July 16, 2020

MAJOR: COMPUTER SCIENCE
DEGREE: MASTER OF SCIENCE (M.S.)

CONCENTRATIONS: (1) HIGH-PERFORMANCE COMPUTING & BIOINFORMATICS, (2) CYBER-SECURITY & NETWORKING, AND (3) DATA SCIENCE

Ali Sekmen, Ph.D., Professor and Chair
Wei Chen, Ph.D., Coordinator

The Department of Computer Science offers a Master of Science degree in Computer Science. The M.S. in Computer Science program provides recent college graduates, or college graduates who have had several years of professional life, with an opportunity to enhance their careers and work on cutting-edge areas of computer science. The program also provides an accelerated path, *Accelerated Master of Science in Computer Science* program, to the undergraduate students majoring Computer Science at TSU to complete the degree program within two semesters upon completion of their Bachelor of Science in Computer Science (B.S. in CS) degree program. The program offers three concentrations: (1) high-performance computing and bioinformatics,(2) cyber-security and networking, and (3) Data Science.

The M.S. in Computer Science offers the non-thesis and thesis options. All students are required to complete a total of 33 credit hours that include 9 credit hours of major core courses, 12 credit hours of concentration core courses, 6 credit hours of electives, and 6 credits hours of design-based courses (for non-thesis option) or 6 credit hours of thesis (for thesis option). Substitution within the core courses may be permitted with the consent of the advisor and approval of the department chair.

Admission Requirements

All students desiring to enroll for graduate study must apply through the Office of the Dean of Graduate School. To be admitted to the program, students should demonstrate readiness to succeed in the graduate program. To do this, students should meet the following criteria:

1. Applicants must have an academic background that covers certain prerequisite knowledge in mathematics, computer programming, computer architectures and data structures. Student transcript should present evidence of the following courses with a grade of "C" or better:

   a. Mathematical background: Calculus and Discrete Mathematics.

   b. Completion of undergraduate computer science prerequisites courses (or their equivalents): COMP 2240 (Computer Programming II), COMP 2400 (Computer Organization), COMP 3010 (Discrete Mathematics), and COMP 3040 (Data Structures).

2. The applicant must have a Bachelor's degree in Computer Science or a related area with a minimum cumulative grade point average (GPA) of 2.75 on a 4.0 sale.
3. The applicant must submit two letters of recommendation.

The application materials of each applicant will be evaluated by a committee, which may recommend some prerequisite undergraduate courses for the applicants under conditional admission. The applicant will have conditional classification until the completion of the recommended course or courses. If admitted, the applicant must correct the deficiency within the first two semesters.

An applicant whose Bachelor's degree is not in Computer Science or a related area and who has exceptional experience in Computer Science may also be considered for conditional admission on an individual basis. Such applicants must have a minimum GPA of 2.75 and provide a written technical summary for evaluation of their technical experience. This summary should emphasize the applicant's experience with software systems and methodology, computer organization and architecture, and theory and mathematical background.

Conditional admission: Applicants admitted in this category will not be allowed to take more than 6 credits hours of graduate courses in the program until successful completion of the prerequisite courses with grade C or above.

Accelerated Master of Science in Computer Science Program

A. Description

The Accelerated M.S. Program targets at the undergraduate students majoring in Computer Science at TSU. It gives them an opportunity to complete Master of Science in Computer Science (M.S. in CS) degree program within two semesters upon completion of their Bachelor of Science in Computer Science (B.S. in CS) degree program. The existing M.S. in CS program requires completion of 33 credit hours of coursework. The Accelerate M.S. in CS program uses course substitutions for 9 credits hours of undergraduate courses, i.e., it allows the undergraduate students to take 9 credit hours of graduate courses during their undergraduate matriculation and use these courses to substitute the related undergraduate courses. The additional 9 credit hours of graduate courses will be added into the minimum 120 credit hours of graduation requirements for B.S. in CS program. The remaining 15 credit hours of coursework will be completed as a graduate student at TSU. The program is integrated with the current programs at the department. Therefore, the students will be graduating with one of the three concentrations offered by the department for the MS in CS program: (1) high-performance computing and bioinformatics, (2) cyber-security and networking, and (3) Data Science.

