North Carolina A&T State University

GRADUATE STUDENT HANDBOOK

Ph.D. Program
in
Applied Science & Technology

Revision Date: April 26, 2018

http://www.ncat.edu/academics/schools-colleges1/cas/ast/index.html

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This document is to serve only as a guide and is subject to change.

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1. Introduction and Student Expectations

The Applied Science & Technology (AST) doctoral program at North Carolina A&T State University (NCAT) offers concentrations in Atmospheric, Environmental & Energy Science, Applied Physics, Applied Chemistry, Bioscience, Information Technology & Technology Management, and Data Science & Analytics as well as a general program option. The graduate faculty associated with Applied Science & Technology has the responsibility of administering the Ph.D. program including: admitting students, determining course requirements, administering comprehensive examinations, and supervising graduate student dissertation research. A graduate student assumes full responsibility for current knowledge of the policies, procedures, and regulations of the Graduate College (see the Graduate College Catalog, http://www.ncat.edu/tgc/graduate-catalog/index.html, and http://www.ncat.edu/legal/policies/sec2-acad-affairs/index.html for the most recent policy changes), and the departmental program requirements and guidelines. For assistance, the student should see the AST program director, the AST executive assistant, or his or her research adviser.

The administrative staff of the academic programs of the AST Department includes:

Program Director:	Dr. Keith Schimmel 301 Gibbs Hall 336-285-2329 schimmel@ncat.edu
Executive Assistant:	Ms. Toni Jarrell 302 Gibbs Hall 336-285-2334 jarrellt@ncat.edu

The AST staff and faculty are committed to doing everything we can to promote doctoral student success while at NCAT and student future career success. This requires a strong partnership, teamwork, work ethic, and accountability among staff, faculty, and students.

The expectations of staff are: *To be added in next revision.*
The expectations of faculty are: *To be added in next revision.*
The expectations of students are: *To be added in next revision.*

The mission of the Applied Science & Technology PhD program is to prepare students for high-level science and technology careers in industry, research, and government. Graduates will be able to conceive, develop, and conduct original research that applies physical, mathematical, and technological methods to provide solutions to a broad range of emerging local, national, and global problems related to physical and life sciences, energy and environment, and technology.

Program Outcomes:

- Communication Skills – (1) Students completing the Applied Science & Technology PhD program will exhibit effective oral communication skills in terms of customizing presentations to the audience, displaying information, and delivering the presentations. (2) Students completing the Applied Science & Technology PhD program will exhibit effective written communication skills in terms of content/ideas, organization, word choice, and grammar.
- Critical Thinking Skills - Students completing the Applied Science & Technology PhD program will effectively use quantitative and qualitative analytical problem - solving skills in terms of defining hypotheses/research questions, reviewing research literature, developing a research plan, identifying the broader impacts of research, and developing a research timetable.
- Disciplinary Expertise - Students completing the Applied Science & Technology PhD program will demonstrate discipline - specific expertise in terms of the scientific method, applying technical knowledge to answer research questions, experimental plans and data analysis, analytical methods, and research ethics.
- Research/Creative Engagement - Students completing the Applied Science & Technology PhD program will demonstrate ability to engage productively in the review and conduct of disciplinary research in terms of making conference presentations and publishing refereed journal publications.

2. Purpose of the Graduate Handbook

The Graduate Handbook provides detailed requirements for the AST Program. Each graduate student should read and conform to the policy contained in this handbook. If there is any doubt regarding the interpretation of any regulation or requirement in this handbook, or if there are questions about the graduate program involving matters not covered in this manual, the student should consult the AST Chair or the AST Executive Assistant.

This handbook includes the requirements, policies, and procedures adopted by the AST faculty for successful completion of doctoral degrees. The requirements set forth apply only to graduate programs in AST. Further requirements have been established by NCAT's Graduate College, and AST graduate students must meet the requirements of both the Graduate College and the AST department for successful degree completion.

The provisions of this handbook do not constitute a contract, expressed or implied, between any applicant or student and the AST Program or North Carolina A&T State University. The University and the Program reserve the right to change any of the provisions, schedules, programs, courses, rules, regulations, or fees whenever university or departmental authorities deem it appropriate to do so.

3. Administration of the AST Doctoral Program

All requirements, policies, and procedures for the AST Graduate Program are approved by the AST faculty at faculty meetings where a quorum is present. The AST Program Director is charged with the responsibility for resolving conflicts that may arise regarding policy or procedural issues. The AST Program Director is responsible for supervising the implementation of requirements, policies, and procedures adopted by the AST faculty. The program executive assistant is the source of information on the graduate program including, but not limited to, appropriate forms for graduate program and Graduate College requirements, applications for admission and financial aid, and other routine paperwork related to the graduate program.

4. Admission to the Doctor of Philosophy Program in Applied Science & Technology

To apply for admission to the AST Ph.D. program, applications must be submitted online at the website of the Graduate College (http://www.ncat.edu/tgc/admissions/index.html). Questions about applications should be directed to the Graduate College Admissions Office (Yolanda Stone: ystone@ncat.edu , 336-285-2374). Once an application is determined by the Graduate College Admissions Office to be complete and is sent to the program, the AST Program generally makes application decisions within a month.

To be considered for admission to the AST Ph.D. Program an applicant must have:

1. B.S. degree in a science, math, technology, engineering or related discipline with a GPA≥3.5/4.0 or a master's degree in a science, math, technology, engineering or related discipline with a GPA≥3.25/4.0 from a college or university recognized by a regional or general accrediting agency
2. Graduate Record Exam (GRE) Aptitude Exam scores that are no older than 5 years.
3. At least two recommendation letters from professional references.
4. A Statement of Purpose that includes research areas of interest and career goals.

If the highest degree is from a non-English speaking country, a TOEFL score (at least 80 or higher internet-based score), IELTS score (6.0 or higher), or PTE Academic score (53 or higher) is required.

Prior research experience and research publications are desirable.

5. Ph.D. Program Requirements

5.1 Grade Point Average and Academic Standing

To maintain good academic standing and to meet the requirements for graduation, a student must demonstrate acceptable performance in course work after being admitted to the AST program. This requires a minimum cumulative AST Grade Point Average (GPA) of 3.00 or higher. The AST grade point average is calculated from the courses appearing on an AST approved Plan of Graduate Study form (http://www.ncat.edu/tgc/continuing/forms/planofstudy.pdf). These courses will include courses taken after enrollment in the AST program plus any courses transferred with grades.

Furthermore, good academic standing requires satisfactory progress in the overall AST program. The AST department chair, student's research advisor, and/or dissertation committee may render judgments as to whether satisfactory progress is being made toward the AST degree, taking into account all aspects of academic performance and promise, not necessarily course work alone. Termination of a student's graduate status may be recommended at any time if the student is not making satisfactory progress toward the AST degree. Examples of unsatisfactory progress may include, but are not limited to, inadequate GPA, inadequate research and/or research skills, or failing the qualifying, preliminary, or final oral examination.

Academic Probation: Any student who has less than a 3.0 cumulative AST GPA will be placed on academic probation. A student on academic probation will be required to improve his/her cumulative GPA to 3.0 or higher by the end of the next regular (non-summer) semester to return to good academic standing.

