

**Department of Applied Science
2013-2014
Graduate Student Handbook**

UNIVERSITY OF ARKANSAS AT LITTLE ROCK *Where excellence has many faces*

T
A
B
L
E

O
F

C
O
N
T
E
N
T
S

Introduction	1
Master of Science	2
Program Requirements for Master of Science	2
Coursework	2
Transfer of Credit	2
Thesis and Advisory Committee	2
Thesis Proposal	2
Thesis Defense	2
Non Thesis Option	3
Credit Requirements	3
Academic Standing	3
Summary of Master of Science Degree Requirements	3
Summary of Graduation Requirements	3
Doctor of Philosophy	6
Assistantships and Fellowships	6
International Students	6
Orientation and Assignment of a Provisional Mentor	7
Program Requirements for the Doctor of Philosophy	7
Writing Requirement	7
Seminar Requirement	7
Research Ethics Course Requirement	8
Laboratory Rotations	8
Doctoral Advisor	8
Advisory Committee	9
Transfer of Credit	9
Candidacy Examination	9
Ph.D. Dissertation Proposal Oral Examination	10
Ph.D. Dissertation Defense Examination	10
Academic Standing	10
Summary of Doctor of Philosophy Degree Requirements	11
Summary of Graduation Requirements	11
Additional Graduate Program Information	12
Annual Graduate Student Progress Report	12
Changing Emphasis Area after Admission	12
Petitioning to Have Requirements Waived	12
Waiving Departmental Course Requirements	12
Graduate Student Travel	13
Code of Conduct for Graduate Students	13
Leaving the Program	13
Facilities	13
Department of Applied Science Registration Procedures	14
Sample Ph.D. Time Table	15
Applied Science Areas of Emphasis	
Applied Biosciences	16
Curriculum	16
Course Listing	17
Course Descriptions	18
Applied Chemistry	19
Curriculum	19
Course Listing	20
Course Descriptions	21

**T
A
B
L
E

O
F

C
O
N
T
E
N
T
S**

Applied Physics	22
Curriculum	23
Course Listing	24
Course Descriptions	25
Computational Science	26
Curriculum	26
Course Listing	26
Course Descriptions	27
 Candidacy Exams	 28
Steps to Select Candidacy Courses	28
Applied Biosciences	28
Applied Chemistry	29
Applied Physics	29
Computational Science	30
Provision to Grant One-Time Waiver	30
 Graduate Institute of Technology	 31
 Applied Science Office Policies and Procedures	 32
Home/Mailing Addresses	32
Student Offices	32
Keys/Key Cards	32
Paychecks	32
Thesis/Dissertation Expenses	32
Graduation	32
Purchase Orders	32
Travel	32
Mail Boxes	32
 UALR Graduate School Guide for New Students	 34
Policies	34
Equal Opportunity/Affirmative Action	34
Equal Access Policy	34
Alternative Formats and Accommodations	34
What You Need to Do Before the First Day of Classes	34
Registering for Classes	34
Car Registration and Parking	34
Disability Support Services	34
Books	35
Safety	35
Especially for Graduate Students	35
Paper Work	35
Confirmation Letter	35
Work Assignment	36
Billing	36
Paychecks	36
Term of Appointment	36
What You Need to Know and Do During the First Week	36
Payment Deadline	36
Schedule Adjustment Period	36
Withdrawal from the University	37
UALR Campus Card	37
Health Services	37
Postal Services	37
Computer/Internet Use	37

T
A
B
L
E
O
F
C
O
N
T
E
N
T
S

Library	37
University Writing Center	38
Copies	38
Donaghey Student Center Fitness and Aquatics	38
GSA	38
Graduate Student Research Forum	38
Policy Documents	39
Grievances and Procedures	39
Grade Point Average	39
Support Personnel Contact Information	40
Faculty Members and Research Interests	
Applied Science Faculty	41
Doctoral Faculty	41
Emeritus Faculty	55
Appendix 1 – Selection of Major Advisor Form	56
Appendix 2 – Annual Graduate Student Progress Report	57
Appointment of Supervisory/Examining Committee	60
Supervisory/Examining Committee Report	61
Candidacy Exam Request	62

Department of Applied Science

Graduate Student Handbook 2012-2013

Introduction

The Department of Applied Science is an interdisciplinary, graduate-only department that supports applied research in a broad set of areas. These areas include applied biosciences, applied chemistry, applied physics, applied mathematics, statistics, astrophysics, computational science, environmental science, geophysics, materials science, and nanotechnology.

The Department offers two degrees, the Doctor of Philosophy and the Master of Science. Each degree has several emphases, which are explained under the separate programs. Faculty housed in several other departments within the College of Science (COS), participates in the various emphasis tracks.

Your graduate education in the Department of Applied Science will be a very different experience from your undergraduate career. Merely meeting or satisfying degree requirements should not be the aim of a quality graduate program. Graduate education is an opportunity to increase your knowledge, to broaden your understanding, and to develop your independent thinking and research capabilities. Consequently, your academic program of study and achievement should reflect a commitment to the discipline and to scholarly standards. While graduate faculty and staff members serve as counselors and assistants, your accomplishments as a graduate student are primarily a result of your own personal ambition and dedication. The success of your graduate education depends on your ability to define goals and to organize and execute a program of study and research needed to meet those goals.

This handbook is intended as a guideline for most of the rules governing the graduate programs within the Department of Applied Science. Graduate students and faculty should familiarize themselves with its content, paying particular attention to Department and University deadlines.

Take time to bookmark these websites in your browsers and make a habit of referring to the sites often. Most questions you have will be addressed either in this handbook or on these websites.

UALR Graduate School Home Page

<http://ualr.edu/gradschool/>

Department of Applied Science Home Page

<http://ualr.edu/appliedscience/>

UALR Graduate Catalog

<http://ualr.edu/gradschool/index.php/home/student-resources/graduate-catalog/>

In general, the information in this handbook and the accompanying forms are the student's responsibility during his/her term in the program. Please refer to the *Graduate Catalog* for official information.

Master of Science

The Master of Science degree is an interdisciplinary program designed to advance a student's knowledge beyond the baccalaureate degree and to teach the student how to approach a research project. The student may either pursue a generic degree in applied science or, with sufficient specialized course work, may earn a master's degree in applied physics.

The degree is designed for students with a wide variety of research and/or curricular interests in science and engineering. The thesis option includes a proposal defense and a thesis defense, and provides an opportunity to the student to carry out thesis-based research. The non-thesis option includes a comprehensive oral exam and a project. The student choosing the non-thesis option will have three different alternatives to satisfy the comprehensive exam and project requirement. These alternatives are intended to cater to students who (1) are in the ASCI Ph.D. program and want to acquire the ASCI M.S. degree since they satisfy a majority of the cognate requirements, (2) want to complete some of the requirements of the ASCI Ph.D. as a precursor to applying for admission to the Ph.D. program, (3) want to complete a predominantly course-based Masters' degree. The details of the program are given below.

Program Requirements for Master of Science

Course Work

The Master of Science degree requires a minimum of 30 credit hours beyond the baccalaureate degree. The Student's plan of study must be developed in conjunction with the Thesis Advisor/Project Instructor and Student Advisory Committee. If a student receives one or more Cs in his/her course work in one semester, he/she will be warned that his/her academic performance is unacceptable and that his/her status will be reviewed by the Applied Science faculty, which will suggest corrective action. A student receiving Cs in more than one semester or either a D or an F in his/her course work will be dismissed from the program, pending review by the Applied Science faculty.

Emphasis in Applied Physics (Masters)

To earn an emphasis in applied physics, students must take at least nine credit hours from recognized physics courses in either the Applied Science Department or the Physics Department.

Transfer of Credit

A maximum of six credit hours may be transferred from an accredited graduate program. The graduate coordinator will determine applicability of the transfer.

Student Advisory Committee

The Student Advisory Committee will be composed of four members, including the committee chair, who will be the Thesis Advisor/Project Instructor. The chair and two of the three members must be faculty members from Applied Science, Systems Engineering, or Physics. The at-large member can be any other UALR graduate faculty or Applied Science adjunct faculty. The Applied Science faculty must approve the committee constituency.

Thesis Option

The thesis subject is selected by the student and the Student Advisory Committee at least one year prior to the oral defense. The written thesis format must follow the *UALR Graduate School Dissertation and Thesis Guide* found on the Graduate School website.

Thesis Proposal

At least one year prior to the thesis defense, the candidate must submit a written proposal and orally present his/her proposed thesis work to the student advisory Committee.

Thesis Defense

The candidate will present and orally defend his/her completed master's thesis before his/her Student Advisory Committee. The defense will be open to the public, needs to be held at Applied Science Conference Room, and must be announced at least two weeks in advance.

Non-thesis Option

Comprehensive Exams

After the candidate has completed eighteen credit hours of graded course work, he/she may attempt the Comprehensive Exams. The comprehensive exam requirement must be passed in no more than two attempts. The second attempt has to be in the semester immediately following the semester in which the first attempt was made. The student may opt for either of the two options listed below to satisfy the comprehensive exam requirement, but must obtain prior written approval from their student advisory committee for their choice. These options are:

- 1) the student may take an oral exam administered by his/her student advisory committee; or
- 2) the student may take the Doctoral Candidacy Exams. If a student chooses this option, he/she must pass the exams in three candidacy subjects within the same emphasis area. The student may test only in those candidacy subjects which he/she has taken as part of the eighteen credit hours of graded course work mentioned above. The Doctoral Candidacy Exam rules will be invoked to determine whether the student has passed or failed.

Project Presentation and Report

The student must complete a project, by means of six credits of Independent Study (ASCI 7389) with the Project Instructor as the instructor of record. Prior to undertaking the Independent Study courses, the student must present a project plan to the Student Advisory Committee. Upon completion of the Independent Study courses, the student must orally present his/her work to the Student Advisory Committee, and deliver a written project report, in the format specified by the Project Instructor, to the Student Advisory Committee for approval, for which at least two thirds of the committee members will have to vote in favor of that outcome.

Successful defense of the doctoral proposal and acceptance of a peer-reviewed written document on some completed portion of a project, such as a conference paper or a journal article, with the student as the primary author, may serve in lieu of the project presentation and report, with prior written approval from the student advisory committee.

Credit requirements

The Master of Science degree requires a minimum of 30 credit hours beyond the baccalaureate degree.

Course Credits

A minimum of 18 credit hours in 5000 or 7000 level graded courses within COS or EIT must be taken. A grade of B or better must be obtained in each course to count towards the minimum course requirement. A maximum of six credits of independent study (ASCI 7389) or special topics (5399, 7399) may be applied to the Master of Science with the following exception. Those students who are required to use six credits of independent study (ASCI 7389) to complete a project under the non-thesis option may apply three additional credits of independent study (ASCI 7389) or special topics (5399, 7399) to the Master of Science.

Thesis/Dissertation or Project Credits

Either a minimum of twelve credit hours of master's thesis (ASCI 8X00) or a minimum of twelve credits of research/dissertation (ASCI 9X00) or a minimum of six credits of independent study (ASCI 7389) are required.

Academic Standing

For a student who is in the thesis-option, his/her academic performance will be considered unacceptable if he/she fails to complete the following requirements in the semester that the student has accumulated program credits as mentioned below.

<i>Requirements</i>	<i>Accumulated program credits</i>
Major advisor selection	9 credits
Advisory committee formation & proposal defense	18 credits
Defend thesis	45 credits

Summary of Graduation Requirements for Applied Science MS Degree

- Successful completion of the program with a minimum GPA of 3.0
- Successful completion of the writing requirements

Thesis Option

- Successful completion of Thesis proposal
- Successful completion of Thesis defense
- Submission of an acceptable thesis to Graduate School

Non-thesis Option

- Successful completion of Comprehensive Exam
- Successful completion of Project Presentation and Report

Sample curriculum

Requirement	M.S. (thesis option)	M.S. non-thesis option		
		Alternative 1	Alternative 2	Alternative 3
Typical Student audience	This option is intended for those who want to complete a thesis-based research at the Masters' level	This alternative is intended for those students who are in the ASCI Ph.D. program and want to acquire the ASCI M.S. degree since they satisfy a majority of the cognate requirements	This alternative is intended for those Masters' students who want to complete some of the requirements of the ASCI Ph.D. program as a precursor to applying for admission to the Ph.D. program	This alternative is intended for those who want to complete a predominantly course-based Masters' degree.
Minimum graded Course credits	18 credits. <i>A maximum of six independent study (ASCI 7389) and/or special topics credits (5399,7399) may be applied towards the M.S. requirement.</i>	18 credits <i>A maximum of six independent study (ASCI 7389) and/or or special topics credits (5399,7399) may be applied towards the M.S. requirement.</i>	18 credits <i>A maximum of three independent study (ASCI 7389) or special topics credits (5399, 7399) in addition to the six credits of independent study (ASCI 7389) credits required for project (see second row and last row) may be applied towards the M.S. requirement.</i>	18 credits <i>A maximum of three independent study (ASCI 7389) or special topics credits (5399, 7399) in addition to the six credits of independent study (ASCI 7389) credits required for project (see second row and last row) may be applied towards the M.S. requirement.</i>
Thesis/Dissertation or Project credits	12 Master's credits (ASCI 8X00)	12 doctoral credits (ASCI 9X00)	six credits of independent study (ASCI 7389) for project (see below)	six credits of independent study (ASCI 7389) for project (see below)
Thesis proposal and defense	Required	Not applicable	Not applicable	Not applicable
Comprehensive Exam	Not applicable	Must pass three candidacy subjects in doctoral candidacy exam	Must pass three candidacy subjects in doctoral candidacy exam	Oral Exam administered by student's advisory committee
Project presentation and report	Not applicable	1.Successful defense of the doctoral proposal, 2.Production of a conference paper or journal with student as primary or corresponding author	Complete project by means of six credits of independent study (ASCI 7389), make project presentation and submit report	Complete project by means of six credits of independent study (ASCI 7389), make project presentation and submit report

Doctor of Philosophy

Faculty participating in the doctoral program is drawn mainly from the Departments of Applied Science, Biology, Chemistry, Earth Science, Mathematics and Statistics, and Physics and Astronomy. Due to the diverse nature of the faculty, the program offers opportunities in several interdisciplinary research areas.

The Doctor of Philosophy in Applied Science is awarded upon completion of a program of advanced study including a significant original dissertation in applied research or design. Work accomplished without the supervision of an Applied Science doctoral faculty member will not be accepted in lieu of the dissertation requirement. The research must be relevant to the emphasis area in which the student is pursuing a degree.

All emphases have different program requirements. Each emphasis has its own candidacy areas and seminar requirements which are described under the "Program Requirements for the Doctor of Philosophy" section of this Handbook and under "Applied Science" in the UALR Graduate Catalog.

The following emphasis areas are offered: Applied Biosciences, Applied Chemistry, Applied Physics, and Computational Science.

Assistantships and Fellowships

Graduate assistantships (GA), teaching assistantships (TA), research assistantships (RA), and fellowships are available to qualified full time students. To apply, students must send an application for an assistantship.

