging Charges.....	21
Cars, Parking, and Mileage .....	21
Flights.....	21
Restrictions.....	21
<b>VI. HOLIDAYS AND IMPORTANT DATES .....</b>	<b>22</b>
<b>Appendix A GENERAL LABORATORY SAFETY RULES .....</b>	<b>23</b>
General.....	23
Glassware.....	23
All Laboratory Equipment .....	24
Reagents & Chemicals.....	24
Miscellaneous .....	24
<b>Appendix B ChBE DEPARTMENT DIRECTORY.....</b>	<b>25</b>
<b>Appendix C Department Forms.....</b>	<b>28</b>
<b>Appendix D Graduate School Travel Grants.....</b>	<b>30</b>

## I. INTRODUCTION

Graduate students at Vanderbilt University are governed by the rules and regulations set by the Vanderbilt University Graduate School. These are documented in the Graduate School catalogue (<https://www.vanderbilt.edu/catalogs/graduate/graduate-school/>). The **honor code** is in effect for all degree candidates in the Graduate Program. All homework and examinations are to be accomplished under the Honor Code rules, unless otherwise specified by the instructor. Violation of the Honor Code will be referred to the Honor Council and can result in the termination of degree candidacy.

This document defines the requirements and guidelines for the Chemical and Biomolecular Engineering (ChBE) graduate program. Course requirements are defined as well as some of the procedures you will need to follow to successfully complete your degree program here at Vanderbilt. In special circumstances the faculty may waive a requirement defined in this Handbook. To request a waiver, submit a letter to the Director of Graduate Studies (DGS). The letter must clearly indicate what you are requesting to be waived and the reasons for your request.

**While we will make every effort to inform students of impending deadlines, it is ultimately each student's responsibility to see that they submit needed documents as required by the Department and the Graduate School. Students will be responsible for payment of late fees if they miss registration deadlines.** The majority of our communication is done by email. Be sure to check your email at least once a day.

## II. Ph.D. PROGRAM

### Course Requirements

The Ph.D. degree in Chemical Engineering requires 72 semester hours of graduate study, at least 24 of which must be didactic coursework. The following Chemical and Biomolecular Engineering courses are required for the Ph.D. degree.

Course Number	Course Name	Credit Hours
ChBE 6100	ChBE Mathematics	3
ChBE 6110	Advanced ChBE Thermodynamics	3
ChBE 6120	Applied Chemical Kinetics	3
ChBE 6200	Transport Phenomena	3
ChBE 6250	Professional Communications	1

All students are also required to sign up for seminar (ChBE 8991) every semester in residence.

The schedule below outlines when these required courses should generally be taken for students with or without Chemical Engineering undergraduate degrees.

	ChE BS degree	Non-ChE BS Degree
<b>Fall Yr 1</b>	ChBE 6100 ChBE 6110 ChBE 6120	<i>ChBE 5300</i> <i>ChBE 5200</i> ChBE 6100
<b>Spring Yr 1</b>	Elective Elective ChBE 6200 ChBE 6250	<i>ChBE 5250</i> ChBE 6200 non-ChBE Elective ChBE 6250
<b>Fall Yr 2</b>	Elective non-ChBE Elective	ChBE 6110 ChBE 6120

For students with Chemical Engineering undergraduate degrees, at least 11 hours of elective courses must be taken, of which at least 3 hours must be taken outside the department in a related technical field or fields (and cannot be for a cross-listed course). These elective courses should complement the student's research interests.

For students without Chemical Engineering undergraduate degrees, some of the courses in italics, which are core undergraduate classes, must be taken in lieu of electives to prepare students for the required graduate-level coursework in Chemical Engineering. Incoming students should consult with the DGS to determine which preparatory courses are needed based on their undergraduate record.

All courses are to be selected with the approval of the student's dissertation advisor and Continuing Committee. Coursework may extend beyond the 24 required hours on the recommendation of the student's dissertation advisor and Continuing Committee. No foreign language is required.

If a student has completed the required 72 hours, but continues to conduct research full time,

they must remain registered by signing up for zero hours of dissertation research (ChBE 9999). **i.e., you are not to exceed 72 hours but must remain registered.**

The M.S. degree is not a prerequisite for doctoral study; however, for students who obtain their M.S. degrees at Vanderbilt, up to 24 hours of graduate coursework with an overall GPA of B or higher may be applied to the Ph.D.

Students who receive graduate credit and/or M.S. degrees at other institutions may, with faculty and Graduate School approval, transfer up to 48 course credit hours to Vanderbilt, at least 12 hours of which can be used to replace the formal coursework requirements described above. Transfer of credit should be discussed with the DGS in the first semester of residence at Vanderbilt. Only those courses with an equivalent A or B grade may be transferred. Students may not repeat courses, or take equivalent courses, for graduate credit.

### **Selection of a Research Advisor**

Research advisors will be assigned during the Fall semester of the first year in residence. A booklet listing the available projects will be provided during orientation. All students are required to meet with at least five of the ChBE faculty members who have a project opening to discuss research opportunities and obtain each faculty member's signature on the form provided in the project booklet. After talking with these faculty, the top three choices for research advisor (with the project name if appropriate) should then be listed on the form and submitted to the DGS by email no later than the date indicated in the booklet (typically October 1). Student choices, along with consideration of faculty funding, will be used to assign advisors. Every effort will be made to match students with their preferred projects. However, student preferences are not guaranteed.

Occasionally, students are recruited by a faculty member to fill an immediate opening in their lab and will not go through the typical advisor selection process described above. Such students would normally join the program as a Graduate Research Assistant rather than a Teaching Assistant. Please discuss with the DGS if you are not sure about whether this situation applies to you.

### **Continuing Committee**

A Continuing Committee oversees each Ph.D. candidate's program. The Committee functions to (i) conduct the Qualifying Examination (QE), (ii) provide guidance to the student through regular Committee updates and informal discussions, (iii) approve the subject of the dissertation, (iv) read and approve the written dissertation, and (v) administer the dissertation defense. Because the Committee will evaluate research progress and will ultimately decide when a student is ready to defend their dissertation, it is important to select a Continuing Committee that can provide fair and effective feedback to the student, his/her advisor(s), and the DGS.

The Committee shall be composed of a minimum of two ChBE faculty members, the student's advisor(s), and an additional faculty member from outside the department. At least one Committee member besides the student's advisor(s) should be a tenured ChBE faculty member. Committee members should be chosen from faculty whose expertise and interests bear on the student's research. The Continuing Committee should be appointed as soon as possible after the student passes the Departmental Examination, and the student must meet with the Committee within six months of passing the Departmental Exam. For many students, this first meeting will satisfy the requirements of the Pre-QE meeting, which should be completed by the end of the student's 2<sup>nd</sup> summer of residence. The pre-QE meeting is intended to prepare the student for the QE, which should be

completed no later than the end of the student's 5th semester in residence.

