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DEPARTMENT OF CHEMISTRY  
KENNETH P. DIETRICH SCHOOL OF ARTS AND SCIENCES  
UNIVERSITY OF PITTSBURGH  
GRADUATE PROGRAM REGULATIONS FOR  
M.S. AND Ph.D. PROGRAMS IN CHEMISTRY

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The graduate program in chemistry at the University of Pittsburgh is designed to prepare students to distinguish themselves as M.S. and Ph.D. chemists, through creativity, critical thought, articulate expression, and keen understanding of the methodology and literature related to their chosen field of chemistry. Students generally meet departmental course-work requirements during the first two terms in residence and begin research in their second or third term.

General requirements that apply to all students pursuing M.S. or Ph.D. degrees in the Dietrich School of Arts & Sciences can be found at the following sites:

Graduate Studies

<http://www.asgraduate.pitt.edu/forms-policies>

Regulations Governing Graduate Study at the University of Pittsburgh, Revised 2008:

<http://www.pitt.edu/~graduate/regtoc.html>

General Academic Regulations

<http://www.bulletins.pitt.edu/graduate/regulations2.htm#Anchor-Regulations-14210>.

Every graduate student is encouraged to review these policies, procedures and regulations. It is each student's responsibility to understand these requirements. Regulations and program details that are specific to the Department of Chemistry are provided in this handbook.

## 1. STUDENT ADVISING

Guidance to all new students is provided by the Graduate Student Advising Committee (GSAC). Members of this committee meet with each new student during orientation to plan a program of study, and to assist with the course registration process. Additional meetings are held during the registration period for the student's second term classes and as otherwise necessary or appropriate. GSAC advises students until they have passed their Preliminary Examination. After students pass their Preliminary

Examination, advising is primarily handled by each student's Major Adviser. GSAC and the Director of Graduate Studies (DGS) continue to monitor the progress of all students to confirm that the major milestones of the graduate program are completed on time (see below).

## 2. THE Ph.D. DEGREE

There are several milestones along the path to the Ph.D. degree. These are described in the following sections. An overview of the milestones and a timeline for completing them may be found as Appendix IV.

### 2.1. THE PRELIMINARY EXAMINATION

Department of Chemistry graduate program policies and procedures are based on University of Pittsburgh Dietrich School of Arts & Sciences graduate study policies, which can be found at <http://www.asgraduate.pitt.edu/>. Student performance in four of the Department of Chemistry graduate level core courses is the basis for the Preliminary Examination. These courses are normally taken in the student's first two terms in residence. To satisfy divisional requirements, two core courses must be taken in an area of concentration selected by the student. (Analytical, Biological, Inorganic, Organic and Physical). Selection of core courses is done in consultation with GSAC.

The following 3-credit core courses are offered. The schedule of courses is available at [http://www.registrar.pitt.edu/schedule\\_of\\_classes.html](http://www.registrar.pitt.edu/schedule_of_classes.html)

- Inorganic: Chem 2110 Chemical Symmetry  
Chem 2120 Descriptive Inorganic Chemistry
- Analytical: Chem 2210 Electroanalytical Chemistry  
Chem 2220 Chemical Separations  
Chem 2230 Analytical Spectroscopy  
Chem 2250 Mass Spectroscopy
- Organic: Chem 2310 Advanced Organic Chemistry 1  
Chem 2320 Advanced Organic Chemistry 2
- Physical: Chem 2430 Quantum Mechanics and Kinetics  
Chem 2440 Thermodynamics and Statistical Mechanics
- Biological: Chem 2810 Introduction to Biological Principles and Methodologies  
(aka Biology for Chemists)  
Chem 2820 Applications of Chemical Tools to Biological Problems

In the Dietrich School of Arts & Sciences, a grade of B is defined as adequate performance for graduate students (see Appendix III for guidelines regarding core course grading). Students who satisfy the breadth requirements and earn a grade of B or higher in four core courses are in good standing and will have passed the Preliminary Examination (see the table below).

Students who earn a grade below B in only *one* of the four core courses, and whose core course GPA is 3.00 or higher, will also pass the Preliminary Examination. (These students should also note the 12-credit Master's degree requirement explained in Section 2.2.)

Students who earn a grade below B in only *one* of the four core courses, and whose core course GPA is less than 3.00, will be permitted to take a fifth core course in the next term in which core courses are taught. These students will pass the Preliminary Examination if the GPA in four of the five core courses taken  $\geq 3.0$ . Note that an overall GPA of 3.00 or greater is required to teach and to graduate. For preliminary exam purposes, no course repetitions are permitted.

### CORE COURSE GRADES

Number of grades that are B or higher	Number of grades that are less than B	Core course GPA	Preliminary Exam Outcome
4	0	$\geq 3.0$	Pass
3	1	$\geq 3.0$	Pass
3	1	$< 3.0$	Take one additional core course
2	2	Any	Dismissed from Ph.D. Program

If a student earns a grade below B in more than one core course, regardless of their core-course or overall GPA, that student will have failed the Ph.D. Preliminary Examination and will not continue in the Ph.D. program. The status of students earning two grades below B in the first two terms in residence will be reviewed at the end of the second term in residence to determine whether they will continue in the program as a Master's degree candidate.

Students may request to take a course from outside the core program instead of one of the courses listed above to meet Preliminary Examination requirements. Requests must be approved by GSAC. Currently, the approved courses are

	Department	Course No.	Title	Credits
1a	BIOSC	2145	Protein Life History*	2 (must also take CHEM 3902)*
1b	CHEM	3902	Directed*	1 (must also take BIOSC 2145)*
2	MSCMBP	2885	Imaging Cell Biology in Living Systems	3
3	BIOSC	2940	Molecular Biology	3
4	CHE	2043	Electron Microscopy in Materials Science	3
* Students write a paper (CHEM 3902) based on material in BIOSC 2145 to create a three-credit course equivalent.				

In some cases, the Graduate Student Advising Committee (GSAC) may approve, in writing, a path of study that differs from the standard two-term, four-core-course sequence.

**2.1.a. Students with advanced standing:** Students who enter the graduate program with advanced standing (i.e. students who have a Master's Degree in chemistry or who have already taken graduate-

level courses in chemistry) may request permission from GSAC to earn credit for a core course by taking an examination. This ‘credit by examination’ option is only available to students who have previously taken a graduate-level course similar to one of this department’s core courses, as determined by the course instructor. Earning credit by examination involves the assignment of a letter grade for an existing Pitt course based on an oral or written examination, at the discretion of the core course instructor. Students who wish to earn “Credit by Examination” must obtain the form from the Graduate Program Administrator, meet with the instructor of the course to determine the nature of the examination, and provide the completed form to the Graduate Program Administrator. You must register for the said course, and you will receive a grade for it which will appear on your transcript. A course passed by examination counts towards the requirements for the Preliminary Exam and towards the University-wide 12 credit requirement (Section 2.2).

**2.1.b. Students who may benefit from extra preparation:** Based on appraisal exam scores, and with the advice and consent of GSAC, students may elect to take preparatory courses from outside the core course offerings; such courses may include 1000-level undergraduate chemistry courses or 2000-level graduate chemistry courses. Students who, with the permission of GSAC, take preparatory courses will receive a suitable time extension for completion of the Preliminary Examination and other milestones. Students are expected to earn grades of B or higher in preparatory courses. Students face dismissal from the program if a grade below B is earned in more than one preparatory course.

**2.1.c. Students on Provisional Graduate Status:** The Department of Chemistry does not currently admit graduate students on provisional status.

## **2.2. UNIVERSITY-WIDE 12-CREDIT REQUIREMENT AND GPA CLARIFICATION**

The University requires that a minimum of 12 credit hours of coursework at the 2000- or 3000-level (excluding Independent Study, Directed Study, Thesis and Teaching credits) must be completed with an earned grade of B or better (note: not a B average but rather a grade of B or better in each course) in order to qualify for the Master’s Degree. Ideally, students will meet the 12-credit requirement on the basis of the core courses taken for the Ph.D. Preliminary Examination. The 12-credit requirement may include, but is not limited to, core courses. Students who do not satisfy this 12-credit requirement are not eligible to receive the Master’s Degree.

To qualify for teaching, the GPA (*including* Independent Study, and Directed Study) must be greater than 3.00.

Regulations Governing Graduate Study at the University of Pittsburgh:

A grade average of at least B (GPA=3.0) is required in the courses which make up the program for any graduate degree. A student with full graduate status is automatically placed on probation whenever his or her cumulative GPA falls below 3.00. A student on probation is not eligible to take the Ph.D preliminary examination, the MA/MS or Ph.D. comprehensive examination, or to graduate.

## **2.3. SELECTING A MAJOR ADVISOR AND JOINING A RESEARCH GROUP**

**2.3.a. Joining a Group:** Each student must join a research group. The faculty member directing that research group will serve as the student’s Major Advisor after the Preliminary Exam is completed. To assist with this decision, entering graduate students take CHEM 2700, a zero-credit research seminar in which chemistry research faculty present overviews of their research programs. Students are required to meet with at least three faculty members to discuss research opportunities. During these meetings, students must ask the faculty member to sign their “Selection of Research Problem and Director” form(Blue Form). This form, along with the form to identify research advisor preferences, are distributed at the last class meeting of CHEM 2700.

After meeting with faculty, students submit their prioritized list of three potential research advisors and their "Selection of Research Problem and Director" form to the Administrative Officer by a date that will be announced. Students who have not reached a decision on group preference by that date may continue to discuss their interests with relevant faculty, however, their assignment to a research group and their ability to begin research activities may be delayed. Students are encouraged to adhere to the deadline for submission of their prioritized list of potential faculty advisors.

After all first year graduate students have submitted their prioritized list of three potential research advisors, the Administrative Officer will notify individual faculty, identifying students who have placed them first on their lists. Faculty will then inform the Administrative Officer which of these students they can accommodate and will accept into their group. If a student is not accepted into his/her first choice group, the Administrative Officer will notify the student's second choice faculty member. If there is no second round match, the iterative process continues until all students have been placed. After faculty have confirmed their student acceptances to the Administrative Officer, students are informed of their research group assignments.

In the rare instance that a student does not get any of his/her first three choices, the Administrative Officer will meet with the student to suggest groups that still have openings for new students. The graduate student is then encouraged to meet with faculty who have openings to complete the group selection process. Group selection for students entering in the fall term is finalized as early as possible in the spring term that follows.

**2.3.b. Dual Advisors:** A student may wish to have two collaborating professors as Major Advisors (Dual Advisors). In such cases, the student should discuss this possibility with both potential Dual Advisors before the formal selection process begins. If the advisors both agree that the plan can work (or if the advisors suggest that they should both be advisors in a Dual Advisor arrangement), then the above-described formal selection process should be modified. The student should list the Dual Advisors as a single 'choice' on the form. A brief letter to the Administrative Officer should accompany the form that is turned in for the selection process, indicating that the first choice for Major Advisor is a Dual Advisor arrangement, and that the potential Dual Advisors have agreed to the plan.

The Administrative Officer should be notified in writing by the potential Dual Advisors before the selection process deadline that a Dual Advisor arrangement is being considered. In the communication, the Dual Advisors should describe the plan for mentoring of the student, for lab and desk space, and for financial support. A copy of this letter will be placed in the student's file.

**2.3.c. Changing research groups:** Most students complete their graduate career in the group that they originally join. However, for a variety of reasons, students may choose to move to another group. In these cases, students should seek the advice of the GSAC Chair or the Director of Graduate Studies to assist with the desired change. A student who decides to change groups must be accepted into another group in order to remain in the program. Moreover, since dissertation research is largely nontransferable and changing research focus may involve additional coursework, switching groups will often result in additional time in the program.

## **2.4. MINIMUM PROGRESS REQUIREMENTS**

To remain in good standing in the graduate program, students must meet the Minimum Progress Requirements listed in this section. Due dates for milestones will be adjusted by GSAC as necessary for students who take preparatory courses outside the core program. Meeting the scheduled milestones listed here is a requirement for continuation in the graduate program.

**2.4.a:** During each of the first two terms in residence (not including summers), each student must complete, for a letter grade, at least six credits of formal course work in chemistry. Only preparatory courses taken on the advice of GSAC and core courses, including those for which credit is earned by

examination or approved courses from outside the department, contribute to the required six-credit load. Due to this requirement, during each of the first two terms in residence, students may not withdraw from any courses after the Add-Drop period has closed and they may not switch from letter grade to audit.

**2.4.b:** Most students will complete the Preliminary Examination during the fall and spring terms of their first year. Students who are advised to take preparatory courses before starting the core courses will require additional time. In this case, GSAC will arrange a schedule of courses that assures timely completion of the Preliminary Examination. These students will register for six-credits of coursework per term until three core courses have been completed or the Preliminary Examination requirements have been fulfilled.

**2.4.c:** All graduate students at the University of Pittsburgh are required to maintain a minimum GPA of 3.0. After completion of nine credits in the graduate program, students whose GPA falls below 3.0 are placed on **academic probation** and are not eligible for teaching appointments at the University of Pittsburgh. If the GPA remains below 3.0 in two consecutive terms, the student faces dismissal from the program. **Note:** The GPA is the average of grade points earned in graduate level courses (2000 and 3000 level). Seminars, undergraduate courses, courses audited or taken for a satisfactory/unsatisfactory grade, teaching credits, etc., do not contribute to the GPA. There is no probation period for students who fail the Preliminary Examination or Comprehensive Examination.

**2.4.d:** Students select a Major Advisor and join a research group as explained in Section 2.3.

## 2.5. COMPREHENSIVE EXAMINATION

**2.5a. The Comprehensive Exam Committee:** As one of the requirements for the Ph.D. degree, each graduate student must pass a Comprehensive Examination. This requires the selection of a Committee who will assess the student's preparation and aptitude for independent scholarship and research. This committee is selected by the student in consultation with the Major Advisor, and will normally consist of three members of the Graduate Faculty of the Chemistry Department, including the Major Advisor, who will serve as the committee chair. The Comprehensive Examination is taken before the end of the seventh term in residence (fall term of the third year).

**2.5.b. 'Precomp' Meetings:** The first meeting of the committee should take place in the fifth term, spring of year two in the program. To help orient committee members, the student provides a two-page description of their research objective and plan of procedure. This report must be delivered to the departmental main office and to the committee members at least two weeks before the meeting. The first meeting is to ensure that the committee members are familiar with the student's plans and progress.

Students are encouraged to seek advice/guidance from their committee members as the Comprehensive Exam approaches. The student, or any member of the committee, may request a committee meeting at any time. Meetings other than the comprehensive exam are informal and focus on helping the student to prepare for the exam itself.

**2.5.c. The Examination:** The Comprehensive Examination provides the candidate an opportunity to demonstrate their potential for independent research and scholarship. The research problem, its theoretical background, and its current literature furnish a natural ground on which to conduct the examination.

The Comprehensive Exam should be scheduled for a range of dates that will be announced each year, but generally in the mid-October to mid-November period of the seventh term. The scheduling process must take place prior to 15 September. Students who earned credit by examination for two or more core courses must take the Comprehensive Exam in the analogous time window by the end of the sixth term. Students who have taken one or two preparatory courses may defer the Comprehensive Examination to the analogous period in the eighth term. Students who take more than two preparatory courses will

consult with GSAC to establish a due-date for the Comprehensive Examination. Extensions of these deadlines can only be granted by both the GSAC chair and the DGS with the approval of the student's Major Advisor. Requests for extensions must be provided in writing to GSAC and the DGS no later than 15 September of the term in which the exam is due. Extensions are not granted automatically and are intended to accommodate circumstances beyond the student's control.

The candidate is to provide a written report on the research problem. The report must be distributed to the committee members two weeks before the examination and should be informative enough so that the committee can, if it desires, dispense with the oral presentation by the candidate and begin the questioning immediately. Each student should confer with their research advisor to determine a reasonable length for the written summary, as designated by their respective chemistry division.

The Comprehensive Examination is an oral exam devoted to a discussion of the candidate's research field. The student will be asked to report on the research he or she has accomplished and to answer questions on the research itself as well as on the theoretical and practical aspects of the general field in which the research problem lies. The student will be expected to show a command of graduate course work and its application to the research problem.

During the Comprehensive Examination, each student will also be evaluated on the following three points; 1) the progress of the student's research and whether it is on track for timely completion of the Ph.D., 2) the student's level of general knowledge, and 3) the quality of the written document.

In addition, since students apply for admission to Candidacy for the Ph.D. degree after they pass the Comprehensive Examination, students should also be prepared to describe their future research plans. The description of future research plans should be sufficiently detailed to serve as the dissertation prospectus.

**2.5.d. Results of the Comprehensive Examination:** The results of the Comprehensive Examination are reported on the University of Pittsburgh *Report on Examinations for Doctoral Degree* card (UMC 78843-0711). (When this card is completed, it is given to the chemistry Graduate Administrator.) Each member of the Comprehensive Committee signs the examination card, and the card is marked as Pass or Fail. Following the procedure noted below, the committee may also choose to defer their decision.

**Pass:** If the student demonstrates satisfactory performance, committee members sign the examination report card and check 'Pass'. The exam is complete. Committee members may provide additional advice, recommendations, and feedback for the student's consideration.

**Fail:** If the student does not demonstrate satisfactory performance, committee members sign the examination report card and check 'Fail.' The committee, or a representative of the committee, most often the Major Advisor, will explain in detail why the student has failed the exam. The explanation will be summarized in a written statement, cosigned by all members of the committee, and provided to the student within one week of the examination. A student who fails the comprehensive exam may seek the advice of the Major Advisor, GSAC, and/or DGS regarding a transfer to the Master's degree program. If a student fails the Comprehensive Examination, no opportunity to retake the examination is permitted.

**Deferred Decision:** The committee may decide that a student must complete additional work to address issues identified during the Comprehensive Examination. In this case, the committee will defer its pass/fail decision until the additional work has been completed and the student meets with the committee again.

The committee or representative of the committee, most often the Major Advisor, will explain in detail what additional work is required and why. The explanation will be summarized in a written statement, cosigned by all members of the committee, and provided to the student within one week of the

examination. The written statement will specify a due date (no later than three months from the date of the original exam), for completion of the additional work. No extensions to this deadline are permitted. If the work is not satisfactorily completed by the deadline date, the student will fail the comprehensive exam.

When additional work is satisfactorily completed, at the discretion of the committee, the student may be required to retake all or part of the Comprehensive Examination.

## **2.6. ADMISSION TO CANDIDACY FOR THE PH.D. DEGREE**

Students are advised to apply for Admission to Candidacy for the Doctor of Philosophy Degree as soon as they pass the Comprehensive Examination. (Complete the *Application for Admission to Candidacy for Doctoral Degree* and obtain the signatures of each member of the doctoral committee (a description is below in section 2.6.a)). When completed, this form must be given to the chemistry Graduate Administrator. Note that the form must be submitted to the Dean no less than eight *months* prior to the final oral defense date. It is a wise student who consults with her/his advisor to find a suitable committee soon after the comprehensive exam and submits the form promptly.

Admission to candidacy for the Doctor of Philosophy degree constitutes a promotion of the student to the most advanced stage of graduate study and provides formal approval to devote exclusive attention to research and preparation of the doctoral dissertation.

**2.6.a. The doctoral committee:** The doctoral committee is four or more persons, including the Major Advisor, at least two other Faculty members of the Chemistry Department, and at least one other Graduate Faculty member from another department in the University of Pittsburgh or from an appropriate graduate program at another academic institution.

The doctoral committee has the responsibility to advise the student during the progress of his/her research, the duty to demand high quality research and the authority to require the rewrite of any or all portions of the dissertation. It conducts the final oral examination and determines whether the dissertation meets accepted standards.

Meetings of the Ph. D. candidate and the doctoral committee must occur at least annually from the time the student is admitted to candidacy. During these meetings, the committee should assess the student's progress toward the degree, discuss objectives for the upcoming year and confirm the timetable for completing degree requirements. A two-page document summarizing the expected thesis and an updated CV should be distributed to the committee two weeks prior to each annual meeting.

**2.6.b. Overview or Prospectus Meeting:** A dissertation prospectus should be presented at the Comprehensive Examination. The doctoral committee must unanimously approve the dissertation topic and research plan before the student may be admitted to candidacy for the doctoral degree. Approval of the topic and research plan does not imply either the acceptance of a dissertation or the restriction of the dissertation research to this original topic.