Students entering the program fall into three categories:

1. Students who are supported by a state-funded graduate assistantship (GA) or teaching assistantship (TA) through the College of Science and Mathematics. These students are given a work assignment based on research/teaching/laboratory duties for 20 hours per week in return for receiving the GA or TA stipend. These assistantships pay tuition and provide a stipend for living expenses. Students must pay registration and technology fees, buy textbooks, and purchase support material. Any student supported on a teaching assistantship or a state graduate assistantship shall maintain a full-time graduate student status, minimum of 9-credit hours, should not exceed 12 hours except by approval of department. GA stipends are available for a total of maximum 5 years for a Ph.D. degree student. The majority of state support does not include summer support. Students should search for a research mentor prior to the first summer to acquire summer funding.
2. Students who are supported by external grant funding—research assistantships (RA). If a graduate faculty member supports a student who has not yet chosen a dissertation topic, the work assignment by the primary investigator will be no more than 20 hours per week.
3. Students supported by fellowships. These fellowships provide support based upon the granting agency.

A student awarded an assistantship must maintain full time graduate student status.

International Students

In order to qualify for a teaching assistantship, international students whose native language is not English must score a 5.0 on the Test of Spoken English (TSE).

It is required to maintain a valid health insurance before the student can register. Students with families are highly recommended to obtain coverage for the entire family.

International students who have questions about visas or other concerns should contact International Student Office.

Orientation and Assignment of a Provisional Mentor

During the week prior to the beginning of their first semester, new Ph.D. students will have the opportunity to ask questions of the Applied Science Department Chair and Graduate Coordinator. At or prior to this orientation session, the graduate coordinator will be assigned as the student's Provisional Mentor. Graduate Coordinator will act as the student's temporary advisor until the student has selected their doctoral advisor. Students should meet with the Graduate Coordinator as soon as possible to receive instruction in selecting and registering for courses, as well as to take care of all the other aspects required to begin their graduate education at the University. Students should consult regularly with the Graduate Coordinator during their first semester concerning progress with coursework, rotations, etc. By the end of the first semester of study, students should have selected their Doctoral Advisors from the College of Science and Mathematics faculty with doctoral status.

Program Requirements for Doctor of Philosophy

Course Work, Research, and Credit Requirements

All emphases require a minimum of 72 credit hours beyond the baccalaureate degree. Specific requirements depend on the emphasis area chosen and are detailed in those sections. A minimum of eighteen (18) credit hours of graded course-work is required from 5000 and 7000 level courses in COS and EIT. The student's plan of study must be developed in conjunction with his/her doctoral advisor and advisory committee. The course on "Introduction to Research in Applied Science" (i.e. ASCI 7145, or ASCI 7245, or ASCI 7345), must be taken, and a grade of "credit" must be obtained.

A minimum of forty-two (42) credit hours in the 9000 level doctoral research/dissertation is required. The research must be substantial and must extend the state of the art in the student's chosen field through theoretical development, design or process improvement, or experimental technique.

If a student receives one 'C' in his/her course-work, he/she will be warned that his/her academic performance is unacceptable, and he/she will be reviewed by the Doctoral Affairs Committee (DAC) which will suggest corrective action. A student receiving two 'C's or either a D or an F in his/her coursework will be dismissed from the program, pending review by the Doctoral Affairs Committee (DAC).

Students can register up to 15 credit hours per fall and spring semesters. Students can register up to 6 credit hours during the full summer term each academic year.

Writing Requirement

An English Writing Proficiency Exam (WPE) is offered each Spring term by the Applied Science Department. This exam assesses the student's ability to communicate in a written format. Each student must pass this exam to fulfill graduation requirements. A student who does not pass the WPE is required to take the English Writing Proficiency Laboratory (EWPL). The EWPL is offered each spring term. The student must take the EWPL each Spring term until they pass.

Seminar Requirement

1. All doctoral students are required to attend the orientation seminar held at the beginning of each semester during academic year.
2. All students registered for 6 credits or more (excluding ASCI 7190) in a semester will need to register for ASCI 7190 in that semester.
3. All students who register for less than 6 credits (excluding ASCI 7190) in a semester will need to register for ASCI 7190 in the fall semester of the current academic year, and may fulfill the seminar attendance requirement over the entire academic year.
4. Students in the Applied Biosciences emphasis area may choose to register for Applied Bioscience Seminar (ASCI 7192) instead of ASCI 7190.

A maximum of 1-credit of seminar hour per semester can be counted towards the credit requirements of Applied Science PhD.

Students who have completed the Applied Science PhD graduation requirements except the dissertation defense and who are in their final semester before graduation may no longer be required to register for seminar (ASCI 7190 or ASCI 7192) upon the approval of Graduate Coordinator.

Research Ethics Course Requirement

All Applied Science doctoral students are required to register for and successfully complete the Research Ethics course (ASCI 7118), for any one semester prior to graduating from the program. A student registered for Research Ethics course can be exempt to register for Applied Science Seminar or Applied Bioscience Seminar for that semester upon the approval of Graduate Coordinator. This one-credit course will be counted towards the overall credit requirements.

Laboratory Rotations

Ph.D. students must register for ASCI 7x45 Introduction to Research in Applied Science, or so called “Laboratory Rotation” in their first semester in the program, and receive a “satisfactory” grade at the end of the rotation.

The purpose of laboratory rotations is to:

- Enable the student to identify a suitable laboratory for dissertation research
- Expose the student to various disciplines within the Applied Science Ph.D. program and to learn techniques that will be useful in the course of the student's research
- Enable the student to identify faculty who would be suitable members of the student's dissertation committee.

The rotations aid the student in the selection of a Doctoral Advisor. Rotations can be performed with any faculty member who is participating in the Applied Science graduate program listed on pages 52-57. Students can receive from one to three credit hours for their rotations by registering for ASCI 7145, 7245, or 7345 (Introduction to Research in Applied Science). Upon arrival, students should arrange meetings with individual faculty members to discuss mutual research interests.

At the end of the rotation, the student and the rotation host will meet and discuss progress of the rotation. The student will present the results, either orally or in the form of a written report, to the rotation host. Student also needs to submit a written report to the coordinator of laboratory rotation.

If the student has not selected their dissertation advisor after the first semester of rotations, the student will be required to register again for ASCI 7x45. Failure to perform adequately in the laboratory rotation may result in termination of state assistantship funding.

A maximum of 2-credit of Laboratory Rotation can be counted towards the credit requirements of Applied Science PhD.

Doctoral Advisor

A student's dissertation advisor must be a Doctoral Faculty (approved by DAC) participating in the Applied Science graduate program. The selection of a Doctoral Advisor is one of the most important choices students will make during their time in our program. A Doctoral Advisor should be chosen with the intent of not only matching research interests, but also with an eye towards finding an individual with whom the student feels comfortable entrusting his/her educational future. Students also are dependent upon the Doctoral Advisor for financial support of dissertation research and, in many cases, Graduate Assistantships. Therefore, this situation should be clarified with prospective Doctoral Advisors. Both students and prospective Doctoral Advisors should take advantage of the system of laboratory rotations to determine compatibility prior to making a firm commitment to each other. Once a Doctoral Advisor is selected, students should complete the “Selection of Major Advisor” form in the Appendix of this Handbook. The form should be signed by both the Doctoral Advisor and the Applied Science Graduate Coordinator for inclusion in the student's file. Those students who do not have a Doctoral Advisor by the end of the third semester may be dismissed. Changing Doctoral Advisors after this point is possible, and sometimes advisable, but it usually slows a student's completion of degree requirements. Therefore, this decision should be approached carefully.

Advisory Committee

You should select and meet with your advisory committee (i.e. dissertation committee) prior to the completion of the third semester. The role of this committee is to advise and help direct your academic and research programs. The advisory committee will be composed of a minimum of five members, including the committee chair, who will be the student's doctoral advisor. Four of the five members including the chair must be Applied Science doctoral faculty members. The at-large member(s) may be any other person who has graduate faculty status at UALR. This also includes full-time research faculty with graduate faculty status. However, postdoctoral researchers cannot serve in dissertation committees. The Doctoral Affairs Committee (DAC) must approve the committee constituency after the initial review by the Graduate Coordinator. When student propose their dissertation committee to DAC, they also need to provide a brief written justification explaining the role of each member in contribution to student's dissertation research. Students are encouraged to form their advisory committee with a majority of faculty members from student's respective emphasis area. Dissertation committee cannot be changed after the proposal defense unless student has a compelling or extraordinary reason (e.g. leave or retirement of one of the members).

The dissertation subject is selected by the student, with input from the advisory committee, at least two years prior to the oral defense. It must be a scholarly contribution to a major field of applied science in the student's emphasis area, consisting of new important knowledge or a major modification, amplification, or interpretation of existing significant knowledge. The written dissertation format must follow the *UALR Graduate School Dissertation and Thesis Guide*, which can be obtained from the UALR Graduate School or online at <http://ualr.edu/gradschool/index.php/home/thesis-and-dissertation-information/>

In the first meeting with the committee, the student also should provide appropriate background material on his/her education to aid committee members in advising the student on course work. The student also should brief the committee on his/her research interest and any thoughts on the dissertation. Obtaining committee consent is essential toward ensuring future success. Subsequently, the student should meet with the committee at least once a year. Regular meetings will ensure that progress is made in accordance with the committee's expectations.

Transfer of Credit

Students can transfer up to 6 credit hours of graduate level course work from a previous institution other than UALR. Transferability of credit is determined by the student's advisory committee based upon the applicability of the courses selected for dissertation work and the student's educational goals. Therefore, student needs to form his/her advisory committee before he/she can transfer the credits. Student needs to collect the signatures of all advisory committee members and Graduate Coordinator on the Transfer of Credit application <http://www.ualr.edu/gradinfo/transfercredit.pdf> before it can be submitted to Graduate School. The form also needs to include attachments of student's transcript from the previous institution and course descriptions of the ones submitted for transfer. Thesis/dissertation research hours from another program are not allowed for transfer. Courses requested for transfer from the previous institution need to be taken in less than 5 years at the time of transfer application.

Those students who were enrolled in a relevant graduate program at UALR prior to Applied Science PhD (e.g. UALR's MS programs of Biology, Chemistry, Mathematics, and Applied Science) do not need to go through a formal transfer of credit paperwork, and all of their relevant course work credits (i.e. no 6-credits hours limit) can be counted towards their Applied Science credit requirements upon the approval of Graduate Coordinator.

Candidacy Examination

The purpose of the Candidacy Examination is to determine whether the applicant possesses the attributes of a doctoral candidate. The Candidacy Exam will be held twice a year after the start of fall and spring classes. The Candidacy Exam is a comprehensive, written test composed of four subject tests (also known as candidacy areas), each of which must be passed. The student will be tested on topics selected from the Candidacy Subject List in his/her emphasis area. The student may attempt the Candidacy Exam a maximum of two times and must attempt it in consecutive semesters. A student who has not passed all exams after the second offering will be dismissed from the program.

Students must attempt the exam no sooner than the beginning of the second semester in the program. A student must take the exam at the next opportunity after completion of the candidacy preparation subjects and, in any event, no later than the

beginning of the fifth semester in the program. A minimum GPA of 3.0 in graduate course-work and admission to an emphasis area is required to take the examination.

Students need to submit Candidacy Exam Request forms to Applied Science Department no later than May 15th or December 15th prior to the Fall or Spring semester exams to be taken, respectively.

Please see the section on Candidacy Exams below for other important information and details.

Ph.D. Dissertation Proposal Oral Examination

At least two years prior to the dissertation defense, candidates must present a written proposal in either a National Institutes of Health (NIH) or National Science Foundation (NSF) grant proposal format for their dissertation work to the advisory committee. The proposal will be given to the advisory committee two weeks in advance of meeting with the committee. Students should schedule Applied Science Conference Room for the oral defense. Proposal title, abstract, date, location, and names of student and dissertation advisor needs to be submitted to the Administrative Assistant of Applied Science Department at least two weeks prior to the oral defense to be announced to Applied Science faculty and students. The student must orally defend the rationale and experimental procedures for the proposed doctoral dissertation. Students are encouraged to present an open seminar on the proposal prior to meeting with the advisory committee. Students who fail the proposal may be dismissed from the program. The Chair of the Advisory Committee will obtain a degree audit from the graduate coordinator and present it to the committee during the proposal defense, and inform the student about the minimum number of credits needed to fulfill program requirements prior to graduation. Supervisory or Examining Committee Report form must be filed at the conclusion of defense with the Applied Science department.

Ph. D. Dissertation Defense Examination

In order to complete the requirements for the Ph.D. degree, students will prepare and successfully defend a written dissertation in accordance with the format and procedure dictated by the UALR Graduate School. Students must orally defend their completed Ph.D. research to their advisory committee. Dissertation should be provided to the members of advisory committee at least two weeks prior to oral defense. The date and location of the defense must be publicized at least two weeks in advance. Students should schedule Applied Science Conference Room for the oral defense. Dissertation title, abstract, date, location, and names of student and dissertation advisor needs to be submitted to the Administrative Assistant of Applied Science Department at least two weeks prior to the dissertation defense to be announced to UALR faculty and students. The first part of this final examination will be open to the public and will consist of an open seminar on the student's research. This will be followed by a closed examination during which the candidate will be examined by the Advisory Committee. This examination will follow guidelines established by the Graduate School. The examination can be wide-ranging, but will usually utilize the student's research as a starting point. At the completion of the examination, the Advisory Committee will vote to either pass or fail the student. If two negative votes are received from committee members, it is considered a failure of the exam. Supervisory or Examining Committee Report form, which will be provided to the chair of the Advisory Committee, must be signed by the members at the conclusion of defense and filed with the Applied Science department. Students who successfully pass the oral defense need to submit an acceptable written dissertation to Graduate School before December 1st for Fall semesters, May 1st for Spring semesters, and August 1st for Summer semesters. The format and content of the dissertation should meet the <http://ualr.edu/gradschool/index.php/home/thesis-and-dissertation-information> and satisfy the review and recommendations of the Advisory Committee.

Academic Standing

The Applied Science Chairman and Graduate Coordinator rely upon the recommendation of the student's Advisory Committee for suggestions regarding that student's status. If academic problems occur in the first year prior to the selection of a Doctoral Advisor, it is the responsibility of the Applied Science Chair or Graduate Coordinator to recommend a resolution to the problem. Normally, a student will be given every opportunity to correct this problem within one year, provided that all other indications (for example, research progress) are positive.

If a student receives one 'C' in his/her course-work, he/she will be warned that his academic performance is unacceptable, and he/she will be reviewed by the Doctoral Affairs Committee (DAC) which will suggest corrective action. A student receiving two 'C's or either a D or an F in his/her coursework will be dismissed from the program, pending review by the DAC.

A student must have a cumulative GPA of 3.0 or higher to graduate from the program.

In addition, a student's academic performance will be considered unacceptable if he/she fails to complete the following requirements in the semester that the student has accumulated net program eligible credits/timelines as mentioned below.