Dismissal: A student who is placed on probation and who fails to improve his/her cumulative GPA to 3.0 or higher by the end of the probationary period, that is, by the end of the next regular (non-summer) semester, will be dismissed. Dismissal of a student may also be recommended at any time if a student:

- is conditionally admitted and fails to meet the conditions of his/her admission;
- is not making satisfactory progress toward the degree, for example, inadequate progress on research projects, or failing the qualifying, preliminary, or final oral examination;
- receives an "F" grade in a required course;
- fails to maintain continuous registration without an approved leave of absence;
- fails to complete program requirements in the maximum allowed time for the degree; or
- is guilty of ethical misconduct or violates the NCAT Student Handbook.

5.2 Expected Timetable

Students are expected to complete the various requirements according to the schedule below. Please note that this is a schedule for full-time students only. Part-time students may take longer to complete each of the requirements.

Requirement	With MS	Without MS
Qualifying Exam	2nd semester	2nd or 3rd semester
Preliminary Exam – Written and Oral Research Proposal Defense	3rd or 4th semester	5th or 6th semester
Final Dissertation Exam – At least two journal article manuscripts approved by Dissertation Committee before can be scheduled	7th or 8th semester	8th or 9th semester

5.3 Graduation Requirements

The Ph.D. graduation requirements are given below:

1. Credit Requirement: For students entering the program with an M.S. degree, a total of 42 credits after the M.S. degree, of which 15 credits are toward dissertation work, and 27 credits are toward course work. For students entering the program with a B.S. degree, a total of 66 credits after the B.S. degree, of which 15 credits are toward dissertation work, and 51 credits are toward course work.
2. Seminar Requirement: Students must register for and complete the Doctoral Seminar class (AST 992; 1 credit) at least three semesters except for students who enter the Ph.D. program

without an MS degree. These students must register and complete the Doctoral Seminar class in at least six semesters. A requirement for passing the seminar course is that a student makes at least one presentation on their research progress each year.

3. Publication Requirements: All AST students are strongly encouraged to publish as many technical papers as possible in peer-reviewed publications. Students are encouraged to consider the impact factor of the journals in which they might publish and strive to publish in high impact factor publications (http://www.citefactor.org/journal-impact-factor-list-2014.html). At a minimum, an AST student must prepare at least two journal paper manuscripts from his/her dissertation research for publication in peer-reviewed journal(s) before scheduling the final defense.

4. Qualifying Exam: The purpose of the qualifying exam is to provide students an opportunity to demonstrate the likelihood of them going on to produce a scholarly doctoral dissertation, helping to identify a student's strengths and weaknesses so that a career development plan can be developed to facilitate student success. Only students with unconditional status and in good academic standing may take the Qualifying Examination. At the end of their second semester in the program, students must pass with a score of 75% or higher a written exam that requires them to demonstrate technical writing and journal article review skills. A student who wants to retake the Qualifying Examination must apply to retake the Qualifying Examination by the posted deadline. No student is permitted to take the Qualifying Examination more than twice. A student not recommended for re-examination or who fails the exam on a second attempt may be dismissed from the doctoral program.

5. Preliminary Exam: The Preliminary Oral Examination is conducted by the student's dissertation committee and is a defense of the student's dissertation proposal. Passing this exam satisfies requirements for Ph.D. Candidacy. The student must prepare a written doctoral research proposal with a thorough literature review, experimental plan, timeline, and some preliminary results. Once this written proposal has been approved by the student's research adviser and the department chairperson, it may be sent to the Dissertation Committee and an oral exam scheduled. Generally, the dissertation committee should receive the written proposal at least two weeks in advance of the oral exam. The dissertation proposal defense is mutually scheduled by the Department, research adviser, and student and is open to all students and faculty. The Dissertation Committee decides the outcome of the defense and informs the student of this outcome within 24 hours. Failure on the examination may result in dismissal from the doctoral program. The student's Advisory Committee may permit one re-examination. At least one full semester must elapse before the re-examination. Failure on the second attempt will result in dismissal from the doctoral program.

For students entering with a M.S. degree, the program requirements are summarized as follows:

Requirement Category	Credits	Courses
Core Courses	9	AST 830, 831, MATH 721
Written Qualifying Examination	0	
Concentration	15	Students in a concentration need to satisfy the requirements of that concentration. The

Courses		electives taken should include a progressive series of graduate courses closely related to a student's research topic. Research advisor and academic advisor (AST chair) approval is required for all elective courses.
Seminar Requirement	3	AST 992
Preliminary Examination	0	
Dissertation	15	AST 997
TOTAL	**42**	

For students entering with a B.S. degree, the program requirements are summarized as follows:

Requirement Category	***Credits***	***Courses***
Core Courses	9	AST 830, 831, MATH 721
Written Qualifying Examination	0	
Concentration Courses	18	Students in a concentration need to satisfy the requirements of that concentration. The electives taken should include a progressive series of graduate courses closely related to a student's research topic. Research advisor and academic advisor (AST chair) approval is required for all elective courses.
Elective Courses	18	Courses relevant to student's research area. Research advisor and academic advisor (AST chair) approval is required for all elective courses.
Seminar Requirement	6	AST 992
Preliminary Examination	0	
Dissertation	15	AST 997
TOTAL	**66**	

Note that while AST does not award an M.S. degree, B.S. to Ph.D. students may qualify to receive an intermediate M.S. degree in Chemistry, Physics, Math, or Biology by completing the Application for Award of Master's Degree to current Ph.D. Students form. If a student plans to do this, they should decide in their second semester whether they plan to get the M.S. degree using the thesis, project, or course option and complete the appropriate Plan of Graduate Study to get it approved by the proposed M.S. awarding department.

Dissertation Research: A student may not register for dissertation credits before passing Qualifying Examination. No more than 15 dissertation credits are counted toward the total credit hours requirement for the degree.

Admission to Candidacy: Student will be admitted to candidacy upon successful completion of the Qualifying Exam and the Preliminary oral Exam.

Final Oral Examination: The Final Oral Examination is conducted by the student's dissertation committee. This examination is the final dissertation defense presentation that is scheduled after a dissertation is completed. The examination may be held no earlier than one semester (or four months) after admission to candidacy. Failure on the examination may result in

dismissal from the doctoral program. The student's Advisory Committee may permit one re-examination. At least one full semester must elapse before the re-examination. Failure on the second attempt will result in dismissal from the doctoral program.

Submission of Dissertation: Upon passing the Ph.D. Final Oral Examination, the Ph.D. student must have the dissertation approved by each member of the student's dissertation committee. The approved dissertation must be submitted to The Graduate College by the deadline given in the academic calendar and must conform to the Graduate College's guidelines for theses and dissertations.

5.4 Academic Advisor, Major Professor, and Dissertation Committee

All students enrolled in the AST program must have an academic (AST Director) and research advisor. Upon admission to the program, the Program Director acts as the student's academic advisor. Generally, AST students should have a research adviser by the end of their second semester in the program. Based on a student's research interests, the AST program will recommend potential research advisers. It is then the student's responsibility to convince a potential faculty adviser of their ability to contribute to the faculty member's research group. While the AST department makes every effort during the admission process to only admit students for whom it is anticipated that research advisers will be available, due to changes over time beyond the control of the department related to funding levels and faculty workloads, the AST program cannot guarantee that a research adviser will be available for all students admitted to the program. The research adviser must be a graduate faculty as designated by the AST Program and the Graduate College.

