

**Department of Computer Science**

**College of Arts and Sciences**

**Bowie State University**

**Graduate Student Handbook**

**August 2009**

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# Introduction

The Department of Computer Science is an undergraduate and graduate department that supports applied research in a broad set of areas. The Graduate research areas include: Artificial Intelligence, Computer Systems, Database Systems, Software Engineering/Programming Languages, Scientific Computing, Algorithms and Computation Theory, Sensor Networking Security, and Satellite Remote Sensory Data Processing.

The Department offers two graduate degrees, the Doctor of Applied Science and Master of Science. Each degree has several emphases, which are explained under the separate programs. Faculty members housed in the department participate in the various concentration areas.

Your graduate education in the Department of Computer 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 Computer Science. Graduate students and faculty should familiarize themselves with its content, paying particular attention to Department and University deadlines.

# MASTER OF SCIENCE

The Master of Science in Computer Science degree is designed to advance a student's knowledge beyond the baccalaureate degree and to teach the student how to approach a research project.

The Department of Computer Science offers both thesis and non-thesis options for the Master of Science degree.

## General Program Requirements for the Master of Science

The following requirements apply to both the thesis and non-thesis options.

### Coursework

The Master of Science requires a completion of at least 36 credit hours beyond the baccalaureate degree with a 3.0 or above grade point average (GPA) on a 4.0 scale. These courses must be at the 500-level or higher, with at least 21 credit hours at the 600-800 levels. At least 30 credit hours must be in computer science courses with the remaining credits in an approved area. The student's program of study must be developed in conjunction with the thesis advisor and the advisory committee.

### Advancement to Candidacy

Advancement to candidacy implies that the student has met the basic criteria needed for graduation. An applicant is expected to possess the prerequisites for the intended area of study. If a deficiency exists, the necessary course work must be completed prior to the advancement to candidacy. A student must have a 3.25 (GPA) for the first fifteen (15) to eighteen (18) credits taken in the program to advance to candidacy.

### Transfer of Credit

A maximum of six (6) hours in a computer science or an approved related area can be transferred from an accredited graduate program. The Computer Science Graduate Coordinator will determine the applicability of all transfers.

### Residency

You must complete at least two full-time semesters, or the equivalent, at Bowie State University (four semesters, part-time, with a course load of at least 6 credit hours are considered equivalent to two semesters full-time).

### Time Limit

You must complete all requirements for your degree no later than seven years after the date you were admitted to the program.

You must be registered for at least one credit in the semester in which you expect to receive your degree.

## Requirements for the Master of Science (Thesis)

You must complete six (6) credits of COSC 696 and 697 (Master's Thesis Research) and prepare a thesis. The thesis must present an independent accomplishment in a research, development, or application area of Computer Science. It must be a scholarly contribution to a major field of Computer Science in the selected concentration area. The written thesis format must follow the BSU Graduate School Dissertation and Thesis Guide.

You may count the course credits for COSC 696 and COSC 697 in the total for the MS graduate degree credit requirement. To register for these two courses, you will need the permission of your thesis advisor.

Two semesters prior to your expected graduation date, you should acquire a packet of graduation materials. This packet will include the following forms:

- Application for Graduation
- Thesis Committee Nomination Form
- Oral Exam Scheduling Form
- Approved Program Form

You must complete the Application for Graduation Form and submit it to the Registrar's Office by the published deadline, which is very early in the semester. The Registrar's Office will process the form if you submit it well before the deadline. The other forms must be submitted to the Computer Science Graduate Coordinator later in the semester, before the posted deadlines.

Once your advisor is satisfied with your thesis topic, you will need to set up a thesis committee, etc. as outlined in the *BSU Dissertation and Thesis Guide*.

### Thesis and Advisory Committee

The student advisory committee will be structured as outlined in the *BSU Dissertation and Thesis Guide* and be composed of at least three members (no more than five), including the committee chair, who will be the thesis advisor. The chair and two of the members must be full-time (tenure track or tenured) faculty members from the Department of Computer Science. All other members must be approved by the Computer Science Graduate Coordinator.

Its purpose is to give you an oral examination called the thesis defense. To request the formation of this committee, you and your advisor should fill out the thesis committee nomination form and return it to the Computer Science office.

### Thesis Proposal

At least one year prior to the thesis defense, the candidate must present a proposal for the thesis work to the thesis advisory committee.

At least two weeks before the day on which you want to have your thesis defense, you must do two things: (1) schedule the defense, by submitting the oral examination scheduling form to the Computer Science Graduate Coordinator's Office, and (2) give a copy of the thesis to each member of the thesis committee.

### **Thesis Defense**

Students will present and orally defend their completed Master's research before the advisory committee. The defense will be open to the public and **must** be announced at least two weeks in advance.

You must pass the thesis defense, and make all changes to the thesis required by the thesis committee. You must then submit two copies of the corrected thesis to the Graduate School and one copy to the Computer Science office, to be forwarded to the library; these are the only copies required. Check with the Computer Science office to get the deadlines for each of these requirements.

If you do not complete your degree in the semester in which you filed all of the required forms, they will remain on file in the Registrar's Office and you will not be required to re-submit them if you graduate in the next semester. However, you need to discuss the graduation change with the Registrar's graduate student associate.

### **Requirements for the Master of Science (Non-Thesis)**

For an MS degree without a thesis, you must pass COSC 698 and create a final project that covers two categories: a software development project and a comprehensive software development document that gives a complete analysis of the software project. The project must represent your chosen area of concentration. You must demonstrate your project and the demonstration is open to the public. The grade in COSC 698 must be at least a B.

You must also complete a scholarly paper acceptable to a professor (who need not be your advisor) in your concentration area. It must be approved by the Master's program coordinator. The paper must include an abstract and references to the relevant literature (follow the format guidelines in the *BSU Dissertation and Thesis Guide*). You must submit, by the appropriate deadline, two copies of the scholarly paper (electronically using email) to the Computer Science office after gaining approval from the supervising professor; these are the only copies required. Your paper, along with your name, will be available for viewing on the **Department of Computer Science's Scholarly Paper Archive Web page**.

At the beginning of the semester in which you intend to graduate, you must acquire a packet of graduation materials. This packet will include the following forms:

- Application for Graduation
- Approved Program Form
- Certification of Completion of Scholarly Paper
- Certification of Completion of MS Degree Without Thesis

You must complete the Application for Graduation Form and submit it to the Registrar's Office by the published deadline which is very early in the semester. The Registrar's Office will process the form for you, if you submit it well before the deadline. The other forms must be submitted to the Computer Science office later in the semester before the posted deadlines.

If you do not graduate in the semester in which you filed the required forms, they will remain on file in the Registrar's Office, and you are not required to re-submit them, if you finish in the next semester. However, you need to discuss the graduation change with the Registrar's graduate student associate.

## Summary of Master of Science Degree Requirements\*

Minimum of 36 credit hours beyond the BS Degree  
Minimum of 21 credit hours at the 600 – 800 level  
Minimum of 30 credit hours of coursework in Computer Science  
Minimum of 6 credit hours of Master's Thesis (COSC 696 COSC 697) (Thesis Program **only**)  
Assemble Thesis Committee (At least three members -five members total) (Thesis Program **only**)  
Thesis Proposal and Thesis Defense (Thesis Program **only**)

Master of Science Project and Demonstration in Concentration Area (Non-Thesis Program **only**)  
Scholarly Paper (Non-Thesis Program **only**)

## Summary of Graduation Requirements

Completion of an approved program of study with a minimum 3.0 GPA  
Successful oral defense and completion of thesis  
Completion of any software development and demonstration, writing and seminar requirements

\*The student is responsible for all program requirements and the information in the Graduate Catalog.

# Doctor of Applied Science in Computer Science

The Doctor of Applied Science in Computer Science is the highest academic degree offered in the Department of Computer Science. It 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 a Computer Science doctoral faculty member will not be accepted in lieu of the dissertation requirement. The research must be relevant to the concentration area in which the student is pursuing a degree.