B. Admission Requirements

All students desiring to enroll for this program must apply through the Office of the Dean of Graduate School. To be admitted to the program, students should demonstrate readiness to succeed in the graduate program. To do this, students should meet the following criteria:

1. The applicant must be in the process of completing or already have completed 90 hours of required undergraduate coursework towards his/her B.S. in CS degree in the Department of Computer Science.
2. The applicant must have a minimum cumulative grade point average (GPA) of 3.00 on a 4.00 scale or a GPA of 3.00 on a 4.00 scale for coursework in computer science only.

The application materials of each applicant will be evaluated by a committee.

C. Course Substitution Table

The following table shows the list of the graduate courses that will substitute undergraduate coursework. Note that the student will not be allowed to enroll in a graduate course until the prerequisite requirement of its correspondent undergraduate course in the table is fulfilled. The three (3) graduate courses with 9 credit hours can be taken from the list of M.S. courses depending on the preferred concentration.

Graduate Courses - Substitutes	**Undergraduate Courses**
COMP 5200 – Advanced Algorithms Design and Analysis	COMP 4700 – Algorithms
COMP 5720 – Cryptography and Computer Security	COMP 4720 – Cryptography and Computer Security
COMP 5750 – Computer Network Management and Security	COMP 4750 – Computer Network Management
COMP 6100 – Bioinformatics and Computational Biology	COMP 4820 – Intro to Bioinformatics Computing
COMP XXXX – Course Title	COMP 4900/4910 – Special Topics: Course Title

Note that the Department typically offers COMP 4900/4910 – Special Topics course every semester with a different special topic in computer science. Also, COMP 4900/4910 is typically dual listed with a corresponding graduate course. For example,

COMP 4910 – Special Topics: Mobile App Development
COMP 5600 – Mobile App Development

COMP 4910 – Special Topics: High-Performance Computing
COMP 5520 – High-Performance Computing

Non-Thesis and Thesis Options

The proposed program requires completion of either a 6-credit hour thesis, for the thesis option, or 6 credit hours of design-based courses, for the non-thesis option. For the thesis option, a thesis manuscript and an oral presentation are required to document the student's research activity. A thesis committee will supervise the student's thesis work. The committee will consist of 3 faculty members, including the thesis chair. At least 2 of the committee members must be computer science graduate faculty. The chair must be a computer science faculty with graduate faculty credentials. For the non-thesis option, 6 credit hours of design-based courses are required. These courses will be selected from an approved list with consent of the student's advisor. These courses have a strong project/design component.

Retention Requirements

The following is a list of the retention requirements:

1. Students are required to maintain a cumulative GPA of 3.00 throughout the program. After completion of nine semester hours of graduate work, if the student's cumulative GPA at the end of the given semester falls below 3.00, the student will be placed on probation. A student who fails to attain a cumulative GPA of 3.00 during the next semester enrolled will be suspended.
2. Students must have a grade of B or better in all core courses and may not have more than two C grades in other courses used to meet degree requirements.
3. Students who have repeated a core course and failed to achieve a grade B or higher will be dismissed from the program.
4. The maximum time allowed for completion of the master's degree is six calendar years. All requirements for the M.S. in CS degree must be completed within the six-year period beginning with the student's first term of enrollment in a graduate course.
5. Students dismissed from the program will not be readmitted.
6. In Accelerated M.S. Program, if the student is dismissed from the program, any graduate course taken from the substitution table above with a grade D or better while in the accelerated program can still be counted toward the B.S. degree.

Graduation Requirements

The M.S. in Computer Science program has two tracks: (a) a non-thesis program that requires 33 hours of coursework or (b) a thesis program that requires completion 27 hours of coursework and a thesis. The thesis option is strongly recommended for the students who intend to pursue a doctoral degree. The Master of Science degree in Computer Science will require the following:

1. Admission of all degree-seeking students to candidacy for the degree after the completion of nine (9) graduate credit hours in residence at the University. The student must file an *Admission to Candidacy* form with the Graduate School prior to the semester in which graduation is desired.

2. A minimum of 33 credit hours of graduate work, including 21 credit hours of required graduate core courses, with the following conditions for the Non-Thesis Option and Thesis Option:

   Non-thesis Option:
   The student must complete 33 credit hours of graduate computer science coursework.

   Thesis Option:
   The student must complete 27 credit hours of graduate computer science coursework and 6 credit hours of thesis work. A thesis is documented by a report and an oral presentation is required. A thesis committee will supervise the student's thesis work. The committee will consist of 3 faculty members including the thesis chair. At least 2 of the committee members must be computer science graduate faculty. The chair must be computer science faculty.