Requirements	Accumulated program eligible credits/timelines
Major advisor selection	18 credits
Dissertation Committee formation	27 credits
Take Candidacy exams	45 credits
Defend proposal	63 credits
Defend thesis	More than minimum of 72 credits and less than 108 credits

Summary of Graduation Requirements for Applied Science PhD Degree

- Minimum of 72 credit hours beyond BS degree
- Minimum of 18 credit hours graded course work (5000 and 7000 level)
- Minimum of 42 credit hours of 9000-level research-dissertation work
- Registration in Applied Science Seminar (ASCI 7190), or Applied Bioscience Seminar (ASCI 7192) for Applied Bioscience emphasis area students, is required every semester (1-credit/semester count towards the overall credit requirements)
- Successful completion of the Research Ethics course (will count towards the overall credit requirements)
- Successful completion of Laboratory Rotation (up to 2-credits count towards the overall credit requirements)
- Successful completion of the writing exam
- Formation of Dissertation and Advisory Committee (a minimum of 5 members)
- Successful completion of candidacy examinations
- Successful completion of dissertation proposal and oral defense
- Successful completion of dissertation defense
- Submission of an acceptable dissertation to Graduate School
- Successful completion of the program with a minimum GPA of 3.0

Additional Graduate Program Information

Annual Graduate Student Progress Report

All M.S. and Ph.D. students in the Applied Science Graduate Program will submit an Annual Graduate Student Progress Report by May 15 each year (Please see the report form attached in this document). The purpose of this report is to ensure that students are making satisfactory progress toward earning their degree. The report should be completed in its entirety every year and approved by the Research Advisor who will verify the information by his or her signature. The report then will be submitted to the departmental administrative assistant who will deliver reports to the Applied Science Graduate Coordinator. It is entirely the student's responsibility to complete the report, with appropriate signatures, by the May 15 deadline. For new students who started the program in Spring semester, Graduate Coordinator will sign as the provisional mentor. Students who fail to submit their Annual Graduate Student Progress Reports will not be allowed to register for credit hours until they do so.

Changing Emphasis Areas after Admission to the Graduate Program

Students are awarded financial support based upon the emphasis area to which they apply. Students who do not pursue a course prescribed by the selected emphasis area will lose their support. For foreign students, a loss of graduate support will impact their ability to support themselves. Additionally, their INS status will be affected.*

When students apply to the graduate program, they select their Ph.D. emphasis areas based on their undergraduate and/or graduate degree. The Department of Applied Science recognizes that every student has a unique background, personal goals, and professional desires. Therefore, an individual's program and course work may bridge between the various emphasis areas to allow a broad-based research program.

The appropriate liaisons and the Applied Science Graduate Coordinator must approve any emphasis area change within the Applied Science Doctoral Program after the student's first semester. Change to a different emphasis area will be discouraged whenever the student would need to take a substantial number of undergraduate courses to prepare for the candidacy requirements in the new emphasis area.

Students who do not pursue the program as outlined in their first semester by the Graduate Coordinator or in future semesters as outlined by their Ph.D. Advisory Committee will lose their financial support.

Students who are holding student F-1 visas should check with the International Student Office to ensure that they are not violating any of the conditions of their F-1 visa status.

Petitioning to Have Requirements Waived

The requirements described in this handbook provide a well-rounded background for all students in areas important to the pursuit of a career in Applied Science. While the described guidelines are to be fulfilled by all graduate students, the Department recognizes that specific cases may arise in which 1.) equivalent requirements (especially course requirements) have been fulfilled recently at a comparable university or, 2.) a student's program would benefit if specific aspects of the Applied Science requirements were modified. If a student feels this to be the case, a formal written petition may be made to the Doctoral Advisory Committee to request waiving or alteration of the Applied Science requirements. Students may petition only once for each issue and, in all cases, sufficient documentation must accompany the request. Petitions should be made in a timely fashion prior to graduation (generally within the first year for M.S. students and the first two years for Ph.D. students).

Waiving Departmental Course Requirements

An amply documented petition to waive departmental course requirements would include, but would not be limited to: grade received, institution and date the course was taken, a letter from the course instructor if possible, a copy of the course syllabus, a description of general areas covered, a listing of textbooks used in the course, and a letter of support from the student's Doctoral Advisor. Other areas open to petitioning include substitutions in general course area requirements. In all cases, the student should clearly describe why the current requirement would not best fulfill their needs and what would be gained as a result of any changes.

Graduate Student Travel

The Applied Science Graduate Program encourages student attendance at scientific meetings/workshops. Generally, a student's Doctoral Advisor is expected to provide support for students who are presenting papers/posters at a meeting. Alternatively, students should seek travel grants from an appropriate professional organization. Department of Applied Science and Graduate School can also provide student travel awards contingent on the availability of funds (Please see the travel award application forms attached.).

Code of Conduct for Graduate Students

Graduate students must abide by all relevant standards and rules of the University. You should recognize that there are general ethical standards that you are obligated to follow with respect to activities such as cheating or plagiarism. As employees, there are different standards with respect to the execution of your responsibilities, including the protection of University property. For instance, you should recognize that all research carried out under a sponsoring faculty member legally belongs not to the student, but to the University. Failure to abide by University or Departmental guidelines can result in dismissal from the program. If you are concerned about an ethical situation, you should consult your Doctoral Advisor, the Graduate Coordinator, or the Department Chair.

Leaving the Program

A student may request a temporary leave of absence from the Graduate Program by petitioning the Applied Science Chair. This should be done in writing and should contain appropriate explanations. To re-enter the program, the student must petition the Applied Science Department. Acceptance will depend upon issues such as past performance, funding availability and whether there is an advisor willing to accept the student in his/her laboratory. Students should recognize that without formally requesting and receiving such a Leave of Absence, they are officially terminated by the University any time they do not register for one semester, after which they must officially apply for readmittance to the University. To prevent the need to reapply for admittance, students should register in Applied Science Seminar (ASCI 7190) so they are registered for at least one class.

Students may resign from the Graduate Program at any time. To do so, they should write a letter to the Graduate Coordinator stating their intent. It is advised that students contemplating such a move should first consult with their Doctoral Advisor or the Graduate Coordinator before beginning such a process.

Students can be dismissed from a faculty member's research program at any time if the Doctoral Advisor (in consultation with the student's Advisory Committee) determines that the student is not making acceptable progress. Such a dismissal in itself will not constitute dismissal from the Department, but it is the obligation of the student to find an acceptable replacement Doctoral Advisor in the Program within one semester. Students will not be allowed to continue their education with the Department without a Doctoral Advisor. If you find yourself in this situation, you should schedule a session with the Graduate Coordinator to determine the best course of action.

Students can be terminated from the Graduate Program by the recommendation of their Advisory Committee and with the approval of Doctoral Affairs Committee for the following reasons:

- 1) Failure to meet minimum academic standards
- 2) Failure to make acceptable progress in their degree work
- 3) Failure to meet generally acceptable ethical standards of the University
- 4) Failure on the candidacy or research proposal exam
- 5) Failure during the thesis/dissertation or project (for non-thesis MS students) defense
- 6) Failure to have research advisor

It is the obligation of the student to ensure that they are complying with University and Departmental guidelines with respect to these aspects of their education. If students are unsure or concerned about their status within the Department, they should consult with their Doctoral Advisor, the Graduate Coordinator, or the Department Chair.

Facilities

Faculty members of the Applied Science graduate programs are primarily distributed between the ETAS, Science Laboratories Buildings, Dickinson Hall, Fribourgh Hall, and the Physics/Astronomy Building. The Applied Science Departmental office is located in room 300 of ETAS. The Graduate Institute of Technology (GIT) is located in room 329 of ETAS. Regular office hours are 8:00 am - 5:00 pm, Monday - Friday.

Department of Applied Science Registration Procedures

- ❖ Registration: Obtain a Registration and Advisement form in the Department of Applied Science main office.
- ❖ Complete and return the form to the Department of Applied Science main office after the approval of the doctoral advisor. The registration and advisement forms are to go through the Applied Science Graduate Coordinator for final approval. All advising flags¹ are lifted through Applied Science office ONLY. The advisement flag is cleared to allow you to register via BOSS. The form is retained as a Departmental record and is filed in your student folder. There may be other forms and/or paperwork that you will need to take care of, especially if you are a new student. This is determined by each individual student.
- ❖ Add / Drop:
 - Regardless of whether you wish to drop or withdraw from your classes you will need to do one of the following:
 - Come to the Office of Records and Registration, in Student Services Center 218, and make your request personally
Fax a signed Drop/Withdraw form to: (501).569.8168
Mail a signed Drop/Withdraw form to

University of Arkansas at Little Rock
Attn: Records and Registration
2801 South University Avenue
Little Rock, AR 72204-1099

- Drop your course online. You have until the last day of late registration to drop a course online. To determine this date please refer to our online pocket guides. **Please Note:** You can drop all but your final course in this manner. In order to drop a course online you will need to:

Log into your BOSS account

Read the *Important Dates* page and click the *Click here to continue...* link

Select *Student Services* from the options given

Click the *Registration* link from the menu

Click the *Add/Drop Classes* link from the menu

Select *Drop* from the drop-down menu next to the course(s) you wish to drop

Click the *Submit Changes* button at the bottom of the page

Sample Ph.D. Time Table

First Year

First Semester

Orientation Session

Meet with Graduate Coordinator - draft a plan of study

Take appropriate candidacy preparation courses

Complete three rotations as required

Select Doctoral Advisor by the end of the semester

¹ An advising flag is a hold placed on the records of a student who has not turned in the Advisement form. Please note that ONLY the Applied Science department can lift the advising flag.

Second Semester

- Continue course work
- Submit Annual Progress Report
- Select Doctoral Advisor by the end of the semester in the event that this was not done in the first semester

Summer

- Begin Dissertation work

Second Year**First Semester**

- Continue preparatory courses
- Form and meet with Advisory Committee to plan dissertation work
- Develop a plan of study and submit to the Doctoral Advisory Committee

Second Semester

- Conclude preparatory course work
- Continue dissertation effort
- Submit Annual Progress Report
- Submit finalized Plan of Study to Doctoral Advisory Committee

Summer

- Concentrate upon dissertation research
- Prepare for Candidacy Exams

Third Year**First Semester**

- Take Candidacy Exams
- Prepare and Defend Research Proposal by the third year of Study
- Take any specialized course work outlined in the Plan of Study
- Continue dissertation research

Second Semester

- Prepare and Defend Research Proposal

Remaining Semesters

- Conclude Dissertation research
- Submit Annual Progress Report in the spring term of each subsequent year

At least one semester prior to intended graduation, begin writing your dissertation

APPLIED SCIENCE AREAS OF EMPHASIS

APPLIED BIOSCIENCES

Applied Biosciences is an interdisciplinary research and academic emphasis offering advanced degrees through the Department of Applied Science. The emphasis incorporates faculty with research programs in the UALR Departments of Biology, Applied Science, and Chemistry. The emphasis is coordinated with the developing biotechnology industry within the state of Arkansas and is aligned with related programs in the University of Arkansas system.

The Applied Biosciences Working Group

The Applied Biosciences Working Group is a group of faculty that acts in an oversight role for the Applied Biosciences emphasis, helping to develop policy governing the program and working to improve the program to the benefit of both faculty and students. The working group is responsible for recommending student admissions and candidates for Graduate Assistantships, overseeing student progress, moderating conflicts between advisors and students when requested and administering other general University and Departmental policies regarding graduate student activities.

Recognizing that science is a cooperative enterprise, the Applied Biosciences working group strives to create a sense of community, cooperation and caring among students and between students, faculty and staff. This is facilitated through participation in seminars, colloquia and special social functions. It is to your advantage to participate fully in all of these activities.

Applied Biosciences Seminar Requirement

Attendance at the Applied Biosciences weekly seminar series is mandatory and all Applied Bioscience PhD students must enroll in ASCI 7192 for one unit each semester. Students are encouraged to present their seminars as part of the final Ph.D. Dissertation Defense examination.

For information on Candidacy courses, go to the section on CANDIDACY EXAMS.

Applied Biosciences Course Descriptions

ASCI 7192 Applied Biosciences and Bioinformatics Seminar

Prerequisites: graduate standing, consent of thesis advisor and graduate coordinator. Students, faculty, and invited speakers will present, discuss and exchange ideas on research topics of general interest in the field of Biotechnology. One-hour session per week. Course may be repeated for credit. Graded: credit/ no credit.

ASCI 7375 Biochemistry of Biological Molecules

Prerequisites: introductory biochemistry course or permission of the instructor. Three, five-week modules providing a critical introduction into the structure and biological functions of nucleic acids, proteins and membranes. Topics in the first section, nucleic acids, include structure-function relationships among DNA, RNA, and proteins during replication, transcription and translation. Topics in the second section, proteins, include the principles of protein folding, function, purification and enzyme kinetics. Topics in the third section, membranes, include mobility of membrane constituents, properties of membrane proteins, mechanisms of membrane transport, membrane synthesis and flow, secretion, receptors and signal transduction.

ASCI 7385 Concepts in Genetic Analysis

Prerequisites: introductory undergraduate genetics or molecular biology course. Methods of genetic analysis including mutant isolation, genetic and physical mapping, receptors genetics, evolutionary mechanisms, molecular variation and genomic evolution.

ASCI 7386 Recombinant DNA Methods and Applications

Prerequisite: Graduate standing in Applied Science or consent of instructor. A laboratory course which teaches the principles, techniques, and applications of recombinant DNA technology, gene cloning, restriction enzyme methods and nucleic acid sequencing. Discussions emphasize both the basic molecular biology of genes and how the techniques can be applied to understand gene structure and regulation elucidate gene function, prepare vaccines, etc. Six hours of laboratory per week.

ASCI 7387 Genomics

Prerequisites: BIOL 3300 Genetics or equivalent or consent of the instructor. The course provides an overview of genomes, the current methods to study genomes, and the function and evolution of genomes. Specific areas and topics that will be discussed include large-scale sequencing projects, genome structure and evolution, genomic variation, and genome-wide analysis of gene/protein expression. Additionally, since advances in genomics are often driven by technology, the course will familiarize students with current methods being used in the field (e.g., computational approaches to comparative sequence analysis, DNA microarrays, proteomic techniques, etc.). The course will rely on current literature with lectures on basic principles as necessary to give students an introduction to a particular topic.

BIOL 7310 Experimental Design

Prerequisites: Graduate standing and a previous course in statistics, BIOL 4415/5415 Biometry is highly recommended. Experimental design in biology is designed to provide students with an appreciation of the utility of rigorous experimental design and the use of inferential statistics in research with biological systems. Students will be given a background in the statistical requirements of manipulative experiments and will critique research designs in recently published literature. Three credit hours.

BIOL 5401 Cell Biology

Prerequisites: BIOL 1400 or 1401, 12 additional hours in biology, CHEM 1401 or 1403; microbiology is strongly encouraged. A study of the organization of cells as related to the structure and function of biological molecules. Emphasis is placed on eukaryotic cells. Three hours lecture and three hours laboratory per week. Four credit hours.

BIOL 5403 Comparative Physiology

Prerequisites: BIOL 1400 or 1401, 2403, CHEM 1403, or the equivalents. Organ function in a wide range of organisms, including vertebrates and invertebrates. A comprehensive survey of functional relationships in more than one group of animals. Three hours lecture and three hours laboratory per week. Four credit hours.