## **2.7. THE PROPOSAL**

When substantial progress on the dissertation problem has been made, the Proposal of an original research problem must be written, presented, and successfully defended before a faculty committee. The defense of the Proposal should take place **not less than four weeks** before the Dissertation Examination. Individual Divisions within the Department may lengthen the required time interval between the Proposal Defense and the Dissertation Defense. If the Proposal requirement is not met, the Doctoral Committee will not review the thesis/dissertation.

The topic of the proposal should differ from the topic of the student's dissertation problem and should suggest an original line of inquiry into an important problem posed by the student. The student, in

consultation with the Divisional Chair, should choose a faculty member other than the Major Advisor to serve as Mentor; the Major Advisor will serve as a nonvoting member of the committee. The Proposal Committee ordinarily will consist of the Mentor, and two other voting members selected by the Divisional Chair for their familiarity with the field of the proposal.

The proposal is an important opportunity for the student to display scientific maturity in terms of originality, critical ability and scholarship. Presentation of plans for projected work is a vital part of professional life in industry, government or academia. Accordingly, the preparation of a proposal involves the student in an essential working experience. A student's performance in this creative assignment will play a key role in his or her evaluation by the faculty. The proposal, both written and oral presentation, is evaluated on the basis of originality, creativity, thoroughness, and clarity. The Mentor will recommend a reasonable length for the written proposal. If the Proposal Committee thinks it advisable, an outside expert in the field may be invited to attend to advise the Committee on the merits of the proposal and its presentation. The student's performance in the examination is judged only by the members of Committee, without the outside expert being present. The Committee will evaluate how well the student demonstrates knowledge and skills that are consistent with current departmental standards and growth potential for the student. The student will only be informed of the Committee's decision after a meeting of that group has been held to evaluate the proposal; a closed meeting with the student may be held at the Committee's discretion. In some cases the student may be required to repeat all or part of the examination.

## **2.8. DISSERTATION AND FINAL EXAMINATION**

An essential part of the training of a chemist is an introduction to independent study. The Ph.D. dissertation is a report on investigation completed under the supervision of a member of the research faculty. It must represent an original contribution to knowledge and must show the relationship between what the student has discovered and the student's prior knowledge. The candidate's dissertation is defended in an oral examination before a Doctoral Committee consisting of the Major Advisor and at least two other Faculty members from the Chemistry Department. The Doctoral Committee must also include either one Graduate Faculty member from another department of the University of Pittsburgh or one qualified Graduate Faculty member from another institution.

(To verify qualifications, external faculty or Pitt faculty who are not listed in the Graduate Faculty Roster (<http://www.ir.pitt.edu/homepg.php>) are required to submit a complete CV)

The Doctoral Committee is proposed by the Major Advisor, listed on the Application for Candidacy and approved by the Department Chair and Graduate Dean. Copies of the dissertation must be given to members of the dissertation committee at least two weeks prior to the defense date.

The following guidelines for inclusion of collaborative research in a dissertation are from the Arts & Sciences Graduate and Professional Bulletin (<http://www.bulletins.pitt.edu/graduate/regulations2.htm>)

*If the dissertation is the result of a collaborative research effort, the project should be structured in such a way that the student's dissertation results from one clearly identified piece of work in which the student has unquestionably supplied the major effort. The contributions of the student and the other collaborators must be clearly identified.*

*Published articles authored by the student and based on research conducted for the dissertation study may be included in the dissertation if the student's department and school have a written policy that this is acceptable. In any case, the published work must be logically connected and integrated into the dissertation in a coherent manner, and sufficient detail must be presented to satisfy the characteristics of a dissertation. The student should be the sole or primary author of the published work. If the published articles were coauthored, the contribution of the student must be clearly delineated in the introduction so the committee can ascertain that the student's own work satisfies the requirements of a dissertation. The [ETD Format Guidelines](#) gives instructions on incorporating articles into the dissertation.*

At least one month before the desired dissertation defense date, the Ph.D. candidate must contact the Chemistry receptionist to reserve the meeting room for the dissertation defense and to provide an electronic copy of both the title page and the approved abstract of the dissertation for publication in the University Times and posting within chemistry buildings. must be given to the Chemistry reception.

## 2.9. OTHER REQUIREMENTS

A student in the Ph.D. program must also satisfy the following requirements:

**2.9.a. Courses beyond the Preliminary Exam:** Successful completion of the core-course program represents the minimum course preparation for a graduate career in chemistry. To provide additional opportunities, the Department offers a range of advanced courses in several branches of chemistry. The Division in which the student is majoring may require some of these courses. Each student may, within reasonable limits, take courses (after completing the core course requirements) that match their interests. Selection of these additional courses should be discussed with the student's Major Advisor. Taking these courses should not interfere with or delay research investigations.

**2.9.b. Seminars:** Each student is required to present at least one public seminar in his or her Division. The seminar may be given at any time during the student's career and on any topic approved by the Major Advisor, including the results of the doctoral research. If the seminar is judged to be inadequate, an improved presentation may be required. The seminar requirement is in addition to the proposal presentation. The student should register for the seminar (1 cr.) in the term in which the required seminar is presented. (CHEM 2190 Inorganic; CHEM 2290 Analytical; CHEM 2390 Organic; CHEM 2490 Physical; CHEM 2890 Biological)

All students are expected to attend formal meetings and seminars sponsored by their Division, and Departmental Colloquia. Students are also encouraged to attend seminars in other Divisions. In addition, Oakland and the greater Pittsburgh area abound with scientific activities. Lectures are presented at the University of Pittsburgh, Carnegie-Mellon University, Duquesne University, and through the auspices of the Pittsburgh Section, American Chemical Society, the Spectroscopy Society of Pittsburgh, and the Society for Analytical Chemists of Pittsburgh.

**2.9.c. Language Requirement:** There is no foreign language requirement in the Ph.D. program.

The following requirements apply to students whose native language is not English:

The English Fluency in Higher Education Act of the Commonwealth of Pennsylvania requires the University to certify that all individuals who teach possess adequate English language fluency for effective communication with students in the classroom. The English Language Institute at the University of Pittsburgh offers non-credit courses in English as a second language for international students who want to improve their English for academic, professional, or personal reasons. ELI also conducts testing of students who are non-native speakers of English, to ensure compliance with the legal requirements of the Commonwealth of Pennsylvania and to validate the English proficiency of non-native speakers of English who are matriculating in University programs.

The University of Pittsburgh English Language Institute (ELI) administers the English Comprehensibility Test to newly appointed TAs who are non-native English speakers during the incoming graduate student orientation period before classes begin in the fall. The test is scored 1 (poor) – 5 (very good). A score of 3 is required for laboratory teaching assistants, while a score of 4 is required for recitation instructors. Non-native students must register for Linguistics 0018, a class in speaking English, if they receive scores of 1 or 2. Tutoring is required of students who get a score of 3. In both cases, a satisfactory grade in the course or in tutoring must be earned, and the student's score must increase by at least one (e.g., from 2 to 3 or from 3 to 4) at the next testing in the Spring term. Students who routinely miss class or tutoring sessions will be warned in writing after two misses. If a student

misses four classes or tutoring sessions, the student will be placed on academic probation. The inability to attain adequate performance is grounds for nonrenewal of financial aid (TA, TF, GSR, GSA). Students who do not demonstrate sufficient improvement on the Comprehensibility Test may face dismissal from the graduate program.

**2.9.d. Teaching Requirement:** At least two calendar terms of teaching experience that includes student contact are required of all Ph.D. candidates. The minimum teaching assignment will consist of one laboratory section or one recitation section per week for each of the two terms. The teaching requirement must be fulfilled within the student's first two calendar years in the graduate program. (Students who are non-native English speakers should review. Section 2.9.c.)

**2.9.e. Residency Requirement:** The minimum credit requirement for the PhD degree is met by six terms of registration as a graduate student for 12 or more credits per term or the equivalent number of credits in a reduced load. This corresponds to 72 credits required for a PhD. A term of full registration is defined as the satisfactory completion of four 3-credit courses or equivalent units of research.

No more than 30 credits may be accepted to meet the minimum credit requirement for students entering the graduate program with an M.S. degree (or its equivalent) awarded by another institution,

During any term that dissertation research is being conducted, a student must register for at least 3 credits, if total credits earned to date are less than 72. When total credits earned are 72 or greater, student should register for zero credits full-time dissertation study (FTDB 3999).

It is not possible to earn the Ph.D. degree by evening study alone.

**2.9.f. Divisional Requirements:** In addition to the requirements specified above, graduate students in the Ph.D. program must satisfy any supplemental requirements set forth by the various Divisions of the Department. These requirements are appended to this document.

**2.9.g. Grades:** A student with full graduate status is automatically placed on probation whenever his or her cumulative GPA falls below 3.00. Students whose cumulative GPA is less than 3.00, cannot pass the preliminary examination, and are not eligible to take the comprehensive examination, to be admitted to candidacy for the PhD degree, and to graduate.

### 3. THE M.S. DEGREE

#### 3.1. COURSE REQUIREMENTS

Each M.S. student must complete a minimum of 12 credits of 2000- or 3000-level chemistry courses with a grade of B or higher (this is a university-wide requirement). Six of these credits must be in core courses; the remaining courses can be either in the student's major area or in other fields. In addition, students electing to present a non-research thesis must take for credit one laboratory course (Chemistry 1250, 1430, 1440, 1600). In addition to classroom courses, the M.S. student will also register for M.S. Research (CHE 2000). See also section 3.5b below.

#### 3.2. COMPREHENSIVE EXAMINATION

The M.S. Comprehensive examination consists of an examination by GSAC, with the approval of the Chemistry Department Faculty, of the student's record in at least 12 credits of 2000- or 3000-level chemistry courses, including at least 6 credits of core courses, with a letter grade of B or better.

#### 3.3. MINIMUM PROGRESS REQUIREMENT IN THE M.S. PROGRAM

**3.3.a:** The student must also maintain a cumulative GPA of 3.00 or higher: if the GPA is below 3.00 the student is placed on academic probation and is not eligible for teaching appointments and is not eligible for the Master's comprehensive exam.

**3.3.b:** The Comprehensive Examination must be passed and a Major Advisor chosen by the end of four calendar terms in residence or before the completion of 24 credits, whichever is earlier.

GSAC monitors the progress of all students to ensure that the Minimum Progress Requirement is met. Satisfying this requirement is necessary for continuing in the graduate program.

#### 3.4. RESEARCH AND THESIS

The thesis for the M.S. degree is written under the supervision of a Thesis Advisor who is chosen by the student. It may consist of either an original research study or a comprehensive literature survey of some topic of current interest in chemistry. In either case, the thesis must be defended in an oral examination before a Thesis Examination Committee consisting of the Thesis Advisor as chairperson and two other members of the Graduate Faculty chosen by the Thesis Advisor and approved by the Department Chair. Copies of the thesis must be in the hands of the thesis committee at least two weeks prior to the defense date.

#### 3.5. OTHER REQUIREMENTS

**3.5.a. Language Requirement:** There is no foreign language requirement in the M.S. program.

**3.5.b. Residency Requirement:** Thirty credits of graduate coursework or research are required to earn an M.S. degree in chemistry. No more than six credits may be granted toward the completion of the requirements for a master's degree for graduate work completed at another institution.

#### 4.0. LEAVES OF ABSENCE

Under special conditions, graduate students may be granted one leave of absence. A maximum leave of two years may be granted to doctoral students or one year to master's students. The length and rationale for the leave of absence must be stated in advance, recommended to the dean by the Major Advisor, GSAC or Administrative Officer, and approved by the dean. If approved, the time of the leave shall not count against the total time allowed for the degree being sought by the student. Readmission following an approved leave of absence requires notification by the student of his or her desire to return.

A leave of absence for medical reasons requires submission of a letter from the student's medical professional indicating the length of leave time requested, not to exceed two years. When a student

wishes to return from medical leave, the medical professional must submit a letter to the department verifying that the student is released to return to full time active status.

Parental accommodation leave is available for eligible students. In the case of adoption or the birth of a child, six weeks of parental leave may be taken. For birth mothers, the time of leave is specified by the health care provider. A request for graduate student parental accommodation (<http://www.asgraduate.pitt.edu/sites/default/files/Request%20for%20Graduate%20Student%20Parental%20Accommodatio%20form.pdf>) should be submitted to the Office of Graduate Studies prior to the anticipated child birth/ adoption date. For further details including eligibility requirements see [http://www.pitt.edu/~graduate/Grad\\_Parental\\_Accommodation\\_Guidlelines.pdf](http://www.pitt.edu/~graduate/Grad_Parental_Accommodation_Guidlelines.pdf).

## **5.0. STATUTE OF LIMITATIONS**

The purpose of the statute of limitations is to ensure that a graduate degree from the University of Pittsburgh represents mastery of current knowledge in the field of study.

All requirements for the MS degree must be completed within a period of four consecutive years from the student's initial registration for graduate study.

From the student's initial registration for graduate study, all requirements for the Ph.D. degree must be completed within a period of ten years, or within eight years if the student has received credit for a master's degree.

If a student is unable to complete all degree requirements within a five-year period after passing the comprehensive examination, a comprehensive re-examination may be required.

## **APPENDIX I: APPOINTMENT OF TEACHING ASSISTANTS AND TEACHING FELLOWS**

Upon selection for admission to the chemistry graduate program by the Admissions Committee, teaching Assistantships will be awarded on a two- or three-term basis to qualified applicants. First-year students who do not receive Teaching Assistantships initially may be considered for appointment at a later time, if qualified.

Participation in Department of Chemistry teacher training activities is required to hold teaching assistantships or teaching fellowships. Teacher training sessions are held prior to each fall term during new graduate student orientation.

At the end of the first term of teaching, each Teaching Assistant's performance will be reviewed by the professor in charge of the course. If the student's performance is not satisfactory, the student will be advised that his or her appointment may not be renewed. Should the performance not improve by the end of the second term, the appointment will not be renewed. In addition, Teaching Assistantships (TA) and Teaching Fellowships (TF) will not be awarded to those who fail to satisfy the Minimum Progress Requirement or who fail to maintain a cumulative 3.00 GPA. All Teaching Assistantship and Teaching Fellowship appointments will be in compliance with the general regulations for graduate students in the Dietrich School of Arts and Sciences. Appointments from the existing graduate student body will be made by the Administrative Officer in consultation with the faculty. The number of appointments will be dependent upon the Department's undergraduate teaching schedule, the projected enrollment in undergraduate chemistry courses and laboratories and the TA/TF allocation received from the Graduate Dean.

## **APPENDIX II. DISTRIBUTION OF DEPARTMENTAL RESOURCES**

At the discretion of the Department and in consideration of budgetary restraints, decisions regarding departmental support for graduate students will be handled on an individual, case-by-case basis.

**APPENDIX III: GRADING OF CORE COURSES**

Performance in graduate core courses is an important component of both the Ph.D. Preliminary and the M.S. Comprehensive examinations. For this reason, faculty of the Department of Chemistry endeavor to to maintain a uniform grading scale in all core courses. The following grading scheme is only presented as an example. Revisions of this scheme may occur based on class size and student performance and are solely at the discretion of the core course instructor.

<u>Grade</u>	<u>GPA</u>	<u>Significance</u>	<u>% of Class (Approximate)</u>
A	4.0	Outstanding	31
A-	3.75		17
B+	3.25		17
B	3.0	Adequate	23
B-	2.75		6
C+	2.25		1
C	2.0		2
C-	1.75		<1
D+	1.25		<1
D	1.0		<1
D-	0.75		<1
F	0.00		<1
Other	0.00		2



## APPENDIX V:DEFENSE OF DISSERTATION OR THESIS

All students preparing for a M.S. Thesis Submission or Ph.D. Dissertation Defense

Re: Room Reservation and Publicity for the Thesis or Dissertation Defense

To arrange a room and the publicity for the proposal (if required), thesis (MS) defense, or dissertation (Ph.D.) defense, students should contact LaShawn, Department of Chemistry receptionist, at least two week prior to the defense date. Information can be provided in person, or students may complete the form on the webpage,:

<http://www.chem.pitt.edu/node/23/presentations-and-theses/room-reservation-form> .

Clicking the submit button will transmit the information directly to LaShawn who will arrange the room and the publicity

The following information is required:

1. Student's complete name.
  2. University/college and date awarded (month/year) for your most recent non-Pitt degree.
  3. Date, time, and location of the public seminar associated with your defense (if appropriate).
  4. Names of all members of your committee with your advisor clearly indicated.
  5. Title of your Thesis or Dissertation
  6. Type of Degree being awarded (M.S. or Ph.D.).
  7. Abstract of your thesis/dissertation (the same one that appears in the front of your thesis or dissertation).
  8. Room location, date and time of defense.
- 

### University Times and Pitt Chronicle Announcement of Ph.D. Defense

*All* PhD defenses are to be announced in the University Times and the Pitt Chronicle. MS and Ph.D. defense meetings will also be publicized on flyers posted throughout the Department of Chemistry. The requested information must be submitted to the chemistry receptionist no less than two weeks before the actual defense date. The receptionist will forward these details to the University Times and Pitt Chronicle. with copies to the Graduate Program Administrator and the Graduate Dean's office.

## Doctoral Program in Analytical Chemistry

University of Pittsburgh, Fall 2012

General regulations are listed in the Bulletin of the Faculty of Arts and Sciences and in the section “Graduate Programs Regulations Pertaining to the M.S. and Ph.D. Program in Chemistry” in this handbook. The information below applies specifically to students choosing to emphasize Analytical Chemistry.

### COURSE REQUIREMENTS

Core courses offered by the Analytical Division include Electrochemistry (Chem 2210), Chemical Separations (Chem 2220), and Analytical Spectroscopy (Chem 2230). Students majoring in Analytical Chemistry will ordinarily take all three courses. However, only two can be counted toward the Preliminary Examination. Beyond the required core courses, students may choose to take an additional 3-6 credits depending on their own interests, the advice of the Graduate Student Advising Committee, or the recommendation of their main advisor.

### SEMINAR REQUIREMENTS

The seminar program is a vital component of graduate education. For that reason, students should attend all seminars sponsored by the Analytical Division, including those presented by fellow students and by invited speakers. Beginning students who are considering joining the Analytical Division are urged to attend carefully selected seminars in the each of the Divisions. Students should also attend all the department-wide seminars (Kaufman, Bayer, Pittsburgh Conference, Phillips, and Dowd). Regular participation in seminars is a clear sign of commitment and motivation.

Because excellent presentation skills are vital to a successful career in chemistry, each doctoral student is also required to present at least two seminars. One seminar will be on the subject of the student’s Proposal (see below) and one will be a report on the student’s own dissertation. For each seminar, a title and one-page abstract should be delivered to the faculty member in charge of seminars two weeks before the presentation. Since the proposal seminar within the Analytical Division is open to the public, the candidate must ensure that the seminar title, the candidate’s complete professional name, dissertation advisor, seminar room and time, be sent by e-mail to the Chemistry receptionist two weeks prior to the seminar who in turn will post it within the Chemistry Department.

### COMPREHENSIVE EXAMINATION

A Committee consisting of the student’s main advisor and two other faculty members will conduct the Comprehensive Examination. Each student, in consultation with the main advisor, will select the committee members. The committee will meet with the student by the deadline stipulated in the department rules (see above). The purpose of the meeting is to evaluate the student’s complete record of accomplishment. At least one week before the meeting, each student will submit a written report that discusses in detail the background of their research problem, their progress to date, and their projected future research plans. During the meeting, the student will present an oral report on their research project and respond to the questions of the committee members. The questions will usually focus on the written and oral report but may also address general aspects of recent seminars, course work, and relevant current literature. Based on the student’s overall performance during the Comprehensive Examination, the Committee will recommend either that the student proceed to candidacy for the Ph.D. degree, or that the student should complete whatever work is necessary to obtain an M.S. degree only. In the latter case, the research report shall be expanded into an M.S. thesis.

## PROPOSAL

The topic of the proposal must be outside the immediate area of the student's research. The student must first present a one- to two-page abstract of the proposal to the Division Chair for approval. The Division Chair, following consultation with the student's research advisor, may approve or reject the topic, or may request modifications of the abstract before giving final approval. The major factors in the decision to accept the topic are the creativity, originality, and significance of the proposal. In consultation with the Division Chair, the student will select a Mentor and two other faculty members to serve on the Proposal Committee. The Dissertation Advisor is a nonvoting member of the Proposal Committee. The student should present the abstract to prospective committee members for approval before preparing the detailed proposal. The detailed proposal, typically 20-30 pages in length, is then prepared under the guidance of the Mentor. The role of the Mentor is to provide guidance on the format of the proposal rather than the scientific content. The detailed proposal must be submitted to the members of the Proposal Committee at least two weeks before the proposal exam. The proposal exam consists of a public seminar and an oral defense, a portion of which may also be public according to the desires of the committee and the candidate.