M.S. IN COMPUTER SCIENCE (CONCENTRATION I)
HIGH-PERFORMANCE COMPUTING & BIOINFORMATICS

PROGRAM OF STUDY-Thesis Option

Required Courses - 27 credit hours

COMP 5100	Software Engineering	3	
COMP 5200	Advanced Algorithms Design and Analysis	3	
COMP 5300	Advanced Computer Architectures	3	
COMP 5520	Introduction to High-Performance computing	3	
COMP 5800	Introduction to Bioinformatics	3	
COMP 6100	Bioinformatics Computing and Computational Biology	3	
COMP 6400	Distributed Algorithm Design and Data Analysis	3	*OR*
CISE 6360	Distributed Computing and Design	3	
COMP 5910*	Master of Science Thesis I	3	
COMP 5920*	Master of Science Thesis II	3	

*Requires completion of a 2-semester long thesis work in high-performance computing and bioinformatics.

Elective Courses - 6 credit hours

Courses from COMP, ENCS, CISE at level 5000 or above with consent of the advisor.

PROGRAM OF STUDY- Non-Thesis Option

Required Courses - 21 credit hours

COMP 5100	Software Engineering	3	
COMP 5200	Advanced Algorithms Design and Analysis	3	
COMP 5300	Advanced Computer Architectures	3	
COMP 5520	Introduction to High-Performance computing	3	
COMP 5800	Introduction to Bioinformatics	3	
COMP 6100	Bioinformatics Computing and Computational Biology	3	
COMP 6400	Distributed Algorithm Design and Data Analysis	3	*OR*
CISE 6360	Distributed Computing and Design	3	

Elective Courses - 6 credit hours

Courses from COMP, ENCS, CISE at level 5000 or above with consent of the advisor.

Design Elective Courses - 6 credit hours

Courses from the list below. Other courses can still be taken with the approval of advisor and department chair.

COMP 5400	Hybrid and Relational Databases	3	
COMP 5440	Mobile Robotics	3	
COMP 6200	Machine Learning	3	
COMP 6280	Advanced Web applications Development	3	
COMP 6300	Advanced Software Engineering	3	
COMP 6700	Network Programming and Computing	3	*OR*
CISE 7300	Network Programming	3	
COMP 6900	Embedded Systems Programming	3	
ENCS 6620	Data Mining	3	
ENCS 7700	High-Performance Computing Applications	3	
ENCS 7800	Graph Theory and Networks Analysis	3	
ENCS 7930	Applied Signal Processing	3	
ENCS 7900	Computer Vision	3	*OR*
COMP 6800	Introduction to Computer Vision	3	

M.S. IN COMPUTER SCIENCE (CONCENTRATION II)
CYBER-SECURITY & NETWORKING

PROGRAM OF STUDY-Thesis Option

Required Courses - 27 credit hours

COMP 5100	Software Engineering	3	
COMP 5200	Advanced Algorithms Design and Analysis	3	
COMP 5300	Advanced Computer Architectures	3	
COMP 5700	Fundamentals of Computer Networks	3	
COMP 5720	Cryptography and Computer Security	3	
COMP 5750	Computer Network Management and Security	3	
COMP 6700	Network Programming and Computing	3	*OR*
CISE 7300	Network Programming	3	
COMP 5910*	Master of Science Thesis I	3	
COMP 5920*	Master of Science Thesis II	3	

*Requires completion of a 2-semester long thesis work in cyber-security and networking.

Elective Courses - 6 credit hours

Courses from COMP, ENCS, CISE at level 5000 or above with consent of the advisor.

PROGRAM OF STUDY- Non-Thesis Option

Required Courses- 21 credit hours

COMP 5100	Software Engineering	3	
COMP 5200	Advanced Algorithms Design and Analysis	3	
COMP 5300	Advanced Computer Architecture s	3	
COMP 5700	Fundamentals of Computer Networks	3	
COMP 5720	Cryptography and Computer Security	3	
COMP 5750	Computer Network Management and Security	3	
COMP 6700	Network Programming and Computing	3	*OR*
CISE 7300	Network Programming	3	

Elective Courses - 6 credit hours

Courses from COMP, ENCS, CISE at level 5000 or above with consent of the advisor.

Design Elective Courses - 6 credit hours

Courses from the list below. Other courses can still be taken with the approval of advisor and department chair.