## Admission Requirements

Applicants must possess a baccalaureate degree in an appropriate scientific discipline, such as computer science, engineering, chemistry, physics, or mathematics. A GPA of 3.0 on a 4.0 scale in the last 60 credit hours is preferred. An applicant is expected to possess the prerequisites for the intended area of study. If a deficiency exists, the necessary course work must be completed prior to the advancement to candidacy.

Students not meeting these requirements may be admitted on a conditional basis. The conditional student must maintain a minimum GPA of 3.0 in at least nine (9) Computer Science graduate credits in the first year of study to be fully admitted.

In the week prior to the start of classes, incoming students will meet with his/her assigned advisor to discuss the program of study. The student's program of study will be directed based on the chosen area of interest. A student is required to take all prerequisite courses within the first year. The prerequisite courses will not be counted towards graduation.

International students whose native language is not English and who do not have a degree from a regionally accredited U.S. institution of higher education must submit a score of at least 550 on the paper-based Test of English as a Foreign Language (TOEFL), 213 on the computer-based version or 75% on the internet based version. In order to qualify for a teaching assistantship, students whose native language is not English must score a 5.0 on the Test of Spoken English (TSE).

International students who have questions about visas or other concerns should contact Mr. Robert Batten, International Student Advisor, in Wiseman Center, Room 126, phone: (301) 860-3830, email: rbatten@bowiestate.edu

## Orientation

During the week prior to the beginning of a student's first semester, new doctoral students will have the opportunity to meet with the advisor, doctoral program director, and department chair. During this orientation session, the concentration area liaison or the program director will be assigned as the student's Provisional Mentor. This mentor will act as the student's temporary advisor for the first and second semesters within the program. Students should meet with their Provisional Mentors 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 their Provisional Mentors during their first semester concerning progress with coursework, rotations where applicable, etc. By the end of the first semester of study, students should select their Doctoral Advisors from faculty within the Department of Computer Science.

The department will organize computer science seminar series during each semester. All DAS students are required to attend the seminar series.

# Program Requirements for Doctor of Applied Science

The Doctor of Applied Science program requires a minimum of 72 credit hours beyond the baccalaureate degree. A minimum of 60 graduate level credits (not including the dissertation) chosen from the list of courses for the doctoral program must be completed. Students who do not have computer science background must meet all of the deficiencies required by the Doctoral Program Committee (DPC). Fifteen credits of core courses are required. A minimum of thirty-six (36) credit hours of graded coursework is required from at least three knowledge areas of which at least 27 credits should be in 600-800 level distributed at all three levels. A minimum of 9 credit hours is required from advanced research concentration areas. Up to 30 credits from approved institutions may be counted towards the doctoral degree for those students who have completed a Master's degree in Computer Science or a related area. The student's program of study must be developed in conjunction with his/her doctoral advisor/mentor and advisory committee.

A minimum of twelve credit hours of dissertation work/research 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.

Each student must satisfactorily complete the qualifying examination and the comprehensive examination.

## Summary of Doctor of Applied Science Degree Requirements \*

Minimum of 72 credit hours beyond BS degree

Minimum of 15 credits hours graded course work from core topics

Minimum of 36 credit hours graded course work (of which 27 credits in 600 - 800 levels)

Minimum of 9 Credits in Advanced Research Concentration areas (courses 890-899)

Minimum of 12 credit hours of research-dissertation work

Participation/Registration in Computer Science Seminar is required every semester

Dissertation and Advisory Committee (Minimum 5 – Maximum 7 members)

Qualifying Candidacy Examination

Comprehensive Examination

Dissertation Proposal Oral Examination

Dissertation Defense Examination

## Doctoral Advisor

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 toward finding an individual with whom the student feels comfortable entrusting his/her educational future. Once a Doctoral Advisor is selected, students should complete the "Selection of Doctoral Advisor" form no later than the end of the second year. The form should be signed by both the Doctoral Advisor and the Doctoral Program Director for inclusion in the student's file.

## Dissertation Committee

You should select and meet with your 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 dissertation committee will be composed of a minimum of five (5) members (no more than seven (7)), including the committee chair, who will be the student's doctoral advisor. The chair and three of the members must be Computer Science doctoral faculty members as previously described. External committee members must be approved and offer a needed expertise. The Doctoral Program Committee must approve the dissertation committee constituency.

The dissertation subject is selected by the student, with input from the dissertation committee, at least two years prior to the oral defense. It must be a scholarly contribution to a major field of computer science in the student's concentration area, consisting of new important knowledge or a major modification,

amplification, or interpretation of existing significant knowledge. The written dissertation format must follow the BSU Dissertation and Thesis Guide, which can be obtained from the Department of Computer Science or online.

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

### **Program of study**

The preliminary program of study should be reviewed by the advisory committee for the course work to be completed. The program of study must receive signed approval by the advisory committee and the Department Chair. The DPC and the Department Chair must approve any subsequent alterations in the program of study.

### **Transfer of Credit**

Transferability of credit is determined by the student's advisor based upon the applicability of the courses selected for dissertation work and the student's educational goals.

### **Qualifying Candidacy Examination**

The purpose of the Candidacy Examination is to determine whether the applicant possesses the attributes of a doctoral candidate. Typically, the Candidacy Examination will be held once a year. The date and time will be announced by the department. The Candidacy Examination is a comprehensive one. It is recommended that a student must take the examination at the next opportunity after completion of the core preparation subjects and, in any event, no later than the beginning of the **fifth** semester in the program. A student may attempt the candidacy exam a maximum of two times. If a student is not successful in passing the candidacy exam in two attempts he/she may be dismissed from the program.

### **Comprehensive Examination**

The Comprehensive Examination is a written test composed of material covering three knowledge areas out of the five knowledge areas. The suggested courses for the comprehensive exam from each knowledge area is indicated with \* in the course list (pp21-22). A student may attempt the comprehensive examination a maximum of two times. A student who has not passed comprehensive exam in the second attempt will be dismissed from the program. A minimum GPA of 3.0 in the doctoral course-work is required to take the examination.

### **Dissertation Proposal**

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) format for their dissertation work to the advisory committee. The proposal will be given to the DPC two weeks in advance of meeting with the committee. The student must defend successfully 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 defense may repeat the proposal defense a maximum of one time. If a second failure occurs, he/she may be dismissed from the program.

### **Doctoral Dissertation and Defense**

In order to complete the requirements for the doctoral degree, students will prepare and successfully defend a written dissertation in accordance with the format and procedure dictated by the BSU Department of Computer Science and the Graduate School. Each student must orally defend the completed doctoral research to his/her dissertation committee. The defense will be open to the public and must be publicized at least two weeks in advance. The **first** hour of this final examination will consist of an open seminar to the Department on the student's research. This will be followed by a closed

examination of the candidate by the Doctoral Advisor and the Dissertation Committee. This examination will follow guidelines established by the Department of Computer Science and 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 Doctoral Advisor and Dissertation Committee will vote to either pass or fail the student. If the majority of the committee members cast negative votes, it is considered a failure of the examination.

### **Summary of Graduation Requirements**

- Completion of any writing and seminar requirements
- Completion of an approved program of study with a minimum 3.0 GPA
- Passed qualifying and comprehensive examinations
- Present an acceptable dissertation proposal to the Dissertation Committee
- Successful oral defense and completion of the dissertation

## **Additional Graduate Program Information**

### **Annual Graduate Student Progress Report**

All doctoral graduate students in the Computer Science Graduate Program will submit an Annual Graduate Student Progress Report by **June 15** each year. The purpose of this report is to ensure that students are making satisfactory progress toward earning their degrees. The report should be completed in its entirety every year and approved by the Doctoral Advisor and the Advisory Committee who will verify the information by their signatures. The report will then be submitted to the departmental administrative assistant who will deliver reports to the Computer Science Chair. It is entirely the student's responsibility to complete the report, with appropriate signatures, by the June 15 deadline.