**All graduate students are required to meet with their Continuing Committee at least once every year, beginning in the second year of study.** The student's primary advisor will Chair the Committee. Following each Committee meeting, the Chair must review and approve the student's Progress Report and Meeting Summary in REDCap. Note, if the proposal defense is not taken on time for some reason, the Continuing Committee must still meet and the outcome of the meeting conveyed in the Meeting Summary.

### **Regular Committee Meetings and Progress Reports**

After passing the Departmental Exam, students will provide a written Progress Report to their Continuing Committee every six months and will meet with their Committee at least once per year, although more frequent meetings are encouraged during critical periods when students are facing major obstacles or decision points in their research. It is the responsibility of the student to identify a date and time that the Committee members will be available, to reserve a room for the meeting, and to notify the Graduate Program Coordinator of the scheduled meetings. Scheduling can be difficult with faculty who are very busy and travel frequently, so students must be proactive to schedule the meetings well in advance of deadlines. **Failure to provide regular Committee updates on time may result in the student being placed on academic probation. Students on academic probation may be dismissed from the program if they remain on probation in subsequent semesters.**

A Progress Report should be completed in REDCap and distributed to the Committee no less than one week prior to each scheduled meeting. For interim Progress Reports (i.e., those that don't coincide with a scheduled Committee meeting), any comments from the Committee should be entered into REDCap within two weeks. A meeting can be called by any member of the Committee or by the student to allow further discussion of any major concerns raised by an interim Progress Report. It is the responsibility of the Committee Chair to certify that the Progress Report has been approved by the Committee and that any comments are recorded in REDCap.

The **Progress Report** should be a brief presentation of the accomplishments on the research project since the previous Committee update, in language understandable to a scientist or engineer who may not be a specialist in the project's research field. A link to the REDCap report template (outline shown below) will be provided by the DGS. Each section of the report should adhere to the character limits specified in REDCap. Tables and figures that summarize key accomplishments are encouraged and may be provided as a single PDF file that can be uploaded to REDCap with the Report.

#### Project Objectives

If the objectives have not been modified since your last update, restate them here. If they have been modified, give the revised objectives and the reason for the modification.

#### Studies and Results

Describe the studies directed toward the Project Objectives since the previous meeting and the positive and negative results obtained. If technical problems were encountered in carrying out the project, describe how your approach was modified. *This section must be written so that it is clear exactly what you have accomplished since the previous report or meeting.*

#### Significance

Emphasize the significance of the findings to the scientific field and their potential impact.

#### Plans

State your specific research goals during the next six months of the project.

### Publications

List your manuscripts published, in press, submitted, or in preparation.

### Meeting Attendance and Presentations

List any scientific meetings you have attended, and whether you presented a poster or talk.

### Teaching and Mentoring Activities

Briefly describe any of your activities related to teaching and mentoring, including classroom and laboratory teaching, training others in the lab, including visiting faculty, postdocs, graduate students, and undergraduates.

### Collaborations

Briefly describe any collaborations you have engaged in that do not fall within the scope of your dissertation project.

During each Committee meeting, the student should describe his/her accomplishments since the previous update and outline plans for the next six months of study. Following the meeting, the student should write a Meeting Summary and append it to their Progress Report in REDCap. It is the responsibility of the Committee Chair to certify that the Meeting Summary has been approved by the Committee and that any comments are recorded in REDCap within two weeks of the meeting date.

Prior to each Committee meeting, or at any other time, students have the option to request a private meeting with their Committee without their advisor(s) present to discuss any concerns they may have about their lab and/or advisor and/or project. Students can also bring such concerns to individual members of their Committee and/or to the DGS, who can provide advice to help resolve the issue or (with permission from the student) share the concern with other members of the Committee in order to work together toward a resolution.

## **Ph.D. Program Examinations**

### *Departmental Examination*

Those students who plan to pursue doctoral studies are required to pass the departmental qualifying examination. Each student will prepare an oral presentation and written report on their research at Vanderbilt to date. The written report is not to exceed 10 double-spaced 12-point font pages with at least half-inch margins (excluding references). The document should be in the format of a research article (i.e., it should have introduction, background, methods, results, and discussion sections). Note that appendices are not permitted. Additional formatting and procedural details will be provided by the DGS prior to the exam.

Each student will make a 20-minute presentation on their research to the faculty, followed by a question and answer session with the faculty to further gauge how well the student applies the principles of chemical engineering (i.e., thermodynamics, transport, and kinetics) to the research outlined. **Each student is REQUIRED to present one slide explaining how chemical engineering principles have been (or could be) applied to her/his research.** Both the written report and oral presentation should be conveyed in language understandable to a scientist or engineer who may not be a specialist in the project's research field. Students will be evaluated not only on the total amount of data they present, but also on their ability to evaluate and interpret data, to describe how their findings compare to other relevant studies in the scientific literature, and to demonstrate a deep understanding of the significance and meaning of their results.

The examination will be held in mid-August. The progress each student makes in their research project is expected to be reflective of how many research credit hours they have taken to date and

whether they TA'd in the Fall and Spring semesters. In preparing for the exam, students are welcome to obtain feedback from other members of their research group, but their faculty advisor should not be involved in the preparation of the oral or written report. The writing and research presented in the report should be the original work of the student. In instances in which some aspects of the research were performed collaboratively, experiments that were performed by other individuals should be clearly indicated with appropriate attribution.

The DGS will advise the student in writing of his or her examination results. The grading will be either: (1) Pass, (2) Fail with a re-examination (presentation of research results to the faculty in December), or (3) Fail with no re-examination (enter a terminal Masters degree program). The grade will be determined from a combination of the student's performance in: (1) the departmental examination, (2) the core ChBE courses (the faculty expects students to have a GPA of 3.3 or higher in core classes), (3) progress in the research project assigned to the student over the previous 6-9 months, and (4) teaching assistantship duties (if applicable).

#### *Pre-QE Committee Meeting*

The Pre-QE meeting should be held before August 31 of the second year of graduate studies. This meeting is intended to provide feedback from the Committee on the student's research prior to the QE, and to encourage students to begin discussing their research projects with faculty other than their advisor(s). At the meeting, the student will give a brief presentation of less than 30 minutes in length, allowing 30 minutes or so for discussion so that the meeting can be completed within one hour. The focus of the presentation should be on the experiments the student has performed in the laboratory and possible Project Objectives for a Thesis Proposal. The presentation should provide sufficient background information that the committee can understand the data and/or Project Objectives that are presented, but a heavy emphasis on background material is discouraged. Although the Pre-QE meeting is not an examination, any concerns the Committee has regarding the student's readiness to develop his/her research proposal should be clearly conveyed to the student and the DGS.