The Dissertation Committee consists of the student's primary research adviser and at least three other graduate faculty committee members with the primary research adviser acting as the chair of the committee. Committee members should be chosen by the student in consultation with their research adviser based on how their expertise can contribute to quality advising of the student. Up to two voting members of the committee may be non-NCAT faculty or scientists who have been granted graduate faculty status by AST. The composition of the committee is approved through the Plan of Graduate Study and the Graduate College Report of Dissertation Committee Composition Form (http://www.ncat.edu/tgc/continuing/forms/thesis-dissertation-committee-report.pdf).

In addition to the minimum of four committee members, the Dissertation Committee must also include a Graduate College Appointee. Graduate College Appointees who contribute to both the preliminary exam and final dissertation defense are voting members of the committee and are allowed to sign the dissertation cover page. Graduate College Appointees who only contribute to the final dissertation defense are non-voting members and do not sign the dissertation cover page.

5.5 Concentrations

There are currently six concentrations approved in AST plus the general degree option:

Atmospheric, Environmental & energy Science
Applied Physics
Bioscience
Applied Chemistry
Data Science & Analytics
Information Technology and Technology Management

5.6 Critical Steps
The following are the critical steps in progression toward a Ph.D. degree in AST:

1. Application for Admission: Complete the Graduate College online application for admission. The Graduate College forwards the completed application to the Program Director who reviews it with the assistance of the Graduate Program Committee.
2. Initial Contact: All students enrolling for the first semester of graduate study in AST must consult with the Program Director.
3. Plan of Study: All graduate students are required to file a Plan of Graduate Study by the end of the second semester after admission to a program of study. Failure to submit the Plan of Study will prevent the student from enrolling in classes for his/her third semester. The Plan of Study is established in consultation with the research advisor and AST department chair. The Plan of Study is based on the Graduate Catalog requirements, but with research advisor and AST department chair approval may be modified to meet the specific needs of each student. The Plan of Study may be amended at any time before the student applies for graduation with the approval of the research advisor and AST department chair. Responsibility for meeting all academic requirements for the AST program rests with the student.
4. Selection of Dissertation Committee: Once a research adviser is assigned, the student must confer with him/her for assistance in the formation of a Dissertation Committee. Once established, the committee as a whole is responsible for recommending any changes in its composition. The committee consists of the research adviser and at least three additional faculty members with research interests related to the field of study of the student.
5. Complete Qualifying Exam: Take the Qualifying Exam that is scheduled by the AST Program and pass the exam.
6. Complete Preliminary Exam: Schedule with Program Director and Dissertation Committee Members, take the Preliminary Exam, and pass the exam.
7. Complete Course Work and Other requirements: The student is required to complete the course work as listed in his/her approved Plan of Graduate Study.
8. Complete and Defend Dissertation Research: The dissertation final defense before the advisory committee must be successfully completed, and a dissertation that complies with Graduate College formatting requirements must be prepared to the satisfaction of the committee. The time between proposal defense and final defense will usually be about two years and should be no less than 180 days.
9. Publication: All AST students are strongly encouraged to publish at least two technical papers in peer reviewed publications.

10. Graduation: Students must apply for graduation in accordance with the deadlines established by the Graduate College.

5.7 Dissertation Research Requirements

The steps in completing dissertation requirements are given below:

1. With the consent and advice of his/her research advisor, the student selects a tentative research topic.
2. In consultation with the research advisor, the student selects Dissertation Committee members.
3. The student prepares a written dissertation proposal outlining the proposed work. Dissertation proposals are expected to review the state-of-the-art and should clearly indicate that a substantial literature search has been completed. A dissertation proposal will not be considered complete without a list of relevant, reviewed references. The proposal should include some preliminary results but does not need to have results for all research objectives.
4. The research advisor and AST department chair approve the proposal and it is submitted to the Dissertation Committee members at least two weeks before the scheduled proposal defense date.
5. A proposal meeting is held that is open to other students and faculty members. The student presents his/her proposal (about 45 minutes) and answers questions. The committee decides if the topic is or is not suitable and makes suggestions on scope, solutions, and so forth.
6. The research advisor directs the dissertation research and initial writing. Other committee members are also available for guidance and advice. The advisor and student should schedule at least annual committee meeting for progress review.
7. The research advisor approves the initial typed draft of the dissertation.
8. The student must prepare at least two technical paper manuscripts for publication in a peer reviewed journals before scheduling the final defense.
9. The student submits copies of the dissertation to the committee members. The student must schedule the oral examination with the individual committee members. Copies of the dissertation must be submitted to the committee members at least ten days prior to the scheduled oral examination date.
10. The committee members read the draft and submit suggestions for changes and/or additions to the student.
11. The oral examination is open to other students and faculty members and begins with a presentation by the student (about 60 minutes) of the dissertation work, followed by questions by the research advisor and committee members.
12. The student leaves the room, the committee decides on a pass, fail, or retest, and the student is informed of the decision. In the case of a retest, the student must again appear for an oral examination no sooner than two weeks following the original examination. This procedure may be repeated at the option of the committee.
13. In consultation with the research advisor, the student makes the changes and/or additions and prepares the final draft.
14. Please consult with the Graduate College for details on dissertation format and publication (http://www.ncat.edu/tgc/continuing/graduation.html).

6.0 Financial Support

The financial aid goal of the AST program is to support all full-time students who have been admitted into the program with an aid package that provides for tuition, fees, and stipend/assistantship. Obviously, the ability to provide these aid packages depends on the availability of funds. Stipends/assistantships come from a variety of sources both within and outside the AST Program and are usually provided in return for work performed on a specific research project or for serving as a teaching assistant. The target level of stipend support is $7,200/semester during the academic year and $5,400 for the summer. If funds are not available to pay for fees and health insurance, attempts will be made to increase the amount of stipend to compensate students for paying for their own fees.

Limited financial support is available from AST for positions as Graduate Teaching Assistants or Graduate Research Assistants. A description of the policies, which apply to all graduate assistantships, is provided in the Graduate College Catalog. The number of assistantships available varies from semester to semester. Students should make known their financial needs to their research adviser and to the department chair as early as possible. The research adviser may have support available for his/her students. The final decision on the award of an assistantship to any student is made by the AST Director. Students who are admitted by March 1 for the fall semester and October 1 for the spring semester and request financial aid will have higher priority for consideration of financial support. There are some financial aid programs especially for African-American students interested in earning doctoral degrees: Department of Education Title III.

Students should not depend on assistance from NCAT in making their financial plans. Assistantships are dependent on the availability of funds and student performance. Student performance indicators that will be used to determine eligibility for funding are GPA in courses taken since enrolling in the AST program that apply to the approved Plan of Study (AST GPA must be at least 3.0); passing the AST Qualifying Exam at the end of a student's second semester in the program; pursuing the AST PhD degree fulltime by being on campus at least 40 hrs/wk doing research; completion of and follow through on AST career plan; passing the preliminary exam no later than the spring semester of the second year; maintaining standards of research ethics covered in AST 830; maintaining office/lab space in a clean, orderly, and safe manner; responding quickly to program requests for information; and integrity in dealing with NCAT faculty, staff, and fellow students.

Out-of-State students are expected to complete and submit an Application for In-State Residency for Tuition Purposes (http://www.ncat.edu/admissions/undergraduate/cost-financial-aid/residency_reclassification_app.pdf) when they near a year of residency in North Carolina. These students should regularly communicate with the AST chair their status in this process. Note that international students on F-1 visas cannot qualify for in-state status.