BIOL 5406 Pathogenic Microbiology

Prerequisites: BIOL 1400 or 1401, 2401, or their equivalents. Survey of pathogenic microbiology, immunology, virology with emphasis on fundamental principles of each science and their application to the diagnosis and control of human diseases. Three hours lecture and two hours laboratory per week. Four credit hours.

BIOL 5413 Immunology

Prerequisites: BIOL 1400 or 1401, 2401, CHEM 1402, 1403. Immunobiology and immunochemistry of humoral and cellular mechanisms of immunity. Three hours lecture and two hours laboratory per week. Four credit hours.

BIOL 5415 Biometry

Prerequisites: 12 hours of biology, environmental health science, or earth science (in combination or singularly); MATH 1302 or higher numbered mathematics course, three hours of statistics, or consent of instructor. Graduate standing required if student enrolled in 5415. A computer based course in experimental design, data analysis and interpretation. The objective of the course is to teach the application of statistical procedures relevant to the academic emphasis of students, not statistics per se. Designed to be especially beneficial to those students planning to seek an advanced degree upon completion of their baccalaureate or to go into quality control or research positions. Two hours lecture and four hours laboratory per week. Four credit hours.

BIOL 5416 Microscopy

Prerequisites: 15 hours of biology. Graduate standing if student enrolled in 5416. A laboratory course in the fundamental theory and practical application of light and electron microscopy including specimen preparation, photomicrography and digital computer image processing and enhancement. Topics include brightfields, darkfield, phase, differential interference contrast, polarized and epic fluorescent light microscopy and scanning and transmission electron microscopy. Strong emphasis is placed on experimental design and use of the microscope as an experimental tool. Two hours lecture and four hours laboratory per week. Four credit hours.

BIOL 5417 Molecular Biology

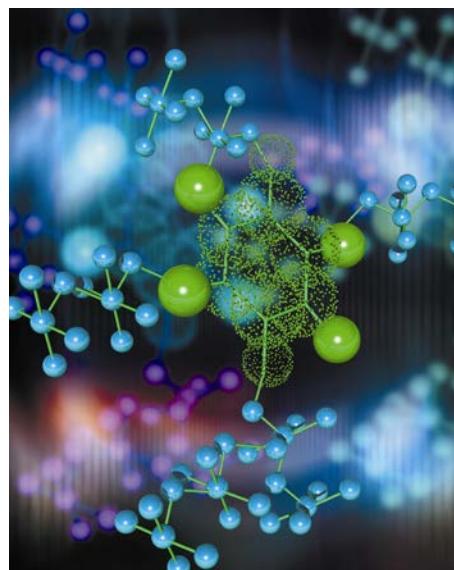
Prerequisites: 19 hours in biology including both Biology 2401 and 3300; CHEM 1401 or 1403. BIOL 3400 and 4401/5401 are strongly recommended. BIOL 4417/5417 also is recommended or may be taken concurrently. A study of the applied science of biotechnology designed to introduce students to the elements of a biotechnological career. Topics range from traditional biotechnology such as animal and plant tissue culture to contemporary molecular biotechnology and the use of recombinant DNA technology and genetic engineering in research and industry. Emphasis will be placed on current biomedical, pharmaceutical and agri/industrial applications. Graduate students must complete and defend a term paper. Two hours lecture and four hours laboratory per week. Four credit hours.

BIOL 5419 Plant Physiology

Prerequisites: BIOL 1400 or 1401, 2402, CHEM 2450, or their equivalents, or consent of instructor. Study of water relations, nutrition and metabolism including photosynthesis, growth and development. Two hours lecture and four hours laboratory per week. Four credit hours.

CHEM 5420 Biochemistry

Prerequisites: CHEM 2510, 3151 and 3351. Basic chemistry and metabolism of proteins, lipids, carbohydrates and nucleic acids; action of vitamins, hormones and enzymes. Three hours lecture and three hours laboratory per week. Three credit hours.



APPLIED CHEMISTRY

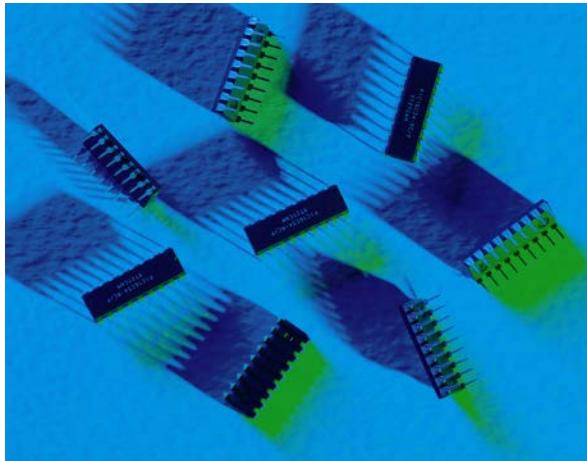
The Applied Science's Ph.D. provides advanced preparation for careers in government, industrial, and academic research. The degree offers a flexible program of study in order to take advantage of the previous training of each student. The number of required courses has been minimized, placing the responsibility for developing a student's program upon the student and their advisory committee. Research is the major emphasis of this program. Our faculty members pursue vigorous and productive research programs on a variety of topics, providing graduate students with numerous opportunities to select an area of specialization. Teaching is also a required activity in the program, and graduate students contribute to the teaching mission of the Chemistry Department as TAs (teaching assistants), most often in freshman level laboratories.

The Applied Chemistry Faculty

Participating faculty are from the Department of Chemistry and the Department of Applied Science. In addition to their other faculty responsibilities, this faculty directs Applied Chemistry students in doctoral research, serve as members of the student's supervisory committees, and generally oversee operation of the program. They also serve as supervisors for the work assignments of Ph.D. students supported by a state-funded graduate assistantship. Several faculty are engaged in collaborative research programs, bringing together talents and knowledge from different areas to focus on interdisciplinary problems. Research collaborations exist among this group of faculty, as well as externally with the University of Arkansas for Medical Sciences (UAMS) and the National Center for Toxicological Research (NCTR). Research collaborations outside the central Arkansas area have included NASA-Kennedy Space Center and Oak Ridge National Laboratories.

Students in Applied Chemistry

Participating students are a diverse group, whose academic background represents not only Arkansas and the surrounding region, but also many other states and foreign countries. Students work closely with one another and with faculty mentors, creating a spirit of community and cooperation. This is facilitated through seminars and various social functions. Students are expected to conduct themselves in a professional and ethical manner. A specific goal and benefit of the program is development of the student's skills in all areas of scientific communication.



For information on Candidacy courses, go to the section on CANDIDACY EXAMS.

Applied Chemistry Course Descriptions

ASCI 7309 Electronics for Scientists

Prerequisites: advanced mathematics, science, or engineering background or consent of instructor. A course in electronics for those with limited or no previous background. Topics covered include DC and AC circuits, diodes, transistors, ideal operation amplifiers and digital circuits. This course has a major laboratory component. Two hours lecture and three hours lab per week.

ASCI 7399 Special Topics in Applied Science

Detailed study in applied science and related areas; may be lecture or lecture and laboratory, depending on specific topics. Variable credit of one to three hours. On demand.

CHEM 5251 Organic Preparations

Prerequisite: CHEM 3151 or 4250. Advanced experiments in organic chemistry using special apparatus and techniques. Two three-hour laboratories per week. On demand.

CHEM 5340 Inorganic Chemistry

Prerequisite or corequisite: CHEM 3340 and 3371 (the latter may be taken as corequisite). A theoretical treatment of inorganic chemistry to include atomic structure, valence bond, molecular orbital and ligand field theories; the crystalline state; thermodynamic and kinetic aspects of transition metal chemistry. Laboratory will reinforce concepts developed in lecture. Two hours lecture and three hours of laboratory per week. Spring.

CHEM 5350 Intermediate Organic Chemistry

Prerequisite: CHEM 3351. Reaction mechanisms; correlation of structure with reactivity; literature survey of recent advances in the field. Three hours lecture per week. On demand

CHEM 5380 Introduction to Polymer Chemistry

Prerequisites: CHEM 3151 and 3351 or 4250 (recommended, but not required: CHEM 3170, 3271, 3371, 3470 and 3572). Coordination of theoretical and practical aspects; includes history, types of polymerizations, kinetics, molecular weight, physical properties including thermal and spectroscopic characterization, biopolymers and engineering resins. Two hours lecture and three hours of laboratory per week. Even years in the Spring.

CHEM 5399 Special Topics in Chemistry

Prerequisite: consent of instructor. Topics may include chemical carcinogenesis, environmental chemistry, solid-state chemistry, radiochemistry, macromolecules, surface chemistry, quantum chemistry and others. Three hours lecture per week. On demand.

CHEM 5411 Instrumental Analysis

Prerequisites: CHEM 2510 and 3351; PHYS 1322 or 2322. Most common modern instrumental methods of analysis; includes topics in spectroscopy, electrochemistry and chromatography. Three hours lecture and one four-hour laboratory per week. Fall.

CHEM 5420 Biochemistry

Prerequisites: CHEM 2510, 3151 and 3351. Basic chemistry and metabolism of proteins, lipids, carbohydrates and nucleic acids; action of vitamins, hormones and enzymes. Three hours lecture and three hours laboratory per week. Spring.

CHEM 7311 Advanced Analytical Chemistry

Prerequisite: CHEM 4411/5411 or equivalent. Complex solution equilibria and selected topics in spectroscopy, electro-analytical techniques and separations procedures. Three hours lecture per week.

CHEM 7340 Advanced Inorganic Chemistry

Prerequisite: CHEM 4340/5340 or equivalent. Advanced theoretical concepts; includes atomic structure, molecular and solid structures, bonding, ligand field theory, organometallic chemistry and metals chemistry and reaction mechanisms. Three hours lecture per week.

CHEM 7317, 7318, 7319 Selected Topics in Analytical Chemistry

Prerequisite: consent of instructor. Topics may include electro-analytical techniques, modern functional group analysis, instrumental design and control and others. On demand

CHEM 7347, 7348, 7349 Selected Topics in Inorganic Chemistry

Prerequisite: CHEM 4340/5340. Topics may include magnetochemistry, X-ray crystallography, chemistry of diamond-like semiconductors, chemistry of rare earth elements, chemistry of boron and its compounds, reaction mechanisms and others. Three hours lecture per week. On demand.

CHEM 7350 Organic Reaction Mechanisms

Prerequisites: CHEM 3350 or equivalent and 3351 or equivalent. Reaction mechanisms of classical organic reactions; includes ionic and free radical addition and substitution, oxidation, reduction and elimination reactions. Three hours lecture per week. Fall

CHEM 7351 Modern Synthetic Reactions

Prerequisites: CHEM 3350 or equivalent and 3351 or equivalent. Modern organic reactions and their applications in synthesis. Three hours lecture per week. On demand.

CHEM 7357, 7358, 7359 Selected Topics in Organic Chemistry

Prerequisites: CHEM 3350 and 3351. Topics may include natural products, stereochemistry, photochemistry, heterocyclic compounds, free radicals, carbenes, polymers and others. Three hours lecture per week. On demand.

CHEM 7370 Physical Principles of Chemical Reactivity

Prerequisites: CHEM 3371 or equivalent and 3470 or equivalent. Chemical and physical properties of selected species in terms of thermodynamics, kinetics and molecular structure; examples in scientific literature illustrate how physical chemistry principles may be applied to chemical reactivity. Three hours lecture per week. Spring

CHEM 7371 Chemical Thermodynamics

Prerequisites: CHEM 3371, 3470. Application of the three laws of thermodynamics to chemical systems; relates spontaneity and equilibrium in gaseous, heterogeneous-phase, and solution reactions to thermal and electrochemical measurements. Three hours lecture per week. On demand.

CHEM 7372 Chemical Kinetics

Prerequisites: CHEM 3371 and 3470. Chemical reaction rates; includes determination of empirical rate laws, collision and transition state theories, activation energy and catalysis, reaction mechanisms and kinetic intermediates. Three hours lecture per week. On demand.

CHEM 7377, 7378, 7379 Selected Topics in Physical Chemistry

Prerequisites: CHEM 3371 and 3470. Topics may include quantum chemistry, statistical thermodynamics, semi-empirical molecular orbital calculations, molecular spectroscopy, photochemistry, states of matter, mathematical methods in chemistry and others. Three hours lecture per week. On demand.

Biol 5417 Molecular Biology

Prerequisites: nineteen hours in biology including both BIOL 2401 and 3300; CHEM 1401 or 1403; BS in biology or permission of instructor. Successful completion of either Biology 3400 or Biology 4401 is strongly encouraged. A study of molecular biology theory and practice. Emphasis is on the study of model systems to understand the current approaches and laboratory techniques necessary to answer basic questions in current molecular biology. Two hours of lecture and four hours of laboratory per week. Spring.

APPLIED PHYSICS

The emphasis area incorporates research programs from the UALR Departments of Applied Science and Physics and Astronomy. Current research areas are listed below with a brief description of each area.

Materials Research

This research area focuses on properties, characterization, and advanced technological applications of thin film and nanostructured materials. Research topics include micro- and nano-fabrication, advanced characterization techniques, solid state physics, materials for energy applications, bio-materials, multifunctional materials, smart materials, thin film coating technologies, composite materials, and materials for space exploration. For more information e-mail Dr. Tansel Karabacak at txkarabacak@ualr.edu or phone him at 501-569-8045.

Applied Geophysics and Seismology

Applied Geophysics, which combines knowledge from physics, mathematics, and geology, includes exploration and imaging of the earth's interior through physical measurement collected at or near the earth's surface by highly specialized equipment. The research program at UALR is oriented toward the development and application of geophysical technologies for environmental, geotechnical, and engineering applications. Gravity, magnetic, electric, seismic, and ground penetrating radar are the main technologies utilized in the research. Topography and three-dimensional imaging of the shallow subsurface using these technologies is an important research focus. Research in earthquake seismology is also conducted through the Applied Physics area.. For more information e-mail Dr. Haydar Al-Shukri at hjalshukri@ualr.edu or phone him at 501-569-8000.

Direct Dark Matter Searches

DarkSide (Depleted Argon Cryogenic Scintillation and Ionization Detection) is an experimental collaboration for the detection of Weakly Interacting Massive Particles (WIMPs), a proposed form of dark matter. Its scientific program is planned in phases with increasing sensitivity. The first step is Darkside-50, a dual-phase, 50 kg depleted argon time projection chamber (TPC). WIMPs would be detected when they scatter off an argon nucleus in the bulk liquid argon target. The nucleus recoils leaving a short track of ionized argon. Molecular processes of electronic recombination produce a flash of scintillation light detected by arrays of photomultiplier tubes (PMTs). By applying an electric field, a fraction of the electrons are drifted to the anode grid, multiplied in the gas phase above the liquid argon and detected as a second signal. This dual readout allows us to distinguish nuclear recoils from other background events. Darkside-50 will be deployed at the Gran Sasso underground laboratories in Italy. The second phase of DarkSide is within a larger project called MAX (Multi-ton Argon and Xenon detectors), which also includes the XENON collaboration. The plan is to run dual-phase ton-sized depleted argon and xenon detectors side by side, to validate discovery claims with different targets. For more information e-mail Dr. Marc S. Seigar at mxseigar@ualr.edu or phone him at 501-569-8964.

