CAPITOL COLLEGE
2014-2015 Catalog

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General Information

Directory
Capitol College
11301 Springfield Road
Laurel, MD 20708-9758

Main Telephone Numbers
301-369-2800
888-522-7486

Admissions
Washington, DC 301-953-3200
Toll Free 800-950-1992
Fax 301-369-2326
Distance Learning 866-960-9620
Undergraduate Admissions Email
admissions@capitol-college.edu
Graduate Admissions Email
gradadmit@capitol-college.edu
Website
www.capitol-college.edu

Office Hours

The following offices are open as indicated (EST).
Admissions
M, F 9 a.m.-5 p.m.
T-Th 9 a.m.-7 p.m.
Saturday appointments are available.

Business Office
M, F 9 a.m.-5 p.m.
T-Th 9 a.m.-7 p.m.

Financial Aid
M, F 9 a.m.-6 p.m.
T-Th 9 a.m.-7 p.m.

Registration and Records
M, F 9 a.m.-5 p.m.
T-Th 9 a.m.-7 p.m.

Student Life
M-F 9 a.m.-5 p.m.
Evenings by appointment.

Emergency Closing

In the event of severe weather or other emergencies, any possible cancellations or late openings will be announced to area radio and television broadcasts and posted on the college website.

The college maintains a recorded message at 301-369-2800, 888-522-7486, 800-950-1992 and 301-953-3200 and posts a weather advisory on the website when possible. Due to power outages and other circumstances that occur during adverse weather, it is not always possible to update this information. It is the responsibility of students to tune in to the radio or television for announcements.

The television channels and radio stations notified by the college are listed in the student handbook and on the college website.
Accreditation

Capitol College is authorized by the state of Maryland (Maryland Higher Education Commission, 6 N. Liberty St., Baltimore, MD 21201, 410-767-3301) to confer bachelor of science (BS) degrees in astronautical engineering, business administration, computer engineering, computer science, electrical engineering, information assurance, management of information technology, software engineering and web development. The college is authorized to confer BS and associate in applied science (AAS) degrees in computer engineering technology, electronics engineering technology, and telecommunications engineering technology. The BS programs in business administration and management of information technology are fully accredited by the International Assembly for Collegiate Business Education (IACBE, PO Box 25217, Overland Park, KS 66225).

The college is authorized by the state of Maryland to confer master of science (MS) degrees in astronautical engineering, computer science, electrical engineering, information assurance, information and telecommunications systems management, and Internet engineering. The college is authorized by the state of Maryland to confer a master of business administration (MBA) degree. The MBA and information and telecommunications systems management programs are fully accredited by the International Assembly for Collegiate Business Education (IACBE, PO Box 25217, Overland Park, KS 66225).

The college is authorized by the state of Maryland to confer a doctor of science (DSc) in information assurance. The college is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools (Commission on Higher Education, Middle States Association of Colleges and Schools, 3624 Market Street, Philadelphia, PA 19104, 215-662-5606). The BS degree programs in electrical engineering, astronautical engineering and computer engineering are also accredited by the Engineering Accreditation Commission of Accreditation Board for Engineering and Technology. The baccalaureate degree programs in computer engineering technology, electronics engineering technology and telecommunications engineering technology are also accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (111 Market Place, Suite 1050, Baltimore, MD 21202, 410-347-7700). Capitol College is approved for veterans’ education by the Maryland Higher Education Commission.

Equal Opportunities

Capitol College actively subscribes to a policy of equal educational and employment opportunity and, in accordance with Title IX of the education amendments of 1972, does not discriminate on the basis of race, color, religion, gender, gender identity or expression, gender orientation, sexual orientation, national or ethnic origin, genetics, disability, age, or veteran status in admission, treatment of students or employment.

The following members of the Capitol College community are designated to receive inquiries concerning the college’s application of the equal opportunities statement.