#### *Ph.D. Qualifying Examination*

Students are acknowledged as a Ph.D. candidate only after they pass the Ph.D. Qualifying Examination. This examination should be taken **before the end of the student's fifth semester in residence**. Please note that the graduate school requires students to have 24 hours of course credit before the qualifying examination can be taken. **Failure to take the examination on time may result in the student being placed on academic probation. Students on academic probation may be dismissed from the program if they remain on probation in subsequent semesters.**

Each student's Continuing Committee administers the exam, which consists of a presentation and discussion of the student's written Ph.D. dissertation proposal and related background material. The major criteria employed by members of the Committee to assess performance on the QE include the ability of the student to pose a scientific question, formulate hypotheses (or research objectives), develop reasonable strategies to test these hypotheses (or achieve the research objectives), anticipate experimental outcomes, and accurately interpret these potential outcomes. The proposal is not meant to be a comprehensive summary of research completed to date, but instead should focus on presenting the planned future dissertation research while drawing on key pieces of preliminary data for support. The proposal is to be written in a format approved by the student's research advisor and should be submitted to the Continuing Committee at least two weeks before the date of the QE. The proposal should not exceed 15 single spaced or 30 double spaced pages (excluding references).

The involvement of the advisor at this planning phase is essential, as it represents a critical component of the mentor-mentee dialogue that should continue throughout the dissertation research. Although a cooperative effort between student and advisor is strongly encouraged during the development of ideas, **it is the responsibility of the student to write and defend the thesis proposal. While the advisor may review the student's document prior to submission to the Committee, the document should primarily represent the work of the student, not the mentor.**

The Continuing Committee is appointed through the completion of the form available on the graduate school web site at: [http://gradschool.vanderbilt.edu/academics/steps\\_to\\_graduation.php](http://gradschool.vanderbilt.edu/academics/steps_to_graduation.php)

The Qualifying Exam is scheduled through the completion of the form available on the graduate school web site at: [http://gradschool.vanderbilt.edu/academics/steps\\_to\\_graduation.php](http://gradschool.vanderbilt.edu/academics/steps_to_graduation.php)

**These forms MUST be submitted to the Graduate Program Coordinator (GPC) in the Department office at least three weeks prior to the proposed exam date. The GPC will obtain the signature of the DGS and submit the forms to the graduate school.**

The Qualifying Examination may not be taken more than twice. The Chair of the Continuing Committee will advise the student of the examination results as soon as possible after its completion. The following form available on the graduate school website must also be completed and submitted to the GPC immediately following the examination: [https://gradschool.vanderbilt.edu/forms/qualifying\\_examination\\_results\\_form\\_rev10\\_17.pdf](https://gradschool.vanderbilt.edu/forms/qualifying_examination_results_form_rev10_17.pdf). The GPC will obtain the signature of the DGS and submit the form to the graduate school.

A completed copy of the SACS PhD Qualifying Exam and Thesis Proposal Assessment form must also be submitted to the Department along with the results of the qualifying examination. The results form will not be processed until the SACS form has been received. The SACS form can be downloaded from the ChBE department website: <https://engineering.vanderbilt.edu/chbe/GraduateProgram/Program-Policies.php>

### *Dissertation*

Before the dissertation document is prepared, the student should obtain the current version of the Graduate School's official instructions. During the development of the dissertation, the student should obtain regular feedback from their advisor, typically after each chapter is completed. In general, the dissertation should contain only the original research of the student. In instances in which some aspects of the research were performed collaboratively, experiments that were performed by other individuals should be clearly indicated with appropriate attribution. It is not acceptable to include entire bodies of work in which the student played a minor role as chapters in the dissertation (e.g., from lab publications). Note that the Graduate School catalog provides specific instructions for how the student should obtain permission to include her/his own previously published or co-authored materials in the dissertation.

### *Final Oral Examination*

The Final Oral Examination is a public presentation and defense of the written dissertation. The Continuing Committee conducts the examination. Passing the Examination is a requirement for the Ph.D. degree.

To schedule the Final Oral Examination, the form available on the graduate school web site ([http://gradschool.vanderbilt.edu/academics/steps\\_to\\_graduation.php](http://gradschool.vanderbilt.edu/academics/steps_to_graduation.php)) must be completed and submitted to the Graduate Program Coordinator (GPC) in the Department office **at least three weeks prior to the proposed exam date**. The GPC will obtain the signature of the DGS and submit the forms to the graduate school. A copy of the thesis abstract (of not more than 350 words) must also be submitted to the DGS by email. The department will only submit the paperwork to schedule the defense to the Graduate School upon receipt of the abstract. Please note that defenses should not be scheduled in the chemical engineering conference room.

At least two weeks before the Final Oral Examination the candidate must submit a copy of the written dissertation to each member of their Continuing Committee. The Committee members should only be asked to evaluate a document that the student and thesis advisor concur is the final draft.

The Examination must be scheduled to allow time for two copies of the signed, approved dissertation to be registered with the Graduate School no later than two weeks before the end of the term in which the student expects to graduate.

Following the Final Oral Examination, the dissertation defense results form on the Graduate School web site ([https://gradschool.vanderbilt.edu/academics/forms\\_timeline.php](https://gradschool.vanderbilt.edu/academics/forms_timeline.php)), should be signed by the committee members and submitted to the ChBE Graduate Program Coordinator (GPC). The GPC will obtain the signature of the DGS and submit the form to the graduate school. A completed copy of the SACS PhD Thesis Assessment form must also be submitted to the Department along with the results of the thesis examination. The dissertation defense results form will not be processed until the SACS form has been received. The SACS form can be downloaded from the ChBE department website:

<https://engineering.vanderbilt.edu/chbe/GraduateProgram/Program-Policies.php>

Following the defense and before a student leaves Vanderbilt the departmental graduation survey at:

[https://docs.google.com/forms/d/1JISpN9DUN7eqoWDLEGFmA5plrm\\_19MsDm6utvEFsvDM/viewform](https://docs.google.com/forms/d/1JISpN9DUN7eqoWDLEGFmA5plrm_19MsDm6utvEFsvDM/viewform)

must be completed and a hard copy submitted to the DGS with the Intent to Graduate Form.