Student Payroll

Assistantships generally require students to work about 20 hours per week as a Research Assistant on a research project or as a Teaching Assistant. As such, paperwork is processed to provide payroll for the student classifying them as student employees of NCAT. Graduate student employees must complete a new hire package and sign a Personal Service Agreement (PSA) which details how many hours the student is required to work, the time period, and the amount the student will be paid for that period. The Office of the State Controller requires all state employees (to include students) paid through Central Payroll to be paid by direct deposit.

The University Payroll Department receives payroll checks for students at the end of each month. After processing the payroll, checks are disbursed by direct deposit to the students' account. Questions arising regarding the amount of a particular check, withholdings, etc. should be addressed directly to payroll. The monthly payroll schedule for students can be accessed at http://ncat.edu. Please note that because of the pay period each semester and the closing period, a new hire should not expect to receive a full pay check until approximately 1 month after beginning employment.

Health Insurance

The Student Health Insurance Plan works in partnership with the university health fee to provide seamless health care at a reasonable cost to students. The university health fee covers provider charges at the Sebastian Health Center, while the student health insurance plan helps cover other charges, i.e. lab, x-ray, and pharmacy charges. If you have other insurance and wish to waive the student insurance plan, you may do so by going to the www.ncat.edu, click on NCAT's popular sites and click on Health Center for details on how to waive the insurance for the semester. The insurance charge will then be removed from your tuition bill after the waiver has been verified.

Graduate students enrolled in at least 6 or more credit hours of graduate level courses, in good academic standing and making appropriate progress toward graduation, and all *international students* (regardless of hours) must have student health insurance. U.S. students registered for less than 6 credits hours will not be granted student health insurance through the University. There are no exceptions to this rule. Students in this category desiring health insurance will need to secure private health coverage if they are not covered by a parent or spouses' policy.

7.0 Department, College, and University Awards – *To be added in next revision.*

Department
-Best Seminar Presentation
-Alumni award

College
-Best Graduate Student
-Merit Award

University

-4.0 GPA
-Outstanding Dissertation

8.0 Computer and Office Policies

Computer Issues

Computer Problem Help

The Cherwell Service Management (CSM) Platform (https://ncat.cherwellondemand.com/CherwellPortal/IT) is used to request help with computer related problems, including e-mail, blackboard and wireless access.

Blackboard

Blackboard is NCAT's campus wide E-learning platform. With this tool, you can manage your class assignment, communicate with classmates, check your course grades and collaborate with instructors and fellow students on-line. You must be a validated (paid) student and have a NCAT e-mail account to access Blackboard. To obtain an account, go to "Get Connected" at http://www.ncat.edu.

Print Management System Policies

Printers are available for limited student use in Gibbs Hall and in Hines Hall. All AST students who would like access to the department printers should consult with the AST Executive Assistant for access. The printers are to be used for course/research printing only. Printing in large volumes (i.e. textbooks) and excessive copying will not be allowed. Printer counts will be monitored for each student and privileges will be terminated if copying becomes excessive. Especially color copying should be kept to a minimum.

Gibbs/Hines Hall Office Key Policies

AST students will have office access in either Gibbs Hall or Hines Hall. Students will be given a key (or in some instances a door access code) to their specific area of assignment. All key requests/access codes must be obtained through the AST Executive Assistant and will be distributed based on availability. Each student is responsible for his/her key. Keys must be returned to the AST Executive Assistant upon leaving the program for any reason.

9.0 Graduate College Requirements

The following procedures are at the direction of the Graduate College. Students must conform to these guidelines.

Transfer of Credit

Up to 40% of the required course work can be transferred from another university if this work was not part of any prior degree requirement and if, in the opinion of the AST department chair, the content adequately replaces current graduate offerings in the student's curriculum (http://www.ncat.edu/tgc/continuing/forms/transfer_external.pdf). Course work being considered for transfer credit must be at the graduate level.

Application for Graduation

A candidate for graduation must file an application for graduation according to the schedule released by the Graduate College. Failure to meet the deadline may result in a delayed graduation date for the candidate.

Course Load

A student using any resource of the University must register for at least one credit hour during the semester of the thesis/project or the dissertation.

Appendix A: AST Graduate Faculty

Directory of Core AST Faculty

- Keith A. Schimmel, Associate Professor of Chemical Engineering and Chairperson Applied Science & Technology, B.S., Purdue University; M.S., Ph.D., Northwestern University

Directory of Associated Faculty

- Lyubov L. Kurkalova, Associate Professor of Economics/AST, B.S., Tajik State University; M.S., Kazakh State University; Ph.D., Iowa State University
- Yuh-Lang Lin, Professor of Physics/AST, B.S., Fu Jen Catholic University; M.A., Fordham University; M.S., South Dakota School of Mines and Technology; Ph.D., Yale University
- Ademe Mekonnen, Assistant Professor of Applied Science & Technology, B.S., Addis Ababa University; M.S., University of Reading; Ph.D., University of Albany
- Yevgenii A. Rastigejev, Associate Professor of Mathematics/AST, B.S., Moscow Institute of Physics and Technology; M.S., Ph.D., University of Notre Dame
- Jing Zhang, Associate Professor of Physics/AST, B.S., M.S., Nanjing University; Ph.D., Peking University

- Zerihun Assefa, Professor of Chemistry, B. S., Addis Ababa University (Ethiopia); Ph.D., University of Maine, Inorganic Chemistry
- Mufeed Basti, Associate Professor of Chemistry, B.S., Baath University (Homs, Syria); Ph.D., North Illinois University, Physical Chemistry
- Solomon Bililign, Professor of Physics, B.S., M.S., Addis Ababa University; Ph.D., University of Iowa
- Mark Burkey, Professor of Economics, B.S., B.A., Appalachian State University; M.A., Ph.D., Duke University
- Shoou-Yuh Chang, Professor of Civil Engineering and DOE Samuel Massie Chair, B.S., M.S., National Taiwan University; M.S., University of North Carolina at Chapel Hill; Ph.D., University of Illinois at Urbana-Champaign
- Jeffrey A. Edwards, Professor of Economics, B.A., University of North Carolina at Chapel Hill; M.A., Ph.D., Virginia Tech
- Godfrey C. Ejimakor, Professor of AgriBusiness, Applied Economics & Ag Science, B.S., North Carolina State University; M.S., North Carolina A&T State University; Ph.D., Texas Tech University
- Albert C. Esterline, Associate Professor of Computer Science, B.A., Lawrence University; M.Litt., Ph.D., University of St. Andrews; M.S., Ph.D., University of Minnesota
- Marc Fiddler, Research Associate of Physics, B.S., Penn State University; Ph.D., Purdue University
- Ellie Fini, Assistant Professor of Civil Engineering, B.S., Isfahan University of Technology; B.S., M.S., Sharif University of Technology ; Ph.D., University of Illinois
- Clay Gloster, Jr., Professor and Chair of Computer Systems Technology, B.S., M.S., North Carolina A&T State University; Ph.D., Computer Engineering, North Carolina State University
- Gregory D. Goins, Associate Professor of Biology, B.S., University of North Carolina at Chapel Hill; M.S., Ph.D., North Carolina State University
- Scott H. Harrison, Assistant Professor of Biology, B.S., Ph.D., Michigan State University