- Jacqueline Enright, the Director of Administration, Jacqueline Enright, or any Vice President of the college or to the Department of Education’s Office of Civil Rights.
- Melinda Bunnell-Rhyne, Dean of Student Life and Retention
- Title IX Coordinator and Section 504 Coordinator
  - 11301 Springfield Rd. Laurel, MD 20708
  - 301-369-2491
  - deanofstudents@capitol-college.edu
- Jacequelyn Enright, Director of Administration
  - 11301 Springfield Rd. Laurel, MD 20708
  - 301-369-2547
  - jke@capitol-college.edu

Changes in Catalog Information

Capitol College reserves the right to make changes in policies, procedures, degree requirements, schedules, course offerings and other college standards or announcements to meet circumstances that may arise after publication.

The provisions of this publication are not to be regarded as an irrevocable contract between the student and Capitol College. The college reserves the right to change any provision or requirement in any college publication without notice at any time during the student’s term of attendance.

Capitol College reserves the right to require a student to withdraw, or to refuse to grant a degree or certificate if, in the judgment of the administration of the college, the student fails to meet the college’s requirements satisfactorily. The college reserves the right to change tuition and fees at any time at the discretion of the Board of Trustees.

Student Records

The procedures and guidelines adopted by Capitol College (hereinafter occasionally referred to as the “college”) regarding student records comply fully with the Family Educational Rights and Privacy Act of 1974 (FERPA). This federal law establishes the rights of students to inspect and review their records, and provides students with a mechanism for correcting inaccurate or misleading data found within a student’s education record. Moreover, FERPA guarantees the privacy of students’ education records. Specifically, FERPA limits the disclosure of personally identifiable, non-directory, information from education records, without the consent of the student. Consistent with its obligations, Capitol College will not release personally identifiable information from a student’s education records without the student’s consent, except in circumstances permitted by FERPA (e.g., in connection with a health or safety emergency).

Education records are records, files, documents and other materials containing information directly related to a student that are maintained by Capitol College. For example, records maintained by faculty advisors, the Office of Admissions, Office of Financial Aid, the Business Office, the Office of Career Services, Dean of Students’ Office, and Office of Registration and Records, are generally education records.

Student Review of Education Records

Students are entitled to inspect and review education records maintained by Capitol College. Students who wish to access a particular record should contact the college’s Office of Admissions. Students may request copies of their Capitol College education records. Reproduction of academic transcripts costs $10 per copy. However, Capitol College will not copy records for students with unpaid financial obligations.

Disclosure of Information Contained in Education Records

Capitol College will generally not disclose personally identifiable information contained in a student’s education record without the student’s prior consent. However, FERPA does allow Capitol College to disclose such information in certain, limited circumstances. For example, Capitol College may disclose information in a student’s education records to school officials within Capitol College whom the college has determined to have a legitimate educational interest in the information. A school official generally has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility. School officials include: professors; instructors; administrators; health staff; counselors; attorneys; clerical staff; trustees; members of committees and disciplinary boards; and a contractor, volunteer or other party to whom the college has outsourced institutional services or functions.

Capitol College may also disclose a student’s directory information without consent. Directory information includes, but is not...
limited to, the student’s name, address, telephone number, electronic mail address, photograph, date and place of birth, major field of study, grade level/class, enrollment status (e.g., undergraduate or graduate, full-time or part-time), dates of attendance, participation in officially recognized activities and sports, degrees, honors, and awards received, and previous educational agencies or institutions attended.

Students may restrict the release of directory information, except to school officials with legitimate educational interests. To do so, a student must make a written request directed to the Office of Registration and Records. Once filed, this request will become a permanent part of the student’s record until the student instructs the college, in writing, to remove the request.

Allegations that Capitol College is not in compliance with FERPA may be directed, in writing, to the Family Policy Compliance Office at the U.S. Department of Education.

The Capitol College Commitment

Capitol College guarantees its qualified bachelor’s degree graduates placement in the field of engineering, engineering technology, computer sciences, information technology or business with a competitive salary within 90 days of graduation, or Capitol College will provide up to 36 additional undergraduate credits tuition free while students continue their job search.