### **Academic Standing**

The Computer Science Chairman, Graduate Program Director, and Graduate Coordinator rely upon the recommendation of the student's Doctoral Program 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 Computer Science Chair, Graduate Coordinator (where appropriate), or Graduate Director to recommend a resolution to the problem. Normally, a student will be given every opportunity to correct a problem within one year, provided that all other indicators (for example, research progress) are positive.

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 Program Committee which will suggest a corrective action. A student receiving two 'C's may be dismissed from the program, pending review by the DPC.

A full-time doctoral student status requires registration for a minimum of 9 credits during the fall and spring semesters. An annual 3.0 GPA is required to maintain doctoral status.

### **Changing Concentration Areas after Admission to the Graduate Program**

When students apply to the graduate program, they typically select their doctoral concentration areas based on their undergraduate degrees. The Department of Computer Science recognizes that every student has a unique background, personal goals, and professional desires. Therefore, an individual's program and course work may bridge a gap between the various concentration areas to allow a broad-based research program.

The appropriate liaison and the Computer Science Graduate Director (or Coordinator) must approve any concentration change within the Computer Science Doctoral Program after the student's first semester. A change to a different concentration 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 concentration area.

Students who do not pursue the program as outlined in their first semester by the appropriate liaison or in future semesters as outlined by their Doctoral Program Committee may be asked to leave the program.

\* 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 Computer Science. While the described guidelines are expected 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 Computer Science requirements were modified. If a student believes that he/she falls into this category, a formal written petition may be made to the Doctoral Program Committee to request a waiver for a given requirement or

that said requirement be altered. 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 MS students and the first two years for doctoral 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 his/her needs and what would be gained as a result of any changes.

### **Graduate Student Travel**

The Department encourages student attendance at scientific meetings/workshops. Generally, a student's Doctoral Advisor is expected to seek support for travel that involves presenting papers/posters at a meeting. Alternatively, students should seek travel grants from an appropriate professional organization.

### **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 Director, 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 Computer Science Chair. This should be done in writing and should contain appropriate explanations. To re-enter the program, the student must petition the Computer Science Department. Acceptance will depend upon issues such as past performance and whether there is an advisor willing to accept the student. 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. If terminated, they must officially apply for re-admittance to the University.

Students may resign from the Graduate Program at any time. To do so, a student should write a letter to the Chair and the Graduate Director stating his/her intent. It is advised that students contemplating such a move should first consult with their Doctoral Advisor, Graduate Coordinator, or the Graduate Director 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 Doctoral Program 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 Department 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 Director or (Graduate Coordinator where applicable) to determine the best course of action.

A student can be terminated from the Graduate Program by the Doctoral Program Committee for the following reasons:

1. Failure to meet minimum academic standards
2. Failure to make acceptable progress in the degree work
3. Failure to meet generally acceptable ethical standards of the University

4. Failure on the qualifying, comprehensive, or research proposal examination
5. Failure during the thesis/dissertation defense

It is the obligation of the student to ensure that he/she is complying with University and Departmental guidelines with respect to these aspects of his/her education. If a student is unsure or concerned about his/her status within the Department, a consultation should be sought with the Doctoral Advisor, the Graduate Director, the Graduate Coordinator, or the Department Chair.

### **Facilities**

Faculty members teaching in the graduate program are solely Computer Science Faculty. The Computer Science Departmental office is located in the Computer Science Building, Suite 207. Regular office hours are 8:00 am - Noon and 1:00 - 5:00 pm, Monday - Friday.

### **Financial Assistance**

Graduate assistantships (GA), teaching assistantships (TA), research graduate assistantships (RGA), and fellowships may be available to qualified full time students. To apply, students must send an application for an assistantship or fellowship and provide three letters of recommendation from employers or faculty members to the Department of Computer Science. The terms and conditions of these opportunities appear in a departmental brochure. Some part-time assistantships may be available.

Typically, fulltime and/or part-time assistantships are based on research/teaching/laboratory duties for 20 hours per week in return for receiving the GA or TA stipend. These assistantships may pay tuition and provide a stipend for living expenses. Students must pay registration and fees, buy textbooks, and purchase support materials. Any student supported on an assistantship may not take less than six hours of graded course work per semester and shall not take more than twelve hours of graded course work per semester. Graduate assistantship stipends may be available for a total of two years for a Master of Science degree student and five years for a DAS degree student. Summer support falls into a separate category and should be discussed with the chair of the department.

**A student receiving financial aid must meet the requirements outlined by the University.**

# Department of Computer Science Registration Procedures

**Registration:** Obtain a Registration and Advisement form in the Department of Computer Science's main office.

**Complete and return the form to the Department of Computer Science's main office.** The Registration and Advisement forms are maintained by the Computer Science office. The advisor, Graduate Director or Coordinator must give final approval. All advising flags are lifted through Computer Science ONLY. The advisement flag is cleared on the computer to allow you to register online, via the Bulldog Connection. A copy is retained as a Departmental record and is filed in your student folder. You should keep a copy for your records of all registration approvals. 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. In all cases, keep a copy of all transactions.

**Drop/Add - Course:** All drop/add situations must be discussed with your advisor, the doctoral director, or the master's coordinator. Follow the same procedure outlined for the registration process. Drop/add actions are done online.

# Sample Doctoral Time Table

## First Year

### Fall Semester

- Orientation Session
- Meet with Provisional Advisor - draft a program of study
- Take appropriate candidacy preparation courses
- Select Doctoral Advisor by the end of the semester

### Spring 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 proposal work

## Second Year

### Fall Semester

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

### Spring Semester

- Conclude preparatory course work
- Continue dissertation effort
- Submit Annual Progress Report
- Submit finalized Program of study to Doctoral Program Committee

### Summer

- Concentrate upon dissertation research
- Prepare for Qualifying Candidacy Examination

## Third Year

### Fall Semester

- Take Qualifying Candidacy Examination
- Prepare and Defend Research Proposal
- Take any specialized course work outlined in the Program of study
- Continue dissertation research

### Remaining Semesters

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

**At least two semesters prior to intended graduation date, begin writing the dissertation**

# **Computer Science Areas of Concentration**

## **Sensor Networks/Computer vision**

Wireless Sensor Networks (WSNs) are emerging as an important technology in many application areas such as battle field surveillance, habitat monitoring, traffic monitoring, environmental and homeland security etc. Sensor networks also have a rich domain of active research involving wireless network protocols and security, efficient data search and delivery, streaming video data analysis etc.

The study topics include but are not limited to

- efficient video data delivery from wireless camera sensors to a mobile base station
- robust background modeling for event detection
- video indexing
- multi-modal multi-nodal moving target tracking
- FPGA implementation for real-time performance of particle filters.

## **Computer Networks/Network Security**

The topic Computer Networks has been established as an important research area in computer science due to their high impact and successful deployment in current society. Also, as the technology is used more and more, the security issues are becoming more and more important due to the potential for catastrophic results.

The study topics include but are not limited to

- computer network protocol design and implementation
- performance analysis and modeling of network protocols
- resource allocation in networks
- emerging issues in wireless ad-hoc networks and sensor networks
- security techniques on authentication, confidentiality, and availability
- denial-of-service defense techniques
- intrusion detection/remediation techniques
- security techniques in resource-scarce environment

## **Advanced Computing Research/ Software Engineering**

Intelligent agents is an emerging trend in computing and is a shift from the machine-oriented views of programming towards concepts and metaphors that more closely reflect the way people understand the world. The trend is towards human computer interaction and development of human learning behavior.

The study topics include but are not limited to

- intelligent agents and multi-agent systems

- virtual reality and social simulation
- evacuation behavior modeling and simulation
- decision-making system based and cognitive science
- knowledge-based systems
- secure coding
- biometrics
- applied cryptography and steganography

### **Databases/AI**

Mobile data management has become a reality thanks to the convergence of two technologies: the appearance of powerful portable computers and the development of fast and reliable wireless networks. In the mobile database system, a massive number of low-powered mobile clients submit queries to databases over the wireless channels. Mobile clients are often disconnected to conserve energy and prolong battery life time; they also frequently relocate between different accessing points and connect to different data servers at different times.