- Abdollah Homaifar, Duke Energy Eminent Professor of Electrical Engineering, B.S., M.S., State University of New York-Stony Brook; Ph.D., University of Alabama
- Salam A. Ibrahim, Professor of Family & Consumer Science, B.S., University of Mosul; M.S., University of Georgia; Ph.D., University of Kentucky
- Shamsuddin Ilias, Professor of Chemical Engineering, Ph.D., Queen's University at Kingston
- O. Isikhuemhen, Associate Professor of Natural Resources & Environmental Design, B.S., M.S., University of Benin, Nigeria; Ph.D. Institute of Microbiology, Prague, Czech Republic
- Manoj K. Jha, Assistant Professor of Civil Engineering, B.E., Tribhuva University; M.E. Asian Institute of Technology; M.S., Ph.D., Iowa State University
- Abebe B. Kebede, Associate Professor of Physics, B.S., Addis Ababa University; M.A, Ph.D., Temple University
- Ajit D. Kelkar, Professor of Mechanical Engineering and Chair, Nanoengineering, B.S., Pune University, Pune, India; M.S., South Dakota State University; Ph.D., Old Dominion University
- Vinaya A. Kelkar, Research Assistant Professor of Biology, B.S., Gujarat University – India; M.S., Old Dominion University; Ph.D., University of North Carolina at Greensboro
- Debasish Kuila, Professor of Chemistry, B.S., Calcutta University, India; M.S., Indian Institute of Technology, Madras; Ph.D., The City University of New York
- Dhananjay Kumar, Associate Professor and ORNL Joint Faculty of Mechanical Engineering, B.S., Bhagalpur University; M.S., Magadh University, Ph.D., Indian Institute of Technology
- Claude N. Lamb, Associate Professor of Chemistry, B.S., Mount Union College; M.S., North Carolina Central University; Ph.D., Howard University, Organic Chemistry
- Liping Liu, Assistant Professor of Mathematics, B.S., Huazhong University of Science and Technology; Ph.D., University of Alberta
- Jianzhong Lou, Professor of Chemical Engineering, Ph.D., University of Utah
- Stephanie Luster-Teasley, Associate Professor of Civil and Chemical Engineering, B.S., North Carolina A&T State University; Ph.D., Michigan State University
- Patricia A. Lynch, Assistant Professor of Family and Consumer Science, B.S., M.S. North Carolina A&T State University; Ph.D., R.D., University of Nebraska
- Patrick Martin, Associate Professor of Biology, B.S. Biology, Virginia Union University; Ph.D., Cell Biology, University of Virginia
- Radiah Corn Minor, Assistant Professor of Animal Science, B.S., Florida A&M University; Ph.D., Meharry Medical College
- Perpetua Muganda, Professor of Biology, B.S., Lock Haven State College; M.S., Howard University; Ph.D., Indiana University School of Medicine
- Robert B. Pyle, Professor Construction Management & Safety and Chair, B.A., M.A., Trenton State College; Ph.D., University of Pittsburgh
- Charles W. Raczkowski, Adjunct Associate Professor of Natural Resources & Environmental Design, B.S., M.S., Kansas State University; Ph.D., N.C. State University
- G.B. Reddy, Professor of Natural Resources & Environmental Design, B.S., M.S., A.P.A.U. (India); Ph.D., University of Georgia
- M.R. Reddy, Professor of Natural Resources & Environmental Design, B.S., Osmania University; M.S., A.P.A.U. (India); Ph.D., University of Georgia
- Manuel R. Reyes, Associate Professor of Natural Resources & Environmental Design, B.S., University of the Philippines at Los Banos; M.S., Cranfield Institute of Technology, England; Ph.D., Louisiana State University
- John Paul Roop, Associate Professor of Mathematics, B.S., Roanoke College; M.S., Ph.D., Clemson University
- Checo Rorie, Assistant Professor of Biology, B.S., Clark Atlanta University; Ph.D., University of North Carolina at Chapel Hill

- Shengmin Sang, Associate Professor, Lead Scientist for Functional Foods, Center for Excellence in Post-Harvest Technologies, B.S. Shandong Normal University, Jinan, P.R. China; Ph.D. Shanghai Institute of Materia Medica, Chinese Academy of Science
- Jagannathan Sankar, University Distinguished Professor of Mechanical Engineering and Director, NSF Engineering Research Center, B.E., University of Madras; M.E., Concordia University, Ph.D., Lehigh University
- Dilip T. Shah, Associate Professor of Construction Management & Safety, B.E., Poona, India; M.S., Illinois State University; Ph.D., Texas A&M University
- Abolghasem Shahbazi, Professor of Natural Resources & Environmental Design, Ph.D., Pennsylvania State University
- Ji Y. Shen, Professor of Applied Engineering Technology and Chairperson, B.S., Northwestern Polytechnic University; M.S., Nanjing Aeronautical University; Ph.D., Old Dominion University
- Musibau A. Shofoluwe, Professor of Construction Management & Safety, B.S., North Carolina A&T State University; M.S., Pittsburgh State University; DIT University of Northern Iowa
- Guoqing Tang, Professor of Mathematics, B.S., Anhui University; M.S., Nanjing University of Science and Technology; Ph.D., Rutgers University
- G.A. Uzochukwu, Professor of Natural Resources & Environmental Design, B.S., M.S., Oklahoma State University; Ph.D., University of Nebraska
- Lijun Wang, Associate Professor of Natural Resources & Environmental Design, Ph.D., National University of Ireland
- Jenora Waterman, Assistant Professor of Animal science, B.S., Bennett College for Women; M.S., North Carolina A&T State University; Ph.D., North Carolina State University
- Niki Whitley, Adjunct Associate Professor, Cooperative Extension's animal sciences specialist and interim program leader for agriculture and natural resources, B.S., M.S., University of Georgia; Ph.D., Mississippi State University
- Leonard L. Williams, Professor, Interim Director and Lead Scientist for Food Safety and Microbiology, Center for Excellence in Post-Harvest Technologies, B.S., M.S., North Carolina A&T State University; Ph.D., Alabama A&M University
- Alex N. Williamson, Associate Professor of Chemistry, B.S., Jackson State University; Ph.D., University of Illinois, Inorganic Chemistry
- Abraham Woldeghebriel, Associate Professor of Animal Science, B.S., Addis Ababa University; M.S., Ph.D., New Mexico State University
- Mulumebet Worku, Professor of Animal science, B.S., Addis Ababa University, Alemaya College of Agriculture, Ethiopia; M.S., Ph.D., University of Maryland, College Park
- Jinsheng Xu, Associate Professor of Computer Science, B.S., Nanjing University; M.S., Beijing University; Ph.D., Michigan State University
- Anthony K. Yeboah, Professor and Chairperson of AgriBusiness, Applied Economics & Ag Science, B.S., University of Science and Technology; M.S., Ph.D., Iowa State University
- Osei-Agyeman Yeboah, Associate Professor of AgriBusiness, Applied Economics & Ag Science, B.S., University of Science and Technology, Kumasi, Ghana; M.S., North Carolina A&T State University; Ph.D., University of Nebraska
- Yeo Heung Yun, Associate Professor of Bioengineering, B.E., M.S., Chonbuk National University, South Korea; Ph.D. University of Cincinnati
- Qing-An Zeng, Assistant Professor of Computer Systems Technology, B.S., Chengdu University of Information Technology, China; M.S., Ph.D., Shizuoka University, Japan