### **Dissertation Registration and Binding**

Final copies of the approved dissertation may be submitted to the Graduate School in electronic or printed form. Style specifications, paper requirements, fees, and further details are listed at <https://gradschool.vanderbilt.edu/academics/theses/index.php>. With either option, three copies of the title page, with original signatures of the Ph.D. committee, and two copies of an abstract of not more than three hundred and fifty words, signed by the student's advisor, must be provided to the Graduate School no later than two weeks before the end of the term in which the student expects to receive the degree, except for the spring term. A candidate who expects to graduate in May must either upload the thesis to the Electronic Theses and Dissertations (ETD) web site (<http://etd.library.vanderbilt.edu>) or submit two printed copies of the dissertation to the Graduate School by the first week in April.

The student is also responsible for furnishing to the Department of Chemical and Biomolecular

Engineering hardbound copies of the dissertation for the thesis advisor(s) and the thesis library in the department conference room. The expense for these hardbound copies is the student's responsibility. These can be printed and bound at Campus Copy.

### III. M.S./M.E. PROGRAMS

Up to six hours of coursework in pursuit of a M.S. or M.E. degree with the equivalent of an A or B grade may be transferred to Vanderbilt. Transfer credit should be accomplished in the first semester of graduate study. Course transfers are subject to approval of the Dean of the Graduate School. There is no foreign language required for either the M.S. or M.E. degrees.

#### M.S. Program for Chemical Engineering Graduates

The M.S. degree in Chemical Engineering requires a minimum of 24 hours of coursework and 6 credit hours of thesis research. Students are required to take the following departmental courses.

Course Number	Course Name	Credit Hours
ChBE 6100	ChE Mathematics	3
ChBE 6110	Advanced ChE Thermodynamics	3
ChBE 6120	Applied Chemical Kinetics	3
ChBE 6200	Transport Phenomena	3

The remaining 12 semester hours are selected from courses in the major or from related areas of interest approved by the research advisor.

#### *Thesis Requirement*

A thesis is required to obtain a M.S. degree in Chemical Engineering. The research for the thesis is conducted under the direction of a faculty member of the Department. The thesis is prepared according to the format specified by The Graduate School and requires the signed approval of at least two graduate faculty members in the ChBE Department. In addition, each student makes an oral presentation of his/her thesis research no later than fourteen days before the end of the term in which the degree is to be granted.

#### *Thesis Registration and Binding*

Final copies of the approved dissertation may be submitted to the Graduate School in electronic or printed form. Style specifications, paper requirements, fees, and further details are listed at <https://gradschool.vanderbilt.edu/academics/theses/index.php>. Two copies of the title page, with the original signatures of the research advisor and a second reader, and one copy of the abstract of not more than three hundred fifty words, also signed by the student's advisor, must be provided to the Graduate School no later than two weeks before the end of the term in which the student expects to receive the degree, except for the spring term. A candidate who expects to graduate in May must upload the thesis to the Electronic Theses and Dissertations (ETD) web site (<http://etd.library.vanderbilt.edu>) or submit two printed copies of the dissertation to the Graduate School by the first week in April.

The student must also furnish hardbound copies of the signed M.S. thesis to the Department of Chemical and Biomolecular Engineering for the advisor(s) and the thesis library in the conference room. The expense for these hardbound copies is the student's responsibility. The thesis can be printed and bound at Campus Copy.

## M.S. Program for Non-Chemical Engineering Graduates

The requirements for a Masters degree for students without a chemical engineering undergraduate degree are identical to those described in the preceding section with the addition of the following:

### *Prerequisites*

Students entering the Graduate Program must have course credits equivalent to the following:

- Mathematics through Differential Equations
- One year of General Chemistry
- One year of Organic Chemistry
- One year of Physics, including laboratory
- Introduction to Computing

### *Chemical Engineering Undergraduate Courses*

Students should complete the following courses to prepare for advanced study in Chemical Engineering, if they have not taken equivalent courses as an undergraduate student. Satisfactory performance, as determined by the faculty, is required before the student can proceed with further graduate coursework.

Course Number	Course Name	Credit Hours
ChBE 5200	Phase Equilibria and Staged-Based Separations	3
ChBE 5250	Chemical Reaction Engineering	3
ChBE 5300	Fluid Mechanics and Heat Transfer	3
ChBE 5350	Mass Transfer and Rate-Based Separations	3

## M.E. Program for Chemical Engineering Graduates

The M.E. degree in Chemical Engineering requires a minimum of 30 hours of coursework. Students are required to take the following departmental courses.

Course Number	Course Name	Credit Hours
ChBE 6100	ChE Mathematics	3
ChBE 6110	Advanced ChE Thermodynamics	3
ChBE 6120	Applied Chemical Kinetics	3
ChBE 6200	Transport Phenomena	3
ChBE 7899	Master of Engineering Project	6

The remaining 12 semester hours are selected from courses in the major or from related areas of interest.

### *Project Requirement*

A master of engineering design project is required to obtain a M.E. degree in Engineering. The work for the project is conducted under the direction of a faculty member. An extensive, written design report is to be submitted on a project approved by the student's project advisor.

## IV. TYPICAL COURSE SCHEDULE FOR ChBE GRADUATE STUDENTS

### M.S. Program in Chemical Engineering

M.S. Program in Chemical Engineering (For students with Undergraduate ChE degrees)

1st Semester:	9 credit hours coursework; select thesis advisor and thesis topic.
2nd Semester:	9 credit hours coursework; begin literature search and research.
Summer:	3 credit hours of thesis research. Continue research and draft thesis.
3rd Semester:	6 credit hours coursework and 3 credit hours of thesis research; finish thesis and make oral presentation of results.

### Ph.D. Program in Chemical Engineering

Ph.D. Program in Chemical Engineering

1st Semester:	9 credit hours of coursework; select dissertation advisor and dissertation topic, and begin literature search.
2nd Semester:	9 credit hours of coursework selected in consultation with advisor; begin dissertation research.
Summer:	Continue dissertation research; complete Departmental Examination.
3rd Semester:	Up to 9 credit hours of coursework and/or dissertation research; select Continuing Committee
4th Semester:	Up to 9 credit hours of coursework and/or dissertation research; hold Pre-QE meeting.
Summer:	Continue dissertation research; submit Progress Report, when due.
5th Semester:	Up to 9 credit hours of coursework and/or dissertation research. Complete Ph.D. Qualifying Examination.
6th Semester:	Up to 9 credit hours of coursework and/or dissertation research; submit Progress Report, when due.
Summer:	Continue dissertation research. Meet with Continuing Committee.
7th Semester:	Up to 9 credit hours of coursework and/or dissertation research; submit Progress Report, when due.
8th Semester:	Complete research, write dissertation and take final oral examination

The number of credit hours of dissertation research taken each semester depends upon the number of graduate credits earned to date and the concurrence of the dissertation advisor. Prior to passing the Qualifying Examination students should sign up for ChBE 8999 Non-candidate research. Once the student passes the Qualifying Examination (a.k.a. the proposal defense) ChBE 9999 should be used to sign up for dissertation research. **Please ensure you sign up for the ChBE 8999 and ChBE 9999 sections that correspond to your advisor.**

## IV. PROCEDURES IN THE ChBE DEPARTMENT

### Keys

For the sake of building security, keys to Olin Hall, student offices, and laboratories must be kept in your personal possession. Do not duplicate, alter, or loan your keys to any person. Alteration of keys is an offense that could result in revocation of financial aid and expulsion.