Our general expectations are described in the departmental regulations, "Information and Regulations Pertaining to the M.S. and Ph.D. Programs in Chemistry". We regard the proposal as a crucial component of the training of a doctoral student, and we urge students to take full advantage of this learning experience.

Keeping up to date with the current literature and regularly attending seminars is essential to formulating a successful proposal.

## DISSERTATION

The student will meet with the Doctoral Committee, consisting ordinarily of the Comprehensive Examination Committee plus one Graduate Faculty member from another department of the University, for an Overview no later than two weeks before the end of the eleventh term. The purpose of the Overview is to advise the student on research to be carried out in the final stages of his/her program and to facilitate preparation of the dissertation.

## Doctoral Program in Biological Chemistry

University of Pittsburgh, Fall 2012

General regulations are listed in the Bulletin of the Faculty of Arts and Sciences and in the section “Graduate Programs Regulations Pertaining to the M.S. and Ph.D. Program in Chemistry” in this handbook. The information below applies specifically to students choosing to emphasize Biological Chemistry.

### COURSE REQUIREMENTS FOR PRELIMINARY EXAMINATION

Advanced courses in Biological Chemistry include Biological Chemistry I (Chem 2810) and Biological Chemistry II (Chem 2820). For students wishing to take the pair of Biological Chemistry courses as their concentration, and who wish to pursue research in this general area will also take one core course from the home division of their research advisor, and one other core course. Students will satisfy all of the other course requirements of the research director's home division (the one exception being the need to take the divisional pair of core courses).

### SEMINAR REQUIREMENTS

The seminar program is a vital component of graduate education. Students are urged to attend seminars addressing topic in Biological Chemistry. Furthermore, attendance at the major departmental seminars (Kaufman, Bayer, Pittsburgh Conference, Phillips and Dowd) is expected.

Each doctoral student is required to present two seminars. The first will be the Proposal. The second usually will be a Dissertation report. A title, a one-page abstract, and a bibliography of the most important references should be delivered to the faculty member in charge of seminars two weeks before the presentation.

### COMPREHENSIVE EXAMINATION

The Comprehensive Examination will follow the regulations of the Research Director's home Division.

### PROPOSAL

The Proposal preparation and defense will follow the regulations of the Research Director's home Division.

## Doctoral Program in Inorganic Chemistry

University of Pittsburgh, Fall 2012

General regulations are listed in the Bulletin of the Faculty of Arts and Sciences and in the section "Graduate Programs Regulations Pertaining to the M.S. and Ph.D. Program in Chemistry" in this handbook. The information below applies specifically to students choosing to emphasize Inorganic Chemistry.

### SEMINAR REQUIREMENT

Each student is required to present one public seminar about his or her dissertation research. He or she should register for Chem 2190 during the term in which the seminar is to be presented.

### COURSE REQUIREMENTS

Students are required to take both inorganic core courses, Chem 2110 and 2120; to take three credits of inorganic minicourses (chosen from Chem 3100, 3110, 3120) if these have been offered during the period of a student's second year through his/her graduation year.

One other graduate course (1, 2, or 3 credits) approved by the Research Director may be substituted for one of the minicourses to be taken for credit.

### COMPREHENSIVE EXAMINATION

A written summary of the student's dissertation research problem, including background material and literature references, the work to date carried out by the student, and future research plans, should be submitted to each member of the Comprehensive Examination Committee at least two weeks before the scheduled oral examination. The Inorganic and Materials division suggests these be ten pages in length, single-spaced, or twenty pages in length double-spaced, ignoring the list of references/bibliography and experimental section. No more than three pages, single-spaced text or five to six pages double-spaced should be devoted to the introduction, so that the student will focus primarily on their research results and discussion.

### PROPOSAL

For inorganic doctoral students, the proposal defense must be finished by the end of the fourth year and at least four weeks prior to the Ph.D. defense, whichever is earlier. Exceptions to this rule for necessities such as leaving for an employment position, etc. will be made on a case by case basis.

## Doctoral Program in Organic Chemistry

University of Pittsburgh, Fall 2012

General regulations are listed in the Bulletin of the Faculty of Arts and Sciences and in the section "Graduate Programs Regulations Pertaining to the M.S. and Ph.D. Program in Chemistry" in this handbook. The information below applies specifically to students choosing to emphasize Organic Chemistry.

### **COURSES**

Organic students are required to take both organic core courses (Chemistry 2310 and 2320) and Chemistry 1380/2380 (Techniques of Organic Research). Advanced courses in the Division are treated in a two-year cycle of one month, one credit modular units (Minicourses) on Special Topics (Chemistry 3300, 3310, 3320). This program is designed to give advanced students exposure to new developments outside their area of concentration. Each doctoral candidate is required to take for credit a total of three credits of advanced-level minicourses during his or her residence, but is encouraged to audit others. No single course can be used to account for all 3 credits, and a GPA of 3.00 or greater is required. In order to ensure maximum freedom of choice, students are advised to register for all three courses (3300, 3310, 3320) during any term in which he or she plans to take one minicourse for credit; before the final examination in the course, the student informs the instructor whether he or she wishes to take the course for credit or audit.

### **COMPREHENSIVE EXAMINATION**

The Organic Division requires that the written summary of the research problem include a discussion of the background of the research problem and of the experimental results to date. In addition, positive results should be described in as full experimental detail as that required for a thesis.

### **PROPOSAL**

Organic doctoral students must submit the proposal by the end of their 10th term of graduate study.

### **SEMINARS**

Among the various methods of fulfilling the Department's requirement of a seminar presentation are: 1) a public presentation of an original proposal or literature review 2) a seminar based on the student's graduate research.

## Doctoral Program in Physical Chemistry

University of Pittsburgh, Fall 2012

General regulations are listed in the Bulletin of the Faculty of Arts and Sciences and in the section "Graduate Programs Regulations Pertaining to the M.S. and Ph.D. Program in Chemistry" in this handbook. The information below applies specifically to students choosing to emphasize Physical Chemistry.

### COURSE REQUIREMENTS

Physical Chemistry doctoral students are required to take both Physical Chemistry core courses; Chemistry 2430 and 2440. The Graduate Student Advising Committee and/or the Research Advisor will recommend additional core and advanced courses.

### COMPREHENSIVE EXAMINATION

A written summary of the student's dissertation research problem, including background material and literature references, the work to date carried out by the student, and future research plans, must be submitted to each member of the Comprehensive Examination Committee at least two weeks before the scheduled oral examination. The summary can vary in length, depending upon the particular research problem, but is generally 15-20 typed pages. The student is reminded of the general requirements that, in addition to defending the thesis problem, the student will be expected to show a command of the more general material in physical chemistry and other relevant graduate courses that he/she has taken.

### DISSERTATION REVIEW

Subsequent to the Comprehensive Exam, within the year and once each succeeding year, the student's Dissertation Committee (the Comprehensive Examination Committee, unless otherwise specified) may meet with the student to review his/her progress toward the degree.

Such a meeting may be requested by the student or a member of the Committee. Topics for discussion include research progress to date, course attendance, plans for completion, and career objectives. Records of these meetings will be kept by the Divisional Chair, to whom the major advisor is to report.

### PROPOSAL

For Physical Chemistry doctoral students entering the Ph.D. program in the Fall Term of 1990 or later, the student should obtain approval of the Proposal topic from his/her Mentor no later than 12 months after the Comprehensive Exam, and should defend the Proposal within the succeeding six months. The Proposal requirement must be satisfied by the end of the student's tenth term in residence. The written Proposal must not exceed 20 pages, double spaced text, and must be submitted to each member of the Examination Committee at least two weeks prior to the oral defense.

### SUBMISSION OF DISSERTATION or THESIS

The dissertation for the Ph.D. or thesis for the M.S. degree must be submitted to each member of the Examination Committee at least two weeks before the date of oral defense.

## CHEMICAL PHYSICS OPTION

The Department, in collaboration with the Department of Physics, has instituted a Certificate Program for students who wish to concentrate their Ph.D. studies in Chemical Physics. The following is a summary of the requirements that must be satisfied by students in this program.

### COURSE REQUIREMENTS

Seven core courses are required. These include Thermodynamics and Statistical Mechanics, 1 term (Chemistry 2440); Quantum Mechanics, 3 terms (Chemistry 2430 and Physics 2565 and 2566); Electricity and Magnetism, 2 terms (Physics 2555 and 2558); and Laboratory Electronics, 1 term (Physics 2675). In addition, two elective courses are required, one from Chemistry and one from Physics. Appropriate choices include Molecular Spectroscopy (Chemistry 2530), Magnetic Resonance (Chemistry 2540), Advanced Quantum Chemistry (Chemistry 3430), Statistical Mechanics of Interacting Systems (Chemistry 3470), Molecular Collision Dynamics (Chemistry 3490), Atomic Collisions (Physics 3705), Atomic Structure and Interactions (Physics 3706), and Solid State Physics (Physics 3715). Other elective courses may be selected if approved by the Chemical Physics Steering Committee. Students must maintain a GPA of 3.0 or better in all nine courses.

### COMPREHENSIVE EXAMINATION

By the end of their second year of residence, students will be required to pass a written examination which tests their mastery of coursework. This examination will be a modified version of that given to graduate students in the Physics Ph.D. program, with problems on subjects like special relativity replaced by problems on more chemically relevant topics like molecular spectroscopy, liquid state behavior, etc.

In order to maximize the probability of success, the following course of action is strongly recommended for students in the Chemical Physics Option. In the Physics Department, the Comprehensive Exam is administered in the late spring of each year. In the early spring, a "Preliminary" Exam is offered which essentially is a practice test for the real Comprehensive. It is taken by all first-year Physics Ph.D. students. Physics students who do well on the Preliminary Exam are encouraged to attempt the Comprehensive after their first year of classes. The suggested procedure for Chemical Physics Option students in the Chemistry Ph.D. program is to take the Physics Preliminary Exam in the first year (again, this exam will be modified for Chemistry students to guarantee relevance to Chemical Physics), and, if recommended, to take the Comprehensive Exam as well. The student will thus be provided with a gauge of his/her probability of successfully passing the Chemical Physics Comprehensive after the second year. Students who wish to revert from the Chemical Physics Option to the "straight" Chemistry Ph.D. may do so at this time, pending approval by the Chemical Physics Steering Committee. (Reversion to the normal Chemistry Ph.D. program implies that all requirements for the normal Chemistry Ph.D. be fulfilled. See above.) If the student fails the Comprehensive Exam after the second year, he/she must then terminate with a Masters Degree in Chemistry (see Sect. 3.6).

## EVALUATION OF STUDENT RESEARCH FOLLOWING COMPREHENSIVE EXAMINATION

Within one year of completion of the Comprehensive Examination, a committee consisting of the research advisor and two faculty advisors selected by the student from the Chemistry and Physics Department will begin to meet on a yearly basis to evaluate the student's progress in research. The student will present a progress report on his/her research project at each meeting of this committee.

## PROPOSAL FOR CHEMICAL PHYSICS OPTION

No proposal will be required of students in the Chemical Physics Option.

## REQUIREMENTS FOR MASTERS IN CHEMICAL PHYSICS PROGRAM

If the student fails the Comprehensive Examination, he/she may obtain a masters degree if, in addition to achieving at least a 3.0 GPA in the coursework described in the Course Requirements Section, a thesis is written under the supervision of a thesis advisor who is chosen by the student. It may consist of either an original research study or a comprehensive library survey of some topic of current interest in chemical physics. In either case, the thesis must be defended in an oral examination before a Thesis Examination Committee consisting of the Thesis Advisor as Chairperson and two other members of the Graduate Faculty chosen by the Thesis Advisor and approved by the Department Chair. The "Other Requirements" noted in that section also apply to Masters students in the Chemical Physics Program.

**ADVANCED UNDERGRADUATE/GRADUATE COURSES**

1130/2180 Inorganic Chemistry 3 cr.

Molecular orbital and hybridization bonding theories are developed to allow the interrelationship of molecular structure, bonding, and trends within the periodic table to be applied to a large number of inorganic complexes and materials. Topics include drawing connections between molecular shapes and group theory in regards to MO's that support certain geometries of complexes. Bonding interactions are connected to spectral and chemical properties for molecules. Common structures of ionic solids and condensed phase materials, the acid/base behavior of ligands in both sigma and pi bonding modes, and introductory transition metal and organometallic chemistry are discussed. The interaction between a metal's dn configuration, its requisite ligands, its reactivity and structures of its complexes are stressed.

1210/3210 Digital Electronics 2 cr.

## Lecture and Laboratory

This basic course investigates digital electronics and applications of small computers in labs. The emphasis will be a "hands-on" lab in conjunction with lecture. The introduction to digital electronics includes basics of digital logic systems and implementation using integrated circuits. Labs utilize circuits in simple experiments designed to demonstrate various parameters associated with building blocks of digital systems. Second half of course covers microcomputer architecture and hardware, peripherals, software and interfacing. Experiments allow students to interface devices to computer.

1230/3230 Chemometrics 2 cr.

To yield information, an experiment must be thoughtfully designed and the data carefully interpreted. The object of this course is to teach statistical methods of experimental design to students in chemistry. The student will learn to design experiments so that information can always be gotten from the results, even though a practical goal may not have been reached. The following are covered: probability distributions (those tables in the back of the book!), regression analysis and curve fitting, experimental design modeling, optimization and factor analysis.

1260/2260 Intermediate Analytical Chemistry 2 cr.

The major part of the course deals with the principles and applications of selected analytical methods that are of unusual current interest, including nuclear magnetic resonance spectroscopy, mass spectrometry, electron spectroscopy, X-ray spectroscopy and Fourier transform spectroscopy. Methods available for trace analysis of pollutants are critically evaluated.

1310/2370 Synthetic Organic Chemistry 2 cr.

Reactions of major interest and wide applicability in synthetic chemistry are presented. Reaction mechanisms and the effect of structure on reactivity are stressed and emphasis is placed on recently developed methods.

1380/2380 Techniques of Organic Research 2 cr.

A course which serves as a guide to the interpretation of ultraviolet, infrared, nuclear magnetic resonance and mass spectra of organic compounds.

1450/3450 Molecular Modeling and Graphics 1 cr.

This course will introduce the student to computational methods to determine molecular structures and stabilities, Monte Carlo and molecular dynamics simulation methods, and the use of graphics for displaying structures, charge densities, and other properties. Use will be made of both microcomputers and the Cray XMP at the Pittsburgh Supercomputing Center.

1480 Intermediate Physical Chemistry 3 cr

The primary focus of this course is on the macroscopic properties of matter, chiefly in the condensed phase. It begins with a quantum mechanical point of view, and then shows how the tools of statistical mechanics may be used to make connections to the macroscopic world. The focus of the remainder of the course is on changes in state, electrochemistry, electric and magnetic properties, macromolecules and colloids, ion transport and molecular diffusion, complex chemical reactions, and processes at surfaces, and in solids. Time permitting; a brief description of nanosystems (molecular machinery, manufacturing and computation) will be given.

## GRADUATE LEVEL COURSES

### \*2110 Advanced Inorganic Chemistry I 3 cr.

Group theory and molecular symmetry, with emphasis on the application to the theoretical aspects of bonding in inorganic and organometallic complexes, as well as to the experimental techniques (magnetometry and electronic, vibrational, and photoelectron spectroscopy) typically used to elucidate the nature of intramolecular interactions in the ground and electronic excited states of these species.

### \*2120 Advanced Inorganic Chemistry II (Descriptive Inorganic) 3 cr.

Inorganic chemistry in the sub-fields of organometallic, coordination chemistry, main group non-metal chemistry, and catalysis are discussed from the viewpoint of how bonding, symmetry and structure provide controls in inorganic reaction processes, and how these influence the nature of reaction products. The grading is based on 3 to 4 exams and a project which involves computer methods and molecular mechanics calculations.

### 2180(1130) Inorganic Chemistry 3cr.

Molecular orbital and hybridization bonding theories are developed to allow the interrelationship of molecular structure, bonding, and trends within the periodic table to be applied to a large number of inorganic complexes and materials. Topics include drawing connections between molecular shapes and group theory in regards to MO's that support certain geometries of complexes. Bonding interactions are connected to spectral and chemical properties for molecules. Common structures of ionic solids and condensed phase materials, the acid/base behavior of ligands in both sigma and pi bonding modes, and introductory transition metal and organometallic chemistry are discussed. The interaction between a metal's d<sub>n</sub> configuration, its requisite ligands, its reactivity and structures of its complexes are stressed.

### 2190 Seminar in Inorganic Chemistry 1 cr.

Only students planning to defend their Ph.D. thesis should register for this course. Others may attend without registering.

### \*2210 Electroanalytical Chemistry 3 cr.

Fundamental electrode processes common to all electrochemical methods: thermodynamics and kinetics of electrode processes; reaction coordinate diagrams for faradaic currents; exchange current and activation polarization; non-faradaic currents and electric double layer. Mass transfer processes. Linear sweep, cyclic and pulse voltammetric methods and their application to analysis as well as the study of reaction mechanisms and problems in battery technology, electrocatalysis, photovoltaic cells and chemical modified electrodes.

\*2220 Chemical Separations 3 cr.

A broad thermodynamic and kinetic framework encompassing all chemical separations is used to classify techniques. Concepts such as separation efficiency are generalized. The most powerful and widely used separations techniques are chromatographic, thus solution chemistry will be discussed to provide a chemical framework for chromatography. The use of gas and liquid chromatography will be presented.

\*2230 Analytical Spectroscopy 3 cr.

Fundamentals of optical spectroscopic methods of analysis for determining composition and structure. The course includes analytical applications as well as mechanisms and instrumentation. Recent developments such as Fourier transform IR spectroscopy and the use of lasers in spectroscopy are emphasized.

2260(1260) Intermediate Analytical Chemistry 2 cr.

The major part of the course deals with the principles and applications of selected analytical methods that are of unusual current interest, including nuclear magnetic resonance mass spectroscopy, electron spectroscopy, X-ray spectroscopy and Fourier transform spectroscopy. The information obtained and the relative advantages of these techniques for the analysis of a wide range of "Real World" samples will be critically evaluated.

2290 Seminar in Analytical Chemistry 1 cr.

Only students planning to defend their Ph.D. thesis should register for this course. Others may attend without registering.

\*2310 Adv. Organic Chemistry I 3 cr.

A discussion of the tools, both modern and classical, that are the basis of mechanistic interpretations of relations between structure and reactivity. Special emphasis is placed on the detailed molecular level analysis of organic molecules, including the transient reactive intermediates: carbanions, carbocations, carbenes, and radicals, to develop a predictive sense for reactivity. The factors that influence equilibria, product distribution, and reaction mechanisms are also explored.

\*2320 Adv. Organic Chemistry II 3 cr.

A course designed to cover modern synthetic methods for the assembly of complex organic molecules (stereospecific olefin synthesis), cycloaddition reactions, sigmatropic rearrangements, organometallic chemistry, natural product synthesis.

2370(1310) Synthetic Organic Chemistry 2 cr.

Reactions of major interest and wide applicability in synthetic chemistry are presented. Reaction mechanisms and the effect of structure on reactivity are stressed and emphasis is placed on recently developed methods.

2380(1380) Techniques of Organic Research 2 cr.

A course which serves as a guide to the interpretation of ultraviolet, infrared, nuclear magnetic resonance and mass spectra of organic compounds.

2390 Seminar in Organic Chemistry 1 cr.

Only students planning to defend their Ph.D. thesis should register for this course. Others may attend without registering.

\*2430 Quantum Mechanics & Kinetics 3 cr.

This course attempts to provide an understanding of chemical phenomena at a fundamental level. It begins with the development of the quantum theory and its application to simple systems, considers next molecular structure and chemical bonding in small molecules, and progresses to the interpretation of the behavior of larger molecules through approximate molecular orbital theory. An introduction to experimental and theoretical chemical kinetics is also given. The emphasis is on the application of the basic concepts of physical chemistry to a wide variety of systems, both organic and inorganic.

\*2440 Thermodynamics & Statistical Mechanics 3 cr.

Development of thermodynamics; applications of the laws of thermodynamics; development and application of statistical thermodynamics.

2490 Seminar in Physical Chemistry 1 cr.

Only students planning to defend their Ph.D. thesis should register for this course. Others may attend without registering.