The Capitol College Commitment is a written job guarantee between the student and Capitol College. The commitment is open to all full-time undergraduate students (U.S. citizens or permanent residents).

Contact the Office of Career Services for more information.

Locations

Laurel Campus

Capitol College occupies the grounds of the former Beltsville Speedway. Located just off the Baltimore-Washington Parkway, the campus is minutes away from NASA Goddard Space Flight Center, the Beltsville Agricultural Research Center, the laboratory headquarters of the U.S. Food and Drug Administration, and the Patuxent Wildlife Research Center.

The tree-ringed suburban campus features gently sloping land and a small pond. The white forms of M/A-COM Hall, MCI Hall and Telecommunications Hall are connected by glass enclosed pedestrian walkways. The William G. McGowan Academic Center houses state-of-the-art classrooms, the Space Operations Institute and the Cyber Battle Lab. The buildings have high ceilings, skylights and exterior reflective glass walls overlooking the woods. Apartment-style student housing is available for 90 to 120 students.

Southern Maryland

Selected courses leading to degrees in electrical engineering and computer science are offered in classrooms at the Southern Maryland Higher Education Center in California, Maryland, near the Patuxent River Naval Air Station.

Mission, Vision and Learning Goals

Motto from the College Seal

Aut viam inveniam aut faciam (Latin).
Either find a way or make one.

Mission

The mission of Capitol College is to educate individuals for professional opportunities in engineering, computer and information sciences, and business. We provide relevant learning experiences that lead to success in the evolving global community.

Vision

In 2020, in accordance with the Mission Statement, Capitol College will be seen by its constituents and by the public as:

A STEM focused institution educating in engineering, information sciences and business, that has flexibility and opportunities to grow, and that adapts offerings to emerging workforce and societal needs.

A provider of hands-on, career-relevant learning that is conducted in an interdisciplinary and interactive environment, where faculty and staff support student achievement and success.

A university that delivers programs of similarly outstanding quality through face-to-face and virtual classrooms, and other forms and mixtures of teaching methods that align with the learning needs of our students.

An organization with faculty and leadership who stimulate and implement new curricula for the professions we serve, and that benefit a diverse community of learners.

An organization that is closely linked to its constituency of local, national, and international partners in business and government, and that provides influence for future technology development and policies.

A university that develops graduates with communications, analysis and critical thinking skills that allow them to be successful in a global environment and pursue lifelong learning as technical professionals, leaders and innovators.

Values

The core values are the characteristics we embrace in working together to fulfill the mission and achieve the vision of the institution.

• Quality – always striving for continuous improvement
• Growth – expanding and changing to meet new needs of society
• Leadership – offering creative, supportive and shared leadership
• Balance – maintaining a balance between competing needs

• Integrity – being honest, ethical and open
• Teamwork – exercising collective effort to support students and staff
• Communications – providing timely and useful information
• Flexibility – discovering and seizing opportunities
• Safety – maintaining awareness and prevention of accidents and threats

Students

Capitol College’s student body mirrors the 21st century diversity of American higher education. Academically prepared and motivated high school graduates come to Capitol College to complete educational experiences that will open career opportunities for them. Working adults, veterans and transfer students come to Capitol College to complete undergraduate programs of study that will open or enhance career opportunities for them. Established professionals come to Capitol College to expand their skills by earning graduate degrees or completing short-term learning experiences. The diversity of students enriches the learning environment of the college.

Learning Goals

Capitol College seeks to prepare graduates who demonstrate four characteristics:

• Employability: The ability to enter and advance in technical and managerial careers, appropriate to their level and area of study, immediately upon graduation.

• Communications: Mastery of traditional and technological techniques of communicating ideas effectively & persuasively.

• Preparation of the Mind: The broad intellectual grounding in technical and general subjects required to embrace future technical and managerial opportunities with success.