### Commodore Card Access to Labs

To gain access to your assigned lab, you will need to email the Graduate Program Coordinator (GPC) with attached advisor approval. The GPC will reach out to the Building Manager on your behalf.

### Telephones

Please do not use the Department's telephone number as a personal contact number. Only in emergency situations will the Department office take telephone messages for graduate students. Graduate students may not charge long distance telephone calls to the Department. Talk with your advisor about procedures for making research related long distance telephone calls and faxes.

### Safety

The Chemical and Biomolecular Engineering Department takes safety issues very seriously. Students must familiarize themselves with all safety guidelines related to their research. These include, but are not limited to, the use of ventilation hoods, safety glasses, and gloves. Discuss safety guidelines specifically related to your research with your advisor. Students must report safety violations and potential hazards to the faculty. It is the student's responsibility to use provided safety equipment, and to inform their advisor of needed equipment not available to them. If there is a problem with obtaining the proper safety equipment, ask the DGS for assistance. The Chemical and Biomolecular Engineering Department safety rules are detailed in Appendix A.

### Financial Aid Restrictions

Students accepting admission into the Chemical and Biomolecular Engineering Department must acknowledge they have read and understood the following conditions: *Students receiving Vanderbilt University financial support must devote full-time to graduate study to the exclusion of other employment, except as approved by their advisor, Department Chair and the Graduate Dean.*

***If funds are available*** a student entering with a B.S. in chemical engineering and leaving with an M.S. may receive support from departmental funds until the student has been in our program for three semesters and one summer, subject to satisfactory progress.

***If funds are available*** a student leaving with a Ph.D. may receive support from departmental funds until the student has been in our program for five years, subject to satisfactory progress.

Extensions of the funding period beyond those listed above require review by the Continuing Committee and departmental faculty.

## Business Cards

The department will pay for you to obtain Vanderbilt business cards once you pass the Qualifying Examination and become a PhD candidate. To get your cards you need to:

1. Go to <http://printingservices.vanderbilt.edu/>
2. Click on 'Order Business Cards' from the menu on the right hand side and log in using your VU id and password.
3. On the next page click 'Business Cards'
4. On the next page click on 'School of Engineering-PMB Address'
5. You want the first choice of card, "University or School Business Cards." Select 250 and hit continue.
6. On the next page you need to select School of Engineering from the pull down tab under the heading Center or School.
7. Fill out your information.
  - Job Name: Last Name- ChBE Business Cards
  - Quantity: 250
  - Title: Ph.D. Candidate- Group Name (i.e. Ph.D. Candidate- Young Group)
  - Department or Division: Chemical and Biomolecular Engineering
  - City,ST,Zip: Nashville, TN 37240-1604
  - Phone: Put in your lab phone #
  - Fax: 615 343 7951
  - Email: You must use your VANDERBILT email address. (no non-Vanderbilt addresses)
  - PMB Number: 351604
8. PREVIEW your card by selecting the eye icon on the left hand side and make sure it matches the info above.
9. Then click "Add to Cart" and on the next page click "Checkout."
10. Fill in your name and the department's address for billing and shipping. Use the following COA for billing: 150.05.15220.000.000.0.0.

At the bottom of the page click submit to submit your order.

## Course Registration

Course selection for first semester students will be made in consultation with the DGS. All other students will select courses in consultation with their thesis advisor. Every semester students must register for classes online using YES.

The type of financial support the student receives determines the number of credit hours that a student may register to take each semester. All courses for which Financial Support is provided

must be in support of the student's chemical engineering degree.

- Students with Departmental financial aid (i.e., those serving as TAs) may not register for more than 9 credit hours each semester or 18 credit hours during the academic year (fall, spring, and summer terms). Registration for more than 18 credit hours per year may invalidate the Departmental financial aid award.
- Students with external support should check with their advisor about the number of allowable credit hours. Generally, students with external support are limited to 24 credit hours during the academic year (fall, spring, summer). If a student registers for credit hours beyond the allowable, he/she may be financially responsible for the tuition associated with the extra credit hours.

### **Photocopying and Facsimile Service**

Graduate students may use the photocopier in 133, 212, or 311 Olin to copy documents related to their thesis research or teaching assistantships. The fax machine is located in 107 Olin.

### **Shop Facilities**

Shop equipment may be used under the direction of the shop supervisor, Prof. Jason Mitchell. Anyone using shop equipment is responsible for cleaning the tools and machines before leaving the shop. To contact Prof. Mitchell, call (615) 322-3668 or email [jason.mitchell@vanderbilt.edu](mailto:jason.mitchell@vanderbilt.edu).

Graduate students may check out a toolbox with hand tools when required. Each student is responsible for returning the complete set of tools before graduation will be authorized.

### **Purchase Order Requisitions**

When you require equipment or supplies for your research, please consult with your advisor and lab staff. Labs should send all orders to the procurement requestor(s) in their lab. If assistance is needed with ordering, please email [chbeorders@vanderbilt.edu](mailto:chbeorders@vanderbilt.edu). These orders will be processed by staff as soon as possible; orders should be submitted within a timeframe that allows for entry and approval.

Labs should also send questions about credit card orders, capital equipment (over \$5K), invoices/estimates, publication fees, and blanket POs to [chbeorders@vanderbilt.edu](mailto:chbeorders@vanderbilt.edu).

- **Graduate students: please send the order to your PI for approval first.** This will allow you to make changes to funding sources or quantities, when necessary. Once you have this approval, you can attach your order form and **forward to [chbeorders@vanderbilt.edu](mailto:chbeorders@vanderbilt.edu) in one email.**
- Your email subject should have your last name/the requestor's last name, your PI last name, and the supplier (Passantino Jennings – VWR) and if it is urgent. Please use prudence when sending urgent requests and contact us to give us a heads-up.
- We will reach out, if we have questions. Incomplete orders will be returned for additional info.
- Orders will be processed and approved by our Financial Unit Manager as soon as possible.
- Orders above \$10,000 will also be approved in the Dean's office by our Business Unit approver.