COMP 5400	Hybrid and Relational Databases	3	
COMP 5440	Mobile Robotics	3	
COMP 6100	Bioinformatics Computing and Computational Biology	3	
COMP 6200	Machine Learning	3	
COMP 6280	Advanced Web applications Development	3	
COMP 6300	Advanced Software Engineering	3	
COMP 6400	Distributed Algorithm Design and Data Analysis	3	*OR*
CISE 6360	Distributed Computing and Design	3	
COMP 6900	Embedded Systems Programming	3	
ENCS 6620	Data Mining	3	
ENCS 7700	High-Performance Computing Applications	3	
ENCS 7800	Graph Theory and Networks Analysis	3	
ENCS 7930	Applied Signal Processing	3	
ENCS 7900	Computer Vision	3	*OR*
COMP 6800	Introduction to Computer Vision	3	

M.S. IN COMPUTER SCIENCE (CONCENTRATION III)
DATA SCIENCE

PROGRAM OF STUDY-Thesis Option

Required Courses - 27 credit hours

COMP 5100	Software Engineering	3
COMP 5200	Advanced Algorithms Design and Analysis	3
COMP 5300	Advanced Computer Architectures	3
COMP 5400	Hybrid and Relational Databases	3
COMP 5500	Introduction to Data Science	3
COMP 5850	Data Visualization	3
COMP 6200	Machine Learning	3
COMP 5910*	Master of Science Thesis I	3
COMP 5920*	Master of Science Thesis II	3

*Requires completion of a 2-semester long thesis work in data science.

Elective Courses - 6 credit hours

Courses from COMP, ENCS, CISE at level 5000 or above with consent of the advisor.

PROGRAM OF STUDY- Non-Thesis Option

Required Courses- 21 credit hours

COMP 5100	Software Engineering	3
COMP 5200	Advanced Algorithms Design and Analysis	3
COMP 5300	Advanced Computer Architectures	3
COMP 5400	Hybrid and Relational Databases	3
COMP 5500	Introduction to Data Science	3
COMP 5850	Data Visualization	3
COMP 6200	Machine Learning	3

Elective Courses - 6 credit hours

Courses from COMP, ENCS, CISE at level 5000 or above with consent of the advisor.

Design Elective Courses - 6 credit hours

Courses from the list below. Other courses can still be taken with the approval of advisor and department chair.

COMP 5440	Mobile Robotics	3	
COMP 6100	Bioinformatics Computing and Computational Biology	3	
COMP 6280	Advanced Web applications Development	3	
COMP 6300	Advanced Software Engineering	3	
COMP 6400	Distributed Algorithm Design and Data Analysis	3	*OR*
CISE 6360	Distributed Computing and Design	3	
COMP 6700	Network Programming and Computing	3	*OR*
CISE 7300	Network Programming	3	
COMP 6900	Embedded Systems Programming	3	
ENCS 6620	Data Mining	3	
ENCS 7700	High-Performance Computing Applications	3	
ENCS 7800	Graph Theory and Networks Analysis	3	
ENCS 7930	Applied Signal Processing	3	
ENCS 7900	Computer Vision	3	OR
COMP 6800	Introduction to Computer Vision	3	

COURSE DESCRIPTIONS

COMPUTER SCIENCE

COMP 5100 SOFTWARE ENGINEERING. (3) This course focuses on foundational concepts of software engineering including software processes and life-cycle models, software requirements and specifications, software design methodologies, software testing, maintenance, and cost analysis. Prerequisite: None.

COMP 5200 ADVANCED ALGORITHMS DESIGN AND ANALYSIS. (3) Analysis and design of advanced algorithms and data structures in many areas of computing including divide and conquer, dynamic programming, greedy technique, graph algorithms, pattern matching, geometric algorithm, P and NP, and efficient approximation algorithms. Prerequisite: COMP 3040 and COMP 3200 or Equivalent.

COMP 5300 ADVANCED COMPUTER ARCHITECTURES. (3) This course introduces advanced computer architectures. It focuses on selecting and interconnecting hardware components to create a computer that meets functional, performance and cost goals, and teaches the qualitative and quantitative examination of computer design tradeoffs. It covers the system architecture, processor technology, advanced memory hierarchy and I/O organization, power and energy management, and reliability, and it further covers the new development in multicore, data center design, and parallel I/O. Prerequisite: COMP 2400 or Equivalent.