Extragalactic Astrophysics

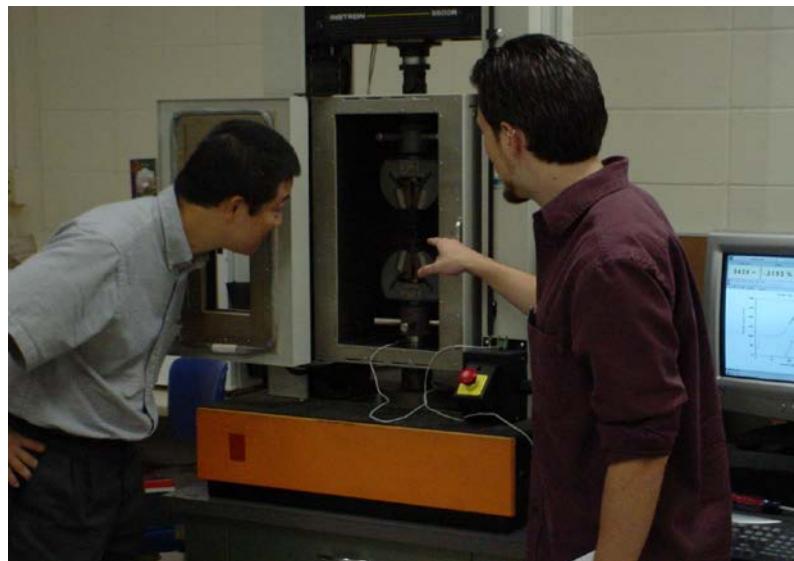
The Arkansas Galaxy Evolution Survey (AGES) collaboration is involved in research in the areas of structure, morphology, and dynamics of nearby galaxies, and the dynamics of clusters of galaxies. Areas of particular interest include the nature of central supermassive black holes, the amount and distribution of dark matter in galaxies, spiral structure, and barred galaxies. We have access to large datasets including, Hubble Space Telescope archival data, Spitzer Space Telescope archival data, Sloan Digital Sky Survey data, The Carnegie-Irvine Galaxy Survey, and the future data products of the Large Synoptic Survey Telescope. For more information e-mail Dr. Marc S. Seigar at mxseigar@ualr.edu or phone him at 501-569-8964.

Optics Research

The science of optics and the technology of photonics (generating and harnessing light and other forms of radiant energy whose quantum unit is the photon) are now recognized as critical enablers for information technology and telecommunications, health care and the life sciences, sensing applications in industry and manufacturing, and developments in several areas of national defense. The Applied Optics Laboratory (AOL) at UALR provides research opportunities in the Applied Physics emphasis area for students interested in developing photonic devices for measurements in industry, the

environment, aerospace, medicine, and agriculture. For more information e-mail Dr. Al Adams at ajadams@ualr.edu or phone him at 501-683-7086.

For information on Candidacy courses, go to the section on CANDIDACY EXAMS.



Applied Physics Course Descriptions

ASCI 5310 Introduction to Signal Processing

Prerequisite: MATH 3322 or equivalent. Introduction to the fundamental concepts in signal processing. Use of the fundamental transform techniques (Laplace transform, discrete Fourier transform, z-transform). Discrete time representation of signals, linear time invariant systems. Correlation, coherence, and time delays. Standard system models (ARMA, ARMAX). FIR and IIR filters. Three hours lecture. Three credit hours.

ASCI 5315 Advanced Dynamics I

Prerequisites: MATH 2453 and PHYS 3311. Kinematics of translating and rotating vectors. Dynamics of systems of particles and rigid bodies. Angular momentum. Newtonian mechanics. Lagrangian mechanics. Examples drawn from the fields of robotics, vehicle motion and planetary motion.

ASCI 5325 Measurement Techniques

Prerequisite: SYEN 2315 or equivalent. Principles of operation and implementation of transducers used in electronic measuring systems. Sensors used for the measurement of strain, capacitance, pressure, flow, force velocity, temperature, humidity, vibration, sound, and acceleration are discussed. Interfacing transducers with a digital system will be emphasized. Effects of quantization, scaling, sampling time, and bandwidth will be examined. Two hours lecture and two hours laboratory per week.

ASCI 5330 Acoustics I

Prerequisite: MATH 2453 or equivalent. Development of the equations for acoustics and vibrations. Transducers for measurement of sound and acceleration. Design of sonic actuators using network analysis. Analog and digital processing of signals, including spectral analysis, adaptive signal processing, and cepstral analysis. Applications to noise analysis and control, and machinery diagnosis through sound and vibration measurements. Three hours lecture. Three credit hours.

ASCI 5335 Mechatronics I

Prerequisite: MATH 2453 or equivalent, PHYS 2321 or equivalent. This course covers basic mechanical design elements, including gears, fasteners, bearings, sprockets and chains, timing pulleys, brakes and clutches. Methods of attaching power and timing elements to shafts, including standard keys, Woodruff keys, splines, pins, and press-fits, are covered. Use of electric motors and pneumatics in mechanical systems is covered. Integration of sensors, including potentiometers, limit switches, and yaw rate sensors is covered. Theories of failure will be introduced, and basic stress/strain calculations will be done. Design theories and project management will be introduced. Three hours lecture. Three credit hours.

ASCI 5340 Mechatronics II

Prerequisite: ASCI 4335 or equivalent. The combination of classical mechanical design, electronic analysis and design, control engineering, and computer science in the design of complex electric-mechanical-controlled systems. Commonly used sensors (Encoders, potentiometers, accelerometers) and actuators (stepping motors, DC motors) are studied. Interfacing sensors and actuators to a microcomputer, discrete controller design, and real-time programming for control using the C programming language. There is a significant, out-of-class project exercise associated with this course. Three hours lecture. Three hours credit.

ASCI 5350 Analog and Digital Electronics Design

Prerequisite: SYEN 2315 or equivalent. Operation of analog, digital integrated circuits. Includes amplifiers, A/D and D/A circuits, active filters, special function circuits as used in computers and instrumentation for measurement and control. Three hours lecture. Three credit hours.

ASCI 5355 Elastic Wave Theory

Prerequisites: MATH 1451, MATH 1452, MATH 2453 and MATH 3322. Elasticity theory developed as a basic necessity to the theory of seismology. Analysis of stress and infinitesimal strain. Perfect elasticity. Equation of motion in term of displacement. Vibration and waves. Theories of body and surface waves. Ray theory and energy partition.

ASCI 5360 Potential Theory

Prerequisites: MATH 1451, MATH 1452, MATH 2453 and MATH 3322. Solution to Laplace's equation using different boundary and initial conditions. One-, Two- and three-dimensional equations will be analyzed. Various coordinate system (rectangular, cylindrical and spherical) will be used in the solution of the Laplace function, the Associate Legendre function and orthogonality of the Legendre function.

ASCI 7295 Practical Topics in Science Management

A survey of practical topics relevant to practicing scientist and engineers such as ethics, project management, and grant writing. While an emphasis is placed on bioinformatics, topics will be of interest to all participating in science and engineering projects. Two credit hours. Cross-listed with BINF 7295.

ASCI 7306 Real-time Embedded Systems

This course presents technologies for the design and implementation of embedded systems using Linux Operating System (OS). Such technologies include Linux, real-time Linux OS, and real-time embedded application design. Students will learn how to administer Linux OS and how to create a task-specific kernel for their own embedded application. They will learn techniques necessary for developing real-time kernel for their own embedded application. They will learn techniques necessary for developing real-time Linux device drivers, real-time kernel and user space. Students will obtain hands-on experience with embedded software design through course projects. Upon completing this course, students should be able to develop their own embedded applications based on open source software resources.

ASCI 7307 Smart Materials

Prerequisite: ASCI 4320 or equivalent. This course will deal with the unique nonlinear, hysteretic response of smart materials that arise due to coupling between mechanical and thermal or electric or magnetic fields. Specifically, microstructural characteristics and constitutive modeling of shape memory alloys, ferroelectric materials and ferromagnetic materials will be covered. Use of these smart materials in sensor and actuator design will be addressed.

ASCI 7312 Transducers and Real Time Control

Prerequisites: ASCI 4335 or equivalent, ASCI 7302, SYEN 1302 or equivalent. Applications of computer techniques for data acquisition, analysis, and real-time control; use of analog-to-digital, digital-to-analog, digital I/O for measurement; C

computer language for experiment control; use of standard transduction elements for physical measurements such as position, velocity, acceleration, and force.

ASCI 7318 Micro- and Nano-Fabrication

Pre-requisites: Consent of instructor. This course will introduce some of the important micro- and nano-fabrication techniques that are mostly used in the areas of microelectronics and nanotechnology. Some of the topics that will be covered include diffusion of impurities, thermal oxidation, ion implantation, optical lithography, thin film deposition, etching, nanolithography, nano-imprinting, growth of nanorods and nanosprings by glancing angle deposition, and growth of carbon nanotubes. During the course, students will become familiar with some of the basic experiments including thin film and glancing angle depositions, etching, and film characterization techniques. The course is intended for graduate students from science and engineering majors.

ASCI 7317 Nanostructural Materials: Physical and Chemical Properties

Pre-requisites: SYEN 3372 or PHYS 4340 or CHEM 4340 or equivalent. This course introduces students to the area of nanotechnology and the novel properties of the materials built at the nanoscale. The course will cover the main properties of nanomaterials, various methods for synthesis and characterization and the most up-to-date applications from nanoelectronics, advanced materials, bio-medicine, etc. The course is designed for graduate students with a background in chemistry, physics, and engineering.

.ASCI 7340 Applied Instrumental Optics

Fundamental concepts in design and implementation of optical principles in analytical instrumentation; solving optics engineering problems; includes electromagnetic wave analysis, reflection and refraction, interference and diffraction, optical waveguides, Fourier analysis, coherence and holography. On demand.

ASCI 7341 Electro-Optics Instrumentation

Prerequisite: Applied Science 7340 or equivalent. Physical principles and operating characteristics of electro-optical devices and systems; gas, chemical, solid state and semiconductor lasers; Gaussian beam optics, laser modulators and scanners; imaging devices; thermal and photon detectors; fiber and integrated optics; nonlinear optical devices. On demand.

.ASCI 7355 Introduction to Geophysics

Prerequisite: MATH 1451. Application of geology and geophysics to study the interior of the earth and the development of its surface features.

ASCI 7360 Applied Geophysics

Prerequisite: MATH 3322. Utilization of various geophysical prospecting techniques to explore the upper few kilometers of the earth for natural resources and environmental and engineering problems. Introduce the students to the main methods of geophysical prospecting, instrumentation and fieldwork. Train the students on the planning of the geophysical field experiments, selecting the appropriate equipment for each particular problem, executing the required work and handling the field procedures. Introduce the students to various techniques of reducing geophysical data, forward and inverse modeling and geological interpretation. Spring

ASCI 7365 Advanced Seismology

Prerequisite: MATH 3322. Analysis of seismic waves in a uniform medium from a pressure pulse in a spherical cavity. Solution to Sharpe's problem using Laplace Transform. Wave propagation from sources in layered medium of different physical conditions. Numerical integration of equation of motion. Seismometry. Foca mechanism and source characteristics. Internal structure of the earth. Nuclear testing and other explosions. Spring

COMPUTATIONAL SCIENCE

Computational Science is an interdisciplinary research and academic emphasis offering a Ph.D. Degree through the Department of Applied Science in coordination with the departments of Mathematics and Statistics, Physics and Astronomy, and Chemistry. The emphasis is designed to enable students in a wide variety of scientific fields to become experts at applying computational tools and techniques to their specific disciplines.

Admission to the Computational Science Emphasis Area

Computational Science emphasis area requires knowledge of discrete mathematics, differential and integral calculus for single and multivariate functions, linear algebra, differential equations, mathematical statistics, and knowledge of programming through data structures. Additional prerequisites may be required for courses in each concentration area.

For information on Candidacy courses, go to the section on CANDIDACY EXAMS.

Computational Science Course Descriptions

CPSC 7312 Parallel Processing

Prerequisites: graduate standing; CPSC 2380 and IFSC 3482. Concepts of parallel computing, parallel architectures and interconnection networks; parallel programming and applications; basic paradigms and primitives, programming using PVM and MPI; efficient mapping of programs, automatic parallelization of serial code.

MATH 7311 Advanced Linear Algebra

Prerequisites: Mathematics 3312 or equivalent course. Vector spaces, subspaces, linear independence and dependence, basis and dimensions; Linear transformations, null space, rank, isomorphism; Inner product spaces, norms, inner products, orthogonal sets, orthogonal projections, bilinear and quadratic forms; Eigenvalues and eigenvectors, similar matrices, diagonalization, symmetric and Hermitian matrices, Jordan canonical form. Three lecture hours per week.

MATH 7312 Computational Linear Algebra Prerequisites: MATH 3312 and 4323. LU decomposition; QR factorization; iterative techniques for solving systems of equations and Gauss-Seidel; eigenvalue problems, iterative and direct techniques, the condition number; Lanczos algorithm. Three lecture hours per week.

MATH 7323 Advanced Numerical Analysis I

Prerequisites: MATH 5323 and 7311. Numerical solutions of linear operator equations, some nonlinear systems and optimization methods. Three lecture hours per week.

MATH 7324 Advanced Numerical Analysis II

Prerequisites: Mathematics 7323 and 7325. Numerical analysis of ordinary and partial differential equations. Three lecture hours per week.

MATH 7325 Partial Differential Equations

Prerequisites: MATH 3322 or equivalent course. First-order equations in two independent variables, the method of characteristics, discontinuous and weak solutions; linear second order equations, elliptic equations, hyperbolic equations and parabolic equations; Fourier series. Three lecture hours per week.

MATH 7327 Graph Theory

Prerequisites: MATH 3312 or equivalent course. Graphs and subgraphs; trees; connectivity; Euler tours and Hamiltonian cycles; matchings; planar graphs; directed graphs; networks. Three lecture hours per week.

MATH 7351 Mathematical Statistics II

Prerequisites: Mathematics 7350. Sampling, sampling distributions, order statistics, point estimators and their properties, interval estimators and their properties, test of hypotheses, linear models, nonparametric methods. Three lecture hours per week.

MATH 7355 Sampling Techniques

Prerequisites: Mathematics 7350; Mathematics 7350 may be corequisite with consent of instructor. Simple random sampling; Sampling for proportions; Stratified random sampling; Ratio estimators; Systematic random sampling; Cluster sampling; Acceptance sampling. Three lecture hours per week.

MATH 7399 Selected Topics in Applied Mathematics

Prerequisites: Consent of the instructor. Topics in mathematics, applied mathematics, and numerical analysis may include discrete mathematics; ordinary, partial differential equations; integral transforms; complex variables; optimization techniques, linear algebra; approximation theory; topology; geometry; abstract algebra; number theory. Topics in statistics may include statistical inference, sampling, linear models, biostatistics, stochastic processes, statistical computing. May be repeated for credit when topic changes. On demand.