2530 Molecular Spectroscopy 3 cr.

This course is a one-term introduction to the subject and covers atoms, and diatomic and polyatomic molecules. The main topics are: a) theory of the absorption and emission of light, and of selection rules; b) rotational spectra; c) vibrational spectra; d) electronic spectra and e) laser spectroscopy.

2550 Magnetic Resonance Spectroscopy 3 cr.

An introduction to the fields of nuclear magnetic resonance and electron parametric resonance spectroscopy for persons with no previous experience in these fields.

2600 Synthesis & Characterization Polymer 3/4 cr

This course will focus on the preparation and characterization of polymers. Current methods of polymer synthesis will be surveyed, with particular attention paid to the practical implementation and kinetic consequences of specific reaction strategies in homopolymer, copolymer, and block copolymer synthesis. Techniques for the characterization of polymer molecular weight (light scattering, GPC, osmometry, viscosity, etc.) composition and stereochemistry (FT-IR, NMR), and mechanical properties (DMA, etc.) will be discussed. Polymer solution thermodynamics will be briefly covered, as will other advanced topics of current interest.

2610 Synthesis & Characterization Polymer Lab 0 cr.

Same as above.

2620 Atoms, Molecules and New Materials 3 cr.

This will be a course designed to increase students' knowledge and understanding of emerging field of nanotechnology. Nanotechnology deals with materials in nanometer scales, typically one to 100 nanometers. One nanometer is one billionth of a meter; approximately the length of five silicon atoms placed side-by-side or the width of a single strand of DNA. On nanometer scale, materials may possess new physical properties or exhibit new physical phenomena. For example, band gaps of semiconductors can be effectively tuned by adjusting their nano-dimensions. For nanomaterials, number of surface atoms becomes a significant fraction of the total number of atoms and the surface energy starts to dominate. This changes thermal stability and catalytic properties of many materials as we know them. During the course, the students will gain a sound appreciation of different techniques and instruments involved in the preparation and characterization of nanomaterials. Current and future applications of nanomaterials in medicine, defense, energy production, and computation will be also discussed.

2700 Graduate Research Seminar

This seminar course is designed to give first year graduate students an introduction to the research being done by faculty members in the Chemistry Department. Weekly seminars are given to help graduate students choose research directors.

\*2810 Biological Chemistry 1

3 cr.

Physical properties of proteins will be presented from a quantitative perspective and related to biological function. Topics will include: Diffusion, structural, and hydrodynamic properties of soluble and membrane proteins; protein folding; conformational transitions; diffraction, spectroscopic and single molecule probes of protein structures and dynamics.

\*2820 Biological Chemistry 2

3 cr.

This course covers current research in chemical biology. We will discuss how chemical principles are being applied to address complex problems in biological research. Some of the topics are DNA replication and repair, transcription, RNA transport, translation, biomacromolecule interactions to transduce signals, metals in biology, posttranslational modifications, chemical syntheses of biomolecules.

\* - Core course

## Policies for Teaching Assistants and Teaching Fellows

The teaching of chemistry by Teaching Assistants and Teaching Fellows is both a responsibility and a privilege. You have been appointed to your position because the Department believes you have the ability necessary to pursue your own graduate studies and at the same time to assist in the education of undergraduate students. It is expected that the latter activity will deepen your own knowledge of chemistry.

There are several excellent handbooks which will give you more information on the role of teaching assistants, and on how to become more effective as a TA. You should start by reading the *The Teaching Assistant Experience* published by CIDDE at the University of Pittsburgh. In addition, the American Chemical Society publishes a *Handbook for Teaching Assistants*, specifically designed for TAs in chemistry.

Finally, the *Manual for Foreign Teaching Assistants* published by the University of Iowa, is especially helpful to TAs who may not be totally familiar with customs and practices in American universities. If you have questions about your role, or procedures, ask your teaching supervisor. He or she will be willing to help you.

As teachers, you will probably put your greatest effort into trying to convey concepts and skills clearly, accurately, and (we hope) enthusiastically. You should also be aware of how you are interacting with the class, and of how your students think you are treating them. The atmosphere of a class and the degree of participation are established early. You should think seriously about how you can encourage an atmosphere that is effective, cordial, and egalitarian. At the same time, remember that you are the “authority figure,” and not one of the students.

It's very easy to complain about students not participating. You should understand that *lack* of participation has many origins, including students' perception of you. Do the students feel that you'll think they're stupid if they ask a question? Are shy students squeezed out? Do the students interrupt each other in a way that makes some students shrink into their chairs for the whole term? Keep in mind that some students may feel less comfortable participating.

Positive feedback from you can be very encouraging. Think about how you treat individuals and groups of students? Do you get impatient with students who have difficulty phrasing a question? Do you ask women questions differently than you ask men (or vice versa)? Do you make inappropriate personal remarks? You may never have noticed yourself doing these things, but if they *do* happen, you can bet that your students will notice and react negatively. You may also find your students treating *you* in a manner that is improper, sexist, or even harassing. Again, it is up to you to establish a clear teacher-student relationship. If you find you're having difficulties, it's not necessarily your fault. Talk with the person in charge of the course, with other professors in the Department or with the Administrative Officer if you feel that you need some guidance or if formal procedures seem warranted.

There are few rules to teaching. The two most important are: 1) treat your students with respect, as you should like to be treated; and 2) do not abuse your responsibility and authority. Beyond that, use good judgment. Classifying students' abilities by nationality, sex or race is wrong and unacceptable. Sexist and racist comments, jokes, slurs, and the like have no place in the classroom. Disparaging comments about the course or the course instructor also have no place. To the best of your ability encourage all students.

The following sections describe: (A) Awards for teaching excellence; (B) Duties of Teaching Assistants and Teaching Fellows; (C) Recommended teaching workloads; (D) Procedures for evaluation of teaching; (E) Other considerations; and (F) Safety Obligations.

#### **A. Safford Awards for Excellence in Teaching**

The Department of Chemistry has established the Safford Awards to recognize graduate student TA/TFs for outstanding contributions to the Department's undergraduate teaching mission. Approximately six awardees are selected each year to receive this award. We encourage all of our TAs to strive for the excellence in teaching that these awards represent.

#### **B. Duties of Teaching Assistants (TAs) and Teaching Fellows (TFs).**

Duties of TAs and TFs are essentially the same. TFs are more experienced graduate students (having served at least two terms as TAs) who may be expected to handle more challenging assignments. [First year students with Teaching Assistantship awards do serve a third term as a TA rather than a TF if they teach during the summer term of their first year.] As a TA or TF you *must*:

***Prepare for and meet all assigned classes promptly at the scheduled time and place.*** If for any reason you cannot meet your class, you should inform the person in charge of the course in advance and, with his/her permission, arrange for an acceptable substitute. If unforeseen circumstances will make you late for class, inform the course coordinator immediately. The only excused absences from teaching duties are for illness or out-of-town research activities. Course instructors will normally refuse permission for other absences, and unexcused absences will be reflected in the final grade for the teaching assignment, and will jeopardize future TA appointments.

***Demonstrate principles of good laboratory safety*** to the students and impress the importance of these principles on the students...for example, requiring students (and yourself) to wear safety goggles when working in the lab. Lab instructors seen not wearing goggles in the lab area will receive one warning. Each subsequent warning will result in a lowering of their final teaching grade by one grade-level.

***TAs / TFs are responsible for supervision of their assigned laboratory sections.*** Laboratory instructors should closely examine all student experimental set-ups at the beginning of the experiment and during laboratory session. Discard or replace damaged glassware, tubing and any other faulty components such as frayed electrical cords. Notify appropriate lab coordinator or stock room supervisor of faulty equipment that requires further attention or repair. TA/TF laboratory

instructors are expected to exercise good teaching practices during the laboratory, including circulating among the students during an experiment, instructing them about technique and responding to their questions. Not paying attention to the class while sitting at the front desk and reading is not acceptable and does not constitute diligent teaching.

***NEVER leave the laboratory unsupervised during an experiment.*** If you must leave the laboratory briefly, announce this to the class and have all students stop working at their respective lab benches until you return. Avoid trips to the stockroom during lab by examining chemicals and equipment before laboratory session begins.

***Proctor and grade lecture examinations.*** As soon as grading/proctoring roster assignments are published, you are responsible to contact the faculty member you are assigned to assist. Ask the faculty member to explain his/her requirements for proctoring and grading in their classes. You are expected to be flexible with your personal schedule so that exams may be graded in a timely fashion. ***Grade quizzes and laboratory reports and return them promptly to students*** in accordance with the procedure explained to you by the person in charge of your course.

***Attend all scheduled TA/TF lab instruction meetings*** with the person in charge of your course. Attendance at these meetings is mandatory. Consequences of failure to attend meetings can result in corrective actions from written warnings to removal from TA assignments and loss of TA funding.

***Infractions of laboratory safety policy by TAs/TFs, unexcused absences from TA meetings or other inappropriate conduct*** will be addressed by the Laboratory Coordinator and will be reported to the Department of Chemistry Administrative Officer, the Professor in charge of the course, the Course Coordinator and the Safety Committee for appropriate disciplinary action.

***Meet privately with individual students when they need help.*** You must schedule 2-3 hours of time each week for students in your classes to contact you for questions.

***Register for CHEM 2970.*** You will need at least two terms of teaching credits as one of the requirements for obtaining your Ph.D.

### C. Recommended Schedule for TA/TF Workloads

*Note - Attending lectures is recommended but not required.*

Example - Chem 0110 & 0120

1. Lab TA
  - 3 lab sections per week (24 students each)
 

(3 hours each section)	9 hrs
------------------------	-------
  - attend 1 recitation section each week 1 hr
  - preparation for labs (weekly average) 2 hrs
  - grade lab experiment (weekly average) 3-4 hrs
  - weekly TA meeting with supervisor 1 hr

- proctor and grade exams (weekly average)	1 hr
- meeting with individual students	2-3 hrs
<b>TOTAL</b>	<b>20 hrs</b>
2. Recitation TA	
- 6 recitation sections per week (24 students each) (1 hour each section)	6 hrs
-preparation for recitation sections (weekly average)	3 hrs
- grade quizzes (weekly average)	4 hrs
- weekly meeting with supervisor	1 hr
- proctor and grade exam (weekly average)	1 hr
- meetings with individual students	4-5 hr
<b>TOTAL</b>	<b>19-20 hrs</b>

Example - Chem 0330 & 0340

1.	Lab TA	
	- 3 lab sections per week (12 students each)	
	(3 hours each section)	9 hrs
	- attend 1 recitation section each week	1 hr
	- preparation for labs (weekly average)	1 hr
	- grade lab experiments (weekly average)	4 hrs
	- weekly TA meeting with supervisor	1 hr
	- proctor and grade exams (weekly average)	2 hrs
	- meetings with individual students (weekly avg)	2 hrs
		<b>TOTAL 20 hrs</b>
2.	Recitation & Lab TA	
	- 2 recitation sections per week (1 hr each)	2 hrs
	- 2 lab sections per week (3 hr each)	6 hrs
	- preparation for recitation sections (weekly avg)	1-2 hrs
	- preparation for labs (weekly average)	1 hr
	- grading lab experiments, writing and grading lab	
	quizzes and exams (weekly average)	3-4 hrs
	- weekly TA meeting with supervisor	1 hr
	- proctor and grade exams (weekly average)	2 hrs
	- meetings with individual students	2-3 hrs
		<b>TOTAL 19-20 hrs</b>

**D. Evaluation**

Your teaching will be evaluated in a number of ways during the term.

1. During the term your class will be visited at various times by the person in charge of your course and, possibly by other faculty members. Try not to be disconcerted by these visits. Their purpose is to observe your class, to check on the accuracy of student comments and evaluations, and to see if there are any ways you can be helped in your teaching.
2. At the end of term (and at mid-term in some lab courses such as General Chemistry) students will complete questionnaires on TA performance. You will be informed of the results and will be encouraged to discuss them with the lab coordinator.

At the end of the term the person in charge of your course will fill out an evaluation of your teaching (including evaluations by your students), and your overall performance as a TA (preparation, attendance, etc.).

***Lack of acceptable performance in key teaching responsibilities may lead to loss of the teaching assistantship for one year.*** Such issues include failure to apply basic safety rules (including negligence to wear or instruct students to wear safety goggles), failure to meet your class punctually, or failure to attend TA meetings. In all cases, warnings will be given before any action is taken, and you will be able to discuss the situation with the lab coordinator and others within the department. First and second warning letters will go to the TA/TF, the lab coordinator, and the research advisor (or the GSAC chair for students who have not joined a research group). After the third incident, the TA position will automatically be withdrawn for a period of one year. The student and/or advisor can appeal to the Chair if he/she disagrees

#### **E. Other Considerations.**

##### ***Proficiency in Speaking English***

On occasion, because of lack of proficiency in English, a TA may be assigned grading and proctoring duties, stockroom duties, or instrument lab duties, in place of classroom duties. It is expected that all students whose English is deficient will correct that deficiency by attending required English courses, and eventually teach in the laboratory or classroom.

##### ***Workload Considerations***

Persons in charge of courses should expect TAs to work in conformance with the standards set forth above. If they find that a TA is working less than the normal amount, they may assign additional course-related duties. If the TA is working more than the normal amount, the supervisor will try to lighten his/her load.

##### ***Academic Integrity***

You have been given a copy of the University's *Guidelines on Academic Integrity* which describes academic classroom situations and behaviors which under certain circumstances are unacceptable. As a lab or recitation TA/TF you may have to deal with issues of cheating or plagiarism in your class. If you suspect a student of cheating or plagiarism, first discuss the matter with the person in charge of the course to determine the best manner in which to approach and (if necessary) correct the problem.

##### ***Problem Resolution***

Any TA or TF who experiences a problem connected with his/her teaching duties should try first to resolve it by talking with the person in charge of the course. If the problem cannot be resolved in this way, the TA or TF should see the Director of Graduate Studies.

#### **F. SAFETY OBLIGATIONS**

Proper lab safety is of paramount importance to all members of the Department of Chemistry. As a TA/TF, you are an appointed representative of the department and are therefore an integral part of maintaining a safe working environment.

As a TA/TF, you are required to follow proper lab safety protocols and you are further required to ensure that those students in your individual classes follow proper lab safety protocols.

Failure to follow lab safety protocols on the part of the TA/TF or students under the direction of the TA/TF can result in disciplinary action.

**REFER TO AND COMPLY WITH THE FOLLOWING FORMS AND GUIDELINES  
AS YOU PREPARE FOR YOUR DUTIES AS A LABORATORY INSTRUCTOR.**



## University of Pittsburgh

<b>University of Pittsburgh Safety Manual</b>	EH&S Guideline Number: <b>04-001</b>	
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### 2. GENERAL GUIDELINES FOR HANDLING HAZARDOUS CHEMICALS

- 2.1 It is possible to handle all chemicals safely, especially in a controlled laboratory environment. Understand the potential hazards associated with materials and procedures in your lab. Obtain and review Material Safety Data Sheets (MSDS) before using chemicals.
- 2.2 Ensure that necessary supplies and equipment are available for handling small spills. See procedures in following section. Also, know emergency numbers of the University (x4-2121) and basic emergency response actions. A basic chemical spill procedure should be posted in each lab or area where chemicals are handled.
- 2.3 Know the location and proper use of safety equipment such as emergency showers, eye wash stations, fire extinguishers, and fire alarms. In the event of skin or eye contact with chemicals, immediately flush the area of contact with cool water for 15 minutes. Remove affected clothing. Get medical help by calling x4-2121.
- 2.4 Do not work alone in the laboratory if you are working with chemicals.
- 2.5 Purchase minimum amounts of hazardous materials necessary to accomplish work and dispense only amounts necessary for immediate use.
- 2.6 Use hazardous materials only as directed and for their intended purpose.
- 2.7 Never smell or taste any chemical as a means of identification.
- 2.8 Avoid direct contact with any chemical. Use engineering controls (such as certified fume hoods) or personal protective equipment to avoid exposure.
- 2.9 Smoking, drinking, eating, the storage of foodstuffs, and the application of cosmetics are forbidden in areas where chemicals are in use.

## Acknowledging Safety Rules and Enforcement Requirements Form

- (Must be on file with Lab Coordinator BEFORE laboratories begin)
- **Laboratory Instructor Name (print):** \_\_\_\_\_  
Semester: \_\_\_\_\_
- Place your initials after each statement.
- I and my students will read the “lime green” safety regulations together. I will turn in the signed green forms to room 201. \_\_\_\_\_
- I understand that I must wear the same type of safety goggles (and clothing) my students are required to wear while I am supervising an undergraduate teaching laboratory. \_\_\_\_\_
- I must explicitly discuss with students the departmental goggle policy and violation consequences on the first day of lab. \_\_\_\_\_
- I understand that part of my supervisory role is to enforce all safety rules.  
\_\_\_\_\_
- Thus, I MUST send improperly dressed students home. \_\_\_\_\_
- Thus, I must follow departmental procedures for goggle violations.  
\_\_\_\_\_
- I must remind students about the goggle policy before each lab begins.
- I must give a student a verbal warning if he/she is observed not to be wearing goggles. I must explicitly remind the student about the consequences of a second violation.
- If the student is observed violating the goggle policy a second time in the same lab period as the verbal warning was given then I must penalize that student’s lab report by 50%.
- Finally, if a student is observed violating the goggle policy a third time in the same lab period as the verbal warning then I must dismiss that student from the laboratory for that day. This dismissal will result in a zero grade for that lab report.
- I must inform the laboratory coordinator of all second and third violations by email.
- If a fire alarm sounds I do NOT have the authority to let my students remain in the laboratory or a classroom. \_\_\_\_\_
- I must immediately instruct them to turn off Bunsen burners or other heat sources and gather their personal belongings.

- The students must then exit the building via the nearest exit.
- In order to ensure proper evacuation, I must be the last one to exit the laboratory.
- I understand that as a condition of my employment I am obligated to attend all regular T.A. meetings. This will ensure I am properly informed of current safety concerns. This regulation applies equally to new AND veteran instructors. \_\_\_\_\_
- I understand that, in the event of an accident, I must fill out an accident report form and give a copy of the completed form to Josh Jones (room 201) and the Lab Coordinator. \_\_\_\_\_
- These forms are available in 201.

Accidents are NOT limited to incidents which result in an injury.

I understand that not complying with the rules and procedures described in this document can result in punitive measures against me. These measures are discussed in the Graduate Student Handbook (page 41-42) and may include such things as a written warning, a meeting with the safety committee, and/or the possibility of no further teaching support.

\_\_\_\_\_

Laboratory Instructor Signature \_\_\_\_\_

Date \_\_\_\_\_

Give completed form to the Laboratory Coordinator

## APPENDIX VI: Safety Incident Reporting and Accountability

### UNIVERSITY OF PITTSBURGH

- **DEPARTMENT OF CHEMISTRY**

- **SUBJECT:** Safety Incident Reporting and Accountability

- **DATE:** September 23, 2006

- **Purpose.**

- It is the goal of the University of Pittsburgh, Department of Chemistry to provide a safe working environment for all faculty, students and staff in the Department. All members of the Department of Chemistry, including undergraduate students working in laboratory courses, have a responsibility to learn and follow safe laboratory practices and meet accepted workplace safety standards.

- **Incident Reporting Procedures.**

- Members of the Department are expected to notify the immediately responsible party (supervisor, course coordinator, research director, *etc.*) and the Director of Facilities of all laboratory and workplace accidents, including those involving any of the following circumstances:

- Chemical spills
- Incidents of exposure or release of hazardous materials
- Incidents resulting in an injury

1. Incidents resulting in damage to facilities
2. Any injury, fire, or hazardous material release requires the immediate notification of emergency responders.
3. A written report of the incident shall be sent to the Director of Facilities, as soon as possible.

4. **Safety Committee Review.**

5. The Director of Facilities, upon receipt of a written incident report, shall forward the report to the Chair and members of the Safety Committee for review. The Safety Committee will review the report, and decide on a course of action. Typically, the Safety Committee will transmit their findings to the Department to improve safety practices.
6. For more serious events, the Safety Committee may choose to convene a meeting of the principals (*e.g.*: undergraduate student(s), graduate student(s), postdoc(s), TA(s), course coordinator, research director, and/or others) in order to understand the circumstances of the incident. Other persons who desire to bring information to the committee may do so at this time, and should contact the Chair of the Safety Committee.