Directory of Adjunct AST Faculty

- Mohamed Ahmedna (Qatar University), Adjunct Professor, B.S., Institut Agronomique et Veterinaire Hassan II; M.S., Ph.D., Louisiana State University
- Rich Baldwin (NOAA-NCDC), Adjunct Assistant Professor
- Cathy Connor (Environmental Science Program, University of Alaska Southeast), Adjunct Assistant Professor, B.S., M.S., Stanford University; Ph.D., University of Montana
- Thomas Doyle (Branch Chief, USGS National Wetlands Research Center), Adjunct Professor, Ph.D., University of Tennessee
- Angela M. Fraser (Department of Food, Nutrition, and Packaging Sciences, Clemson University), Adjunct Associate Professor, B.S., M.S., Ph.D., Michigan State University
- Ipek Goktepe (Qatar University), Adjunct Associate Professor, B.S., University of Istanbul; M.S., Ph.D., Louisiana State University
- Stephen Holland (Department of Economics, UNCG), Adjunct Associate Professor, B.S., University of Iowa; M.S. Iowa State University; Ph.D., University of Michigan
- Jaehak Jeong (Department of Biological & Agricultural Engineering, Texas A&M University), Adjunct Assistant Professor, Ph.D. (Civil Engineering) University of Texas at Austin
- Jin-Luen Lee (NOAA, Earth System Research Laboratory), Adjunct Professor, Ph.D. University of Utah
- John Meriwether (Department of Physics, University of Louisiana at Lafayette), Adjunct Professor, Ph.D. Florida State University
- Albachir Seydou Niandou (Niger University), Adjunct Assistant Professor, B.S., Université Hassan; M.S., Ph.D., North Carolina A&T State University
- Jack Odle (Department of Animal Science, North Carolina State University), Adjunct Professor, B.S., Purdue University; M.S., Ph.D., University of Wisconsin-Madison
- Jeff Ramsdell (Director of the Appalachian Energy Center, Technology & Environmental Design Department, Appalachian State University), Adjunct Professor, B.S., University of Florida; M.B.A., Rollins College; Ph.D., University of Central Florida
- João C.M. Sá (State University of Ponta Grossa, Brazil), Adjunct Associate Professor
- Silvia Secchi (Department of Agribusiness Economics, Southern Illinois University), Adjunct Assistant Professor, B.S., Università Commerciale L. Bocconi, Milan, Italy; M.S., University of Reading, England; Ph.D., Iowa State University
- Gilbert Sigua (USDA, Coastal Plains Soil, Water, and Plant Research Center), Adjunct Professor
- Tammy Song (Food Technologist at FDA, Washington D.C.), Adjunct Associate Professor, M.S., Harbin Medical University; Ph.D., North Dakota State University
- Florent Tivet (CIRAD, France), Adjunct Associate Professor
- Yuanfu Xie (NOAA-ESRL), Adjunct Professor
- Jianjun Xu (Research Professor in the College of Science, George Mason University), Adjunct Professor, B.S. and M.S., Nanjing University; Ph.D., Nanjing Institute of Meteorology
- Xiangdong Zhang (Professor, University of Alaska Fairbanks, International Arctic Research Center), Adjunct Professor, Ph.D., Nanjing University

Appendix B: Course Descriptions

AST Course Descriptions

AST 812. Environmental Chemistry **Credit 3(3-0)**
This course presents the chemical aspects of applied environmental science. Topics covered include the sources, reactions, transport, and fates of chemical species in water, soil, and air along with the analytical techniques used to study the chemicals. Prerequisites: Graduate standing and consent of instructor.

AST 813. Sustainable Energy Systems **Credit 3(3-0)**
The course will cover the thermodynamic, mass and energy balance, economic, and environmental considerations of sustainable energy systems. Alternative energy technologies and conventional energy technologies will be compared. Prerequisites: Graduate standing and consent of instructor.

AST 814. Life Cycle Analysis **Credit 3(2-2)**
The course introduces the life cycle assessment (LCA) process with the aid of an LCA software package. Topics covered include life cycle goal and scope definition, inventory analysis, impact assessment, and reporting and interpretation. Prerequisites: Graduate standing and consent of instructor.

AST 821. Environmental & Energy Economics I **Credit 3(3-0)**
This course presents theories of natural resource utilization and allocation. Topics covered include externalities, public goods, environmental quality, planning natural resource use and environmental quality, evolution of energy industries, and current energy and environmental regulatory systems. Prerequisites: Doctoral Standing and consent of instructor.

AST 822. Environmental & Energy Economics II **Credit 3(3-0)**
This course presents interrelationships of natural resource use and the environment. Topics covered include applied welfare and benefit-cost analysis, externalities and pollution abatement, and quantitative methodologies for analyzing energy, natural resource, and environmental problems. Prerequisites: AST 711.

AST 830. Foundations of Scientific Research **Credit 3(3-0)**
This course provides students the foundation needed to successfully design and communicate their dissertation research. Students will improve their ability to perform a literature search, read and understand scientific journal articles, develop clear hypotheses about issues for which there is no answer in the literature, design experiments to test hypotheses, and present them clearly in writing and orally. Prerequisites: Graduate Standing and consent of instructor.

AST 831. Math & Computational Modeling **Credit 3(3-0)**
This course explores how to mathematically model a system, select an appropriate numerical method, implement computer simulations, and assess the ensuing results. Topics include nonlinear, 2D, and 3D models; nonrectangular domains; systems of partial differential equations; and large algebraic problems requiring high-performance computing.
Prerequisites: Graduate Standing and consent of instructor.

AST 841. Biomaterials Characterization **Credit 3(3-0)**
This course presents the analytical and spectroscopic techniques and tools available for examining molecular and macroscopic structural features of naturally occurring materials with emphasis on the lignocellulosic substrate. Topics covered will provide an appreciation for the fundamental principles behind the available techniques. Prerequisites: Graduate standing and consent of instructor.

AST 842. Biomass Thermal Conversion Processes **Credit 3(3-0)**
This course presents the available chemical and thermal methods and processes that are available to convert biomass into commodity chemicals and energy as part of a biorefinery concept. Topics covered include the conversion of biomass to specific end products or to complex mixtures of materials such as syngas and pyrolysis oils. Prerequisites: Graduate standing and consent of instructor.

AST 843. Biomass Biological Conversion Processes **Credit 3(3-0)**
This course presents the available biological conversion methods and processes that are available to convert biomass into commodity chemicals and energy as part of a biorefinery concept. Topics covered will highlight the challenges of

bioconversions in terms of cost, dewatering, and limited thermal and pH ranges. Prerequisites: Graduate standing and consent of instructor.

AST 844. Environmental and Policy Studies of Biomass Use **Credit 3(3-0)**
This course presents the ways in which biomass technological principles impinge upon policy issues. Topics covered include lifecycle analysis, management issues, public policy development, and principles of green engineering and sustainability. Prerequisites: Graduate standing and consent of instructor.

AST 850. Physical Meteorology **Credit 3(3-0)**
This course presents physical principles related to atmospheric environmental systems, processes, and measurements. Topics covered include atmospheric thermodynamics, atmospheric radiation transfer, and cloud microphysical processes. Prerequisites: Graduate standing and consent of instructor.