Although a wireless network with mobile clients is essentially a distributed system, there are some characteristics that make mobile database systems unique:

- efficient broadcasting and data delivery
- location management of mobile clients and location-dependent queries
- peer-to-peer query processing
- content-based information retrieval
- content distribution profiling

### **Scientific Computing**

Research in this area addresses data processing algorithms of science data such as remote sensing satellite and DNA analysis. The study topics include but not limited to

- efficient numerical algorithms
- distributed/parallel algorithms
- pattern classification
- numerical optimization techniques

# Computer Science Course List and Description

## **A. Computer Science Core Topics (15 credits)**

- COSC 502: Computer Organization
- COSC 504: Software Design and Development II
- COSC 522: Discrete Structures
- COSC 528: Design and Analysis of Algorithms I
- COSC 514: Operating Systems I

## **B. Knowledge Areas (36 Credits from at least three different knowledge areas. Maximum of 9 credits at 500 level)**

### **1. Computer Systems**

- COSC 614: Operating Systems II\*
- COSC 635: Information Privacy and Security
- COSC 585: Computer Networks I\*
- COSC 685: Computer Networks II
- COSC 687: Distributed Computing
- COSC 735: Computer and Network Security
- COSC 887: High Performance Computing

### **2. Software Engineering and Programming Languages**

- COSC 565: Software Engineering I\*
- COSC 665: Software Engineering II
- COSC 575: Object Oriented Programming and Design Paradigm
- COSC 561: Compiler Design and Construction I\*
- COSC 661: Compiler Design and Construction II
- COSC 551: Formal Methods in Programming Languages
- COSC 815: Performance Evaluation

### **3. Database Systems and Artificial Intelligence**

- COSC 531: Database Design I\*
- COSC 631: Database Design II
- COSC 573: Artificial Intelligence I\*
- COSC 673: Artificial Intelligence II
- COSC 831: Data Warehousing and Data Mining

### **4. Multimedia Technology**

- COSC 518: Computer Graphics I
- COSC 720: Multimedia Technology I
- COSC 719: Image Processing I\*
- COSC 729: Virtual Reality and Its Applications\*
- COSC 819: Image Processing II\*

### **5. Scientific Computing**

- COSC 541: Numerical Analysis I \*
- COSC 641: Numerical Analysis II
- COSC 771: Numerical Optimization
- COSC 523: Logic, Computability, and Automata I \*

COSC 628: Design and Analysis of Algorithms II  
COSC 623: Logic, Computability, and Automata II  
COSC 676: Queuing Theory in Computer Science  
COSC 678: Modeling and Simulation

The courses with \* are suggested courses for the comprehensive exam.

**C. Advanced Research Concentration Area** (minimum 9 credits)

**COSC 890-899: Selected Topics in Computer Science**

COSC 890-892: Sensor Networks/Computer vision  
COSC 893-895: Computer Networks/Network Security  
COSC 896- 897: Databases/AI  
COSC 898- 899: Advanced Computing Research/ Software Engineering

**D. Dissertation Area** (minimum 12 credits)

COSC 900-910: Dissertation courses.

**COSC 501 LOGICAL COMPUTER STRUCTURE**

**(3 Credits)**

Prerequisite: Graduate Status

The functional characteristics of a hypothetical computer will be discussed as a basis for the development of system software. This includes a discussion of binary arithmetic, a definition of the hypothetical computer including its associated mnemonic language, input-output, interrupts, routines, and one- and two-pass assemblers. This is a prerequisite/background course and does not count towards the master's degree.

**COSC 502 COMPUTER ORGANIZATION**

**(3 Credits)**

Prerequisite: Graduate Status

Contemporary computer internal architecture and operation are described at various levels, beginning with a summary of digital logic design of memory, buses and processor chips. Topics include: microprogramming, machine language, addressing techniques, interrupts, operating systems, virtual memory and memory management, one-pass and two-pass assemblers, linking and loading, and advanced computer architectures.

**COSC 503 SOFTWARE DESIGN AND DEVELOPMENT**

**(3 Credits)**

Prerequisite: Graduate Status

Fundamental techniques of computer program development using a high-level language. Topics include assignment, expression, declarations, control statements, arrays, structures, functions and subroutines, block structure, string handling, and programming methodology, including top-down design, structured programming, programming style, and debugging. This is a prerequisite/background course and does not count towards the master's degree.

**COSC 504 DATA AND INFORMATION STRUCTURES**

**(3 Credits)**

Prerequisite: COSC 503 or equivalent or consent of instructor

Topics include preprocessor facilities, storage control, pointer variables, direct I/O, and recursion. Data structures, such as stacks, queues, circular lists, linked lists, trees, and graphs. Algorithms for searching, sorting, merging, hashing. System functions, such as compiling, link editing, and libraries.

### **COSC 514 OPERATING SYSTEMS I**

#### **(3 Credits)**

Prerequisites: COSC 502 and COSC 504

Introduction to the structure of multiprogramming computer operating systems. Topics include concurrent programming and monitors, process communication and synchronization, process and disk scheduling, deadlocks, memory hierarchies, paging and segmentation. Survey of various processors, performance coprocessors, open systems, O/S security, Unix, and VMS.

### **COSC 516 COMPUTER ARCHITECTURE**

#### **(3 Credits)**

Prerequisite: COSC 502

Introduction to high-speed computer architecture. Parallel architecture, memory and I/O subsystems. Principles of pipelining and vector processing, pipeline computers and vectorization methods, examples of vector processors. Structures and algorithms for array processors, SIMD and MIMD computers, interconnection networks, associative array processors. Case studies of representative high-speed processors.

### **COSC 518 COMPUTER GRAPHICS I**

#### **(3 Credits)**

Prerequisites: COSC 502 and COSC 504

Two-Dimensional (2D) interactive graphics. Basic clipping and scan conversion techniques, 2D homogeneous coordinate system, graphics hardware and software systems, user interfaces, graphics standards, and rendering techniques.

### **COSC 522 DISCRETE STRUCTURES**

#### **(3 Credits)**

Prerequisite: Graduate Status

A survey of those areas in mathematics that are particularly useful to computer science. Topics discussed include set theory, relations and functions, equivalence and order relations, digraphs and trees, and probability concepts.

### **COSC 523 LOGIC, COMPUTABILITY AND AUTOMATA I**

#### **(3 Credits)**

Prerequisite: COSC 522

An elementary development of propositional and predicate logics, set and Boolean algebras with a discussion of Markov algorithms, Turing machines and recursive functions. Topics include post productions, word problems and formal languages.

### **COSC 528 DESIGN AND ANALYSIS OF ALGORITHMS**

#### **(3 Credits)**

Prerequisites: COSC 504 and COSC 522

Design and analysis of basic computer algorithms based on the following techniques: divide-and-conquer, greedy, dynamic programming, tree and graph traversals, backtracking, and branch-and-bound method. Applications to problems such as sorting and searching, traveling salesman, knapsack, graph coloring, set union-and-find, matrix multiplication, and scheduling. Use of advanced data structures appropriate for different techniques and problems. Use of mathematical tools, such as big-oh notation and recurrence relations, in the analysis of algorithms and discussion of P=NP question.

### **COSC 531 DATABASE AND INFORMATION SYSTEMS I**

**(3 Credits)**

Prerequisite: COSC 504

Introduction to data base design and data base information management systems. Discussions of the various types of data and information models, such as hierarchical, network, relational, entity-relation, and object-oriented models. Functional dependencies and data normalization. An in-depth look into relational database systems and query languages.

### **COSC 541 NUMERICAL ANALYSIS I**

**(3 Credits)**

Prerequisites: MATH 226 and MATH 228

Introduction to the types of problems that require numerical techniques for their solution and examples of error propagation which arise when applying numerical methods. Topics include solutions of equations in one variable using bisection, fixed point iteration, Newton Raphson and Muller's methods; interpolation and polynomial approximation; iterative and direct methods of solving linear and non-linear systems.