Once the order is approved, the requestor will receive an email confirmation entitled **“FYI: Requisition RXXXXXXXXX Approved.”**

When the PO is implemented, you will receive an email entitled **“FYI: Document PXXXXXXXXX Implemented”** with the purchase order attached. The requestor who submitted the order is

responsible for checking the PO to confirm the order is correct and complete. If it is not, you will need to cancel the order with the original company and contact the person who placed the order (your lab member or staff) to cancel the invoice/amend the order.

If an invoice requires approval, you will receive an email entitled “**Action required: XXXX.**” **Do not ignore these emails.**

- Confirm the invoice total matches your PO total before shipping charges. The invoice will be a bit higher, if we are charged shipping.
- Select the blue [Approve](#) link which will generate a new email
- Send the approval email without edits
- If you dispute the invoice, please speak with the person who placed your order to discuss next steps.

We encourage students to take procurement classes to place orders. Please contact staff for more information and next steps.

## V. TRAVEL AND EXPENSE REIMBURSEMENT

### Travel Process

- Advisor approval is **required** prior to traveling.
- The student must contact their advisor directly by email to request use of funds for travel and to obtain the POET information for the grant being charged.
- The advisor must respond with their approval, and the email with approval and grant information will then be forwarded to [Chineme.chokuba@vanderbilt.edu](mailto:Chineme.chokuba@vanderbilt.edu).
- Please use the POET string with the number your PI specifies (e.g. 150.10.15220.000.000.GC\_111111.10)
- This email chain must be attached to all reimbursements for travel and match the funding source listed.
- Travelers are required to read and follow VUSE and Vanderbilt guidelines. ([Travel and Business Expense Policy](#), [VUSE Travel Site](#) and [Traveler Responsibilities](#))
- You must book airline travel via **Concur Travel** from main landing page in Oracle. **If you book airline travel outside of CONCUR/World Travel, you will not get refunded for this expense.** If you find a cheaper air fare online or have trouble locating a flight, World Travel can help at 877-271-9258.
- Rental cars must be booked through Concur. Hotels or Airbnb may be booked outside of Concur, if prices are not comparable.

### Safety, Security, and Insurance

- Vanderbilt requires travelers to contact the Vanderbilt Incident Response for Travel (VIRT) team in the event of an emergency. The university also requires travelers to report accidents, thefts, and other crimes that occur while traveling on university business to the proper authorities, consistent with local/state laws, and to Risk and Insurance Management. Their phone is **615-322-2745**.
- See [Travel and Business Policy](#) for more information regarding insurance during business travel.

Access Oracle via SkyVU: <https://www.vanderbilt.edu/skyvu/>

Click on the cloud and log in using the blue Company Single Sign-On button.

### Concur set-up: Initial Actions Required

- See [Quick Guide](#).
- Create a personal profile by logging into Oracle. Click on **Concur Travel** from the main landing page.
- Confirm that your name in the profile matches the name listed in your travel documents (e.g. passport, driver's license).
- Add any travel programs into your profile.
- Add your credit card information to be used for travel reservations and charges.

### Expense Reimbursements

- Create your expense report by logging into Oracle. Click on **Expenses** from main landing page.

- Click on the gold “i” icon in Oracle and type “expense” for instructions.
- You can also use the **Oracle Mobile App** to keep track of your receipts and travel expenses. [Click here](#) to download a guide to getting started.

### **Basics**

- Please submit all purchases within 30 days of travel; charges over 60 days old are taxed as income.
- Charges over one year will not be reimbursed.
- Confirm your estimated items/dates for expenses with your PI before travel.**
- For multiple charges, submit in one report for each trip. If you have more than one trip with multiple receipts, you may elect to submit more than one report.
- Itemized receipts are required for all meals; these include the food purchased. With the card number and date of visit, restaurants are usually able to send you this receipt.
- For group meals or other expenses shared by multiple people, include all first and last names, including Vanderbilt and non-Vanderbilt attendees. Attach a list, if necessary.
- Only faculty can charge per diem to an expense report.
  - Per diem cannot be used if any part of the trip is being charged to a federal grant.
  - Per diem cannot be used if the trip includes meals, one card expenses, or entertainment.

### **COA/Project**

- Before changes are made, all charges will populate with our department chart of accounts (COA). Without approval to charge on this budget, your report will get rejected.
- You will need the grant (also called project or POET) or other fund from which you will be reimbursed. (Click on the gold “i” icon in Oracle and type “expense” for instructions.)
- Allow the four-digit number for account to auto-populate from your selection in the “Type” field.

### **Itemization**

- Itemization is only required to split the charge against multiple funding sources.**
- Click on the gold “i” icon in Oracle and type “expense” for instructions.
- For **personal expenses** that are not reimbursed, you can remove the portion that will not be reimbursed from the total charge and make a note in the description to explain the discrepancy from the receipt (e.g. “Removed \$15 personal alcohol charge from meal total.”)
- For hotel expenses, including meals, see section V.

### **Meals**

- All meals should include an itemized receipt.**
- Business Meal:** Meal at a local restaurant (or delivered) for a group of people. Alcohol must be itemized and charged to a different funding source. Attendees required.
- Food and Non-alcoholic Drink:** Food and/or drinks bought at a grocery store for an event. No alcohol. Attendees required.
- Domestic Meal (Individual or Group):** Food purchased while traveling outside of Nashville. Alcohol must be itemized and charged to a different funding source. If ‘Domestic Group,’ attendees are required.
- Alcohol/Entertainment:** Meal includes Alcohol and does not need to be itemized. Should not be used on grants.

### **Hotel/Lodging Charges**

- a. You may expense Airbnb in Oracle.
- b. You may charge your hotel outside of Concur, if you have a better price or conference discount code. Explain this justification in the description.
- c. If your hotel bill includes room service or individual meals at a restaurant charged to the room, list the amount of each individual meal in the description box.
- d. If you paid for multiple people and charged it to your room, itemize that particular meal as 'Domestic Group.' In the itemization, you must state the business purpose in the description and list or attach attendees.
- e. If a hotel meal is \$75 or more, a separate itemized receipt is required. This is not included in the basic hotel folio and must be requested by the traveler.

### **Cars, Parking, and Mileage**

- a. When rental cars are used for Vanderbilt travel, they must be booked in Concur.
- b. Uber/Lyft receipts are acceptable and must show payment.
- c. For parking charges, include parking stub or bank charge to confirm payment.
- d. Travelers using their own vehicle will be reimbursed for mileage at the current IRS rate. For mileage reimbursement please provide proof of mileage using maps.google.com or mapquest.com. If traveling without other Vanderbilt attendees for more than 1000 miles, Vanderbilt requires a round-trip airfare comparison. You will be reimbursed the price of a comparable flight.
- e. See [Travel and Business Policy](#) for more information regarding car insurance during business travel.