CANDIDACY EXAMS

You need to get approval from the Graduate Coordinator before taking the candidacy exams. Students need to submit Candidacy Exam Request forms to Applied Science Department no later than May 15th or December 15th prior to the Fall or Spring semester exams to be taken, respectively.

Use the simple steps below to decide on the areas you would like to be tested on, fill up the “Candidacy exam request form” at the end of this handbook (electronic version of the form can be requested from the Applied Science Office) and submit the form to the Applied Science department administrative assistant.

Steps by select candidacy area selections:

1. Consult the table below that is specific to your emphasis area.
2. Select four candidacy subjects you want to be tested on.
3. For each candidacy subject, select a candidacy course you want to be tested on (Under the Discipline-Specific Applications subject, a course listed in other subjects of the same emphasis area can not be requested for candidacy exam). You must have taken these courses here at UALR before taking the corresponding candidacy exams. However, a *one-time waiver may be granted. See the end of this section for details.*
4. Take exams in all four candidacy subjects in one semester (no exceptions). If you pass all four exams, you are done. If you fail one or more exams, you will have only one more chance to pass the exams in the semester immediately following the semester you took the exams for the first time. Exams that you passed in the first attempt must not to be retaken.
5. If you fail one or more candidacy subject(s), you may retake the exam in the same subject(s) or other candidacy subject(s) that was (were) not part of the original four within the emphasis area.

EMPHASIS AREA: Applied Biosciences							
	CANDIDACY SUBJECTS						
	(Candidacy subjects appear in bold letters below. There may be one or more candidacy courses under each candidacy subject. These appear in regular font.)						
CANDIDACY COURSES	Organismal Functions	Cellular Function	Genetics	Biochemistry and Molecular Biology	Biological Modeling and Analysis	Ecological Interactions	Discipline-Specific Applications
	BIOL 5403 Comparative Physiology	BIOL 5401 Cell Biology	ASCI 7385 Concepts in Genetic Analysis	BIOL 5418 Molecular Biology	BIOL 5415 Biometry	BIOL 7311 Behavioral Ecology	In this section, any COS course with a regular course number (i.e. Special topics with 5399 or 7399 designation not allowed) may be chosen.
	BIOL 5419 Plant Physiology	BIOL 5413 Immunology	ASCI 7387 Genomics	ASCI 7375 Biochemistry of Biological Molecules	BIOL 7420 Phylogenetics	BIOL 5412 Plant Ecology	
	BIOL 5422 Mammalian Physiology	BIOL 5406 Pathogenic Microbiology			BIOL 7310 Experimental Design		
	ASCI 7386 Recombinant DNA Methods and Applications						

EMPHASIS AREA: Applied Chemistry					
	CANDIDACY SUBJECTS				
	Analytical Chemistry	Inorganic Chemistry	Organic Chemistry	Physical Chemistry	Discipline-Specific Applications
CANDIDACY COURSES	CHEM 7311 Advanced Analytical Chemistry	CHEM 7340 Advanced Inorganic Chemistry	CHEM 7350 Organic Reaction Mechanisms	CHEM 7370 Physical Principles of Chemical Reactivity	In this section, any COS course with a regular course number (i.e. Special topics with 5399 or 7399 designation not allowed) may be chosen.

Emphasis Area: Applied Physics					
	CANDIDACY SUBJECTS				
	Mechanics	Electricity and Magnetism	Quantum Mechanics	Statistical Thermodynamics	Discipline Specific Applications
CANDIDACY COURSES	PHYS 5311 Classical Mechanics	PHYS 5321 Electromagnetism	PHYS 5350 Quantum Mechanics I	PHYS 5310 Statistical Thermodynamics	In this section, any COS course with a regular course number (i.e. Special topics with 5399 or 7399 designation not allowed) may be chosen.
	ASCI 5315 Advanced Dynamics				
	ERSC 5373 Hydrogeology				
	Elastic Wave Theory	Potential Theory	Materials Physics	Astrophysics	
	ASCI 5355 Elastic Wave Theory	ASCI 5360 Potential Theory	PHYS 5340 Solid State Physics	PHYS 5301 Astrophysics	

EMPHASIS AREA: Computational Science (Candidacy subjects appear in bold letters below. There may be one or more candidacy courses under each candidacy subject. These appear in regular font.)				
CANDIDACY SUBJECTS				
	High Performance Computing	Modeling and Visualization	Mathematics	Discipline-Specific Applications
CANDIDACY COURSES	CPSC 7312 Parallel Processing	CPSC 7383 Modeling and Simulation	MATH 7311 Advanced Linear Algebra	In this section, any COS / EIT course with a regular course number (i.e. Special topics with 5399 or 7399 designation not allowed) may be chosen. Course work will be at the discretion of the advisor. Possible disciplines include computational biology, computational chemistry, bioinformatics, numerical analysis, etc.
	CPSC 7321 Operating Systems	MATH 7324 Advanced Numerical Analysis II	MATH 7312 Computational Linear Algebra	
	CPSC 7361 Computer Graphics	MATH 7353 Linear and Non-Linear Regression	MATH 7325 Partial Differential Equations	
	CPSC 7374 Image Processing		MATH 7327 Graph Theory	
			MATH 7351 Mathematical Statistics II	
			MATH 7354 Experimental Design	

Provision to grant a one-time waiver(s) of requirement to take Candidacy subject course(s) at UALR prior to taking Candidacy Exam(s) in those subject(s)

Prior to taking candidacy exams, a Ph.D. student in Applied Science can petition the Graduate Coordinator for a one-time waiver(s) of requirement to take candidacy subject course(s) for credit at UALR if the student has taken comparable course(s) in that(those) subject(s) at the graduate level for credit in another university. The graduate coordinator will approve or deny the petition based on, in part, the following:

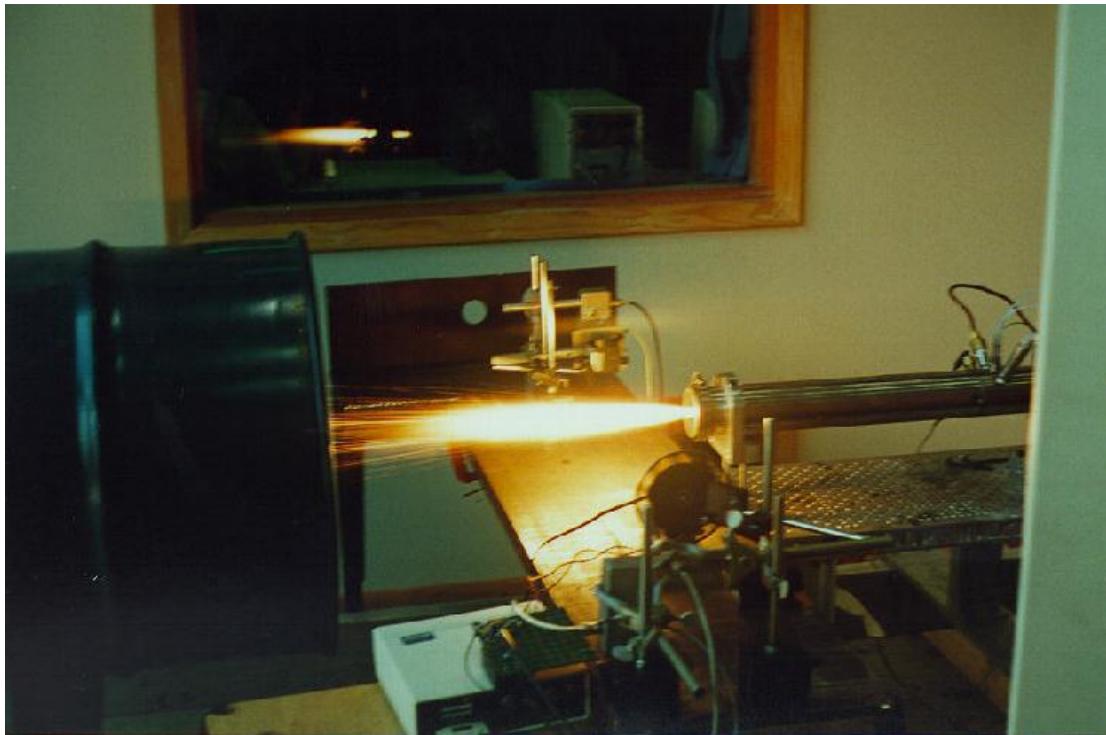
1. The student has provided the graduate coordinator with an official syllabus (syllabi) of comparable course(s) (see above paragraph) taken at another university as well as the grade(s) received.
2. Student has met the instructor(s) of the candidacy subject at UALR who has reviewed all materials in Item 1 above, interviewed the petitioner and provided written communication to the Graduate Coordinator (with a copy to the petitioner) as to whether or not he/she is ready to take the exam.

Under no circumstances will a waiver for more than two candidacy subjects be granted nor subsequent requests for waivers be considered.

Graduate Institute of Technology

The mission of the Graduate Institute of Technology (GIT) at the University of Arkansas at Little Rock is to serve as a support unit to COS and EIT. GIT performs this mission by providing technical and research assistance to both of these colleges as follows:

- Provides high-level professional support specialists including computational, research, and financial experts and other support staff as appropriate.
- Provides support for major instruments and equipment valued at over \$2 million; an Advanced UNIX lab for the computational needs in the science and engineering areas; and machine and electronics shops.
- Assists with instruction and laboratories needs within both colleges.
- Serves as the umbrella organization for several grant-funded programs at UALR.



Applied Science Office Policies & Procedures

Office: ETAS 300, Phone: (501) 569-8000

Home Mailing Addresses

It is extremely important that we keep up with your current home mailing address at all times. If your address has changed since last semester or if you are a new student, please be sure we have your current address. If your address changes during the semester, you are required to notify the office staff; then you need to notify the Graduate School, Human Resource Services (HRS) and the Registrar's Office. For International students, according to INS policy, a "change of address" form must be filled out each time there is a change of residence. Forms are available in the Applied Science department. This is YOUR responsibility.

Student Offices

Students will be assigned office space during their term of study at UALR. If practical, space will be located near their chosen Doctoral Advisor's research area.

Keys/Key Cards

Key cards (required to obtain any keys) are obtained from <http://www.ualr.edu/physicalplant/> go forms. Key cards are to have your supervisor's initials. Key cards are signed by Dr. Haydar Al-Shukri, Chair of Applied Science, and Dr. Keith Hudson, Director of GIT. When the request has been approved take the key cards to Physical Plant to pick up your key(s). Along with your key, your major professor should give you the keypad code to enter their laboratory. Upon graduation, your keys must be turned in to the Physical Plant or you do not receive your degree.

NOTE: Students are responsible for making sure office/lab doors are locked and lights are turned off.

Receipt of Paychecks

Graduate Research Assistants, Fellows, and Teaching Assistants are paid twice monthly on the 15th and the last day of the month. Paychecks are distributed by direct deposit to your bank account through the University. You may fill out a direct deposit form at the Payroll Office in the Administration North Building, Room 108. To view your paystub, visit the UALR Web site <http://www.ualr.edu> and click on the BOSS Online Registration link. Follow the directions posted on that sight to view your paystub. You will need your student ID number and PIN number which can be obtained in the Admissions and Records Office of the UALR when you present a photo ID.

Thesis/Dissertation Expenses

Students are responsible for all costs pertaining to the preparation and finalization of their thesis/dissertations (that is, copies/transparencies made, binding, special paper, etc.).

Graduation

The Graduation Application should be completed well in advance of your graduation date. To fill out a Graduation Application go to the UALR website and go directly to your BOSS account.

Purchase Orders

A Departmental Purchase Requisition form is used to order materials and/or supplies, equipment, etc., for your research project. If the purchase is to be paid by grant funds, you need to direct all purchase requisitions to the appropriate personnel; otherwise see the Administrative Assistant in the Applied Science Department. You must type or neatly and clearly print pertinent information on this form. You will be responsible for finding vendor(s), acquiring price quotes, getting part or catalog numbers, etc. Please note that you now need to add sales tax of 7.5%. The account number or project title, your name, the name of your major professor and the date must be included at the bottom of the form.

The completed form is to be returned to the appropriate support person. Check back within 10-15 days if you have not received your order. You will be notified as soon as your order has arrived. Once your order arrives, check the order to ensure that everything was received. Return the packing slip to the appropriate support person to be processed. Please make notes on the packing slip if everything was not received.

Travel

Provide the appropriate support person with all of your travel information. A travel authorization is completed to make arrangements, including cash advances. Cash advances must be requested 7 days prior to the travel. During your trip, please keep all your receipts. When returning from a trip, you must complete a TR-1 form (available from the department) within 3-days of returning; then return it to the appropriate support person with all of your original receipts. **Please note: you must fill out a travel authorization you make any final travel arrangements or purchase airline ticket.**

Mail Boxes

Mail is delivered to a single location between 12:00 noon and 2:00 pm in ETAS 300 Monday-Friday, excluding holidays. It is the goal of the Department to provide every Applied Science student a mailbox for incoming mail. These student mailboxes are located in ETAS 300F. If you do not have a mailbox, please contact the Administrative Assistant of Applied Science. You may decline the use of a mailbox if your mail is delivered at another location on campus. Please notify the main office of Applied Science if this is the case for you. Check your mailbox on a regular basis. Packages are delivered throughout the day. When sending packages via UPS, FedEx or DHL, you must fill out a shipping form from Mail Services; either have Mail Services pick up the package or take it to Mail Services yourself. Permission from a faculty member is required before sending any packages.

UALR Graduate School Guide for New Students

Policies

Equal Opportunity / Affirmative Action

The University of Arkansas at Little Rock is committed to the policy of providing equal opportunity for all persons and will not discriminate in admissions, programs, or any other educational function or service on the basis of sex, disability, age, race, national origin, color, or religion. In carrying out this commitment, the University follows the principle of affirmative action and operates with the federal laws and executive orders prohibiting discrimination. Inquiries concerning the application of any of the federal laws or regulations may be referred to the UALR Office of Human Resources, 501-569-3180.

Equal Access Policy

The University of Arkansas at Little Rock makes every effort to meet special accommodation and access needs. For information on specific accommodations for individuals with disabilities, contact the department or organization sponsoring the class or event you wish to attend or call the Office of Disability Support Services at (501) 569-3143. If you have questions, concerns, or comments regarding accommodations and accessibility, you may contact UALR Health Services, (501) 569-3188.

Alternative Formats and Accommodations

This document can be provided in alternative formats. The University of Arkansas at Little Rock makes every effort to meet special accommodation and access needs. For information on specific accommodations for individuals with disabilities, contact the Graduate School or call Disability Support Services at 569-3143.

What You Need to Know and Do Before the First Day of Classes

Visit the UALR Web site for the online schedule of classes: <http://www.ualr.edu>. All programs require that you be advised before you register for classes.