7. If the incident in question was not caused by failure to follow accepted, safe laboratory practices, no further action will be taken in regard to the incident, unless faulty equipment was deemed to be responsible, in which case the equipment will be repaired.
8. If the committee determines that accepted, safe laboratory practices were not followed and that failure to follow said practices caused the incident in question, the following actions shall apply:

**9. First Incident.**

10. If the incident in question is the first such involvement of the individual(s) in a safety infraction, he/she will be required to re-take all safety training offered by the Department of Chemistry. The incident and required actions will be documented.
11. Upon completion of the re-training, the individual(s) shall provide notice to the immediate supervisor, the Chair of the Safety Committee and the Administrative Officer of the Department of Chemistry that the safety training has been completed.

**12. Second Incident.**

13. If the incident in question is the second such incident within twelve months of the date of the first incident, the individual(s) shall receive written notification requiring the following actions:
14. Repeat training in all Department of Chemistry Safety Programs

The individual(s) should prepare a written protocol for each experimental procedure to be performed. Each written protocol shall be reviewed and approved by the immediate supervisor prior to the start of any work in the laboratory/workplace and will continue for a time defined by the Safety Committee.

The incident and required actions will be documented. Upon completion of the re-training, the individual(s) shall provide notice to the supervisor, the Chair of the Safety Committee and the Administrative Officer of the Department of Chemistry that the safety training has been completed.

**Other Incidents.**

In the event that more than two incidents occur within twelve months, the Safety Committee may require adjustments to the term of the safety probation or written protocols or any other requirement designed to ensure that the individual follows accepted, safe laboratory/workplace practices.

For individuals who chronically fail to demonstrate appropriate safety practices, the Safety Committee may decide to recommend more severe sanctions, perhaps even dismissal from the program and/or termination of employment.

## **PATENT RIGHTS AND TECHNOLOGY TRANSFERS POLICY**

### **I. SCOPE**

This policy establishes the rights and responsibilities of all faculty, staff, and students under the circumstances specifically provided herein who discover or invent a device, product, or method, while associated with the University, whether or not University time or facilities are used. This policy also applies to all pending invention disclosures and/or patent applications and/or patents not yet licensed or transferred as of July 1, 2005.

### **II. POLICY**

When an invention is made, the inventor must promptly submit an Invention Disclosure Statement to the Office of Technology Management. See Procedure 11-02-01, Patent Rights and Technology Transfer.

#### Title to Patents

The University claims ownership and control of the worldwide patent and intellectual property rights which result from activities of its faculty, staff, and students. University "faculty and staff" includes all persons who hold any official faculty or staff relationship to the University, with the exception of those persons who render their services to the University on a gratuitous basis. This exception does not include faculty who are members of professional corporations affiliated with the University, even though the faculty may receive all or part of their compensation from the professional corporation. The inventor will normally receive thirty percent and the University seventy percent of the net financial returns from the licensing or other transfer of patent rights or other intellectual property rights.

If, however, the inventor or another institution believes that the circumstances surrounding the invention, including such factors as support provided by other than the University, place where discovery was made, or lack of relevance to the regular work of the member of the faculty or staff, warrant another distribution, the inventor or the institution may request the Office of Technology Management, in consultation with the Technology Transfer Committee, to review the circumstances. After review, and upon consultation with the Office of General Counsel and the Senior Vice Chancellors, the Office of Technology Management will make recommendations to the Chancellor on the distribution of proceeds.

The University, as determined by the Technology Transfer Committee and the Office of Technology Management, may choose to waive all rights to file a patent on a particular invention or to pursue licensing of such invention, electing instead to grant the inventor permission to proceed on his or her own in whatever manner the inventor deems appropriate. If an inventor subsequently licenses or commercializes an invention for which the University has waived its rights the University shall receive 5% of the net proceeds received by the inventor above \$25,000 from all sources for the life of the license or commercialization arrangement. Half of any such proceeds shall be designated to a University Development Fund; and half to the inventor's department for use in research at the discretion of the inventor with the approval of the department chair, for so long as the

inventor remains a member of the University faculty. If the inventor leaves the University, this portion will revert to a University Development Fund (the inventor's former department may subsequently choose to apply for the use of these funds).

Patent rights resulting from any activities conducted by a student, including the preparation of a thesis or dissertation, which made use of University resources, are subject to the provisions regarding title to patents.

Patent rights resulting from government-sponsored research grants, contracts, fellowships, or other such arrangement, are controlled by the terms of those agreements, but as between the University and faculty members and staff accepting such grants, patent rights are subject to the provisions herein regarding title to patents.

Patent rights resulting from the research grants or contracts of nongovernment agencies or sources are, as between the University and faculty members and staff, subject to the provisions herein regarding title to patents.

#### Management of Patents

Inventions and discoveries resulting from University research are administered and managed in a manner determined to be in the best interests of the public, the inventor, and the University. The responsibility for the management of such technology is through the Office of Technology Management. The inventor(s) will be kept informed by the Office of Technology Management of negotiations involving their intellectual property prior to execution of any license.

#### Patent Rights Fund

The Patent Rights Fund has been established to provide resources to obtain patents and maintain them and for filing and maintaining them in foreign countries.

The fund will be reimbursed from any royalties, sales, or other proceeds from patent licensing or other transfer for each particular patent (see "Distribution of Income from Licensing or Sale of Patent Rights or Other Intellectual Property Rights" below).

There will be additional reimbursement to the Fund, as provided below, to increase the amount in the Fund for patent searches and obtaining and maintaining patents. At the discretion of the Senior Vice Chancellors, surpluses existing on an annualized basis once legal costs have been reimbursed will revert to a University Development Fund.

#### Distribution of Income from Licensing or Sale of Patent Rights or Other Intellectual Property Rights

First, income from each particular license or other transfer will reimburse the "Patent Rights Fund" for legal, professional, and government fees paid for outside services incurred for that licensed or transferred patent or portfolio of patents.

Second, if a particular patent was facilitated by financial support from a University Development Fund (see below), then the income attributable to that patent must reimburse the fund if the support was categorized as a reimbursable expense at the time of the award.

The balance of proceeds from any license, sale, or other amounts derived from the transfer of patent rights or unpatented intellectual property (excluding copyrights) will then be distributed as follows:

- 30% to the inventor(s)
- 30% to the above "Patent Rights Fund."

- 10% to a "University Development Fund," to provide resources to enhance the academic enterprise of the University and/or to develop patentable material under the direction of the Provost and the Senior Vice Chancellor for the Health Sciences. (Schools that have supported research leading to patentable discoveries may apply for money from the University Development Fund for support of future endeavors.)

- 15% to the department of the inventor, for use in research at the discretion of the inventor with the approval of the department chair, if inventor is still a member of the faculty. If the inventor leaves the University, this portion will revert to a University Development Fund (the inventor's former department may subsequently choose to apply for the use of these funds).

- 15% to the Office of Technology Management to cover administrative expenses.

- In the event that total income for a patent or group of related patents or technology rights exceeds \$100,000, the above distribution of royalties may be changed in accordance with a plan approved by the Chancellor of the University, but not so as to reduce the inventor's share.

- In the event an inventor entitled to compensation under the paragraphs above, leaves the University either voluntarily or involuntarily, such inventor will continue to remain entitled to receive payments under the paragraphs above, but will not in any fashion be entitled directly or indirectly to continue to receive or transfer any other rights or benefits to the department of the inventor. In the event of death of an inventor entitled to receive compensation under the paragraphs above, such payments will continue to be paid to the inventor's estate and subsequently to those lawfully taking thereunder in accordance with a court approved distribution.

#### Public Disclosure/Publication

No University invention or discovery may be licensed, sold, or otherwise transferred without prior approval of the Office of Technology Management.

All publication rights relating to sponsored research or research supported entirely or largely by University resources are reserved by the University for itself and its faculty members, staff, and student, subject to the following conditions:

- Publication may be withheld for a maximum period of six months if required for the filing of a patent application.

- Any patent or commercial product mentioned in a publication may not be referred to by its trade name without the consent of both the University and the sponsoring agency.

- The University, on request, submits any publication to the sponsoring agency before printing and considers any recommendation made by the Sponsoring agency. However, the University makes the final determination as to the form, scope, and content of such publication.

#### Patent Clauses

The terms of the invention disclosure to other parties and patent clauses in agreements for sponsored research are subject to the review, negotiation, and acceptance by the Office of Research and the Office of Technology Management. In the event that clauses in any such agreement appear to be unusual or to require special consideration, the Office of Research and the Office of Technology Management will submit the agreement to the Office of the Provost and the Office of General Counsel for consideration and recommendation.

#### Non-Patentable Inventions

Certain discoveries and inventions, including trade secrets and know-how, may not be patentable but may have material commercial value or potential as revenue producers. These accomplishments are subject to the same policy as any patentable invention and will be considered by the Technology Transfer Committee and the Office of Technology Management on an individual basis.

### III. REFERENCES

Procedure 11-02-01, Patent Rights and Technology Transfer

Policy 02-06-01, Outside Employment

Policy 07-05-02, Conflict of Interest for Designated Administrators and Staff

## **Guidelines on Academic Integrity**

### **Student and Faculty Obligations and Hearing Procedures**

#### **Preface**

Provided here are Academic Integrity Policy Guidelines based on the 1983-86 document which was initially approved by the Board of Trustees on the recommendation of the University Senate Council. The original document evolved from and represented careful deliberation among staff, Senate committees, and student leaders of the University. The purpose of this document is to clarify and codify the rights and responsibilities that are inherent in traditional faculty-student relationships, and to reflect procedural modifications that were approved, effective January 1, 1989 by the Chancellor.

In following the Guidelines, the faculty of each academic unit of the University are expected to adapt them to the circumstances of their own academic unit.

The Guidelines are designed to assure due process, equity, and prompt and objective review by third parties, with appropriate appeals procedures. There is a general intent to maintain confidentiality, to avoid unnecessary formality, and to resolve issues at the lowest possible level.

Faculty have a particular interest and responsibility in assuring that the Guidelines are adhered to, by virtue of their profession and their role as academic officials of the University. Any failure to follow these Guidelines would be harmful to the whole University community.

All members of the University community have access to advice and interpretation regarding these Guidelines. Students may consult with the Campus Judicial Coordinator, faculty may consult with their dean or school hearing officer, and may ask for any other guidance they need from the Office of the Provost.

In general, we seek to preserve the traditional freedoms and duties associated with academic endeavors. The University should work to preserve the rights and responsibilities of faculty and students in their relationships with one another. Just as faculty and students must be free to seek truth and to search for knowledge with open minds, they must also accept the responsibility that these activities entail maintaining the highest standards of integrity, mutual respect, and honest inquiry.

#### **Historical Background**

In March 1965, the Senate Council approved a policy statement on the subject of academic integrity. It was there declared, in language that is as true and vital today as then, that:

The University of Pittsburgh seeks excellence in the discovery and dissemination of knowledge. Excellence in scholarship cannot be achieved in situations which are contaminated by dishonest practices. All members of the University community are obligated to adhere strictly to the highest standards of integrity in study, research, instruction, and evaluation.

It is presumed that those who instruct and administer observe such standards of integrity. Administrators and senior faculty members are presumed further to encourage these

standards among their junior colleagues. Students are presumed to accept the concept of academic integrity and to seek to live by it but they may need continuing clarification of the concept and guidance in its observance. Particularly, students need the assurance that those who work honestly will not suffer thereby in comparisons with the dishonest. Those who cannot or will not adopt the concept and practices of academic honesty do not belong within the University.

These principles are reaffirmed.

In February 1974, the Senate Committee on Tenure and Academic Freedom reported to the Senate Council, recommending a general statement on academic integrity as follows:

The integrity of the academic process requires fair and impartial evaluation on the part of faculty, and honest academic conduct on the part of students. To this end, students are expected to conduct themselves at a high level of responsibility in the fulfillment of the course of their study. It is the corresponding responsibility of faculty to make clear to students those standards by which students will be evaluated, and the resources permissible for use by students during the course of their study and evaluation. The educational process is perceived as a joint faculty-student enterprise which will perforce involve professional judgment by faculty and may involve--without penalty--reasoned exception by students to the data or views offered by faculty.

Consistent with these considerations (and without limiting their scope and application in their entirety to the academic programs of the University), faculty and students are directed to observe the following guidelines:

Faculty should meet and students should attend their classes when scheduled; faculty should be available at reasonable times for appointments with students and both parties should keep such appointments; faculty and students should make appropriate preparations for classes and other meetings; students should submit their assignments in a timely manner; and faculty should perform their grading duties in a timely manner.

The general content of a course or other academic program should be described with reasonable accuracy in catalogues or other written documents available to students. The content, objectives of and standards for evaluation (including the importance to be assigned various factors in academic evaluation) in a course should be described by the faculty member at the first or second class meeting, preferably in a written hand-out.

Integrity of the academic process requires that credit be given where credit is due. Accordingly, it is unethical to present, as one's own work the ideas, representations, or words of another, or to permit another to present one's own work without customary and proper acknowledgment of sources. The limits of permissible assistance available to students during a course or an academic evaluation should be determined by the faculty member and described with reasonable particularity at the first or second class meeting, or well in advance of an evaluation, so as to allow for adequate student preparation within the permissible limits.

All academic evaluations should be based upon good-faith professional judgment, in accordance with applicable standards; factors such as race, color, religion, sex, national origin, political affiliation, sexual orientation, and activities outside the classroom that are unrelated may not be considered in matters of academic evaluation, academic assignments,

or classroom procedures, nor shall reasoned views expressed by students during the course adversely prejudice any student.

University records, which shall contain only information reasonably related to educational purposes, shall be considered a matter of privacy not to be released except with student consent, or as may be permitted by law. Any student shall be permitted to review his or her own personal record, except for its confidential contents (such as the recorded comments of counseling personnel).

The faculty of each school shall establish rules implementing these principles, and procedures pertaining to the investigation and redress of grievances.

The above Guidelines cannot be fulfilled in the University of Pittsburgh as a whole unless they are fulfilled in each and every academic unit. University-wide Guidelines of implementation as outlined in the above six points are accordingly appropriate as an expression of a common understanding and dedication. These Guidelines are presented in some detail in the two model codes of this statement, which deal with student and faculty responsibilities, respectively. Each academic unit is required to adopt regulations conforming to these documents. The development of exact procedures remains sufficiently flexible to provide proper discretion on the part of the individual faculty; however, such procedures must be designed to assure fair and orderly review of particular cases, and should adhere closely to the language of the attached codes.

The dean of each academic unit will be responsible for furnishing to the Provost the regulations and procedures adopted by the faculty, and any amendments. The codes of each academic unit will be reviewed to insure reasonable conformity with the principles and procedures of the attached model codes. The dean shall also assure that all full-time and part-time students and faculty are informed about the existence and availability of the applicable regulations and procedures.

The jurisdiction shall be held by the academic unit which offered the course. Remedial action benefiting the student must be approved by the dean of the academic unit in which the course is offered. However, in offenses involving academic integrity, only the dean of the academic unit in which the student is matriculated can suspend or dismiss the student from the University. In cases that cross campus, college or school boundaries, consultation between the deans may be appropriate.

**SUGGESTED CODE**  
**UNIVERSITY OF PITTSBURGH**

School of \_\_\_\_\_

**Academic Integrity:**

**f) Student Obligations**

**g) I. Student Obligations**

- h) A student has an obligation to exhibit honesty, and to respect the ethical standards of the profession in carrying out his or her academic assignments. Without limiting the application of this principle, a student may be found to have violated this obligation if he or she<sup>1</sup>: (see note concerning more appropriate invocation of University of Pittsburgh Student Code of Conduct and Judicial Procedures)
- i) Refers during an academic evaluation to materials or sources, or employs devices, not authorized by the instructor.
- j) Provides assistance during an academic evaluation to another person in a manner not authorized by the instructor.
- k) Receives assistance during an academic evaluation from another person in a manner not authorized by the instructor.
- l) Engages in unauthorized possession, buying, selling, obtaining, or using of any materials intended to be used as an instrument of academic evaluation in advance of its administration.
- m) Acts as a substitute for another person in any academic evaluation process.
- n) Utilizes a substitute in any academic evaluation procedures.
- o) Practices any form of deceit in an academic evaluation proceeding.
- p) Depends on the aid of others in a manner expressly prohibited by the instructor, in the research, preparation, creation, writing, performing, or publication of work to be submitted for academic credit or evaluation.
- q) Provides aid to another person, knowing such aid is expressly prohibited by the instructor, in the research, preparation, creation, writing, performing, or publication of work to be submitted for academic credit or evaluation.
- r) Presents as one's own, for academic evaluation, the ideas, representations, or words of another person or persons without customary and proper acknowledgment of sources.
- s) Submits the work of another person in a manner which represents the work to be one's own.

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<sup>1</sup> **NOTE:** There may be instances where the charging party may more appropriately invoke the *University of Pittsburgh Student Code of Conduct and Judicial Procedures*. This may occur where the alleged wrong mainly involves factual determinations and not academic issues.

- t) Knowingly permits one's work to be submitted by another person without the instructor's authorization.
- u) Attempts to influence or change one's academic evaluation or record for reasons other than achievement or merit.
- v) Indulges, during a class (or examination) session in which one is a student, in conduct which is so disruptive as to infringe upon the rights of the instructor or fellow students.
- w) Fails to cooperate, if called upon, in the investigation or disposition of any allegation of dishonesty pertaining to another student, or any other breach of a student's obligation to exhibit honesty.
- x) Violates the canons of ethics of [here refer to relevant discipline or disciplines.]
- y) ***II. Procedures for Adjudication***
- z) No student should be subject to an adverse finding that he or she committed an offense related to academic integrity, and no sanction should be imposed relating thereto, except in accordance with procedures appropriate for disposition of the particular matter involved. The degree of formality of proceedings, the identity of the decision maker or decision makers, and other related aspects should properly reflect such considerations as the severity of the potential sanction, its probable impact upon the student, and the extent to which matters of professional judgment are essential in arriving at an informed decision. In all cases, however, the objective is to provide fundamental fairness to the student as well as an orderly means for arriving at a decision, starting first with the individual instructor and then with designated administrative officers or bodies.
- aa) These Guidelines are not meant to address differences of opinion over grades issued by faculty in exercising good faith professional judgments of student work. They are meant to address ways in which a faculty member deals with a student regarding an alleged breach of academic integrity. In matters of academic integrity the succeeding procedural steps must be followed:
- bb) Any member of the University community who has evidence may bring to the attention of the instructor a complaint that a student has failed, in one or more respects, to meet faithfully the obligations specified in the above Section I.<sup>2</sup> Acting on his or her own evidence, and/or on the basis of evidence submitted to the instructor, the instructor will advise the student that he or she has reason to believe that the student has committed an offense related to academic integrity, and the student will be afforded an opportunity to respond. If the accused student and the instructor accept a specific resolution offered by either of them, the matter shall be considered closed if both parties sign a written agreement to that effect, and submit it to the dean's office. The dean's office will maintain a written record of the agreement, signed by the student and the instructor. These records are not to be added to the student's individual file and they are to be destroyed when the student graduates or permanently terminates registration. The

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<sup>2</sup> **NOTE:** If the instructor elects not to pursue the complaint submitted by a member of the University community, the complaint can be submitted to an individual appointed by the dean who can pursue the matter in place of the instructor.

dean's office may provide such information identifying an individual student for the following uses:

- cc) to an instructor who is involved with a student integrity violation at the initial stage and who wishes to use this previous record in determining whether a resolution between the faculty member and the student or an academic integrity hearing board may be most appropriate, especially in the case of repeat offenders; and,
  - dd) to a college or school Academic Integrity Hearing Board after a decision of guilt or innocence has been made in a case, but before a sanction has been recommended.
  - ee) If an agreed on resolution between the faculty member and the student cannot be reached, the faculty member will file a written statement of charges with the dean's designated academic integrity hearing officer. Such statement should set forth the alleged offenses which are the basis of the charges, including a factual narrative of events and the dates and times of occurrences. The statement should also include the names of persons having personal knowledge of circumstances or events, the general nature and description of all evidence, and the signature of the charging party. If this occurs at the end of a term, and/or the last term of enrollment, the "G" grade should be issued for the course until the matter is decided. In situations involving the student's last term before graduation, degree certifications can be withheld pending the outcome of the hearing which should be expedited as quickly as possible.
  - ff) The dean's designated academic integrity hearing officer will transmit the written statement of charges to the student, together with a copy of these regulations.
  - gg) The letter of transmittal to the student, a copy of which shall also be sent to the instructor or charging party, will state a time and place when a hearing on the charges will be held by the Chair of the Academic Integrity Hearing Board.
  - hh) In proceedings before the academic unit's Academic Integrity Hearing Board, the student shall have the right:
    - ii) to be considered innocent until found guilty by clear and convincing evidence of a violation of the Student obligations of academic integrity;
    - jj) to have a fair disposition of all matters as promptly as possible under the circumstances;
    - kk) to elect to have a private or public hearing;
    - ll) to be informed of the general nature of the evidence to be presented;
    - mm) to confront and question all parties and witnesses except when extraordinary circumstances make this impossible;
    - nn) to present a factual defense through witnesses, personal testimony and other relevant evidence;
- to decline to testify against himself or herself;
- to have only relevant evidence considered by the Academic Integrity Hearing Board; and
- to have a record of the hearing (audio tape) at his or her own expense, upon request.