### **COSC 551 FORMAL METHODS IN PROGRAMMING LANGUAGES**

**(3 Credits)**

Prerequisite: COSC 504

Evolution of some imperative programming languages; formal methods of describing syntax; semantics; data types and variables; assignment statements; control structures; subprograms and their implementation; exception handling; logic programming languages; data abstraction.

### **COSC 561 COMPILER DESIGN AND CONSTRUCTION I**

**(3 Credits)**

Prerequisite: COSC 504

Design and implementation of compilers. Semantics and pragmatics as they affect the design of compilers. Topics include: lexical and syntax analysis, parsers, semantics processing, code generation, and simple code optimization.

### **COSC 573 ARTIFICIAL INTELLIGENCE I**

**(3 Credits)**

Prerequisite: COSC 528

Introduction to artificial intelligence. Topics include knowledge acquisition and representation, heuristic search methods, logical and probabilistic reasoning, and expert system architecture. AI applications in languages, such as LISP and PROLOG.

### **COSC 575 Object Oriented Programming and Design Paradigm**

**(3 Credits)**

Prerequisite: COSC 504

Software engineering issues as they relate to object oriented techniques will be covered. Students will study object-oriented design methodology, and will acquire the ability to analyze a system using object-oriented techniques. Students will learn to enhance maintainability and reusability by the use of encapsulation, inheritance, polymorphism, and other object oriented concepts. Object oriented programming languages, such as Java, C++, and Smalltalk, will be compared and discussed. Advance topics such as frameworks, components, etc. will be discussed.

### **COSC 585 COMPUTER COMMUNICATION NETWORKS I**

**(3 Credits)**

Prerequisite: COSC 504

Introduction to computer communication and layered network architectures. Encoding and modulation, compression and multiplexing, error detection and correction. Use of the Open Systems Interconnection (OSI) Reference Model as a framework. Review of layered network architecture: design of layered protocols, network topology, switching techniques. Protocols and network design from the physical layer to the application layer.

**COSC 614 OPERATING SYSTEMS II  
(3 Credits)**

Prerequisite: COSC 514

Continuation of COSC 514. Advanced topics in virtual memory management, file and data base system management, operating systems security, disk performance optimization, analytic modeling, and distributed operating systems. Case studies in operating systems.

**COSC 615 PERFORMANCE EVALUATION  
(3 Credits)**

Prerequisites: COSC 514 and COSC 516

A survey of computer systems performance issues and evaluation methodologies. Topics include workload characterization, parallelism, concepts in hardware/software, computer measurement tools (e.g., hardware and software monitors, modeling and benchmarking), system utilization and performance profiles, and systems evaluation methodology (including the analysis and optimization of CPU, memory, channels, and peripheral resources).

**COSC 618 COMPUTER GRAPHICS II  
(3 Credits)**

Prerequisites: COSC 518 and COSC 528

Continuation of COSC 518. Topics will be chosen from three-dimensional (3D) interactive graphics, raster display system architecture, 3D homogeneous coordinate system, hidden surface elimination, modeling, shading, shadow generation, anti-aliasing, ray-tracing, fractals, animation techniques, color theory, graphics languages, and modern graphics.

**COSC 623 LOGIC, COMPUTABILITY AND AUTOMATA  
(3 Credits)**

Prerequisite: COSC 523

Continuation of COSC 523. The theory of abstract mathematical machines. Structural and behavioral classification of automata; finite state automata; theory of regular sets. Pushdown automata, linear bounded automata. Finite transducers. Universal Turing machines.

**COSC 631 DATA BASE AND INFORMATION SYSTEMS II  
(3 Credits)**

Prerequisite: COSC 531

Continuation of COSC 531. Advanced topics in data base design and information management systems. Topics include normalization and semantic modeling, view integration, recovery and concurrency, security and integrity, data base machines, distributed and heterogeneous data base management, intelligent data bases, and object-oriented systems.

**COSC 635 INFORMATION PRIVACY AND SECURITY  
(3 Credits)**

Prerequisite: COSC 504

Introduction to security and privacy issues associated with information systems. Technical, physical, and administrative methods of providing security. Identification and authentication. Encryption and management of encryption systems, including key protection and distribution. Cost/risk trade-offs. Privacy legislation and technical means of providing privacy.

**COSC 641 NUMERICAL ANALYSIS II**

**(3 Credits)**

Prerequisite: COSC 541

This course is a continuation of COSC 541. The topics include numerical differentiation and integration; the solution of initial value and boundary ordinary differential equations; methods of solving nonlinear systems of equations; other topics as time permits.

**COSC 661 COMPILER DESIGN AND CONSTRUCTION II****(3 Credits)**

Prerequisite: COSC 561

Continuation of COSC 561. Advanced topics in compiler design and construction. Automated compiler tools and compiler compilers.

Advanced code optimization techniques. Compilation of different computational models. Role of compilers in natural language processing.

**COSC 673 ARTIFICIAL INTELLIGENCE II****(3 Credits)**

Prerequisite: COSC 573

Continuation of COSC 573. Advanced topics in artificial intelligence, such as natural language understanding, computer vision, machine learning, robotics, neural networks, automatic theorem proving, and an in-depth look into the design and implementation of intelligent computer systems.

**COSC 675 APPLIED COMBINATORICS AND GRAPH THEORY****(3 Credits)**

Prerequisite: COSC 522

General enumeration methods, difference equations, generating functions. Elements of graph theory, matrix representations of graphs, applications of graph theory to transport networks, matching theory and graphical algorithms.

**COSC 676 QUEUEING THEORY IN COSC****(3 Credits)**

Prerequisites: COSC 504 and COSC 522

A study of the development of queuing theory and the application of that theory of discrete simulations, in general, and to computer systems, in particular. Topics include random processes, characterization of different queuing systems, the classical single-server exponential queuing system model, additional single and multiple-server queuing models, including birth-death processes and finite sources, and the assumptions and limitations of the various queuing models. The applications of queuing theory to computer systems are emphasized.

**COSC 678 MODELING AND SIMULATION****(3 Credits)**

Prerequisites: COSC 504 and COSC 522

A study of the construction of models which simulate real systems. The methodology of solution should include probability and distribution theory, statistical estimation and inference, the use of random variables, and validation procedures. A simulation language should be used for the solution of typical problems.

**COSC 685 COMPUTER COMMUNICATION NETWORKS II****(3 Credits)**

Prerequisites: COSC 514 and COSC 585

Continuation of COSC 585. Advanced topics in computer networks and their applications. Inter-networking: international gateways and data-gram internets. Emphasis on the characteristics, implementation and configuration of Local Area Networks (LANs), Wide Area Networks (WANs), and Integrated Services Digital Networks (ISDNs).

### **COSC 687 DISTRIBUTED COMPUTER SYSTEMS**

#### **(3 Credits)**

Prerequisites: COSC 514 and COSC 585

Introduction to the concepts and the design principles used in constructing distributed computer systems. Coverage of topics from the architectural foundations of distributed systems through networks; file servers including transaction handling; replication; and security issues, with descriptions of the design and the facilities offered in some specific systems. Areas of applications include distributed data base management, interoperable information systems, and distributed artificial intelligence.

### **COSC 690, 691, 692 SELECTED TOPICS IN COMPUTER SCIENCE**

#### **(3 Credits)**

Prerequisite: Consent of Instructor

Presentation of advanced topics reflecting state-of-the-art developments in computer science.

### **COSC 696, 697 MASTER'S THESIS IN COMPUTER SCIENCE I & II**

#### **(3, 3 Credits)**

Prerequisite: A minimum of 18 Graduate Credits in COSC

A research problem in the area of computer science is chosen by the student under the supervision of a faculty advisor from the department of computer science. An advisory committee consisting of the thesis advisor and at least two other faculty members will be constituted. Research must be carried out and concluded over a period of two consecutive semesters and submitted in the form of a formal thesis with the consent of advisory committee. Thesis will be defended in an oral presentation by the student to the faculty.

### **COSC 698 APPLIED RESEARCH IN COMPUTER SCIENCE**

#### **(3 Credits)**

Prerequisite: A minimum of 27 Graduate Credits in COSC

This course requires the student to perform research in computer science somewhat less in scope than a master's thesis. Such research should adequately demonstrate the student's proficiency in the subject material. The research must be applied in a semester-long project and concluded with a short seminar and a comprehensive paper.