Registering and Confirming Classes

Visit the UALR Web Site at <http://www.ualr.edu> and click on the BOSS Online Registration link. Follow the directions posted on that sight to register. You will need your student ID number and PIN number which can be obtained in the Admissions and Records Office of the UALR when you present a photo ID.

Car Registration and Parking

There is no extra fee for non-reserved campus parking. However, you need to get a sticker for your car. Stickers are generally made available at a special location on campus (usually in one of the meeting rooms of the Donaghey Center) during the first few weeks of school. They are available the rest of the year at the Parking Office in Public Safety (located in the Plaza Shopping Center on Asher Avenue).

Parking regulations are enforced. In particular, do not leave your car unattended in the circle drive by the Administration South building.

Disability Support Services

UALR accommodates students with documented disabilities of any type. If you think you might be eligible for services, contact Disability Support Services at 569-3143. You could be eligible for extended time on exams, testing in other formats (for example, oral or large print). Assistance with getting books on tape, and other accommodations designed to equalize your opportunity to succeed at UALR. Parking for people with disabilities is

available (contact Health Services at 569-3188). There are also rooms in the residence hall equipped for people who use wheelchairs and for people with hearing loss (contact Housing at 661-1743).

For those of you who use books on tape because of visual loss or a learning disability, or who need mobility training on campus because of visual loss, it is critical that you contact Disability Support Services as soon as possible, even if you currently live in another community or state. Most of you who use books on tape know how long this process can take. Mobility training must be arranged through the State Division of Services for the Blind, and the application process for these services also takes time.

Books

The UALR Bookstore, a branch of Barnes and Noble, is located on the lower floor of the Donaghey Student Center. Both new and used textbooks are sold there for most courses. The Bookstore also carries a wide range of school and office supplies, clothing and munchies. The Campus Bookstore, at 3006 S. University in the Broadmoor Shopping Center, also carries UALR textbooks. Both bookstores buy back textbooks.

Safety

It is best to be prudent: do NOT walk alone on campus after dark. If you do not have a friend to walk with, call the Department of Public Safety (DPS) at 569-3400 from an office or pay phone, or pick up the receiver of one of the campus blue light telephones to be connected with a DPS dispatcher directly. Ask for an escort. Between the hours of 5:30 p.m. to 10:00 p.m. Monday through Thursday, members of the UALR Student Patrol are on duty to perform this service. Later than that, and on weekends, officers will escort you.

If you are interested in becoming a member of the Student Patrol, drop by DPS and fill out an application form. Hours can be arranged around your class schedule.

Remember: if a crime, accident, or other emergency does occur, notify DPS immediately, 569-3400. Contacting the Little Rock Police Department only will delay action to your report since the LRPD's first action is to call UALR DPS.

Especially for Graduate Assistants

Paperwork

Go to Human Resources Services (Personnel) in the University Services Building and complete the following forms so you can be put on the payroll:

- Federal and State tax forms
- I-9 form. You will need to show two forms of identification such a driver's license and social security card. Foreign students will need passports and other certificates.
- Drug use statement
- Personal Data Sheet

If you have worked on campus during the previous year, you may not need to complete all of the forms.

International students on F-1 or J-1 visas also must complete the Certificate of On-Campus Employment Eligibility from the International Student Office and return it to the Graduate School. You will not be paid until you have returned the necessary form or forms.

Confirmation Letter

Shortly before school starts, you should receive a letter from the Graduate School delineating the terms of your graduate assistantship. If you have not received your letter by the last two days before the semester starts, please call the Graduate School at 501-569-8661.

Work Assignment

You should meet with your supervisor and arrange your hours shortly before the semester begins. Your hours of work depend on the arrangements you make. Records are not sent to the Graduate School or Payroll office. You are accountable to your supervisor for your time and may be requested to complete a time log for internal departmental use.

Billing

Tuition scholarships will be credited to your account during the registration period. You are responsible for all registration fees. Depending on the arrangements of your assistantship, you may be responsible for part of your tuition. Be sure you have paid your portion or arrange for deferred payment with the Cashier's Office before the payment deadline. If registration fees are NOT paid by the advertised deadline, a late charge is assessed. Also, be sure to let the Graduate School know if you make any changes (drop or add) in your schedule. Undergraduate classes, even if required for certification purposes or efficiency removal, will not be covered by the tuition scholarship.

Paychecks

You will be paid twice a month, on the 15th and on the last day of each month. If the 15th or last day falls on a weekend, payday will be on the previous Friday. All pay is distributed by direct deposit to your bank account through the University. You may fill out a direct deposit form at the Payroll office in the Administration North Building, Room 108. To view your paystub, visit the UALR Web site <http://www.ualr.edu> and click on the BOSS Online Registration link. Follow the directions posted on that sight to view your paystub. You will need your student ID number and PIN number which can be obtained in the Records and Registration Office of the UALR when you present a photo ID.

Those of you whose assistantships are renewed for the next semester should note that there is a six-week gap between the last payday in the fall semester and first payday in the spring.

Term of Appointment

Appointments are renewable each semester, contingent upon satisfactory academic progress toward a degree (passing nine graduate hours) and satisfactory work performance. If your initial appointment covered two semesters, you will not receive another notification letter, and you do not need to do anything for your appointment to continue. If your initial appointment was for one semester, ask your supervisor if it will be continued. If not, and if you are interested in finding another appointment, speak to the Graduate School as soon as possible.

What You Need to Know and Do during the First Week

Payment Deadline

The deadline for payment of all tuition and fees is at the end of the first week of classes and is published in the UALR Schedule of Classes. This is a real deadline! If your total payment has not been received (and you have not made arrangements for a payment plan) you will be administratively withdrawn and will not be able to re-enroll for the semester.

Schedule Adjustment Period

The schedule adjustment deadline is also at the end of the first week of classes and is published in the class schedule. During the first week of classes, students may add and drop classes without penalty or notation on the permanent record, and may change from credit to audit status and vice versa. Any increases in tuition costs resulting from schedule changes must be paid by the normal payment deadline.

The end of the schedule adjustment period is not the same as the drop date. As mentioned above, classes dropped during the schedule adjustment period do not show on your record and do not have to be paid for. You may still

drop classes after the end of the adjustment period, up to the drop date (about seven weeks into the semester). Your record will show a grade of W and you will get no refund. Incidentally, although you may be forced to drop a class because of circumstances beyond your control, a continued pattern of W grades does not look good on a graduate transcript. As a graduate student, you are expected to be able to judge your time commitments and plan accordingly.

Withdrawal from the University

If you must withdraw from the University, or drop all your courses, you may be able to receive a full or partial refund, depending on when you withdraw. Consult the Schedule of Classes for the refund schedule. You can generally get a 100% refund on any or all courses if you drop them by the payment deadline. You can get a 50% refund if you withdraw (drop all classes) within the second week of school. The dates and conditions of this policy may change; be sure to check the Schedule of Classes for the specifics.

UALR Campus Card

You will need your campus ID card; for instance, you may want to check a book out of the library or use the exercise equipment at the Donaghey Student Center. Go to the lower level of the Donaghey Student Center near the entrance of the UALR Bookstore. The staff will take your picture and generate your card while you wait. This card will be valid as long as you are a continuing student at UALR; it does not need to be updated. You can also put money on the card, and use the card to purchase food at the campus cafeterias. In that case, you don't have to pay sales tax. For definitive information on this facility, please contact Dining Services in the Donaghey Student Center.

Health Services

Cut your finger? Have a sinus infection? Faint from anxiety in your first seminar? Health Services can help. Staff members can treat minor injuries, write some prescriptions, make physician referrals and give you general health information on a wealth of topics. Health Services is located on the lower level of the Donaghey Student Center across from the bookstore.

Postal Services

Need to mail a letter or pay a bill? You can buy stamps from a vending machine in the Donaghey Student Center in the upper level, near Meeting Rooms A, B and C. There is a mailbox in the Student Concourse (nearest to the old Student Union Building, A, which houses computer labs and University Mailing Services). At Mail Services, you may mail a letter there as late as 4:00 p.m. to go out the same day, as long as you provide the postage.

The closest post office to UALR is Asher Station at 7401 Asher Avenue, a bit more than a mile west of the intersection of Asher and University, adjacent to the University of Arkansas Criminal Justice Institute.

Computer/Internet Use

All incoming students are automatically issued e-mail and web site accounts on UALR's server. The account password is set initially to your student identification number, but you are required to change it to a password of your choice the first time you log on. Access the UALR web mail system at <http://mail.ualr.edu>. In addition to the computer resources of your program, there are computers available for your use in many locations throughout the campus. These include the Library Lab, the PC Lab, the Mac Lab, the HELP Lab in ETAS 308 and the CyberCafé in the Donaghey Student Center.

Library

You can search the library online through the public access catalog (OPAC) for a book by title, author, subject, a combination of those, or by additional methods. The OPAC will show whether the library holds a book and whether it is currently available in the stacks. You do not even need to go to the library to "go to the library". Access the Ottenheimer Library online at any time from any place through UALR's web site at <http://www.ualr.edu>. Both connections also offer information on your account: you can key in a user number and get a list of materials you have charged out.

In case 300,000 book volumes and 2,600 periodical subscriptions are not enough, the OPAC also offers a gateway to other libraries and databases around the nation. If the book or periodical issue you need is not available in the library, you can usually obtain it through Interlibrary Loan, which offers various book and document delivery services.

Tours of the library are offered by the reference department. These include class and group tours, limited tours for individuals and a self-guided tour using a printed handout. Many other handouts on library holdings and research techniques also are available at the reference desk.

University Writing Center

Do not miss this wonderful resource. Writing is a skill that always can be improved. The staff members of the University Writing Center are qualified and prepared to help writers of all levels. They are trained to help you improve your own writing. They will not do the writing for you and they will not compromise your ownership of your own work.

In addition to personalized assistance, the Center offers other resources: basic English laboratory courses; cassette and computer lessons on usage, punctuation, and structure; a library of books and flyers on writing; and Macintosh computers with software for word processing, publishing, and internet access. The Center is located in Student Union B 116; telephone 569-8343.

Copies

If you have been to the library, you have probably noticed the copy machines in there. Photocopying is subject to copyright laws; it is your responsibility to be aware of them. Then, buy copy cards at the circulation desk; you get a better price per copy than if you pay with handfuls of change. There is also copy machines located outside the entrance to the UALR Bookstore in the Donaghey Student Center.

Donaghey Student Center Fitness and Aquatics

Exercise your body as well as your mind! No matter how busy you are with your studies, it is a sound investment of your time and energy to exercise, and you have already paid for it as part of your student fees. Rather than spending one more hour after countless hours of research or work on a project, take that hour and play racquetball, go for a swim, take an aerobics class, or lift weights. Some of the exercise machines can even be used in a racing mode, so invite your lab partner to come with you.

The Fitness and Aquatic Center is located on the bottom floor of the Donaghey Student Center. Facilities include Arkansas' only Olympic-sized pool (wheelchair accessible), four basketball courts, seven types of cardiovascular training machines, racquetball and volley ball courts, strength training facilities including free weights and machines and a 1/8 mile, two-lane indoor track with lanes for walking and jogging.

Graduate Student Association (GSA)

The GSA is an organization for graduate students that work with UALR and the Graduate School to assess graduate student needs and help meet those needs. It is not a governing body, but an advocacy group, looking after your interests as a graduate student. GSA holds monthly meetings that provide information on UALR services, news about special opportunities for UALR graduate students and opportunities to socialize and network with peers. Community leaders often speak at the meetings allowing students to learn more about career options and community issues. Call the Graduate School (501569-8781 or 501-569-8661) to find out when and where the meetings are scheduled, and then come!

Graduate Student Research Forum

The Graduate Student Research Forum is a yearly event hosted by the UALR Graduate Student Association. The Forum has the specific goal of giving UALR graduate students a chance to present their scholarly work. Presentations are evaluated by a panel of judges from the University and professional communities. Awards for the

finest presentations from each category are presented at a noon luncheon ceremony. Participating in the Research Forum allows students to learn about what other students are doing and get ideas for future projects. Prizewinners have an excellent item to add to their resume. Check with your program coordinator to find out how participants are chosen in your area. It may be time for you to start a project!

Policy Documents

There are three major documents (besides this one) you should obtain and be familiar with as a UALR graduate student. The Graduate Catalog contains academic policies and specific information about all graduate programs and courses. It is available in the Graduate School to fully admitted students for free, or may be viewed on the World Wide Web at <http://www.ualr.edu/gradschool/>. The Student Handbook contains the Code of Student Rights, Responsibilities, and Behavior and other nonacademic policies. It is available in the Office of the Dean of Students. Finally, the UALR Dissertation and Thesis Guide contains the guidelines for preparation and submission of dissertations, thesis and other final projects. It appears in its entirety in the Graduate Catalog and can be viewed on the World Wide Web at (<http://www.ualr.edu/gradschool/assets/archive/pdfs/thesisguide.pdf>). .

Grievances and Procedures

As a student, you have specific rights and responsibilities. There are procedures to follow to rectify the situation. The procedures vary depending on the type of problem. Below is a list containing descriptions of situations, the school policy that applies to each situation, where to find the information and the suggested first contact you should make with the administration.

- You believe you have been discriminated against because of your race, ethnicity, sex, disability, or age
- You believe you have been discriminated against because of HIV-positive status
- A student, faculty member, or administrator makes sexual remarks to you that make you uncomfortable
- You are sexually assaulted on campus
- You receive an Allegation of Academic Offense form accusing you of an offense
- You witness another student or students cheating
- You believe someone has tampered with your lab data or broken into your computer account
- You receive a final course grade that you think is unfair
- There is a dispute about what requirements you need to fulfill for your degree
- You believe you should be exempted from or receive special accommodations in a course because of a disability
- You are accused of a behavioral violation
- Another student assaults or verbally abuses you

Grade Point Average

You must maintain a minimum cumulative grade point average of 3.0; it is as simple as that. If you do not, you will be placed on academic probation and will have a fixed amount of time to rectify the situation. Consult “Academic Probation” and “Graduation Requirements” in the Graduate Catalog for more information.