AST 851. Dynamic Meteorology **Credit 3(3-0)**
This course presents classical and physical hydrodynamics. Topics covered include perturbation theory, scale analysis of dynamic equations, atmospheric boundary layers, atmospheric wave motions, the general circulation model, dynamics of tropical convections, middle atmosphere dynamics, atmospheric instabilities, and numerical weather forecasting. Prerequisites: Graduate standing and consent of instructor.

AST 852. Climatology **Credit 3(3-0)**
This course presents physical and chemical principles that influence climate. Topics covered include earth climate history and present-day climate, climate equilibrium, earth energy budget, climate in middle and high latitudes, climate change detection, and future climate scenarios. Prerequisites: Graduate standing and consent of instructor.

AST 853. Numerical Weather Prediction **Credit 3(3-0)**
This course presents the physical and mathematical basis for numerical weather prediction with computer experiments to demonstrate principles and techniques. Topics covered include derivation of sets of prediction equations consistent with scale analysis and dynamical constraints, atmospheric waves and filtered equations, numerical methods and computational instabilities, filtered and primitive equation models, and National Weather Service operational models. Prerequisites: Graduate standing and consent of instructor.

AST 854. Advanced Synoptic Weather Analysis **Credit 3(3-0)**
This course presents advanced analysis of synoptic weather systems, such as extratropical cyclones and their associated fronts and jet streams. Topics covered include the quasigeostrophic theory, isentropic analysis, potential vorticity dynamics, baoclinic instability, fronts and frontogenesis, and cyclones and cyclogenesis. Prerequisites: Graduate standing and consent of instructor.

AST 855. Principles of Air Quality **Credit 3(3-0)**
This course presents the chemical interactions, transport, and monitoring of trace gas, aerosol, and particulate pollutants in the atmosphere. Topics covered include geochemical cycles, biogeochemical cycles, climate effects, health effects, regulations, and air quality meteorology. Prerequisites: Graduate standing and consent of instructor.

AST 856. Atmospheric Aerosols **Credit 3(3-0)**
This course presents the physics and chemistry of particles and droplets in the atmosphere. Topics covered include optical properties and particle absorption and scattering, solutions of radiative transfer equation in multiple scattering atmospheres, statistics of size distributions, and physical chemistry of atmospheric aerosols. Prerequisites: Graduate standing and consent of instructor.

AST 857. Advanced Remote Sensing **Credit 3(3-0)**
This course presents principles of remote sensing with emphasis on atmospheric science applications. Topics covered include satellite and radar remote sensing, principles of atmospheric radiative transfer, descriptions of important satellite platforms, orbits and sensors, the retrieval of atmospheric variables from active and passive systems, and basic principles of interpretation. Prerequisites: Graduate standing and consent of instructor.

AST 858. Tropical Meteorology **Credit 3(3-0)**
This course presents the dynamics of circulations, convection, and wave activity in the tropics. Topics covered include various theories of tropical cyclone formations, large scale circulation systems of the tropical atmosphere, El Niño Southern Oscillations, and wave disturbances in the tropics such as African easterly waves, Rosby waves, Kelvin waves, and waves in the intraseasonal range. Prerequisites: Graduate standing and consent of instructor.

AST 859. Advanced Mesoscale Analysis **Credit 3(3-0)**
This course presents mesoscale atmospheric phenomena and processes attributed to instabilities, topographic forcing, and/or air mass boundaries. Topics covered include mesoscale instabilities, boundary layer convection, mesoscale convective systems, and orographic mesoscale flows. Prerequisites: Graduate standing and consent of instructor.

AST 885. Doctoral Special Topics **Credit 3(2-4)**
This course allows the introduction of new topics on a trial basis at the doctoral level. The topic of the course will be determined prior to registration. Prerequisites: Graduate standing and consent of instructor.

AST 984. Laboratory Internship **Credit 3(0-6)**
This course allows a student to explore various research areas first-hand by performing multiple projects in different laboratories under the mentorship of members of the graduate faculty. It should be taken before a student passes the qualifying exam. Grading is satisfactory/unsatisfactory evaluation only. Prerequisites: Doctoral standing and consent of instructor.

AST 985. Doctoral Supervised Practicum **Credit 3(0-6)**
This course represents the supervised internship for the doctoral student that satisfies the 3 credits of required professional development. Oral and written presentations on the experience will be provided to the faculty. Grading is satisfactory/unsatisfactory evaluation only. Prerequisites: Doctoral standing and consent of instructor.

AST 992. Doctoral Seminar **Credit 1(1-6)**
This course includes presentations delivered by the doctoral students, faculty, and invited speakers on topics related to energy and environmental issues and research. Grading is satisfactory/unsatisfactory evaluation only. May be repeated. Prerequisite: Doctoral standing.

AST 993. Doctoral Supervised Teaching **Credit 3(2-2)**
This course represents the supervised teaching for the doctoral student that satisfies required professional development. This course introduces the doctoral student to classroom or laboratory teaching under the supervision of a faculty mentor. Doctoral students who serve as teaching assistants or as instructors are required to take this course during the first semester they teach. Grading is satisfactory/unsatisfactory only. Prerequisites: Doctoral standing.

AST 994. Doctoral Supervised Research **Variable Credit 3(3-9)**
This course is supervised research under the mentorship of a member of the graduate faculty before a student passes the preliminary exam. This research should lead to the identification of a dissertation topic and written research proposal. Grading is satisfactory/unsatisfactory only. Prerequisites: Doctoral standing.

AST 997. Doctoral Dissertation **Variable Credit 1(1-15)**
This course represents the supervised research leading to the dissertation for the doctoral student. Doctoral dissertation research will be conducted under the supervision of the dissertation committee chairperson and include regular meetings with the dissertation committee to evaluate progress on the dissertation. Grading is satisfactory/unsatisfactory only. Prerequisite: Doctoral standing.

AST 999. Continuation/Residency **Credit 1(1-3)**
Meets requirement for continuous enrollment during final term prior to graduation when all course credit requiremetns (including dissertation) have been completed. This course is non-graded, may receive a grade of S/U, and credit for this course does not count toward the degree. May be repeated twice. Prerequisites: Doctoral standing.

Appendix C: Guidelines for Students Seeking a Dissertation Topic

1. First consider the area of Applied Science & Technology that you find most interesting and the courses you have taken and your past research/work experiences. Thus, to find a topic that you are interested in working on, first pick the area of study you like most.

2. Check the appropriate technical journals. The required AST 830 Research Proposal Writing Course is provided to help with this process. Often, authors point out unanswered questions in their articles. Such questions can become the basis for your research. Seek the assistance of faculty for any of these steps.

3. After completing the above process, visit with the professors who normally teach courses in your area of interest or have ongoing research projects in this area. Bring a list of the literature you have reviewed, as well as any ideas you may have come across for possible topics. Sometimes, a professor may have a topic in mind for a dissertation, and is waiting for a graduate student to express an interest. But you cannot count on this situation. You have the responsibility of identifying a topic, while the professors provide advice to help you determine a topic of interest. During this process, keep the following in mind:

a) You must find the topic;
b) No faculty member is required to direct your dissertation; it is solely the decision of the faculty to serve as advisor based on his/her research interests and prior commitments;
c) You are responsible for your dissertation and its progress; faculty do not (and should not) do your research, do not write your dissertation, do not take the responsibility for your mistakes, nor are they responsible for seeing that you finish your degree by your personal deadline;
d) The date of completion is a function of how many hours you work on your dissertation, the quality of work you put into it, and how well your research progresses; research has uncertainty, and that is why it is research, and your advisor cannot determine how long it will take you to finish your degree.