• Professionalism: Commitment to lifelong learning, ethical practice and participation in professions and communities.
The Educational Philosophy of the Academic Programs

Four principles define the educational philosophy of Capitol College. Academic programs must be:

- Grounded in both theory and practice in order to prepare graduates for immediate employment and long-term professional careers.
- Fundamentally hands-on and practice oriented to provide the technical skills for students to be immediately employable upon graduation.
- Tied to the contemporary needs of industry so that curriculum reform and development are pragmatic, and
- Enriched by courses in the liberal arts to provide every graduate with an enhanced sense of self, society, history and aesthetics.

Strategic Goals

Elevating Education and Expanding Enrollment

Capitol College is an institution that offers career relevant curriculum with quality learning outcomes. The strategy includes continuing to expand educational offerings at higher levels of degree attainment, program completion, and learner qualifications and outcomes. Capitol will accelerate the strategy to become more globally known and active in serving international countries, companies and learners. The 52-acre campus will be built-out to accommodate current and future growth in volume and diversity of educational programs and student services. Capitol will increase student enrollment to 1500 by Fall 2018.

Diversifying Institutional Resources

Capitol will enhance its financial resources by expanding the range and amount of funding available to the institution, aligning costs with strategic initiatives, and expanding corporate relationships. Capitol will increase annual revenue from philanthropy to $1.34 million by 2018 through a coordinated advancement plan.

Extending Family of Organizational Partners

The mission of Capitol College is to provide relevant learning experiences that lead to success in the evolving global community. In order to achieve the mission, Capitol will enhance and expand corporate relationships. Capitol will increase annual revenue from services to corporations and government agencies to $500,000 by 2018.

Maintaining Institutional Viability

Capitol College is committed to providing relevant learning in a quality learning environment. Capitol continuously reviews the higher education landscape to identify opportunities to revise and enhance the learning environment, either online or on campus. Capitol will develop plans to ensure the sustainability of the organization.

History

Since its start more than 80 years ago, Capitol College has remained true to its mission – preparing students for careers in a quickly changing world. With a tradition of academic excellence and practical learning, Capitol College has equipped its alumni with the knowledge and skills to evolve with the advanced sophistication of technology.

Capitol College was founded in Washington, DC as the Capitol Radio Engineering Institute in 1927, by Eugene H. Rietzke. A Navy veteran and radio operator, Rietzke foresaw the need for an advanced school that could produce talented radio and electronics technicians. CREI began as a correspondence school, but its popularity led to the 1932 opening of a residence division allowing students to work hands-on in laboratories. As radio technology improved, new training programs and courses were quickly added. Following World War II, CREI became one of the first three technical institutes accredited by the Engineers’ Council for Professional Development.

The institute entered a new era in the mid-1950s when it began awarding three-year AAS degrees. The school expanded its reach to new programs in applied engineering and electronics. To reflect this evolution, the institute changed its name to Capitol Institute of Technology in 1964. It awarded its first bachelor of science degrees in 1966 to four graduates of its electronics engineering technology program. Anticipating the need for more room, Capitol relocated in 1969 to a leased space in Kensington, Maryland.

During the following decade, enrollment increased and so did the program offerings. In 1976 the Middle States Association of Colleges and Secondary Schools granted accreditation to Capitol, and the National Science Foundation provided funding for new instructional scientific equipment. Quickly outgrowing its space, Capitol’s leaders recognized a need for a permanent campus and began searching for the right location.

In 1980 the college found its home in Laurel, Maryland. Capitol purchased the 52-acre former site of the Beltsville Speedway, built new academic facilities and opened the doors to students in 1983. Enrollment swelled and two more engineering technology degrees were added. Within the next decade a capital campaign and funding from the state of Maryland raised millions for buildings, equipment and a scholarship endowment. The campus expanded with Telecommunications Hall and the 340-seat Avrum Gudelsky Memorial Auditorium.

In the late 1980s, Capitol’s leadership again recognized the transformation in the institution. The technology-based curriculum had become broader, with an increasing incorporation of humanities and social science courses. With a spacious campus and four-year degrees, the school had shed its skin as a technical institute. Preferring a title and an environment that would better suit its presence, the Board of Trustees changed the school’s name to Capitol College. Along with the name change came a plan to offer more degrees in engineering and management, build on-campus housing and convert from a quarterly academic calendar to a semester system.