### **COSC 719 IMAGE PROCESSING I**

#### **(3 Credits)**

Prerequisite: COSC 504

This course is an introduction to Computer Vision and Image Processing fundamentals, human visual system, image resolution, binary images, gray scale images, multispectral images, digital image formats, preprocessing, image algebra, spatial filters, image enhancement, edge detection, segmentation, feature extraction etc. Additional topics include discrete transforms and image compression techniques.

### **COSC 729: VIRTUAL REALITY AND ITS APPLICATIONS**

#### **(3 Credits)**

Prerequisite: Instructor's permission

The goals of this course are to introduce students to Virtual Reality (VR) hardware, software, and provide an opportunity for them to apply this knowledge to applications for education and games. This course applies cutting-edge virtual reality technology currently available in academia and industry. Students will design, model, and script the VR environment by developing a complete VR application as a group project.

### **COSC 771: NUMERICAL OPTIMIZATION**

**(3 Credits)**

Prerequisite: COSC 560

This is the study of linear and non-linear programming focusing on the implementation and analysis of algorithms. Numerical aspects such as propagation of errors and the control of errors will be covered. Topics such as genetic algorithms and simulated annealing will be included as global optimization techniques.

**COSC 819 IMAGE PROCESSING II****(3 Credits)**

Prerequisite: COSC 719

This course is a study in the analysis of data stored as images. Image and video data processing has emerged as a major study area in computer science. Topics include color image processing, compression techniques, wavelet and multi resolution processing, image segmentation, and object recognition and tracking.

**COSC 831 DATA WAREHOUSING AND DATA MINING****(3 Credits)**

Prerequisites: COSC 531

This course covers the fundamentals of data warehousing architecture and issues involving planning, constructing and maintaining a data warehouse. The course introduces the concept of data mining and how it relates to data warehousing. The specific topics covered include the logical design of a data warehouse, data staging area and extract-transform-load processing. The course discusses multi-dimensional analysis using OLAP techniques, and coverage of knowledge discovery processing including common data modeling techniques

**COSC 887 HIGH PERFORMANCE COMPUTING****(3 Credits)**

Prerequisites: COSC 502, COSC 504

This course explores the architectural classifications and taxonomies of parallel machines. Topics include enabling technologies including advanced processor concepts, interconnection networks, parallel performance and scalability. An introduction to parallel algorithms and programming models will be studied.

**COSC 890-899 SELECTED TOPICS****(3 Credits)**

Prerequisite: Advancement to Candidacy

These courses are seminar courses which require students to research on a topics of their choosing. This research should adequately demonstrate the student's proficiency in the subject material. At the end of the semester the students are required to write a report of their study/findings and make a seminar presentation.

**COSC 900-909 DISSERTATION****(1-9 Credits)**

Prerequisite: Advancement to Candidacy

These courses require students to perform research and document the results leading to the development of a thesis. The research should include focused study of the problem, literature review, development of algorithms (or methodology), and implementation.

# Computer Science Office Policies and Procedures

Computer Science Building, Suite 207, (301) 860-3960

## Home Mailing Addresses

It is extremely important that the Department has 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 to give any changes to the administrative assistant. If your address changes during the semester, you are required to notify the office staff 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 Computer Science department. This is YOUR responsibility.

## Student Offices

A student may be assigned office space during his/her term of study at BSU. If practical, space will be located near the chosen doctoral advisor's research area.

## Entry Codes and Keys

Key request cards (where applicable) are obtained from the administrative assistant in the Department of Computer Science and should be returned to that office when they are completed. Key requests must carry your advisor's initials. Your advisor or the administrative assistant will give you the keypad entry code to enter their laboratory or office suite (depending on the method of security). Upon your graduation, all keys must be returned to the Physical Plant or you will not receive your degree.

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

## Receipt of Paychecks

Graduate Research Assistants, Fellows, and Teaching Assistants get paid twice monthly. The schedule can be obtained from the administrative assistant in the Computer Science office. Checks may be picked up from the Controller's Office or received via direct deposit to your bank account through the University. You may fill out a direct deposit form at the Payroll Office in the Thurgood Marshall Library Building in the Controller's office. You should receive additional information on your pay stubs, etc.

## Photocopying

The copy machine is located in the Department of Computer Science's resource room (suite 207). Your advisor will give you the guidelines for photocopying. Copying material that carries a copyright is prohibited unless it falls within the scope of the academic guidelines or you have written permission.

## Thesis/Dissertation Expenses

Each student is responsible for all costs pertaining to the preparation and finalization of the thesis/dissertation (that is, copies/transparencies, 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 BSU website. **The Department of Computer Science now requires that all graduating students fill out a Graduation Check-Out Sheet (exit form).** This form will be for Departmental use only and assists us in making sure that you have completed everything in order to graduate, as well as, for alumni information purposes.

## Research Supplies, Materials, and Equipment

All materials and/or supplies, equipment, etc., needed for your research project should be shared with your advisor. The two of you will prepare the paperwork to be submitted to the administrative assistant who will arrange for your items to be purchased. You will be notified as soon as your order has arrived. Once your order arrives, check the contents to ensure that each item ordered is present. Return the packing slip to the appropriate support person to be processed. Please make notes on the packing slip if

an item or items was/were not received.

### **Petty Cash/Cash Reimbursements**

If you must purchase items immediately with your personal money, you MAY be able to be reimbursed for these items. However, there are procedures you must follow. First, approval of the purchase is required from your advisor or the Principal Investigator (PI) of the project. Either one of these individuals will tell you the process to follow.

### **Travel**

Provide the appropriate support person with all of your travel information. A travel authorization is required before any arrangements can be completed. During your trip, please keep all receipts. Upon returning from a trip, you must complete a travel reimbursement form (available from the department) within 5-days. Return the form to the appropriate support person with all of your original receipts. **Please note: you must fill out a travel authorization form before your trip.**

### **Mail Boxes**

Mail is delivered to a single location: the Computer Science Building, Suite 207. Packages are delivered throughout the day. If you need to mail a package, please check with your advisor and the administrative assistant. Permission from your advisor or a faculty member is required before sending any packages via the University's mail system.

### **Bulletin Boards**

There are two bulletin boards – one outside the main office and one in the hallway on the left as you exit the main elevators. You need to check these bulletin boards on a daily basis.

# **BSU Graduate School Policies for New Students**

## **Equal Opportunity / Affirmative Action**

Bowie State University 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 Office of Equal Opportunity Program, (301) 860-3442.

## **Equal Access Policy**

Bowie State University 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 (301) 860-3292.

## **Alternative Formats and Accommodations**

This document can be provided in alternative formats. Bowie State University makes every effort to meet special accommodations and access needs. For information on specific accommodations for individuals with disabilities, contact the Department office or call the Office of Disability Support Services at (301) 860-3292.

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

Obtain your BSU email account information from the Help Desk on the second floor of the Library. You access the Help Desk by entering the doors at the back of the Library and taking the elevator to the second floor. Using your account information, visit the BSU Web site for the online schedule of classes: <http://www.bowiestate.edu>. All programs require that you be advised before you register for classes.

## Registering for Classes

After meeting with your advisor, the graduate director, the graduate coordinator, or the designated program representative, visit the BSU Web Site at <http://www.bowiestate.edu> and click on the Bulldog Connection Students link. Then log into your account. Follow the directions posted on that sight to register. Remember that you will need your bulldog ID number and password, which must be obtained from the Help Desk, a part of the Division of Information and Technology (DIT).

Register early! Courses are retained based on the enrollment.

## Car Registration and Parking

All students, faculty, staff, administrators, part-time and fulltime employees, vendors, contractors, telecommuters, visitors and guests must obtain a parking permit before parking a vehicle on the Bowie State University Campus.