### **Flights**

- a. **Airfare receipts must include proof of purchase, which is the last four digits of credit card showing you paid.** Itineraries or reservations are not proof of purchase as they only show intent to pay.
- b. Travel receipts from Concur/World Travel will come via email with *Travel Receipt Communication* in the subject line. If you cannot locate it, you can download a copy of your receipt via this link: <https://www.graspdata.com/Public/PrintInvoice.aspx?agency=76D8286F866141D8A207BA59613F68DE>
- c. Bank statements can also be accepted. Please crop or blur out unrelated info to highlight the flight charge

### **Restrictions**

- a. We do not reimburse students for alcohol, laundry, or valet service.
- b. **Alcohol:** Use Entertainment for charges with alcohol, unless you are itemizing the food charges to a federal grant. Most grants do not allow alcohol or entertainment charges, so the alcohol would need to be expensed to a discretionary fund that is not a grant. See section III.
- c. The general amount of a per diem (currently \$55/day) is considered when reviewing and approving meals for staff and students.
- d. **Graduate students may not use per diem and must submit itemized receipts.** Meal limits are \$15 for breakfast, \$15 for lunch and \$25 for dinner. If three meals are expensed for a day and all meals are below the total of \$55, that is acceptable.

## **VI. HOLIDAYS AND IMPORTANT DATES**

The following are the graduate student holidays:

New Year's Day (January 1)  
Martin Luther King Jr. Day (third Monday in January)  
Memorial Day (last Monday in May)  
Independence Day (July 4)  
Thanksgiving Day (fourth Thursday in November)  
Friday after Thanksgiving Day  
Winter Break (December 24 - 31)

Any time away from Vanderbilt must be arranged in advance with the student's advisor or the DGS if an advisor has not yet been assigned.

## Appendix A

# GENERAL LABORATORY SAFETY RULES

### General

1. All graduate students, staff and faculty are required to complete safety training annually.
2. Observe General Building SAFETY rules.
3. Safety Data Sheets (SDS) are an essential element of a chemical safety program. These sheets normally come with each chemical order. They are also available through Vanderbilt's Environmental Health and Safety website (<https://www.vumc.org/safety/chem>). The sheets tell you of any special requirements in safety and handling of chemicals including health effects, fire and reactivity, spills and disposal, first aid, storage, and handling.
  - a. Copies of SDSs must be readily accessible during work hours. It is the responsibility of each laboratory to have a complete set of SDSs for all chemicals in the laboratory.
  - b. All personal protective equipment (PPE) indicated on the respective chemical SDS sheets must be used.
4. Do not smoke.
5. Wear safety glasses, appropriate gloves, and proper attire in work areas. **Do not** wear contact lenses or dark tinted safety glasses. Long pants and closed toe shoes must be worn in all chemical laboratories.
6. Do not eat or carry food or drinks in laboratory work areas.
7. Building maintenance will inspect all lab safety showers a minimum of once per semester. Graduate students should test eye wash stations in their respective labs at least once per month.
8. Only trained and qualified personnel will operate Department equipment.

### Glassware

1. Inspect all glassware for defects each time it is used. Damaged pieces must be disposed of, fire polished or sandpapered before they are used. Damaged pieces awaiting repair must have sharp edges protected with tape and be collected in a designated area.
2. Clean up broken glass immediately. Wear leather gloves and use proper equipment - do not pick up pieces by hand.

## **All Laboratory Equipment**

1. You must have an equipment setup plan and protocol approved by your advisor prior to starting any experiments.
2. Always perform a safety inspection of laboratory equipment before use.

## **Reagents & Chemicals**

1. Read SDSs for each chemical before usage and storage.
2. All chemicals must be properly stored in categories consistent with their respective SDSs.
3. Do not dispose of any chemicals in a sink without Vanderbilt Environmental Health & Safety approval.
4. Disposal of wastes must comply with University procedures. There should be a Vanderbilt hazardous waste disposal manual in each lab.
5. Keep yourself and the equipment clean when handling all laboratory materials. Wash your hands frequently. Contact Environmental Health and Safety at Vanderbilt immediately concerning any spill of toxic material.

## **Miscellaneous**

1. Never force an operation as it often causes accidents.
2. Clean used equipment promptly.
3. Label all samples. Unlabeled samples will not be received into the lab.
4. Maximize use of exhaust hoods when handling solvents, irritants, dusts and toxic materials.
5. Wear special eye protection if you will be exposed to ultraviolet (UV) light sources or lasers.
6. You must get the lab supervisor's approval before you use compressed gases.

Other safety information (biological, radiation, etc.) and links to training are available on Vanderbilt's Environmental Health and Safety website (<https://www.vumc.org/safety/index>)

This document provides general guidelines only. More detailed chemical safety information can be found at: <https://www.vumc.org/safety/chem>

**APPENDIX B**  
**ChBE DEPARTMENT DIRECTORY**

<b>Faculty</b>	<b>Title</b>	<b>Office #</b>	<b>Phone #</b>	<b>Email (@vanderbilt.edu)</b>
Bridget R. Rogers	Associate Professor	306B/218, 220 Olin	3-3269/ 2- 1564	bridget.rogers
Carlos Silvera Batista	Assistant Professor	308A Olin	7-6195	silvera.batista
De-en Jiang	Professor	MuMS**	TBD	de-en.jiang
Ethan S. Lippmann	Associate Professor	303B,118 Olin	2-3961	ethan.s.lippmann
Jamey D. Young	Professor/Director of Graduate Studies	212B,213-216 Olin	3-4253/ 2- 5274	jamey.d.young
John T. Wilson	Associate Professor/Director of Graduate Recruiting	364,342 ESB	2-6406/ 3- 4035	john.t.wilson
Kane Jennings	Professor	308B Olin	6-8431	kane.g.jennings
Marjan Rafat	Assistant Professor	426,408 ESB	3-3899	marjan.rafat
Matthew Lang	Professor	207,009 Olin	5-7493/ 3- 5050	matt.lang
Paul E. Laibinis	Chair/Professor	110,006 Olin	2-2707/ 2- 1467	paul.e.laibinis
Peter Pintauro	H. Eugene McBrayer Chair	304B, 322,323 Olin	3-3878/ 2- 5267	pn.pintauro
Piran Kidambi	Assistant Professor	372,346 ESB	3-7466	piran.kidambi
Russell F. Dunn	Professor of the Practice	206 Olin	3-4268	russell.f.dunn
Scott A. Guelcher	Professor	412C/205,211– 1175J MRB/Light Hall	2-9097/ 3- 4977	scott.guelcher
<b>Research Faculty/Staff</b>	<b>Title</b>	<b>Office #</b>	<b>Phone #</b>	<b>Email (@vanderbilt.edu)</b>
Bo Wang	Research Assistant Professor	212D Olin (Young)	TBD	bo.wang.2
Chris Iacovella	Research Assistant Professor	MuMS** (remote)	3-3531	christopher.r.iacovella
Julianne Vernon	Assistant Dean/Research Professor	308B Olin	3-1543	julie.vernon
Katarzyna Zienkiewicz	Senior Research Assistant	412B,211 Olin	5-8196	katarzyna.zienkiewicz
Peifu Cheng	Research Engineer	376 ESB	TBD	peifu.cheng
Wycisk, Ryszard	Research Associate Professor	310 Olin (Pintauro)		ryszard.wycisk