Master’s degrees were introduced in the 1990s. The college began several outreach efforts and business partnerships, such as the NASA PREP summer program for minority students and the Maryland Distance Learning Network. Meanwhile, the college expanded the John G. and Beverly A. Puente Library, creating a spacious state-of-the-art facility with a multimedia teaching center. The opening of the William G. McGowan Academic Center in 2005 marked the next era for the college. The academic center hosts an expanded computer science department, the Space Operations Institute, and the BRAC-funded Cyber Battle Lab.

In 2013, with a new century and millennium well under way, the time had come once again to take stock of Capitol’s achievements and set a course for its future growth. The radio institute founded in 1927 had burgeoned over the decades in ways that few could have predicted. It had become a full-fledged institution of higher education, offering a wide palette of academic disciplines and degrees. Reflecting these changes, a five-year strategic plan was adopted in November 2013, paving the way for the college’s transition to a university.

Today Capitol is the only independent college in Maryland that specializes in providing a relevant education in engineering, business and related fields. It takes pride in its proven record of placing graduates in competitive careers with salaries that are higher than the industry average. As a respected regional leader, Capitol continues attracting the attention of government agencies and corporate partners. Through a partnership with NASA, Capitol offers academic programs in astronautical engineering and practical training at its Space Operations Institute. The National Security Agency and Department of Homeland Security have designated Capitol a National Center of Academic Excellence in Information Assurance Education, and the Institute of Electrical and Electronics Engineers has named the school one of its twelve educational partners. In 2010, Capitol introduced a doctor of science in information assurance to its academic repertoire, allowing students to pursue their education to the highest level in the discipline.

While new innovations spur new developments and industries, the foundations that are taught at Capitol – thinking critically, actively and creatively – will remain. As it looks to the future, Capitol remains committed to providing students with a quality education and the relevant experience to excel in a changing world.

The Centers of Excellence

Capitol College has a vision, mandated by industry leaders, government officials, and education policy makers, to answer the call to provide a new generation of engineers and technology professionals who have higher
levels of innovation and leadership in order to ensure the national workforce is competitive in science, technology, engineering, mathemat- 

ics, and business.

Critical Infrastructures and Cyber Protection Center

Capitol College established the Critical Infrastructures and Cyber Protection Center (CICPC) to address the technical and manage- 

rial needs of the nation’s professional workforce in the areas of critical infrastructure protection and homeland security. The CICPC delivers professional training to the home- 

land security workforce as well as facilitating employment connections between our tal- 

ented students and the federal agencies and industry contractors that hire them. CICPC 

programs and services specifically target the needs of individuals employed in fields 

responsible for securing what many take for granted – the American way of life.

From technical training in areas such as Computer Forensics and SCADA protection to 

managerial areas such as project manage- 

ment and supply chain management, CTU 

provides customized programs featuring dedi- 

cated faculty who bring years of experience 

with theory and concepts. Our programs can be 

delivered at the customer site, on campus, 

and/or via our synchronous distance-learning 

platform.

Innovation and Leadership 

Institute

The Innovation and Leadership Insti- 

tute offers programs designed to build the 

technical and social skills of young people 

and working adults who want to succeed in 

technology entrepreneurship and leadership 

careers. ILI sponsors the Capitol President’s Forums and speaker series, which bring dis- 

tinguished speakers and panelists together 

with students and community members to 

share insights on innovation, entrepreneur- 

ship and leadership.

Future ILI endeavors will continue to 

deliver seminars, conferences and symposia 

on innovative topics, and non-credit profes- 

sional development programs in information 

assurance, technology management and 

entrepreneurship.