To obtain a parking permit for the current academic year, fees may be paid either at the Office of Student Accounts in the Henry Administration Building or through the Interactive Voice Recorder (IVR) 1-866-364-5826. The receipt or confirmation number and completed BSU Application for a Motor Vehicle Parking Permit are submitted to the BSU Parking Office located in McKeldin Gymnasium. A satellite office is located in Robinson Hall, room 103. **Only Bowie Card payments are accepted at the Parking Office in Robinson Hall.** The required information to complete the application for a parking permit is: license plate information, driver's license number, campus address and/or off-campus address, and the applicant's status, i.e., student, faculty, staff, and I.D. number.

## Special Medical Arrangements:

To use handicap spaces on campus, a driver must meet the State requirements and purchase and display a BSU Parking Permit and handicap license plate or handicap hangtag.

## Valid Parking Permit:

A permit is valid only when it corresponds to the license plate number registered at the BSU Parking Office, is displayed properly, and is not suspended, altered, or revoked. A parking permit is transferable only to vehicles listed on the registration card. If the permit is affixed to an unregistered vehicle, the owner of the vehicle will be subject to a \$100 fine, and the owner of the permit is subject to revocation of parking privileges (with no refund). All permits must hang from the rearview mirror with the expiration date visible from the front of the vehicle.

Permits for an academic year must be in place by September 1st and expire August 31st. Note the expiration date on the hangtag. **Parking permit fees are subject to change at any time.**

## Parking Lot Designations:

The parking permit designates the lots in which you may park. If you park in a lot other than the one designated by your permit, you may receive a citation and/or be towed at the car owner's expense.

## Disability Support Services

BSU accommodates students with documented disabilities of any type. If you think you might be eligible for services, contact Disability Support Services at (301) 860-3292. You could be eligible for extended time on examinations, 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 BSU.

Parking for people with disabilities is available (contact the Department of Public Safety at (301) 860-4040). There are also rooms in the residence halls equipped for individuals who use wheelchairs and for individuals with some form of hearing loss (contact the Housing Office at 301-860-5000 located in the Alex Haley Residential Complex, Room 160).

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. This process can be lengthy. Mobility training must be arranged through the State Division of Services for the Blind, and the application process for these services also takes a long period of time.

### **Books**

The BSU Bookstore, a part of the Follett Higher Education Group, is located in the Wiseman Center. Both new and used textbooks are sold for most courses. The Bookstore also carries a wide range of school and office supplies, clothing, and munchies. The bookstore buys back textbooks.

### **Safety**

It is best to be prudent: do NOT walk alone on campus after dark. If you do not have a friend with whom you can walk, call the Department of Public Safety (DPS) at (301) 860 - 4040 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. The Campus Public Safety Office stays open 24/7. Request that an officer escort you to your car.

**Remember: if a crime, accident, or other emergency does occur, notify the Department of Public Safety (DPS) immediately, (301) 860 - 4040.**

## **Information for Graduate Assistants**

This information is contained in a separate document that can be obtained from the Department of Computer Science or the Graduate School.

# 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 BSU 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. **You may not audit a course after the end of the schedule adjustment period.**

## Withdrawal from the University

If you must withdraw from the University, or drop all of 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 prior to the first day of classes. The dates and conditions of this policy may change, be sure to check the Schedule of Classes for the specifics.

## Bowie Card

You will need your campus ID card for such activities as use of the library or the exercise equipment at the Leonidas James Physical Education Complex. Go to the Wiseman Center, Room, 118 (301-860-3795). 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 BSU. The Bowie Card office will let you know whether the card needs to be updated at any time.

## Health Services

Cut your finger? Have a sinus infection? Faint from anxiety in your first seminar? Henry Wise Wellness Center Clinic 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 Christa McAuliffe Residence Hall.

The Henry Wise Wellness Center Clinic Hours of operation are:

**Monday through Friday:** 8:00am - 5:00pm *(By Appointment)*

**Doctor's Hours:** Thursday 10 am - 12 pm *(By Appointment)*

*Evening hours are by appointment only*

If the Henry Wise Wellness Center is closed and an ambulance is needed, call the Department of Public Safety at (301) 860-4040. If you are unable to contact the Department of Public Safety, DIAL 911 and give the appropriate information.

### **Postal Services**

Need to mail a letter or pay a bill? You can buy stamps from the Bookstore and the Mail Room in the Maintenance Building, next to the Christa McAuliffe Residential Community (CMRC). All outgoing mail should be taken directly to the Mail Room.

The closest post office to BSU is the United States Postal Service (USPS) on 6710 Laurel Bowie Road, Bowie, MD 20715-9998, approximately 0.8 miles from the University adjacent to Bowie Plaza.

### **Computer/Internet Use**

All incoming students are automatically issued e-mail and web site accounts on BSU's server. The account password is previously set. However, if you want your Bulldog connection password to be reset, you need to stop by OIT Support Services located on the 2nd floor of the Thurgood Marshall Library and show your Bowie ID to get a new password.

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 two open Labs in the Library.

### **Library**

You can search the library online through the USMAI electronic catalog for a book by title, author, subject, a combination of those, or by additional methods. The catalog also links users to materials in all the University System of Maryland libraries. Patrons are provided information through the Reference Department and by the Research Port gateway to library databases. Reference services are available for most of the hours that the library is open. Copiers, computers, and printers for microfiche and microfilm readers are also available for patron use. Additional media services can be obtained from the Office of Media Operations.

Information regarding computer accounts is available from the Office of Information Technology. For more information, call 301-860-3850. After hours and on holidays and weekends, call 301-860-3870 or 301-860-3862.

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 are also available at the reference desk.

### **Departmental Writing Workshops**

Do not miss this wonderful resource. Writing is a skill that always can be improved. The workshop facilitators 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 the ownership of your own work.

### **Copies**

One day soon, you will need to make copies. If you have been to the library, you have probably noticed the copy machines. It costs 10 cents per page for black and white copies, and 75 cents for color copies. If you find yourself copying a lot in the library, please make sure you study up on the copyright laws. The copy machines accept payments from your Bowie Card as well as cash.

### **Leonidas James Physical Education Complex**

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 Leonidas James Physical Education Complex, home to the Athletics Department offices, is designed to accommodate students enrolled in physical education courses, as well as indoor intramural sports and intercollegiate athletic activities of the University. First occupied in 1973, this facility features a triple-court gymnasium and exercise room, eight handball courts, and an eight-lane, 25-yard swimming pool. Spectator areas provide seating for 1,831 in the gymnasium and 196 in the pool area.

### **Graduate Students' Association (GSA)**

GSA is an organization for graduate students who want to work with BSU and the Graduate School to assess 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 meetings that provide information on BSU services, news about special opportunities for BSU 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.

Check the website at <http://www.bowiestate.edu/groups/GSA.asp> to find out when and where the meetings are scheduled, then come!

### **Graduate Student Research Forum**

The Graduate Student Research Forum is a yearly event hosted by the BSU Graduate Student Association. The Forum has the specific goal of giving BSU 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. Prize winners have an excellent item to add to their résumé. 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 BSU 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.bowiestate.edu/community/catalog.asp>. The Student Handbook contains the Code of Student Rights, Responsibilities, and Behavior and other nonacademic policies. It is available in the Office of Student Affairs. Finally, the BSU Dissertation and Thesis Guide contains the guidelines for preparation and submission of dissertations, thesis and other final projects.

### **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 that may arise. The University policy that applies to each situation is referenced in the catalog. If there is no information in the catalog, contact the Computer Office as soon as possible.