The hearing should provide a fair inquiry into the truth or falsity of the charges, with the charged party and the instructor or charging party afforded the right to cross-examine all

adverse witnesses. At the level of the academic unit's Academic Integrity Hearing Board, legal counsel shall not be permitted, but a non-attorney representative from within the University community shall be permitted for both faculty and students. A law student cannot be used as a representative at the Academic Integrity Hearing Board.

Any member of the University community may, upon showing relevancy and necessity, request witnesses to appear at the hearing. Witnesses who are members of the University community shall be required to appear and other witnesses may be requested to appear at a hearing. When necessitated by fairness or extraordinary circumstances, the (name of hearing authority) may make arrangements for recorded or written testimony for use in a proceeding.

**HEARING PROCEDURE:** The hearing will be conducted as follows:

the Chair of the Academic Integrity Hearing Board will not apply technical exclusionary rules of evidence followed in judicial proceedings nor entertain technical legal motions. Technical legal rules pertaining to the wording of questions, hearsay and opinions will not be formally applied. Reasonable rules of relevancy will guide the Chair of the Academic Integrity Hearing Board in ruling on the admissibility of evidence. Reasonable limits may be imposed on the number of factual witnesses and the amount of cumulative evidence that may be introduced;

the alleged offense or offenses upon which the complaint is based shall be read by the Chair of the Academic Integrity Hearing Board;

objections to procedure shall be entered on record, and the Chair of the Academic Integrity Hearing Board shall make any necessary rulings regarding the validity of such objections;

the charging party shall state his/her case and shall offer evidence in support thereof;

the accused or representative for accused shall have the opportunity to question the charging party;

the charging party shall be given the opportunity to call witnesses;

the accused or representatives for the accused shall be given the opportunity to question each witness of the charging party after he/she testifies;

the charging party shall inform the Chair of the Academic Integrity Hearing Board when his/her presentation is completed, at which time the Academic Integrity Hearing Board members shall be given an opportunity to ask questions of the persons participating in the hearing;

the Academic Integrity Hearing Board shall recess, and the Chair of the Academic Integrity Hearing Board shall make a determination as to whether the charging party has presented sufficient evidence to support a finding against the accused if such evidence is uncontroverted. The parties may be required to remain in the hearing room during the recess or may be excused for a time period set by the Chair of the Academic Integrity Hearing Board;

depending upon the determination of the Chair of the Academic Integrity Hearing Board, the matter shall be dismissed or the accused shall be called upon to present his/her case and offer evidence in support thereof;

the accused may testify or not as he/she chooses;

the charging party shall have the opportunity to question the accused if the accused voluntarily chooses to testify;

the accused or a representative for the accused shall have the opportunity to call witnesses;

the charging party shall have the opportunity to question each witness of the accused after he/she testifies;

the accused shall inform the Chair of the Academic Integrity Hearing Board when his/her presentation is complete, and the Academic Integrity Hearing Board members shall have an opportunity to ask questions of the accused as well as the accused's witnesses;

the Chair of the Academic Integrity Hearing Board shall have an opportunity to address the hearing board on University regulations or procedure in the presence of all parties, but shall not offer other comments without the consent of all parties; and,

the hearing shall be continued and the members of the hearing board shall deliberate in private until a decision is reached and recorded.

A suitable record (audio recording) shall be made of the proceedings, exclusive of deliberations to arrive at a decision.

The proposed decision, which shall be written, shall include a determination whether the charges have been proven by clear and convincing evidence, together with findings with respect to the material facts. If any charges are established, the proposed decision shall state the particular sanction or sanctions to be imposed. Prior violations or informal resolutions of violations may be considered only in recommending sanctions, not in determining guilt or innocence. Once a determination of guilt has been made, and before determining sanctions, the Chair of the Academic Integrity Hearing Board should find out from the appropriate dean(s) whether prior offenses and sanctions imposed have occurred.

The proposed decision shall be submitted to the dean, who will make an independent review of the hearing proceedings. The dean may require that the charges be dismissed, or that the case be remanded for further proceedings whenever he or she deems this to be necessary. Upon completion of such additional proceedings, if any, and within a reasonable time the dean shall issue a final decision. The dean may reject any findings made by the Academic Integrity Hearing Board adverse to the student, and may dismiss the charges or reduce the severity of any sanction imposed, but the dean may not make new findings adverse to the student or increase the severity of a sanction, except in the case of repeat offenders of the Academic Integrity Guidelines.

The Chair of the Academic Integrity Hearing Board shall then transmit to the charged party and the instructor copies of all actions taken by the hearing authority and the dean. If a sanction is imposed, the notice to the student will make reference to the student's opportunity, by petition filed with the Provost, to appeal to the University Review Board.

### ***III. Timeliness***

It is the responsibility of all parties, including administrative officers, to take prompt action in order that charges can be resolved quickly and fairly. Failure of the instructor to utilize these procedures diligently may constitute grounds for dismissal of charges. Parties have

the right to seek review of the Provost or to petition the University Review Board for an appeal from a decision of an academic integrity hearing board or investigatory committee within five (5) working days of the date of the decision letter.

#### ***IV. Sanctions***

The alternative sanctions which may be imposed upon a finding that an offense related to academic integrity has been committed are the following:

Dismissal from the University without expectation of readmission.

Suspension from the University for a specific period of time.

Reduction in grade, or assignment of a failing grade, in the course in which the offending paper or examination was submitted.

Reduction in grade, or assignment of a failing grade, on the paper or examination in which the offense occurred. Individual colleges, schools, or campuses can add other sanctions approved by the dean of the academic unit and the Provost. Such sanctions must be made known to students.

In administering sanctions, academic units must strive to achieve consistency in their application. That is, within the same units, the same sanctions should be applied for the same offenses, unless extenuating circumstances can be documented, e.g. the student is a repeat offender.

The imposition of such sanctions may be considered by the school in the preparation of any report concerning a student submitted to a government agency, accrediting body, or other person or institution in accordance with the requirements of law or the written consent of the student.

### ***V. Academic Integrity Hearing Board***

The Academic Integrity Hearing Board shall be composed of both faculty and students and consist of: [Here state the number of persons on the board; the manner and criteria for selecting members as well as the chair; the terms of service; the means for choosing individuals to serve in particular cases, if a panel of the entire board is to have this responsibility; and other related organizational matters.]

In electing or appointing members to the Academic Integrity Hearing Boards, emphasis should be placed on obtaining faculty members with expertise and/or concerns related to academic integrity matters. Regardless of the selection process, it is the responsibility of the dean to provide all new Academic Integrity Hearing Board members with an orientation designed to familiarize the new members with the academic integrity guidelines for the given unit. Hearing board memberships should be elected or appointed in a way to insure continuity of membership as well as an orderly turnover of the membership.

### ***VI. Review and Appeal***

A student or faculty member may seek to have a dean's final decision (or a determination that the charges are not subject to adjudication) reviewed by the Provost, who may seek the advice of the University Review Board, or the student may appeal to the University Review Board, whose recommendation shall be made to the Provost.<sup>3</sup> The action of the Provost, taken with or without the advice of the University Review Board, shall constitute an exhaustion of all required institutional remedies.<sup>4</sup>

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<sup>3</sup> The University Review Board and its jurisdiction are described at the end of this document.

<sup>4</sup> In implementation, the decision of the Provost shall be binding also on matters of interpretation of codes and procedures, determination of serious injury, and determination that an allegation is subject to adjudication by the procedures provided herein.

## SUGGESTED CODE

### UNIVERSITY OF PITTSBURGH

School of \_\_\_\_\_

#### Academic Integrity:

#### Faculty Obligations

##### *I. Faculty Obligations*

A faculty member accepts an obligation, in relation to his or her students, to discharge his or her duties in a fair and conscientious manner in accordance with the ethical standards generally recognized within the academic community, (as well as those of the profession).

Without limiting the application of the above principle, members of the faculty are also expected (except in cases of illness or other compelling circumstance) to conduct themselves in a professional manner, including the following:

To meet their classes when scheduled.

To be available at reasonable times for appointments with students, and to keep such appointments.

To make appropriate preparation for classes and other meetings.

To perform their grading duties and other academic evaluations in a timely manner.

To describe to students, within the period in which a student may add and drop a course, orally, in writing, or by reference to printed course descriptions, the general content and objectives of a course; and announce the methods and standards of evaluation, including the importance to be assigned various factors in academic evaluation and, in advance of any evaluation, the permissible materials or references allowed during evaluation.<sup>5</sup>

To base all academic evaluations upon good-faith professional judgment.

Not to consider, in academic evaluation, such factors as race, color, religion, sex, sexual orientation, age, national origin, and political or cultural affiliation, and lifestyle, activities, or behavior outside the classroom unrelated to academic achievement.<sup>6</sup>

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<sup>5</sup> As each school develops its code, it should recognize that what is expected of faculty hereunder is intended to provide students with a notion of what is required in the course, and how they will be evaluated; a general statement of broadly defined parameters would therefore suffice. If a course is deemed experimental in content, evaluation techniques, or grading practices, the students should be so advised. By academic evaluation is meant a measurement or grading of a student's academic performance, such as in written or oral examinations or papers, research reports, or class or laboratory participation.

<sup>6</sup> If the student charges such discrimination, the [designated administrative officer] will consult with the unit affirmative action officer to ensure compliance with civil rights legislation and regulations. In such cases, the University Senate Tenure and Academic Freedom Committee may be consulted at any time.

To respect the confidentiality of information regarding a student contained in University records; and to refrain from releasing such information, except in connection with intra-University business, or with student consent, or as may be permitted by law.<sup>7</sup>

Not to exploit their professional relationship with students for private advantage; and to refrain from soliciting the assistance of students for private purposes in a manner which infringes upon such students' freedom of choice.

To give appropriate recognition to contributions made by students to research, publication, service, or other activities.

To refrain from any activity which involves risk to the health and safety of a student, except with the student's informed consent, and, where applicable, in accordance with the University policy relating to the use of human subjects in experimentation.

To respect the dignity of students individually and collectively in the classroom and other academic contexts.<sup>8</sup>

## ***II. Grievance Procedures***

Any member of the University community having evidence may bring to the attention of the department chairman and/or dean a complaint that a faculty member has failed, in one or more respects, to meet faithfully the obligations set forth above. The chair or dean, in his or her discretion, will take such action by way of investigation, counseling, or action-in accordance with applicable University procedures-as may appear to be proper under the circumstances. The faculty member's and student's interest in confidentiality, academic freedom, and professional integrity in such matters will be respected.

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<sup>7</sup> References or recommendations may be given in good faith by a faculty member on his or her own behalf, without documentation of a student's consent if it may be reasonably perceived that the student initiated the request for a recommendation, in response to apparent bona fide inquiries, such as those from institutions which state that the student has applied for employment, for admission to graduate school, or for a professional license. See fuller statements concerning University records in the "Student Code of Conduct and Judicial Procedures."

<sup>8</sup> Students are advised that other University policies may more appropriately apply to a given grievance or avenue of redress, including, but not necessarily limited to, the *University of Pittsburgh Sexual Harassment Policy and Procedure*.

### ***III. Individual Grievances***

In order to provide a means for students to seek and obtain redress for grievances affecting themselves individually, the following procedures should be followed. These are not intended and shall not be used to provide sanctions against faculty members.

### ***IV. Procedures***

Where an individual student alleges with particularity that the actions of a faculty member have resulted in serious academic injury to the student, the matter shall (if requested by the student) be presented to the Academic Integrity Hearing Board for adjudication. Serious academic injury includes, but is not necessarily limited to, the awarding of a lower course grade than that which the student has earned, or suspension from a class. However, this is not intended to address normal grading decisions of faculty in exercising good-faith professional judgment in evaluating a student's work.

It is the responsibility of the student, before seeking to have a grievance adjudicated, to attempt to resolve the matter by personal conference with the faculty member concerned, and, if such attempts are unavailing, to call the matter to the attention of the department chairman, associate dean, etc., as appropriate for consideration and adjustment by informal means. If a matter remains unresolved after such efforts have been made, the following grievance procedures shall be employed:

The aggrieved student will file a written statement of charges with the dean's designated Academic Integrity Administrative Officer.

If the dean's designated Academic Integrity Administrative Officer determines that the charges are subject to adjudication under the terms of the Academic Integrity Guidelines, he or she will transmit the charges to the faculty member, together with a copy of these regulations.

The letter of transmittal to the faculty member, a copy of which shall also be sent to the student, will state the composition of a committee that has been named to meet with the involved parties to make an informal inquiry into the charge. The purpose of this committee is to provide a last effort at informal resolution of the matter between the student and the faculty member.

The committee shall meet with the faculty member, the student, and others as appropriate, to review the nature of the problem in an attempt to reach a settlement of the differences. This is not a formal hearing and formal procedural rules do not apply. On completion of these meetings if no mutually agreeable resolution results, the committee may produce its own recommendation for a solution to the conflict.

Should the committee recommend that the faculty member take some corrective action on behalf of the student, its recommendations shall be provided to the faculty member. As promptly as reasonable and at least within five working days after the faculty member receives the recommendations of the committee, the faculty member shall privately take that action which he or she elects, and so advise the student and chairman of the committee of that action.

Should the committee conclude that the faculty member need take no corrective action on behalf of the student, this finding shall be forwarded to both the faculty member and the student.

If the student elects to pursue the matter further, either because he or she is dissatisfied with the resulting action of the faculty member or the conclusion of the committee, he or she should discuss this intent with the chair of the committee who should review the procedures to be followed with the student. If the student wishes to proceed with a formal hearing, the chair of the committee shall advise the Chair of the Academic Integrity Hearing Board that the case appears to involve a student's claim of serious academic injury, and that the formal hearing procedure must be initiated.

The formal hearing should provide a fair inquiry into the truth or falsity of the charges, with the faculty member and the student afforded the right to cross-examine. At the level of the Academic Unit Academic Integrity Hearing Board, legal counsel shall not be permitted, but a representative from within the University community shall be permitted for both faculty and students.

A suitable record (audio recording) shall be made of the proceedings, exclusive of deliberations to arrive at a decision.

The proposed decision, which shall be written, shall include a determination whether charges have been proved by clear and convincing evidence, together with findings with respect to the material facts. If any charges are established, the proposed decision shall state the particular remedial action to be taken.

The proposed decision shall be submitted to the dean, who will make an independent review of the hearing proceedings. The dean may require that the charges be dismissed, or that the case be remanded for further proceedings whenever he or she deems this to be necessary. The dean may limit the scope of any further proceedings or require that a part or all of the original proceedings be reconvened. Upon completion of such additional proceedings, if any, the dean shall issue a final decision. The dean may reject any findings made by the Academic Integrity Hearing Board, may dismiss the charges or reduce the extent of the remedial action to be taken. If the dean believes remedial action to be taken may infringe upon the exercise of academic freedom, he or she will seek an advisory opinion from the Senate Committee on Tenure and Academic Freedom before issuing his own decision. The decision of the dean shall be in writing, shall set forth with particularity any new findings of fact or remedies, and shall include a statement of the reasons underlying such action.

The dean shall then transmit to the faculty member and to the student copies of all actions affecting them taken by the hearing authority and the dean. Suitable records shall be maintained as confidential and retained in the office of the dean.

#### ***V. Remedial Action***

Remedies in a student's behalf should usually be those agreed to willingly by the faculty member. Other remedial action to benefit a student may be authorized by the dean only upon recommendation of the Academic Integrity Hearing Board and limited to: Allowing a student to repeat an examination; allowing a student to be evaluated for work that would otherwise be too late to be considered; directing that additional opportunities be afforded

for consultation or instruction; elimination of a grade that had been assigned by a faculty member from the transcript; changing of a failing letter or numerical grade to a "pass" or "satisfactory" grade, so as not to adversely affect a student's grade average; allowing a student to repeat a course without paying tuition or any other penalty, schedule and program permitting.

If some action is contemplated that might be deemed to infringe upon the academic freedom of the faculty member, the dean will seek an advisory opinion from the Senate Committee on Tenure and Academic Freedom (TAF). In such cases, the Senate TAF may identify other acceptable remedies or render such advice as may be appropriate in the particular situation.

No action detrimental to the faculty member will be taken, except as in strict accordance with established University procedures. An adjustment hereunder in the student's behalf shall not be deemed a determination that the faculty member was in any way negligent or derelict.

#### ***VI. Review and Appeal***

A student or faculty member may seek to have a dean's final decision (or a determination that the charges are not subject to adjudication) reviewed by the Provost, who may seek the advice of the University Review Board, or the student may appeal to the University Review Board, whose recommendation shall be made to the Provost. The action of the Provost, taken with or without the advice of the University Review Board, shall constitute an exhaustion of all required institutional remedies.

If any such determination may be deemed to have a possible adverse effect upon the faculty member's professional situation, the faculty member may seek the assistance of the Tenure and Academic Freedom Committee of the University Senate.

### ***VII. Timeliness***

It is the responsibility of all parties, including administrative officers, to take prompt action in order that grievances may be resolved quickly and fairly. While no explicit time limit could apply to all cases, failure to use diligence in seeking redress may constitute grounds for denial of a hearing or other relief, especially if prejudice results. Parties have the right to seek review of the Provost or to petition the University Review Board for an appeal from a decision of an academic integrity hearing board or investigatory committee within five (5) working days of the date of the decision letter.

### ***VIII. Investigatory Committees and Hearing Boards***

The informal investigatory committees and the formal hearing boards shall be composed of both students and faculty, and shall consist of [here state the number of persons on the board; the manner of criteria for selecting members as well as chairs; the terms of service; the means for choosing individuals to serve in particular cases, if a panel of the entire board is to have this responsibility; and other related organizational matters].

### **Grievance Procedures Against Senior Administrators**

A student complaint of arbitrary or unfair treatment against the principal officer of an academic unit (e.g., the dean), should be made to the Provost or appropriate Senior Vice Chancellor. There must be a prompt review and decision on the grievance. Members of the faculty who may be called upon to review and advise on the grievance should be drawn from outside the jurisdiction of the administrator against whom the charge is made.

## **I. University Review Board**

- II. The University Review Board (URB) is the duly authorized appellate body which serves as an advisor to the Provost and Senior Vice Chancellor and the Chancellor. (Regional campuses may establish similar appellate bodies which serve as an advisor to their President and whose appellate jurisdiction shall be limited to non-academic matters).
- III. The URB may exercise appellate jurisdiction for academic and non-academic matters and shall have sole appellate jurisdiction for matters originating from judicial bodies within the University Student Judicial System.
- IV. The URB shall also exercise limited jurisdiction for matters referred directly from the Chancellor and the Provost, the Senior Vice Chancellor for the Health Sciences or the Vice Chancellor for Student and Public Affairs.
- V. The University Review Board may meet from time to time for the purpose of orienting new members and reviewing poor decisions and shall meet at such other times as are necessary to conduct appellate hearings.

## **VI. URB Structure**

- VII. The URB shall be a standing body of fifteen members of the University community appointed for staggered terms of two years. Appointment shall be made in the following manner:
- VIII. Five faculty members elected by the University Senate.
- IX. Five graduate and professional students appointed by the Graduate and Professional Student Association.
- X. Five undergraduate students:
  - A. two appointed by the General Studies Student Council; and,
    - 1. three appointed by the Undergraduate Student Government.
    - 2. A matter properly submitted for review shall be heard by a review board of five members of the URB. Review boards shall be composed as follows:
    - 3. In academic cases, three faculty members and two students.
    - 4. In non-academic cases, two faculty members and three students.

## **URB Moderator**

An attorney appointed by the Chancellor, who shall serve as URB Moderator is authorized to:

Conduct the administrative and procedural operations of the URB.

Determine the appropriateness and completeness of petitions to the URB in consultation with one student and one faculty member of the URB.

Provide advice and assistance to members of the University community regarding the processing of an appeal.

Select members from the URB membership to serve on review boards.

Moderate all proceedings before the URB.