4. Ph.D. students should consider topics related to their M.S. thesis work, if appropriate.

Appendix D: Guidelines for Change of Dissertation Committee

This situation should normally not arise. However, these guidelines are stated in the event of such an unlikely situation. A student who wants to change his/her dissertation advisor and/or the composition of his/her committee should follow these guidelines:

1. Changes in Committee:
Once established, the committee shall be responsible for recommending changes in its composition. A student may petition the committee providing reasons and justification for any desired changes in its composition. When necessary, the student may be required to appear in person before the committee to make arguments in favor of their position. The committee shall do everything necessary to ensure that the student's concern is heard fairly; when necessary, individual committee members may be excused from the proceedings to avoid a possible conflict of interest. The research advisor will communicate the committee's decision to the student in a timely manner. If the change of committee members is permitted, the student may seek a replacement member. In the event the research advisor is involved in the dispute, a member of the committee will be appointed to make this decision, to avert any conflict of interest.

2. Solicitation of individual faculty members as replacements in the Committee:
It shall be the duty of all AST faculty members prior to committing to a solicitation by a student to serve as either a research advisor or committee member, to ensure that the solicitation is for the formation of a new committee. In cases where the solicitations are for replacement of committee personnel, the faculty member should verify and ensure that the case has been properly channeled through the student's research advisor and other committee members and that a decision has been made for replacement before engaging in any significant dialogue with the student.

If a replacement is sought for the research advisor, a new research topic that is in line with the new advisor's research interests and expertise may be required. In the event that the student desires to maintain the same topic, it shall be his/her responsibility to convince the committee that a change of research advisor is justifiable.

3. Requirements for the student in the event of a change:
If a change is approved by the student's committee and replacement is made, the student will be required to present his/her dissertation proposal for the approval of the new committee (even if a proposal defense has been previously completed). For the sake of professional courtesy and to ensure a smooth transition, each faculty member who is contacted by a student to serve as a replacement in the committee should confer with the student's current research advisor and/or colleague to be replaced and ensure that there are no conflicts of interest issues.

Appendix E: Ph.D. Qualifying Exam Preparation Guide

1. Format of Exam:
The Qualifying Examination (QE) is 4 hours in duration. The exam will be questions related to a journal article provided to the student for review in advance of the exam (provided about 2 weeks in advance).

2. What student may bring to the exam:
As this exam is a closed-book, open-article test. Homework and course exam questions and solutions are not allowed. Access to computers is permitted for use of EXCEL, WORD, and Calculator only; no network resources may be accessed.

3. Exam Evaluation
Passing Score Criteria: A score of 75% is considered passing.

No more than one retake is allowed.
Dismissal: If the student does not pass the exam on the second attempt, (that is, the student does not pass the retake), then the student will be dismissed from the doctoral program.

4. Exam Date:
The Exam is given during the last two days of finals week if students do not have any conflicts with this. If there are conflicts, the exam may be held during the first two week days after finals week.

5. Preparing for the Exam:

Appendix F: List of Required Forms

The forms below are available at either the Graduate College website or the AST Department website. Download the forms you need. Complete your information. Print the completed form. Get appropriate signatures and return to the AST Executive Assistant.

From Graduate College Website (http://www.ncat.edu/tgc/continuing/forms/index.html):

- Change of Name form
- Change of Program form
- Transfer of Credit - External
- Plan of Study
- In-State Residency Claim Form
- Report of Dissertation Committee

From the Department website (?):

In progress.

Applied Science & Technology
PHD STUDENT MONTHLY CUMULATIVE PROGRESS REPORT

STUDENT NAME:_____
DATE SUBMITTED:_____

RESEARCH ADVISER:_____

Part 1. Career Goals

Current career goal (s):
1.
2.
3.

When do you anticipate beginning a job search?

List of Long-range Goals (In 5-10 years) – e.g., obtain a chemical engineering faculty position, start own business in the solar energy industry, etc.
List of Short-range Goals (Next 3-4 years) – e.g., publish 4 journal articles, make 5 conference presentations, intern with the Department of Energy, etc.
List of Current Network of Mentors/Useful Contacts
Plan for Developing enhanced Network of Mentors/Contacts – e.g., find someone from USDA to add to my dissertation committee, etc.
Plan for Improving Communication Skills – e.g., join the local chapter of Toastmasters, present regularly in my research group, take a short course on technical writing, etc.
Plan for Improving Research Skills – e.g., participate in a workshop on a new analytical technique, read and summarize a journal article per week, etc.
Plan for Improving Computer Skills – e.g., learn to type without looking at keyboard; learn how to use EndNotes software package, etc.

Part 2. Career Progress Review

Honors/Awards (Since first semester of enrollment at A&T)
List any Student honors, awards, scholarships, and/or fellowships you have received, include both external and A&T awards

Honors/Awards	***Date (Month/Year or Semester)***

Journal Publications (Since first semester of enrollment at A&T)

Authors (Last Name, First Initial)	*Article Title*	*Journal Name*	*Volume (Issue#) or Submitted/Accepted Status*	*Year*

Conference Proceedings Papers (Since first semester of enrollment at A&T)

Authors (Last Name, First Initial)	*Article Title*	*Name of Conference*	*Location (City, State)*	*Date (Mo/Day/Yr - Mo/Day/Yr)*

Conference Presentations (Since first semester of enrollment at A&T)

Authors (Last Name, First Initial)	*Presentation Title (oral or poster)*	*Name of Conference*	*Location (City, State)*	*Presentation Date (Month/Day/Year)*

NC A&T Seminar Presentations

Presentation Title	*Hosting Department/Program*	*Presentation Date (Month/Day/Year)*

Attendance at Meetings and Conferences (Since first semester of enrollment at A&T)

Name of Conference Attended	*Location (City, State)*	*Date (Mo/Day/Yr - Mo/Day/Yr)*

Internships & Co-ops (Since first semester of enrollment at A&T)

Semester, Year	*Company/Organization*	*Location (City, State)*

Patents

Teaching Activity

Course Lectures or Lab Sections (department, course name, date)

Oversight of graduate, undergraduate or high school students (name, academic level, project title)

Committee or other service activity (indicate if you held an office)

Other professional activities not identified above

Part 3. Plans for the Year
Research project goals (bulleted)

Anticipated publications

Anticipated meeting or workshop attendance

Funding or other funding applications planned

Other professional training

Part 4. Progress this Month

Research Adviser Meetings
How often did you meet with your research adviser this month?

Literature Review (List the titles for articles/reports you read this month related to your research area)
1.
2.
3.
4.
5.

Problems (Explanation of any tasks planned to be accomplished during the month that were not or low grades in courses)
1.
2.
3.

Plans for Addressing Problems

1.
2.
3.

Goals for Next Month

1.
2.
3.

Needs (Things you would like the AST Department to do to enhance your experience at A&T and facilitate your research and career success)

1.
2.
3.

Software package learned, equipment setup accomplished, experiments performed, dissertation sections written, research group presentation made.

Graduate College plan of study?

Dissertation committee form?