COMP 5400 HYBRID AND RELATIONAL DATABASES. (3) This course presents relational, object-oriented, and hybrid database concepts. Topics include: definitions of objects and attributes, methods and messages, classes, object-oriented data models, architectural issues, the object-oriented database system manifesto, object-oriented database design, object-oriented database management systems, and object/relational database management systems. Prerequisite: None.

COMP 5440 MOBILE ROBOTICS. (3) This course provides students with hands-on experience in mobile robot design, implementation, and testing. It covers mobile robot topics such as robot hardware, robot sensing, actuation, embedded system programming, and algorithms for localization, path planning, and mapping. It briefly covers multi-robot systems. Students are expected to work in laboratory in teams to build and test increasingly complex mobile robots and compete in an end-of-semester robot contest. Prerequisite: COMP 5100.

COMP 5500 INTRODUCTION TO DATA SCIENCE. (3) This course is an introduction to data science and the analysis of large data sets in order to draw insights and to extract information. The course covers using Python libraries for reading large data sets including Numpy and Pandas, reading input from standardized formats, calculating statistical measures from large data sets, linear regression, and evaluating model accuracy, precision and sensitivity. The course also covers logistic regression, unsupervised learning including k-means and hierarchical clustering, and time-series analysis with relational and non-relationship databases. It also covers sentiment analysis and recommendation systems. Prerequisite: None.

COMP 5520 INTRODUCTION TO HIGH PERFORMANCE COMPUTING. (3) This course focuses on concepts of distributed system, concurrency control, files system, resource management in shared/distributed memory, and high-performance computing in different computing systems. The topics include computing in multiple-core computer, GPU, computer cluster, parallel computer, and synchronous/asynchronous computer networks. The problems of consensus, communication, resource allocation, synchronization, link/process failures in synchronous/asynchronous networks will also be discussed. Prerequisite: COMP 5200.

COMP 5600 MOBILE APPLICATIONS DEVELOPMENT. (3) This course provides comprehensive understanding of the principles of application design, implementation, and testing for mobile platforms (e.g. cell phones). Memory management, user interface design and implementation, data handling, networking, GPS and motion-based sensing are among the topics covered. Students are expected to work in teams to build and test increasingly complex mobile phone applications and compete in an end-of-semester contest. Prerequisite: COMP 5100.

COMP 5700 FUNDAMENTALS OF COMPUTER NETWORKS. (3) This course provides fundamental design principles of ATM, Internet and local area networks; protocol layers and the Internet Architecture; medium access protocols; application protocols and TCP/IP utilities; basic principles and virtual circuit switching; naming and addressing; flow and congestion control protocols; routing algorithms; Quality-of-Service in computer networks; security issues in networks. Prerequisite: COMP 5100.

COMP 5720 CRYPTOGRAPHY AND COMPUTER SECURITY. (3) This course introduces modern cryptography, focusing on the fundamental concepts of secure computation and communication in the distrustful environments, for instance, wireless networks, internet banking, satellite radio and more. The course uses an incremental approach. It starts with the mathematics background of cryptography. Then, it will discuss attack and threaten models and security goals and review the traditional cryptography. The course will mainly investigate the techniques of modern cryptography in design of private and public key encryption schemes, digital signatures, authentication and key management. Applications in network security will be discussed. Prerequisite: ENGR 5100 and COMP 5700 or Equivalent.

COMP 5750 COMPUTER NETWORK MANAGEMENT AND SECURITY. (3) This course presents various concepts of computer network management and tools. Topics include: Network interfacing, measuring failures and availability, reliability, security, maintenance, network statistics, reconfiguration and documentation. Prerequisites: COMP 5700 or Equivalent.

COMP 5800 INTRODUCTION TO BIOINFORMATICS. (3) Bioinformatics is an interdisciplinary field in which biology and computer science merge. This course is designed to introduce students with concepts, methods and tools to analyze biological problems, prepare students with skills necessary to communicate across the fields of computer science and biology. Topics include (but not limited to) biological sequence and literature databases, strategies to search these databases to solve fundamental biological problems, principle and algorithms used for processing and analyzing biological information.

COMP 5850 DATA VISUALIZATION. (3) This course is an introduction to data visualization and the graphical representation of data. The growing data deluge from multiple sources require skills in representing data, in order to extract meaning and actionable intelligence from these data sets. Students learn how to communicate the relationship between data through systematic mapping between graphical representations and the underlying data values. The class teaches how representations of data can give insight and make data analysis easier. Prerequisite: None.