<b>Staff</b>	<b>Title</b>	<b>Office #</b>	<b>Phone #</b>	<b>Email (@vanderbilt.edu)</b>
Brittany Hill	Administrative Manager	108 Olin	2-6417	brittany.hill.1
Chineme Chokuba	Sr. Administrative Officer	109 Olin	3-5529	chineme.chokuba
Irina Trenary	Lab Manager (Young)	210, 213 Olin	2-5274	irina.trenary
Borislav Ivanov	Lab Assistant	122 Olin, 208 Olin	TBD	borislav.ivanov
Jenni Powell	Grad Program Coordinator	212C Olin	2-7001	jenni.c.powell
Rae Hull	Grants Manager	Remote	3-7204	rae.hull
Ross Denham	Building Manager	610C	3-5693	ross.denham
Sharon Soxayachanh	Grants Manager	Remote	3-2597	sharon.soxayachanh

**\*MuMs = Multiscale Modeling and Simulation Center, Suite 200 1102 17th Ave South  
Phone extension prefixes (32)2-xxxx, (34)3-xxxx, (93)6-xxxx, (87)5-xxxx**

## **ChBE Graduate Students**

### **Incoming Graduate Students**

Nolan Petrich  
Mina Saleh  
Maggie Orlova  
Nicole Marguerite  
Skyler Hornback  
Jamie Hemstock  
Rayan Alghanayem

### **Cummings**

Xiaobo Lin  
Co Quach  
Andres Ordorica

### **Guelcher**

Taylor Scott

### **Jennings**

Marc Nabhan  
Allison Cordova Huaman  
Zane Parkerson

### **Jiang**

Shicheng Li  
Yujing Tong

### **Kidambi**

Andrew Naclerio

### **Kosson**

Autumn Taylor

### **Lang**

Mark Hilton  
Madeline Johnson  
Liz Holliday  
Allyson Karmazyn  
Hannah Stephens  
Evan Kirkpatrick  
Daniel Masi

### **Lin**

Joshua Livingston  
Ali Zaker Shawon

### **Lippmann**

Corinne Curry  
Anup Challa

### **M<sup>c</sup>Cabe**

Chloe Frame  
Alyssa Nelson  
Parashara Shamaprasad

### **Pintauro**

Xiaozong Fan  
Xiaomin Xu  
Zezhou Yang

### **Rafat**

Gregory Berumen  
Kevin Corn  
Benjamin Hacker  
Tian Zhu  
Shannon Martello

### **Silvera Batista**

Behrouz Behdani  
Kun Wang

### **Weiss**

Rabeb Layouni  
Juliana Yang

### **Wilson**

Christian Palmer  
Lucinda Pastora  
Payton Stone

### **Young**

Javier Gomez  
Amy Zheng  
Rachel Moen  
Kevin Ruiz-Márquez

### **Zanic**

Laura Richardson

## Appendix C Department Forms

- 1) **Purchase Request Form** – Students should send orders to the procurement requestor(s) in their lab. For any orders sent to [chbeorders@vanderbilt.edu](mailto:chbeorders@vanderbilt.edu), a completed purchase request form is required. Please note that no purchase will be made without the complete information, including the **POET number** that the purchase is to be charged to, business justification, vendor name, address and phone number and the approval email of the faculty responsible for the budget charged.
  
- 2) All forms are available on line as a download from the department website:  
<https://engineering.vanderbilt.edu/chbe/GraduateProgram/Program-Policies.php>.

**DEPARTMENT OF CHEMICAL & BIOMOLECULAR ENGINEERING  
PURCHASE REQUEST FORM**

Vendor: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_  
 State: \_\_\_\_\_  
 Zip Code: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Fax: \_\_\_\_\_  
 Website: \_\_\_\_\_

**\*\*Required Business Justification -- Part One:**  
 Supplies and how they will be used. **Part Two:** Name  
 the grant(s)/project(s) that will benefit\*\*

Requested by: \_\_\_\_\_

**\*\*This block REQUIRED for AL Gas Orders\*\***

COA/POET NUMBER(S):	%	Lab Room #:
150 xx.15220.xxx.xxx.GC_XXXXXX.x	100	_____
150		Gas VU Acct#:
150		_____
150		_____
150		_____

**FACULTY APPROVAL**  
 (signature or by email)

Quote # (if applicable) \_\_\_\_\_

Item #	Quantity	Unit	Model/Catalog #	Description	Unit Cost	Total Cost
1						\$0.00
2						\$0.00
3						\$0.00
4						\$0.00
5						\$0.00
6						\$0.00
7						\$0.00
8	Shipping					
<b>TOTAL</b>						<b>\$0.00</b>

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 PO Form revised April 4, 2018

## Appendix D

### Graduate School Travel Grants

In the effort of promoting graduate student research, the Graduate School offers a travel grant to all graduate research assistants to attend both domestic and international conferences. The Graduate School Travel Grant has the following requirements:

- The student must have completed at least one academic year in the Vanderbilt Graduate School.
- The student must be the **first** and sole presenter of research conducted at Vanderbilt University.
- The meeting must be a major regional, national, or international conference.
- Grants are limited to \$500 and all charges must be allowable and comply with accepted Vanderbilt travel and reimbursement policies.
- Grants are awarded per budget year (July 1-June 30) and travel must begin in the year they are awarded.
  - Students are allowed one travel grant per year.
  - Students are eligible for three trips during their Graduate School tenure.
- If awarded a Graduate School Travel grant, you must have travel authorization from your department prior to travel.
- Notice that in the application you are requested to attach a copy of the abstract that you are presenting.
- The application must be received by the Graduate School at least two weeks prior to your travel.
- A copy of the application and abstract should be submitted to the Graduate Program Coordinator in the Department office in order to obtain the required signatures prior to submitting the application to the Graduate School.

The application form may be downloaded from the following website:

<https://gradschool.vanderbilt.edu/funding/travel.php>