Serve as legal advisor to the URB.

Provide legal advice related to URB proceedings and recommendation, if requested, to the Chancellor or other referring authority.

## **Basis for Appeal**

The URB shall hear an appeal whenever requested by the Chancellor, Provost and Senior Vice Chancellor, Senior Vice Chancellor for the Health Sciences, or the Vice Chancellor for Student and Public Affairs.

The URB shall also hear appeals on the petition of a faculty member, student or student organization when either petition, together with supporting documentation, presents a substantial question within the scope of review of the URB and the prior adjudication or action resulted in:

Suspension or dismissal from the University for violation of the Student Code of Conduct.

Suspension or dismissal from the University or the imposition of a serious academic sanction for violation of academic sanction for violation of academic integrity standards.

Grant or denial of a remedy in an academic grievance proceeding.

Suspension or dismissal from the University residence halls.

Procedural rulings or substantive interpretations which have an important continuing impact upon the University Student Judicial System or the University community.

## **Scope of Review**

The scope of review of the URB shall be limited to consideration of the following questions:

Whether rights affirmed by the Board of Trustees have been denied.

Whether the adjudicatory process of an initial hearing was conducted fairly and in conformity with properly prescribed procedures.

Whether the adjudication was supported by substantial evidence.

Whether the regulations involved were lawful and proper and whether they were properly applied in the particular case.

Whether the sanction or remedy imposed was in due proportion to the gravity and nature of the conduct.

## **URB Procedures**

Any faculty member or student adversely affected by the decision of a judicial body within the University Student Judicial System may institute an appeal before the URB by filing a petition in the Office of the URB Moderator.

A petition must set forth the following:

The name and address of the petitioner adversely affected by the prior adjudication.

The name and address of the respondent.

The result of the prior adjudication.

One or more of the questions within the scope of review of the URB.

A statement supporting, through factual narrative and argument, the petitioner's position.

The Moderator in consultation with one student and one faculty member of the URB shall review petitions and determine whether all requirements set forth for the filing of an appeal are satisfied and whether the petition sets forth the basis for an appeal and raises a question within the scope of review.

Upon receipt of a properly filed petition the Moderator shall notify the parties that an appeal has been instituted. Notice shall include:

A copy of the petition.

A copy of the relevant regulations and procedures.

After determining the appropriateness and completeness of a petition and allowing a reasonable amount of time for preparation and review of any documents and recordings, the Moderator shall schedule an appeal. All parties shall receive written notification of the time, date and place.<sup>9</sup>

The Moderator shall convene a Review Board at the time, data and place scheduled and the appeal shall be conducted under the procedural guidance of the Moderator.

## **Postponement of Sanction Pending Appeals**

A sanction or remedy which has been recommended by a judicial board and approved by the appropriate administrative officer may be postponed upon petition by the affected party or parties upon a determination that pending the final examination of an appeal it would be unfair not to postpone imposition of the sanction or remedy.

Persons wishing to postpone a sanction or remedy may petition URB by separate petition setting forth reasons why the imposition of a sanction or remedy would unfairly prejudice a party. Petition for postponement shall be reviewed by the Moderator, one student and

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<sup>9</sup> The URB, in its discretion, may elect to decide an appeal based on the submission of briefs by the parties without oral argument. In such cases, the Moderator will provide written instruction to the parties.

one faculty member of the URB. The criteria to be applied in determining whether to postpone a sanction or remedy are as follows:

Whether the issues raised in the appeal may be resolved in favor of the petitioning party.

Whether the petitioning party will be unfairly prejudiced pending a final determination of the appeal by the immediate imposition of the sanction or remedy.

Whether the responding party will be unfairly prejudiced by the postponement of the sanction or remedy.

All decisions regarding the postponement of sanctions shall be made within 5 days of the receipt of such a petition and shall be communicated to all parties in writing through the Office of the Moderator.

## **Representation**

A party may be represented or assisted by whomever he/she wishes, but only one representative may take an active part.

## **Argument Format**

Each party in interest shall be given ample time to present his or her position. In support of a position a party may refer to any records, documents, or recordings from a prior proceeding and may present an oral or written argument.

Each party may question the other about his or her argument. Members of the URB may question the parties.

The URB shall make factual findings and shall render a final adjudication in the form of a written opinion. A majority shall control all decisions but there may be an accompanying minority opinion.

## **URB Action**

The URB may remand a matter to the initial adjudicatory authorities for further proceedings if it determines there are insufficient written findings or prejudicial procedural error. In other cases, the URB shall render a written opinion and recommend action to the Chancellor, Provost and Senior Vice Chancellor, Senior Vice Chancellor for the Health Sciences, or the Vice Chancellor for Student and Public Affairs, accompanied by the complete record.

The Moderator shall be responsible for promptly communicating any formal action of the URB to the parties, transmitting remanded cases to the initial adjudicatory authorities, and forwarding the recommendations to the Chancellor and his or her representatives.

## **Action by the Chancellor or Other Referring Authority**

The Chancellor and his or her representatives shall consider the opinions and recommendations of the URB, the record and such other advice as they may deem necessary and proper. He/she or they may remand the matter to the initial adjudicatory authority or to the URB for further proceedings, or may enter a final decision, accepting or rejecting the recommendations in part or in their entirety. (A sanction imposed by an initial adjudicatory authority may not be increased.)

# GUIDELINES FOR ETHICAL PRACTICES IN RESEARCH

## Office of Research Integrity

### 2409 Cathedral of Learning

#### THE GUIDELINES

The purpose of this set of guidelines is to provide a positively oriented set of practical suggestions for maintaining integrity in research. Not only does the ethical conduct of science satisfy a scientific moral code; it also leads to better scientific results because the adherence to ethical research practices leads to more attention to the details of scientific research, including quantitative and statistical techniques, and to more thoughtful collaboration among investigators. Also, the credibility of science with the general public depends on the maintenance of the highest ethical standards in research.

Observance of these guidelines will help an investigator avoid departures from accepted ethical research practice and prevent those most serious deviations that constitute research misconduct. **Research misconduct** is defined as fabrication, falsification, or plagiarism, including misrepresentation of credentials, in proposing, performing, or reviewing research, or in reporting research results. It does not include honest error or differences of opinion. Misconduct as defined above is viewed as a serious professional deviation that is subject to sanctions imposed both by the University and by a sponsoring federal agency.

These guidelines can be used as a common repository of generally accepted practice for experienced researchers and as an orientation to those beginning research careers. Although some of these principles apply to all fields of research, much of what follows deals with scientific research, including those areas of the social and behavioral sciences that involve collection and interpretation of data. These materials can be adapted or specified in a more particular form appropriate for each scholarly discipline or academic unit. In fact, many academic units have developed excellent handbooks on research ethics and integrity. When in doubt about the accepted ethical standards in a particular case, a researcher should discuss the matter with a respected colleague or consult the University Research Integrity Officer on a confidential basis.

This document, an updated edition of Guidelines for Ethical Practices in Research, the most recent edition of which was issued in April, 2003, is not a policy, but it supplements existing University-wide policies and procedures governing various aspects of research, a partial list of which is found in the Appendix. Ethical concerns in research are the subject of the Responsible Conduct of Research subset of the self-administered education, testing, and certification program, the Internet-based Studies in Education and Research (formerly Research Practice and Fundamentals), accessible at <https://cme.hs.pitt.edu/servlet/IteachControllerServlet?actiontotake=displaymainpage&site=rpf>.

## **MATTERS OF ETHICAL CONCERN IN RESEARCH**

### **1. Plagiarism**

Authors who present the words, data, or ideas of others with the implication that they are their own, without attribution in a form appropriate for the medium of presentation, are committing theft of intellectual property and may be guilty of plagiarism and thus of research misconduct. This statement applies to reviews and to methodological and background/historical sections of research papers as well as to original research results or interpretations. If there is a word-for-word copying beyond a short phrase or several words of someone else's text, that section should be enclosed in quotation marks or indented and referenced to the original source. The same rules apply to grant applications and proposals, to clinical research protocols, and to student papers submitted for academic credit.

An author should cite the work of others even if he or she had been a co-author or editor of the work to be cited or had been an adviser or student of the author of such work. Not only does plagiarism violate the standard code of conduct governing all researchers, but in many cases it could constitute an infraction of the law by infringing on a copyright held by the original author or publisher.

The work of others should be cited or credited, whether published or unpublished and whether it had been written work or an oral presentation. Each journal or publisher may specify the particular form of appropriate citation. One need not provide citations, however, in the case of well-established concepts that may be found in common textbooks or in the case of phrases which describe a commonly-used methodology. Special rules have been developed for citing electronic information.<sup>10[1]</sup>

Members of a research group who contribute to work of the group that is later incorporated into a proposal or protocol are entitled to be consulted and informed as to what their role will be if the proposal is funded or the protocol approved. A charge of plagiarism in the proposal or protocol, however, can usually not be sustained on the grounds that such members are not later included as part of the team that conducts the approved or funded research. Such researchers who are excluded from subsequent research are entitled, however, to be considered for co-authorship in publications if their contributions merit it.

### **2. Misuse of Privileged Information**

One particularly serious form of plagiarism is the misuse of privileged information taken from a grant application or manuscript received for peer review. In such a case, the plagiarism is a serious matter of theft of intellectual property because it not only deprives the original author of appropriate credit by citation but could also preempt priority of first publication or use of the original idea to which the source author is entitled. Also, one who breaches confidentiality by showing a privileged unpublished document to an unauthorized person can be held to a shared responsibility for any subsequent plagiarism of the document committed by that unauthorized person.

### **3. Data**

#### **a. Integrity of Data**

Fabrication and falsification of research results are serious forms of misconduct. It is a primary responsibility of a researcher to avoid either a false statement or an omission that distorts the truth. A researcher must not report anticipated research results that had not yet been observed at the time of submission of the report. In order to preserve accurate documentation of observed facts with

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<sup>10[1]</sup> *e.g.*, Gibaldi, J., *MLA Handbook for Writers of Research Papers*, 4th ed. NY: MLA, 1995 and Li, X. and N. Crane. *Electronic Style: A Guide to Citing Electronic Information*, Westport, Meckler, 1993.

which later reports or conclusions can be compared, every researcher has an obligation to maintain a clear and complete record of data acquired. As stated in the University's Guidelines on Data Retention and Access, "records should include sufficient detail to permit examination for the purpose of replicating the research, responding to questions that may result from unintentional error or misinterpretation, establishing authenticity of the records, and confirming the validity of the conclusions." The intentional destruction of research records or the failure to maintain and produce research records underlying a questioned research publication or report may be considered to be evidence of research misconduct.

Meticulous record-keeping is a sound scientific practice which provides an accurate contemporaneous account of observations that become a permanent reference for the researcher, who otherwise might not remember several weeks, months, or years later exactly what had been observed or what methods had been used. An accurate record also serves others who may want to replicate the observation or to apply a method to other situations. In addition, it is an aid in allowing the eventual sharing of information with others and as documentation that might disprove any subsequent allegation of fabrication or falsification of data.

In many fields of laboratory research, it is standard practice to record data in ink in an indexed permanently bound laboratory notebook with consecutively numbered pages. Research methods, including statistical treatments, should be either described in the notebook or referenced by citation to some other primary or secondary source. Information on materials used, along with their sources, should be recorded. Entries should not be erased or whited out. If mistakes are to be corrected, a thin line should be drawn through the erroneous entry so as not to obscure it and an initialed dated correction written separately, along with an explanatory note, near the original entry or in the margin. All entries, or at least all pages of a notebook should be dated and initialed. Such records may also be important at a later date in establishing scientific priorities or intellectual property claims.

All data should be recorded contemporaneously with the production or observation of the data. If some data are obtained as printouts from instruments or computers, these printouts should be appropriately labeled and pasted into the notebook or, if pasting is not possible, stored securely and referenced in the notebook as to storage location. If unique critical materials, such as cell lines, archeological artifacts, or synthetic chemical intermediates, are prepared or discovered, they should be preserved and appropriately labeled, and explicit instructions should be written in the notebook as to where they are stored. Extensive data sets may be stored either as hard copy or on disks. In such cases, carefully documented definitions for codes should be included, together with rules for applying them to the experimental, clinical, or field data and notes.

The use of computers in research laboratories is a necessity, and managing the data generated and stored is becoming a challenge to the investigator. As more and more data are generated electronically, current documentation methods involve both the hand-written laboratory notebooks discussed above as well as electronic files pertaining to experiments. Establishing processes to organize, store and protect such electronic data is becoming crucial. One way to manage the generated electronic data is to use electronic lab notebooks. Such notebooks allow the direct entry of laboratory observations, results from data analysis, and the seamless transfer of electronic data and images from a variety of laboratory instruments in a centralized fashion. In addition, background information on reference materials or protocol details can be entered from electronic sources. One advantage of using such an electronic lab notebook is the ability to lock down the data and prevent subsequent data manipulations. In addition such systems will also provide the

ability to add electronic signatures for further validation. Commercial electronic lab notebooks are available in the market place but they usually involve establishing a server infrastructure with an associated high cost. Alternatively, such systems can be developed in house. It is highly recommended that a process should be established to protect the data and ensure that the data are formatted so that they could not be modified. One suggestion would be to write the data to a CD-ROM (CD-R) where they could not be modified or overwritten.

Research in social sciences and in some clinical biomedical fields poses specific problems with respect to the availability of primary data for use by other researchers or by reviewers of allegations of possible scientific misconduct. The protection of human subjects requires that data be used, stored, and disclosed in a way that insures the privacy of individual research subjects. Furthermore, while for purposes of analysis these data are frequently coded and entered into computer files with only code numbers identifying the individual subjects, there is often an interest of the researcher in reviewing the coding procedures in order to identify either random or systematic mis-entry of data into files. To satisfy these guidelines fully, the primary data - clinical or laboratory records, questionnaires, tapes of interviews, and field notes - should be available for review. See also **3.c.** below. (In some research areas, anthropology for example, field notes are viewed as the product of the researcher rather than as data, and are thus customarily not made available to others.) Where possible, questionnaires should be stored without identifiers, using only code numbers to link them to computerized files. Records, including transcripts of taped interviews, can be redacted to remove names and other key identifiers. The rules and procedures for carrying out such redactions should be available to anyone who reviews the data. Access to health information identified with a particular subject is restricted, as discussed in **11**.

#### **b. Use and Misuse of Data**

Researchers should acquaint themselves with the current relevant quantitative methods available for processing data, including graphical and tabular methods of presentation, error analysis, and tests for internal consistency.

Research integrity requires not only that reported conclusions are based on accurately recorded data or observations but that all relevant observations are reported. It is considered a breach of research integrity to fail to report data that contradict or merely fail to support the reported conclusions, including the purposeful withholding of information about confounding factors. If some data should be disregarded for a stated reason, confirmed by an approved statistical test for neglecting outliers, the reason should be stated in the published accounts. A large background of negative results must be reported. Any reckless disregard for the truth in reporting observations may be considered to be an act of research misconduct.

Modifying an approved protocol in the midst of a clinical or epidemiological study or changing the character of an approved study (e.g., from an exploratory to a confirmatory study) might in some cases be considered improper or even be viewed as research misconduct.

Expenditure of government grant funds for fabricated or falsified research is not only a violation of research ethics but also a federal crime, and those responsible may be subject to prosecution for fraud with the possibility of a demand for restitution of funds to the government, a fine, and/or imprisonment.

#### **c. Ownership of and Access to Data**

Research data obtained in studies performed at the University of Pittsburgh and/or by employees of the University are not the property of the researcher who generated or observed

them or even of the principal investigator of the research group. They belong to the University of Pittsburgh, which can be held accountable for the integrity of the data even if the researchers have left the University. Another reason for the University's claim to ownership of research data is that the University, not the individual researcher, is the grantee of sponsored research awards. Reasonable access to data, however, should normally not be denied to any member of the research group in which the data were collected. If there is any possibility that a copyright or patent application might emerge from the group project, a written agreement within the group should specify the rights, if any, of each member of the group to the intellectual property. A researcher who has made a finding which may be patentable should file an Invention Disclosure with the Office of Technology Management. The University patent policy allows the sharing of revenues from licensing, sale, or royalties between the inventor(s) and the University.

A principal investigator who leaves the University is entitled to make a copy of data to take to another institution so as to be able to continue the research or, in some cases, to take the original data, with a written agreement to make them available to the University on request within a stated time period. A formal Agreement on Disposition of Research Data should be negotiated in such cases through the Office of Research. Each student, postdoctoral fellow, or other investigator in a group project should come to an understanding with the research director or principal investigator, preferably in writing, about which parts of the project he or she might continue to explore after leaving the research group. Such an understanding should specify the extent to which a copy of research data may be taken. Co-investigators at another institution are entitled to access the data which they helped to obtain.

For unique materials prepared in the course of the research, such as intermediates in a chemical synthesis, autoradiograms, cell lines, and reagents, items that can be proportioned should be divided among members of a research group at different locations under negotiated terms of material transfer agreements. For non-divisible items, the nature of the assignment should be clearly stipulated in the agreement. The Office of Research facilitates the execution of such agreements.

Since the scientific enterprise may be a cooperative endeavor encompassing many persons who now or in the future might pursue common research interests, and since it is in the interest of all to rely on the contributions and findings of others, every investigator has an obligation to the general scientific community to cooperate by sharing of data. Other virtues of sharing data include the facilitation of independent confirmation or refutation of reported outcomes. It is generally accepted that the data underlying a research publication should be made available to other responsible investigators upon request after the research results have been published. A researcher who has access to a unique set of experimental or observational data, e.g., from a satellite or from an archeological or paleontological site, has an obligation either to publish research results within a reasonable time or to make the data available to others who will be able to do so.

The National Science Foundation has a specific requirement that data, samples, physical collections, and other materials created or gathered in the course of NSF-supported research be shared in a timely manner. The U.S. Public Health Service (PHS) insists that not only data but also unique materials (such as cell lines, cloned DNA, or reagents) developed with PHS funds must be made available to qualified individuals in the scientific community after the associated research results have been published or provided to the sponsoring agency.

#### **d. Storage and Retention of Data**

Data should be stored securely for at least seven years after completion of the project, submission of the final report to a sponsoring agency, or publication of the research, whichever comes last. Some agencies that sponsor research may specify a longer period for which data must be retained. For example, the U.S. Food and Drug Administration (FDA) requires that data associated with Phase I-III clinical trials be retained for a minimum of two years following final approval of the respective drug or device, which is likely to be a substantially longer period of time than seven years after completion of the research project. In the absence of a specific agency regulation, a conservative rule is to retain data for as long as there is still scientific interest in the details of the research.

Some types of data are expected to be deposited in a national or international databank, especially when they are so extensive as to preclude publication in a journal of record. Some examples are X-ray crystallographic data on protein structures, human genomic data, and DNA microarray data. The Interuniversity Consortium for Political and Social Research has prepared guidelines for preparing data in the social sciences for archiving. A list of web sites for social science archives is available through the University of California at San Diego. In some research fields, authors are encouraged to create their own web sites on which they may store extensive data sets for general access.

#### **4. Authorship and Other Publication Issues**

Publication of research results is important as a means of communicating to the scholarly world so that readers may be informed of research results and other researchers may build on the reported findings. In fact, it is an ethical obligation for an investigator at the University to make research findings accessible, in a manner consistent with the relevant standards of publication. The reported data and methods should be sufficiently detailed so that other researchers could attempt to replicate the results. Publication should be timely but should not be hastened unduly if premature publication involves a risk of not subjecting all results to adequate internal confirmation or of not considering adequately all possible interpretations.

A sponsor of a research project may not have a veto over a decision to publish, but a delay of publication for an agreed period, not to exceed six months, may be allowed in order to permit filing of a patent application.

A group of journal editors, acknowledging the potential abuse of published information by perpetrators of bioterrorist acts, have suggested that on occasion the potential harm to society of publication outweighs the potential societal benefits of open publication of research results. Editors should be consulted about procedures that might be employed in such cases, such as modifying or withholding publication.<sup>11[2]</sup>

##### **a. Criteria for Authorship**

Publication must give appropriate credit to all authors for their roles in the research. If more than one person contributes significantly, the decision of which names are to be listed as co-authors should reflect the relative contributions of various participants in the research. Many professional associations and research journals have specified criteria for authorship. One common standard appearing in many of these statements is that each author should have participated in formulating the research problem, interpreting the results, and writing

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<sup>11[2]</sup> *Science* **299**, 1149 (2003)

the research paper, and should be prepared to defend the publication against criticisms. Other statements require meeting two or three of the above criteria and, with respect to the last of these requirements, a more limited expectation is often prescribed - that each author should be prepared to defend against criticism those portions of the publication falling within his or her particular area of expertise. A person's name should not be listed as author without his or her knowledge, permission, and review of the final version of the manuscript, which includes the names of all co-authors.