COMP 5900 SPECIAL TOPICS. (3) This course is for teaching important emerging computer science topics that are not covered in other computer science courses. Prerequisites: successful completion of at least 9 hours of COMP graduate courses.

COMP 5910 MASTER OF SCIENCE THESIS I. (3) Thesis topics to be selected in consultation with the chairman of thesis committee and approval of the department head. Students in specific concentration are required to work on thesis work in their corresponding concentration areas. Other students may complete a thesis work in other state-of-the-art areas of computer science. Prerequisite: Completion of at least 18 credits of graduate coursework.

COMP 5920 MASTER OF SCIENCE THESIS II. (3) Continuation and completion of thesis and oral presentation defense. Prerequisite: COMP 5910.

COMP 6100 BIOINFORMATICS AND COMPUTATIONAL BIOLOGY. (3) This course is designed to introduce students with basic concepts, methods and tools to analyze biological information, algorithm design and programming skills for biology computing, and prepare students with knowledge and skills necessary to communicate and solve the problem across the fields of biology and computer science. Topics include fundamental knowledge of biology and bioinformatics, literature databases and tools for analysis and visualization, algorithm design, bioinformatics-oriented programming, and HPC of bioinformatics. Prerequisite: COMP 5800.

COMP 6200 MACHINE LEARNING. (3) This course provides a broad introduction to machine learning, data-mining, and statistical pattern recognition. Topics include: (i) Supervised learning (parametric/non-parametric algorithms, support vector machines, kernels, neural networks). (ii) Unsupervised learning (clustering, dimensionality reduction, recommender systems, deep learning). (iii) Best practices in machine learning (bias/variance theory; innovation process in machine learning and AI). The course will also draw from numerous case studies and applications, so that you'll also learn how to apply learning algorithms to building smart robots (perception, control), text understanding (web search, anti-spam), computer vision, medical informatics, audio, database mining, and other areas. Prerequisite: ENGR 5100 or Equivalent.

COMP 6280 ADVANCED WEB APPLICATIONS DEVELOPMENT. (3) This course provides a comprehensive overview of web-based software architectures (e.g. JSP, ASP, Servlets, Web Services) and their applications. Students are expected to work in teams on a medium-scale web application development. Prerequisite: COMP 5400.

COMP 6300 ADVANCED SOFTWARE ENGINEERING. (3) This course explores software engineering topics including software reuse, component-based software engineering, distributed software engineering, service-oriented architectures, embedded software development, aspect-oriented software engineering, advanced validation and verification methods, and configuration management. Prerequisite: COMP 5100.

COMP 6400 DISTRIBUTED ALGORITHM DESIGN AND DATA ANALYSIS. (3) The course introduces the computing models and algorithms of distribution systems. The course also exposes students to an array of big data analysis theories, techniques and practices in different fields of study using distributed models. The topics include distributed computing models, massage-passing and shared memory systems, design and analysis of synchronous and asynchronous algorithms, fault tolerance, and data distribution, collection, processing and analysis in distributed systems. This is a project-based course that provides students with hands-on experience on distributed computing with different data types. Prerequisite: COMP 5520/5200.

COMP 6700 NETWORK PROGRAMMING AND COMPUTING. (3) This is course provides students fundamentals of network programming and network computing. The course reviews connection and connection-less network protocols, Winsock socket programming, network protocols, multi client-server system, peer-to-peer models, networked computer communication and coordination through message passing and basics of cluster computing. Prerequisite: COMP 5700 or equivalent.

COMP 6800 INTRODUCTION TO COMPUTER VISION. (3) This course introduces the concepts and applications in computer vision. Topics include: cameras and projection models, low-level image processing methods such as filtering and edge detection; mid-level vision topics such as segmentation and clustering; shape reconstruction from stereo, as well as high-level vision tasks such as object recognition, scene recognition, face detection and human motion categorization. Prerequisite: ENGR 5100 or Equivalent.

COMP 6900 EMBEDDED SYSTEMS PROGRAMMING. (3) In this project-based course, students will design and develop an application for an embedded systems platform, and then investigate low-level performance tuning and optimization. This course incorporates topics from the domains of software engineering, compilers, operating systems, and computer architecture, and provides students with the foundation they will need for addressing the concerns of developing real-world embedded systems. Prerequisite: C or Java Programming.