Support Personnel Contact Information

<u>Support Personnel</u>	<u>Telephone</u>	<u>E-mail</u>	<u>Office</u>
<u>Department of Applied Science</u> Haydar Al-Shukri, Chair Tansel Karabacak, Graduate Coordinator	569-8000 569-8010 569-8045	hjalshukri@ualr.edu txkarabacak@ualr.edu	ETAS 300
<u>Department of Biology</u> John Bush, Chair	569-3270 569-3511	jmbush@ualr.edu	FH 406
<u>Department of Chemistry</u> Jeffrey Gaffney, Chair	569-3152 569-8823	jsgaffney@ualr.edu	SLB 451
<u>Department of Earth Science</u> Jeffrey Connelly, Chair	569-3546 569-3543	jbconnelly@ualr.edu	FH 312
<u>Department of Physics and Astronomy</u> Tony Hall, Chair	569-3275 569-8968	tahall@ualr.edu	PHYS 108
<u>Graduate Institute of Technology</u> Keith Hudson, Director Missy Hill, Asst to Dir. of GIT	569-8210 569-8211 569-8015	mkhudson@ualr.edu mshill@ualr.edu	ETAS 329
<u>UALR Graduate School</u> Paula Casey, Interim Dean Johanna Miller-Lewis, Associate Dean Sheena Brooks, Program Coordinator.	569-3206 569-8661 569-8660 569-8661	pjcasey@ualr.edu jmlewis@ualr.edu srbrooks@ualr.edu	Library 5 th Floor
<u>Emphasis Area Liaisons</u> John Bush, Applied Biosciences Tito Viswanathan, Applied Chemistry Marc Seigar, Applied Physics Eric Kaufmann, Computational Science	569-3270 569-8825 569-8964 569-8054	jmbush@ualr.edu txviswanatha@ualr.edu mxseigar@ualr.edu erkaufmann@ualr.edu	SCLB 383 SCLB 469 PHYS 108D DKSN 602

Faculty Members and Research Interests

★ *Applied Bioscience Faculty*
▲ *Applied Chemistry Faculty*
● *Nanotechnology Faculty*

+ *Applied Physics Faculty*
■ *Computational Science Faculty*
◆ *Geosciences*

Applied Science Faculty

Ali, Nawab, Ph.D., Aligarh University, India (★)

Signal transduction and intracellular signaling mechanisms regulating subcellular compartmentation, membrane biogenesis, vesicular transport, endo/exocytosis, protein sorting and targeting, and protein-protein interactions. Emphasis is placed on G-proteins and G-protein coupled receptors, and their second messenger systems such as inositol polyphosphates, cAMP, cGMP, intracellular calcium, protein kinases etc. Biomedical engineering interests are related to development of biocompatible cardiovascular devices.

Al-Shukri, Haydar, Ph.D., St. Louis University (◆, +)

Seismology; applied geophysics; 3-dimensional topography; digital signal processing; infrasonic studies; nuclear monitoring; fault monitoring; earthquake awareness and education.

He, Qingfang, Ph.D., Arizona State University (★)

Protein and biochemistry; genomic and molecular genetic studies of high light stress signal perception and transduction; genetic dissection and metabolic engineering of myxoxanthophyll; biotechnological application of cyanobacteria and microalga.

Hudson, M. Keith, Ph.D., Baylor University (▲, +)

Analytical chemistry and instrumentation; liquid and gas chromatography; atomic and molecular spectroscopy; combustion; simulation of combustion phenomenon; solid and hybrid rockets; propellant and fuel formulation; rocket ground testing; propellant testing.

Karabacak, Tansel, Ph.D., Rensselaer Polytechnic Institute (●, +)

Nanostructure and thin film growth; properties and applications of 3D nanostructures by oblique angle deposition; dynamics of thin film and nanostructure growth.

Khodakovskaya, Mariva, V., Ph.D., Russian Academy of Sciences (★)

Plant biology, biotechnology, plant genetic engineering.

Doctoral Faculty

Adams, Al, Ph.D., University of Florida, (+)

Optics and laser measurement systems.

Baltosser, William H., Ph.D., New Mexico State University (★)

Avian ecology; molecular systematics.

Berry, Brian, Ph.D., University of Arkansas at Little Rock (▲)

Polymer Chemistry, self-assembly of nanostructures, and organic photovoltaics.

Biris, Alex, Ph.D., University of Arkansas at Little Rock (●)

Nanotechnology, Nanoparticle and Carbon Nanotubes Generation, Nanocomposites, Materials Science and Engineering, Coating Technology, Hydrogen Interaction with metals, Alloys, and Carbon Nanostructures, Ni-MH Batteries, Planetary Instrumentation (Mars Dust Analyzer), Surface Science, Particulate Science.

Bush, John M., Ph.D., Louisiana State University At Shreveport Medical Center (★)

Analysis of Vesicular Transport in Eukaryotic Cells; Bioinformatics and Molecular Analysis of Avian Systematics

Chen, Tar-pin, Ph.D., University of New York at Buffalo (✚,○)

Thin film fabrication (magnetron and laser ablation), nanomaterials and nanodevices (including superconductor, terahertz, qubits, solar cells, semiconductor and metal oxides), phase transition and critical phenomena, correlated/coherence phenomena.

Connelly, Jeffrey B., Ph.D., University of Tennessee (❖)

Structural Geology, Tectonics, and Engineering Geology

Cui , Jingbiao, Ph.D., University of Science and Technology, of China (✚)

Semiconductor physics and nanomaterials; growth and physical properties of semiconducting nanostructures and thin films; electronic and optoelectronic devices.

Cui, Jintao, Ph.D., Louisiana State University (■)

Numerical Analysis, Finite Element Methods

Darsey, Jerome A., Ph.D., Louisiana State University (▲)

Physical chemistry and computational chemistry; theoretical calculations to determine molecular structures of electroactive polymers and biopolymers; applications of artificial intelligence to chemical systems; nanotechnology. Position emission topography (PET) studies with colleagues at University of Arkansas for Medical Sciences.

DeAngelis, Michael T., Ph.D., University of Tennessee (❖,○)

Experimental Mineralogy, Petrology, and Geochemistry

Elsalloukh, Hassan, Ph.D., Baylor University (■)

Distributional theory; multivariate analysis; bayes inference, and linear models.

Gaffney, Jeffrey S., Ph.D. University of California, Riverside (Chemistry) (▲)

Atmospheric and environmental chemistry, climate change, aerosols, organic oxidants (peroxyacetyl nitrates), stable isotopes and natural radionuclides as tracers, analytical instrumentation development, chemiluminescent reactions, humic and fulvic acids, surface and groundwater chemistry, global change and environmental science education.

Ghosh, Anindya, Ph.D., Carnegie Mellon University (▲,○)

Catalysis, small molecule activation, asymmetric synthesis, polymer synthesis, sensor and storage devices, anticancer drug synthesis, chemistry related to oil-field.

Grace, Stephen, Ph.D., Duke University (★)

Biochemistry of active oxygen and antioxidants; plant bioenergetics; oxidant signaling mechanisms; physiological ecology of secondary plant metabolites.

Hall, Tony A., Ph.D., Purdue University (✚)

Gamma-rays; x-rays; pulsars; supernova remnants; high mass x-ray binaries; eclipsing binaries; Cherenkov radiation astronomy.

Jones, Darin E., Ph.D., University of Missouri (▲)

Drug discovery, medicinal chemistry, and organic chemistry.

Kaufmann, Eric R., Ph.D., Auburn University (■)

Boundary value problems; Green's functions for ordinary differential and difference equations; finite difference equations; integral transforms; measure chains.

Kleve, Maurice, Ph.D., University of Houston (★)

Kosmatov, Nickolai, Ph.D., Auburn University (■)

Ordinary Differential Equations.

Lanza, Janet, Ph.D., University of Connecticut (★)

Leggett-Jones, Lakeshia, Ph.D., Howard University (■)

Topological Algebra, Combinatorics, Mathematical Finance

Mahdi, Hanan, Ph.D., St. Louis University (✚)

Paleoseismology; seismology; shallow geophysics; potential fields' analysis.

Marley, Nancy, Ph.D., Florida State University (▲)

Analytical Chemistry, atmospheric chemistry, aerosols

McMillan, Beth, Ph.D., University of Wyoming (◆)

McMillan, Thomas, Ph.D., University of Utah (■)

Payne, Forrest, Ph.D., University of Wyoming (★)

Limonology

Seigar, Marcus, Ph.D., Liverpool John Moores University (✚)

Extragalactic Astronomy; galaxy structure; galaxy dynamics; galaxy formation and evolution; supermassive black holes; dark matter; star formation in galaxies.

Seo, Hye-Won, Ph.D., University of Houston (✚, ○)

Superconducting oxide thin films; Strain effect and strain-induced defect of materials ; Nitride semiconducting films and nanostructures ; Novel optoelectronic device fabrications ; Field emission device fabrications; Solar cell device fabrications ; Photovoltaic measurement.

Shaikh, Ali, Ph.D., Howard University (▲, ○)

Analytical Chemistry, metal-based derived sulfonamides, lignosulfonic acid-doped polyaniline, polymer chemistry

Sikes, Robert, Ph.D., University of Minnesota (★)

Behavioral and evolutionary ecology.

Tang, Fusheng, Ph.D., The University of Iowa (★)

Viswanathan, Tito, Ph.D., Tulane University (▲, ○)

Organic and green (environmentally friendly) polymer chemistry; synthesis and characterization of polymers from renewable sources, conducting polymers and composites.

Wang, Hong Li, Ph.D., University of Newcastle, Australia (★)

Plant molecular biology.

Wang, Xiaoshen, Ph.D., Michigan State University (■)

Numerical analysis with concentration on solving polynomial systems.

Ye, Xiu, Ph.D., University of Pittsburgh, PA (■)

Numerical analysis.

Zeng, Lirong, Ph.D., Ohio State University (★)

Zhao, Wei, Ph.D., Peking University (▲, ○)

Analytical and physical chemistry; materials science; application of nonlinear laser spectroscopy multi-resonant four wave mixing for structure and interaction studies on complex systems; two-dimensional infrared correlation spectroscopy.

Emeritus Faculty

Hawk, Roger M., Ph.D., University of Michigan (★, ▲, +)

Physical, analytical and inorganic chemistry; liquid and solid state nuclear magnetic resonance; magnetic resonance imaging; semiconductors and solar cells.

Mazumder, Malay K., Ph.D., University of Arkansas-Fayetteville (○)

Laser Doppler velocimetry; turbulence characterization; aerosol technology; acoustics; optical character recognition; biomedical instrumentation; telemetry; instrumentation development.

ANNUAL GRADUATE STUDENT PROGRESS REPORT

DEPARTMENT OF APPLIED SCIENCE

(write N/A in those fields that do not apply to you)

(Must be completed by May 15 – Return to the Department of Applied Science Office)

Student information

Name of student:	Reporting Period:	May 16, 20__ to May 15, 20__
M.S. <input type="checkbox"/>		
Ph.D. <input type="checkbox"/>	Emphasis area:	
Date entered program:	Expected completion date:	

Academic Progress (see Appendix A)

Semester Laboratory Rotation Completed: _____

Dissertation Title: _____

Dissertation Advisor: _____

TOTAL CREDITS COMPLETED INCL. CURRENT SEMESTER: _____
(Do not include lab rotation and seminar credits)

Requirements	Semester & Year Completed	Total credits completed include, the semester of completion (do not include rotation and seminar credits)	Program Requirements	
			M.S.	Ph.D.
Major Advisor selection			9 credits	18 credits
Dissertation Committee formation			9-18 credits	27 credits
Take Candidacy Exams			N/A	45 credits
Defend Proposal			18 credits	63 credits
Defend Thesis				Within 2 years of proposal defense

Dissemination of your research

ITEM	THIS REPORTING PERIOD		SINCE JOINING PROGRAM		NUMBER PLANNED FOR NEXT REPORTING PERIOD
	Total No.	Total No. as First Author	Total No.	Total No. as First Author	
Conferences where you participated or will participate as an author					
Conference proceedings					
Journal papers submitted					
Journal papers accepted/published					N/A

**** In Appendix B, give details of all items listed in above table for this reporting period****

Self-Assessment

Based on the guidelines in Appendix A and your report in the previous section on “Academic Progress”, are you on track for timely completion of your degree? If not, explain the reasons for the delay and how do you propose to speed up your academic progress (please limit your response within the provided space)?

ASSESSMENT BY THE DISSERTATION ADVISOR:

The Dissertation advisor’s comments on the student’s self-assessment are given below.

- Student is making satisfactory progress toward his/her degree
- Student is making unsatisfactory progress toward his/her degree

Advisor:

Date:

Student:

Date: __

APPENDIX A: Academic Progress

A student's academic performance will be considered unacceptable if he/she fails to complete the following requirements in the semester that the student has accumulated program credits as mentioned below.

M.S. Students (Thesis Option)

Requirements	Accumulated program credits
Major advisor selection	9 credits
Advisory committee formation & proposal defense	18 credits

Ph. D. Students

Requirements	Accumulated program credits
Major advisor selection	18 credits
Dissertation Committee formation	27 credits
Take Candidacy exams	45 credits
Defend proposal	63 credits
Defend thesis	Within 2 years of proposal defense

APPENDIX B: Dissemination of research during the reporting period

(give details below; use additional pages if needed)

1. Conferences where you participated or will participate as an author

2. Conference Proceedings

3. Journal papers submitted

4. Journal papers accepted/published



APPOINTMENT OF SUPERVISORY OR EXAMINING COMMITTEE

Check here if this form amends and supersedes one submitted earlier.

To: Dean of the Graduate School

RE: _____
Student name and ID number

Street Address, city, state, zip

Major/option code: _____

Type of Committee:

- | | | |
|--|--|--|
| <input type="checkbox"/> Comprehensive Examination | <input type="checkbox"/> Doctoral Dissertation | <input type="checkbox"/> Doctoral Program |
| <input type="checkbox"/> Master's Thesis | <input type="checkbox"/> Portfolio | <input type="checkbox"/> Project/Other _____ |

_____ Proposed title of thesis/dissertation/portfolio Anticipated Completion Date _____

Faculty members recommended for the above-named student and committee:

(give name and title: e.g. Dr. John Doe, associate professor of biology)

(Chair) _____

Graduate Coordinator _____

Date _____

Graduate Dean _____

Date _____



SUPERVISORY OR EXAMINING COMMITTEE

Check here if this form amends and supersedes one submitted earlier.

To: Dean of the Graduate School

Re: _____

Student Name

ID Number

Address

Graduate Program: _____ Examination Date: _____

The above-named student has attempted the:

- Comprehensive Examination Oral Proposal* Thesis/Project Defense
 Dissertation Defense Portfolio Defense Other _____

* When applicable, attach a Human Subjects review form

This is to certify that the student's *overall* performance was rated as:

- Satisfactory Unsatisfactory

Comments: _____

Signatures of Committee:

The committee chair notified the student in writing of the results of this examination.

Chair

Departmental Coordinator (if applicable) Date

Graduate Program Coordinator Date

Graduate Dean Date

The student named above has completed all course requirements for the dissertation, thesis, or project and all thesis, dissertation, or project hours currently listed as IP should be changed to a grade of _____ (usually CR/NC).

The minimum number of hours for this program is _____.

The catalog year under which the student entered is _____.

Forwarded to registrar *only* if performance was satisfactory

CANDIDACY EXAM REQUEST

This form needs to be routed through your dissertation advisor and submitted to the Graduate Coordinator for approval.

Your name:

Semester in which you joined the program:

Your Emphasis area:

Name of your dissertation advisor:

No. of credits you have taken so far:

- (1. *Include current semester,*
2. *Do not count rotation credits
and colloquium credits)*
-

Semester and Year requesting exam:

Candidacy subject	Candidacy Course Name	Candidacy Course Number	Name of instructor with whom you have taken this course , the semester in UALR you took the course and the grade you received

Signature of student and date

APPROVALS:

Signature of Dissertation Advisor and Date

Signature of Graduate Coordinator and Date

******MAKE A COPY FOR YOURSELF AND SUBMIT THE ORIGINAL FORM TO THE APPLIED SCIENCE OFFICE (ETAS 300P)******