- 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 3.0 cumulative grade point average; 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

Support Personnel	Telephone
<b><u>Department of Accounting, Finance and Economics</u></b> Mr. Samuel Duah, Chair	(301) 860 - 3594
<b><u>Department of Behavioral Sciences and Human Services</u></b> Dr. Elliott Parris, Chair	(301) 860 - 4703
<b><u>Department of Communications</u></b> Dr. Chucka Onwumechilli, Chair	(301) 860 - 3709
<b><u>Department of Computer Science</u></b> Dr. Sadanand Srivastava, Chair Dr. Joan Langdon, Graduate Coordinator Dr. Manohar Mareboyana, Doctoral Program Director	(301) 860 - 3962 (301) 860 - 4036 (301) 860 - 3971
<b><u>Department of Counseling Department</u></b> Dr. Rhonda Jeter-Twilley, Chair	(301) 860 - 3233
<b><u>Department of Educational Leadership</u></b> Dr. Barbara Jackson, Interim Chair	(301) 860 - 3125
<b><u>Department of English &amp; Modern Languages</u></b> Dr. Anne Gaskins-Nedd, Chair	(301) 860 - 3687
<b><u>Department of Fine &amp; Performing Arts</u></b> Dr. Clarence Knight, Chair	(301) 860 - 3751
<b><u>Department of History &amp; Government</u></b> Dr. William Lewis, Chair	(301) 860 - 3602
<b><u>Department of Management Information Systems</u></b> Dr. David Anyiwo, Chair	(301) 860 - 3626
<b><u>Department of Management, Marketing and Public Administration</u></b> Dr. Shelton Rhodes, Chair	(301) 860 - 3622
<b><u>Department of Mathematics</u></b> Dr. Nelson Petulante, Chair	(301) 860 - 3352
<b><u>Department of Military Science</u></b> Lt. Col. Thurinton Harrell, Chair	(301) 860 - 3562
<b><u>Department of Natural Sciences</u></b> Dr. Elaine Davis, Chair	(301) 860 - 3876
<b><u>Department of Nursing</u></b> Dr. Bonita Jenkins, Chair	(301) 860 - 3204
<b><u>Department of Psychology Department</u></b> Dr. Cheryl Blackman, Chair	(301) 860 - 3257

**Department of Social Work Department**

Dr. Doris Polston, Chair

(301) 860 - 3251

**Department of Teaching, Learning & Professional Development**

Prof. Barbara Smith, Chair

(301) 860 - 3146

**School of Continuing Education**

Mathis M'bah, Interim Director

(301) 860 - 3232

**Graduate School**

Cosmas Nwokeafor, Interim Dean

(301) 860 - 3406

**Disability Support Services**

Michael Hughes, Coordinator

(301) 860 - 3292

**Department of Public Safety/Campus Police**

(301) 860 - 4040

## Computer Science Faculty Members Contact Information and Research Interests

Seonho Choi, Associate Professor  
Computer Science Building  
Room 223  
(301) 860-3967  
seonho@cs.bowiestate.edu  
Research Interests: Computer Networks, Network Security

Hoda El-Sayed, Associate Professor  
Computer Science Building  
Room 325  
(301) 860-3964  
helsayed@cs.bowiestate.edu  
Research Interests: Parallel Processing, High Performance Computing, Algorithms, and Computer Architecture.

James Gil de Lamadrid, Associate Professor  
Computer Science Building  
Room 222  
(301) 860-3968  
gildelam@cs.bowiestate.edu  
Research Interests: Robotics, Compilers, and Programming Languages.

Joseph Gomes, Assistant Professor  
Computer Science Building  
Room 220  
(301) 860-3963  
jgomes@bowiestate.edu  
Research Interests: Multimedia databases, Computer Networks.

Patricia Hughes, Assistant Professor  
Computer Science Building  
Room 215  
(301) 860-3969  
phughes@cs.bowiestate.edu  
Areas of Specialty: Discrete Structures, and Computer Architecture.

Lethia Jackson, Associate Professor  
Computer Science Building  
Room 324  
(301) 860-3970  
ljackson@cs.bowiestate.edu  
Research Interests: Programming Languages.

Darsana Josyula, Assistant Professor  
Computer Science Building  
Room 218  
(301) 860-4456  
djosyula@cs.bowiestate.edu  
Research Interests: Artificial Intelligence, Databases, and Cognitive Science

Joan Langdon, Professor  
Computer Science Building  
Room 217  
(301) 860-4036

jlangdon@cs.bowiestate.edu  
Research Interests: Software Engineering, and Security.

Velma Latson, Lecturer  
Computer Science Building  
Room 323  
(301) 860-4037  
vlatson@cs.bowiestate.edu  
Areas of Specialty: Computer Technology and Instructional Technology.

Manohar Mareboyana, Professor  
Computer Science Building  
Room 221  
(301) 860-3971  
manohar@cs.bowiestate.edu  
Research Interests: Image/video Processing, Sensor networks, and Data Compression.

Clarence Ray, Lecturer  
Computer Science Building  
Room 318  
(301) 860-3972  
cray@cs.bowiestate.edu  
Areas of Specialty: Operating Systems, Networking, Security and Architecture.

Sharad Sharma, Assistant Professor  
Computer Science Building  
Room 317  
(301) 860-4502  
ssharma@cs.bowiestate.edu  
Research Interests: Multi-Agent Systems, Agent-Based Modeling, Virtual Reality

Sadanand Srivastava, Professor  
Computer Science Building  
Suite 207B  
(301) 860-3962  
ssrivastava@cs.bowiestate.edu  
Research Interests: Agent based Computing and theory.

Daryl Stone, Lecturer  
Computer Science Building  
Room 319  
(301) 860-3973  
dstone@cs.bowiestate.edu  
Areas of Specialty: Software Engineering, Internet/Web Programming, Database Management and Minorities in Computers.

Claude Turner, Assistant Professor  
Computer Science Building  
Room 216  
(301) 860-3965  
cturner@cs.bowiestate.edu  
Research Interests: Information Assurance, Financial Computing. Image Processing

Jie Yan, Assistant Professor  
Computer Science Building  
Room 219

(301) 860-3966  
jyan@cs.bowiestate.edu  
Research Interests: Computer Animation, Face recognition

Bo Yang, Assistant Professor  
Computer Science Building  
Room 322  
(301) 860-4459  
byang@bowiestate.edu  
Research Interests: Database Management, Image Processing, Sensor networks

**APPENDIX I – SELECTION OF MAJOR ADVISOR**

Department of Computer Science \_\_\_\_\_

Date: \_\_\_\_\_

Memo to: \_\_\_\_\_

From: \_\_\_\_\_

RE: Proposed Research Advisor

\_\_\_\_\_ has agreed to serve as my Dissertation Advisor.  
(Print or type)

\_\_\_\_\_  
(Signature of Research Advisor)

\_\_\_\_\_ Approved: \_\_\_\_\_ Date:  
Chair, Dept of Applied Science

Description of financial commitment from the Major Advisor to the student:

**APPENDIX 2 – ANNUAL GRADUATE STUDENT PROGRESS REPORT**

Department of Computer Science

**(Must be completed by June 15 – Return to the Department of Computer Science)**

Name: DAS

Dissertation Title:

Dissertation Advisor:

Date entered program: Expected completion date:

Comprehensive exam: Research proposal exam:  
(Date passed) (Date passed)

Total credit hours toward degree:

Total credit hours of dissertation completed:  
Laboratory Rotations (if any): Attach a separate summary describing your laboratory rotations (complete once)

**Courses taken this past year:**

Fall Semester (year: )  
Course No. and Title                      Units                      Grade

Spring Semester (year: )  
Course No. and Title                      Units                      Grade

**Courses planned for next two semesters:**

Fall Semester (year: )  
Course No. and Title                      Units                      Grade

Spring Semester (year: )  
Course No. and Title                      Units                      Grade

Candidacy courses completed:

Candidacy Area	Course No. and Title	Semester Completed
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Progress to date toward dissertation: Attach a separate summary describing your research objectives and what you have accomplished. Include a list of publications, presentations, grants, scholarships, and awards for this year and your research plans for next year.

Describe your participation in Departmental activities over the last two semesters.

Date of last full Committee meeting:

Signature of the student, advisor, and dissertation advisory committee members. (Note: advisory committee members should sign only after reviewing all submitted materials)

Student:

Date:

Student is making satisfactory progress toward his/her degree \_\_\_\_\_

Student is making unsatisfactory progress toward his/her degree \_\_\_\_\_

Advisor Name: \_\_\_\_\_  
Print

Signature \_\_\_\_\_

Date:

Advisory Committee Comments (Comments required for unsatisfactory progress)