A procedure that has been adopted by some journals and some universities or departments is that each author must sign a statement attesting to having read and approved the final manuscript and/or to having made a substantial contribution to the manuscript. Departments or other academic units might consider drawing up statements of criteria and procedures for certification of authorship appropriate to their own units.

A person whose contribution merits co-authorship should be named even in oral presentations, especially when abstracts or transactions of the proceedings of a conference at which a paper is presented will be published. The entitlement to authorship should be the same whether or not a person is still at the original location of the research when a paper is submitted for publication.

Just as one should include all those who have a right to be listed as co-authors, so one should avoid the listing of so-called honorary authors, who do not meet the criteria for authorship. Many published versions of standards for authorship suggest the use of alternative forms of acknowledgment within the paper for contributions that do not merit co-authorship, e.g., for technical assistance, for providing research materials or facilities, or for meeting some but not all of the stated criteria for authorship. To avoid misunderstandings and even recriminations, the inclusion and exclusion of names of research participants as co-authors should be made clear to all participants in the research prior to submission of the manuscript.

## **b. Order of Authors**

Customs regarding the order in which co-authors' names appear vary with the discipline. Whatever the discipline, it is important that all co-authors understand the basis for assigning an order of names and agree in advance to the assignments.

A corresponding, or senior, author (usually the first or last of the listed names in a multi-authored manuscript) should be designated for every paper, who will be responsible for communicating with the publisher and for informing all co-authors of the status of review and publication and of any changes in the list of co-authors and who will ensure that all listed authors have approved the submitted version of the manuscript. This person has a greater responsibility than other co-authors to vouch for the integrity of the research report and should make every effort to understand and defend every element of the reported research, even though this may be challenging when the report depends on data generated by co-authors using technical methods in which the senior or corresponding author has no or limited expertise, or when the report depends on observations made by a co-author that cannot readily be replicated (e.g., a rare molecular interaction or an astronomical event that occurs for an instant, not to be repeated for many years).

## **c. Self-citations**

In citing one's own unpublished work, an author must be careful not to imply an unwarranted status of a manuscript. A paper should not be listed as submitted, in anticipation of expected submission. A paper should not be listed as accepted for publication or in press unless the author has received galley proof or page proof or has received a letter from an editor or publisher stating that publication has been approved, subject perhaps only to copy-editing.

#### **d. Duplicate Publication**

Researchers should not publish the same article in two different places without very good reason to do so, unless appropriate citation is made in the later publication to the earlier one, and unless the editor is explicitly informed. The same rule applies to abstracts. If there is unexplained duplication of publication, sometimes referred to as self-plagiarism, a reader may be deceived as to the amount of original research data.

It is poor practice in most fields to allow the same manuscript to be under review by more than one journal at the same time. Very often journals specify that a submitted work should not have been published or submitted for publication elsewhere, and some journals require that a submitted manuscript be accompanied by a statement to that effect.

An author should not divide a research paper which is a self-contained integral whole into a number of smaller papers merely for the sake of expanding the number of items in the author's bibliography.

Publication of two papers representing different interpretations of the same data by different participants in the research is confusing to readers. The participants with differing interpretations of the same data should attempt to reconcile their differences in a single publication or present their alternative interpretations in the same paper.

#### **e. Accessibility of Publications**

Some research funding agencies have proposed that all publications supported by federal funds be posted within a reasonable time in an electronically accessible form. An NIH Public Access Policy became effective May 9, 2005, requesting and strongly encouraging all NIH-funded investigators to make their peer-reviewed manuscripts available to the public at the NIH National Library of Medicine's PubMed Central (PMS) immediately after the date of journal publication, or at a later time not exceeding 12 months from the date of publication. As of December, 2006, compliance with this request remained voluntary.

#### **f. Early Release of Information About to be Published**

It is unethical to release to the media scientific information contained in an accepted manuscript prior to the publication. An exception may be made if a public health issue is involved and the editor agrees to an advance release.

### **5. Interference**

Not only withholding of data but intentional removal of, interference with, or damage to any research-related property, including instruments and other equipment, is improper and could be classified as research misconduct.

## **6. Obligation to Report**

### **a. Reporting Suspected Misconduct**

Reporting suspected research misconduct is a shared and serious responsibility of all members of the academic community. Any person who suspects research misconduct has an obligation to report the allegation to the dean of the unit in which the suspected misconduct occurred or to the Research Integrity Officer. Allegations are handled under procedures described in the University's Research Integrity Policy. All reports are treated confidentially to the extent possible, and no adverse action will be taken, either directly or indirectly, against a person who makes such an allegation in good faith. Protection of whistleblowers against retaliation is guaranteed under policies of both the University and the federal and state governments.

The Research Integrity Officer must report findings of research misconduct to the funding agency, and in some cases even an allegation must be reported at some stage of the investigation.

### **b. Correction of Errors**

If a finding of error, either intentional or inadvertent, or of plagiarism should be made subsequent to publication, the investigator has an obligation to submit a correction or retraction in a form specified by the editor or publisher and, in the case of research misconduct, in a form specified by the University and a sponsoring federal agency.

## **7. Curriculum Vitae**

A biographical sketch incorporated into a grant proposal or a curriculum vitae used in an application for a fellowship or any other position must follow the same standards of accuracy as a research publication. Inflated or otherwise inaccurate listings of educational background or academic status with an intent to deceive, including degrees, employment history, and professional accomplishments, are just as reprehensible as irresponsible entries in a list of publications and in some cases could be considered as falsification and be categorized as misconduct.

In listing publications it is recommended that clearly labeled separate sections should be used for referenced research publications, chapters for books summarizing or reviewing a field, books or monographs, and abstracts. A separate additional listing of public presentations may be another appropriate category. No item should be listed more than once in the same category. Some schools of the University have established standard formats for curricula vitae.

## **8. Conflict of Interest**

There are some circumstances in which conflicts of interest could compromise the integrity of research or even lead to research misconduct, for example, by the distortion of research outcomes as a result of personal financial interests of a researcher. The annual disclosures of outside interests by researchers required under the University's Conflict of Interest Policy and the review of these disclosures by academic administrators are intended to avoid the escalation of conflicts into improper behavior or misconduct. Possible preventive measures provided under that policy include divestiture, public disclosure of outside interests, reduction of the conflicted researcher's role in the research, and internal monitoring of the research within the University. A notice of conflicting financial interests should be included, possibly as a footnote, in publications, in research proposals and reports, and in clinical research protocols. Many journals and funding agencies require such disclosures. A faculty member should also disclose to research students and members of the research staff the existence of his or her financial interests in

activities related to the research. When asked to enter into peer review of a manuscript or proposal, a researcher should disclose any conflict of interest with respect to the matter under review.

The author(s) of a commercially sponsored study report must have access to all the data underlying a publication, including data from all sites in a multi-site study, and must have full control over the decision to publish. University researchers should not allow their names to be used as “ghost” authors of manuscripts written by commercial sponsors.

In the special case where University researchers are considering or are involved in commercialization of an invention, for example through a start-up company or by licensing technology to an established company, researchers should consult not only the Conflict of Interest Policy, but also the policy on Commercialization of Inventions through Independent Companies. The latter policy specifies certain limitations on a faculty member’s equity holdings. It also provides for some restrictions on the faculty member’s participatory role in such a company and on that person’s role in University research sponsored by the spin-off company. For information relating to commercialization of University technology, contact the University's Office of Technology Management. Oversight of faculty relationships with start-up companies is provided by the Conflict of Interest Committee.

Conflict of commitment must be avoided so as not to threaten a University researcher’s primary professional allegiance and responsibility to the University. Although outside activities occupying no more than one day a week may be allowed for faculty (but not staff) members, the approval of each such activity from the academic supervisor must be obtained in advance. In no case are University facilities to be used in the conduct of an outside activity, and the University name and logo may be used by outside entities only with permission of designated University business officers.

## **9. Responsibilities of a Research Investigator**

An investigator who leads a research group has leadership and supervisory responsibilities with respect to the research performed by members of the group. A principal investigator must not only put together the research group but also arrange for the assembly of an adequate financial and administrative structure to support the research. A supervisor not only provides guidance and advice to individual members of the group in the responsible conduct of the research but also has ultimate responsibility for the scientific integrity of the whole group. He or she should thus take all reasonable steps to check the details of experimental procedures and the validity of the data or observations reported by members of the group, including periodic reviews of primary data in addition to summary tables, graphs, and oral reports prepared by members of the group. Written policies and procedures for collecting, maintaining and communicating experimental data within the research group are highly recommended. Close oversight is particularly important during the first few months of participation in the group of a student or junior researcher.

An investigator serves not only as a research manager with respect to members of the research group but also as a mentor responsible for the intellectual and professional development of graduate students, postdoctoral fellows, and junior faculty in the group. Mentors should assist students in defining a thesis or dissertation problem that is intellectually challenging and has a reasonable prospect of being brought to a conclusion within the expected period of time. Encouragement should be given to students to report their research progress regularly both in oral and written modes and to present completed work at regional or national meetings. Senior investigators must promptly review drafts of student theses or dissertations and provide timely feedback. In order to fulfill all of the inherent role responsibilities, a supervisor should not have a research group larger than he or she can manage effectively and responsibly.

Some departments or schools may consider assigning limits to the size of a research group, particularly with regard to students.

Negotiation of sponsored research agreements is not one of the responsibilities of the investigator. That is a function of the Office of Research.

A researcher should be open to collaborative work with investigators having different but complementary skills, whether at the University of Pittsburgh or elsewhere. Early understandings should be reached in any collaboration about sharing of research resources and materials, authorship credit and responsibilities, and entitlement to any revenue from marketing of intellectual property through patents, copyrights, or licensing. (See **3.c.** for circumstances for executing material transfer agreements.)

## **10. Responsibilities to Funding Agencies**

An investigator should be aware that the same standards of accuracy and integrity pertain to grant applications and proposals as to manuscripts submitted for publication. Description of experiments not yet performed as evidence in support of the proposed research, for example, is considered to be fabrication and is subject to a finding of research misconduct, even if the proposal is subsequently rejected for funding or is withdrawn before full consideration for funding is completed. The same definition of plagiarism applies to an application or proposal, including background and methodological sections, as to a publication.

An investigator must submit progress and final research reports to a sponsor at times specified in the award. He or she must authorize expenditures in a manner consistent with the approved budget and should review financial reports carefully.

Investigators who enter into agreements with commercial sponsors of research, as negotiated by the Office of Research, should familiarize themselves with the special terms of such agreements, such as those, for example, concerning reporting of results, disclosure of inventions, and confidentiality. Failure to comply with the provisions might sometimes constitute a breach of contract or might compromise the University's claims to intellectual property.

## **11. Special Obligations in Human Subject Research**

Research protocols involving human subjects must be approved in advance by the University Institutional Review Board (IRB), which determines whether risks posed to subjects are acceptable and whether information describing risks and benefits of subject participation is conveyed to subjects in an accurate and intelligible manner. This requirement applies not only to biomedical and dental research, but also to many research projects in the social and behavioral sciences as well. Depending on the funding agency, IRB approval may be obtained and submitted after the proposal due date but prior to implementation of the peer review process by the funding agency.

Special attention must be given to the broad federal definition of "human subject research" as this is important in determining the level of IRB oversight required.

*Research* means a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities which meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program which is considered research for other purposes.)

*Human subject* means a living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention or interaction with the individual, or identifiable private information.

( <http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.htm> )

Regulations require that the IRB, not the investigators, make the determination of whether the research activity constitutes “human subject research” and is therefore subject to IRB oversight. Please note that the University applies this definition regardless of the source of funding for the project. Guidelines may be found in the IRB Reference Manual for the Use of Human Subjects by way of the IRB Home Page, [www.irb.pitt.edu](http://www.irb.pitt.edu).

The IRB reviews both the protocol and the informed consent document that potential research subjects must sign before participating in the protocol. Volunteer subjects must be informed that they may withdraw from a research program at any time. Research subjects already participating in a protocol by virtue of signing an approved consent document must be informed of any new information regarding risks and benefits of study participation when such data become available as the study progresses. Such information must be conveyed by a new consent document approved in writing by the IRB. Any proposed change in the research protocol or consent document must be approved by all investigators as well as by the IRB in advance of implementation of the proposed change. If a consent document states that subjects will be informed of the research outcomes, the investigator must honor that commitment and so inform the subjects.

Every protocol submitted to the IRB must include a plan for data and safety monitoring. A protocol should identify the research sponsor. The submission of a protocol to the IRB should include a plan for managing potential conflicts of interest on the part of any of the investigators, approved by the Conflict of Interest Office. Such a plan may place limits on the role of an investigator who has a conflict. Conflicts should also be disclosed to the research sponsor.

The privacy of information relating to each subject must be respected and maintained. It is not permissible to collect for research purposes private information that may be linked (e.g., by names, initials, social security numbers, study numbers, or other personal identifiers) to individual subjects without prior written consent of the subjects as approved by the IRB. Data and samples of body tissues or fluids may be used for any purpose only if the subject has provided consent prospectively and in writing, unless otherwise approved by the IRB. Privacy requirements pertaining to use of individually identifiable health information in research are codified in the federal Health Insurance Portability and Accountability Act (HIPAA).

Every research protocol involving human subjects should receive a scientific review and written approval as specified in the investigator's academic unit prior to submission to the IRB for review. This prior review must address the scientific merit, research subject availability, resource utilization and financial support, as well as compliance with federal, state, and University policies and procedures.

Sponsoring agencies are to be notified promptly of any definitive results, whether significantly adverse or beneficial, that may have an impact on public health. Also, the IRB must be notified promptly of any significant adverse reactions. Adverse events discovered in the course of studies involving investigator-sponsored use of investigative drugs, devices, or biological materials must be reported directly to the FDA.

When large studies are organized as cooperative projects involving many different institutions, the coordinating institution has a special responsibility for developing a monitoring system to check the reliability of data reported from the various data-collecting centers.

The IRB office (412-383-1480) may be consulted for answers to questions. Protocols involving gene therapy must be submitted for approval to the Institutional Biosafety Committee (412-383-1768). Studies using human bodies or tissues following certification of death must receive approval of protocols and consent documents from the Committee for Oversight of Research Involving the Dead (412-648-9756).

## **12. Laboratory Animals in Research**

Investigators who use laboratory animals are obliged to follow humane procedures so as to minimize animal pain, suffering, and distress and to use no more animals than absolutely necessary. Wherever possible, alternative protocols which do not require the use of animals should be considered and, if practicable, adopted. Written approval must be obtained from the Institutional Animal Care and Use Committee (IACUC, 412-383-2008) prior to the initiation of any research or teaching that requires the use of animals. The Clinical Director of the Division of Laboratory Animal Resources (412-648-8950) should be consulted about guidelines and appropriate procedures. The same requirements for disclosure of research sponsorship and conflicts of interest in the use of human subjects in research apply for vertebrate animal research, except that the disclosures in the latter case are made to the IACUC.

### **SOME UNIVERSITY UNITS SUPPORTING RESEARCH**

#### **1. Safety**

The University Radiation Safety Officer (412-624-2728) oversees the safe use of radioactive isotopes and other sources of ionizing radiation. Application forms to be submitted for authorizations may be found at [www.radsafe.pitt.edu/forms.htm](http://www.radsafe.pitt.edu/forms.htm).

The Director of Environmental Health and Safety (412-624-9505) should be consulted about proper use, storage, and disposal of hazardous materials, including bloodborne pathogens and other biohazardous materials.

All proposals for work involving recombinant DNA or gene therapy must be submitted to the Institutional Biosafety Committee (412-383-1768) on forms accessible at [www.rcco.pitt.edu/rdna](http://www.rcco.pitt.edu/rdna).

#### **2. Intellectual Property and Technology Management**

Investigators may have occasion to protect their research findings, both for themselves and for the University, through copyrights or patents. The Office of Technology Management (412-648-2206) assists faculty in evaluating discoveries or inventions for this type of legal protection and in applying for copyrights or patents.

Investigators should also consult the Office of Technology Management if they are considering or are involved in commercialization of an invention or other intellectual property through a start-up company, an established company, or any other business venture.

#### **3. University Office of Research**

The Office of Research (412-624-7400) is the only gateway for submitting and processing research proposals and budgets to sponsoring agencies, whether governmental or private. Material transfer agreements are also processed through this office. The Director of the Office of Research must approve and sign all such documents as the authorized University signatory. This Office maintains a useful library of information about agency regulations and guidelines, funding sources and opportunities, and institutional and national data banks of investigators grouped by research interests.

**4. Office of Basic Biomedical Research, Health Sciences**

The Office of Basic Biomedical Research, Health Sciences (412-648-2233) has responsibility for overseeing and facilitating biomedical research in the Schools of the Health Sciences. Issues or concerns related to biomedical research should be brought to the attention of the Associate Vice Chancellor for Basic Biomedical Research, Health Sciences, or her staff.

**5. Office of Clinical Research, Health Sciences**

The Office of Clinical Research, Health Sciences (412-648-2332) facilitates the process of clinical research, promotes its values and fosters communication among the various entities engaged in its conduct. It provides research-related resources for volunteers, sponsors, investigators, and research staff.

**6. UPMC Clinical Trials Office**

The purpose of this office (412-647-4461) is to facilitate the implementation and provide institutional oversight of the conduct of industry-initiated and sponsored clinical trials within the UPMC.

**7. The Research Conduct and Compliance Office**

This office (412-383-1771) is the umbrella entity encompassing various units that oversee and facilitate the conduct of ethical and regulation-compliant research.

## APPENDIX

### **PARTIAL LIST OF RELEVANT UNIVERSITY POLICIES AND PROCEDURES** Numbers and dates refer to the listings in the **University Policy and Procedure Manuals**.

University Policies can be accessed at [www.pitt.edu/HOME/PP/pp\\_handbooks.html](http://www.pitt.edu/HOME/PP/pp_handbooks.html).

**Bloodborne Pathogens**, 06-01-03, January 31, 1995

**Commercialization of Inventions through Independent Companies: Policy and Recommendations**, 11-02-03, July 1, 2005. This describes University policy with respect to the participation of faculty, staff, and students in start-up companies based on inventions by those faculty, staff, and students, and defines the role of the Entrepreneurial Oversight Committee in administering this policy.

**Conflict of Interest in Research and Teaching**, 11-01-03, April 4, 1997. This document states University policy for eliminating or dealing with conflict of interest and describes the annual disclosures of outside interests required of all persons involved in research.

**Copyrights**, 10-04-01, February 14, 1989, and 11-02-02, June 29, 1990. These describe procedures for seeking copyrights and specify the relative rights of the author and the University.

**General Health and Safety Manual and Biosafety Manual**, available from the Environmental Health and Safety Office (412-624-9505) or at [www.ehs.pitt.edu](http://www.ehs.pitt.edu)

**Guidelines on Academic Integrity**, 02-03-02, September, 2005 In addition to this University document, each school has its own specific document governing the performance of students in the academic setting - in courses, examinations, and degree-related research, and the responsibilities of faculty with respect to students.

**Guidelines on Data Retention and Access**, February 3, 1997, available from the Vice Provost for Research (412-624-0784), or at [www.pitt.edu/~provost/retention.html](http://www.pitt.edu/~provost/retention.html)

**IRB Reference Manual**, available from the Institutional Review Board (412- 383-1480) or on line at [www.irb.pitt.edu/](http://www.irb.pitt.edu/). This is a detailed description of the regulations governing the use of human research subjects and of the procedures for seeking IRB approval.

**Patent Rights and Technology Transfer**, 11-02-01, July 1, 2005. This describes the procedures for applying for patents and outlines the relative rights and responsibilities of the inventor(s) and the University.

**Research Integrity Policy**, 11-01-01, January 1, 2002. This defines research misconduct and describes the procedures for conducting inquiries and investigations into allegations of misconduct and for making and appealing decisions related to misconduct.

**Rights, Roles, and Responsibilities of Sponsored Research Investigators**, 11-01-02, April 3, 1992. This document outlines the rights and responsibilities of investigators and provides a mechanism for resolution of disputes.

**Use of Animals in Research, Testing and Teaching**. IACUC (412-383-2008) has listed all policies governing use of animals on its website, <http://www.iacuc.pitt.edu/policies.asp>.