Other ILI activities include:

- a program of applied innovation and 

  leadership research, resulting in the 

  publication of best practices, organiza- 

  tional trends and successful leadership 

  stories;
- providing facilities and college faculty as 

  neutral resources focused on bringing 

  together people with common technol- 

  ogy and leadership challenges to solve 

  problems;
- programs for minorities and women, two 

  groups that continue to be under-repre- 

  sented in both technology and business 

  leadership;
- outreach programs to high school 

  and community college audiences to 

  increase interest in engineering, tech- 

  nology and business leadership careers.

Space Operations Institute

The Space Operations Institute (SOI) was established at Capitol College in 2003 with 

a grant from the National Aeronautics and 

Space Administration (NASA). It is a consor- 

tium of NASA, industry, government and edu- 

cation partners. 

The SOI builds on Capitol’s established 

engineering foundation and works closely 

with NASA and industry partners to under- 

stand the aerospace industry’s changing 

skills requirements. The SOI provides support 
educational programs that prepare students 

for careers in the aerospace industry. The 

SOI provides the infrastructure to provide 

hands-on experience in satellite mission 

operations and planning, and developing and 

operating a picosatellite ground system. 

Students enrolled at Capitol may apply 

for an industry sponsored or internal college 

SOI internships. Industry sponsored student 

interns work at NASA, the employers facility, 

or on campus. SOI interns work in the Aero-

space Research Lab or SOI Control Center 

on development and ground system opera- 

tions projects. The SOI provides students 

with practical experience that supplements 

their academic learning. The SOI currently 

has interns working on the Tropical Rainfor- 

est Measurement Mission (TRMM) at NASA 

Goddard Spaceflight Center, the James Webb 

Telescope at the Hubble Space Science 

Institute in Baltimore, and the Jet Propulsion 

Laboratory in California.

SOI management is continually seeking 

new opportunities with NASA and private 

industry to expand training and learning 

opportunities for students.

Center for Space Science Education and Public Outreach

The Center for Space Science Education and Public Outreach (SSEPO) provides hands- 

on education and workforce development experiences for students in K-12, community 

colleges, colleges or universities and those 

who support them in achieving leadership 
careers in the science, technology, engineer- 

ing and math (STEM) fields.

The Center’s vision is to assist in educat- 

ing and developing the future leaders of the 

STEM workforce through utilizing space 

science, astronomy and other related areas 
of study at Capitol College to engage students 
of all ages.

Working at the local, regional, and 
national levels, the Center will:

- assist the Capitol College Space Opera- 

  tions Institute in fulfilling their mission;
- provide hands-on educational experi- 

  ences for middle school, high school, 

  community college, and college stu- 

  dents to both introduce them to STEM 

  fields and continue to expand their 

  interest in these fields as possible 

  career choices;
- provide leadership development oppor- 

  tunities, in conjunction with the Innova- 

  tion and Leadership Institute, to enable 

  students to be future leaders within the 

  STEM fields;
- support the dissemination of informa- 

  tion regarding STEM workforce and 

  leadership opportunities.

Affiliations, 

Memberships and 

Partnerships

The college’s academic offerings are strengthened by relationships with govern- 

ment agencies, professional societies and 

private industry.

CyberWATCH

Capitol College is a member of Cyber- 

WATCH, an Advanced Technological Education 

Center funded by a grant from the National 

Science Foundation. CyberWATCH, founded in 

2005 as a consortium for ten institutions in 

the DC metro area, has grown to 95 member 

institutions across 29 states and the District 
of Columbia. The CyberWATCH mission is to 

increase the quantity and quality of the cyber- 

security (information assurance) workforce 

through increased education, curriculum 

development, faculty development, student 

development, career pathway exploration 

and development and public awareness.

Institute of Electrical and 

Electronics Engineers

Capitol College is a participating college 

partner with the Institute of Electrical and 

Electronics Engineers. Individuals who hold 

full membership in IEEE at the time of regis- 

tration will receive a 10 percent discount on 

tuition charges upon verification.

National Defense University

Capitol College is a partner with the 

National Defense University iCollege (formerly Information Resource Management College) 

to advance the professional skills and knowl-

dge of active-duty military, veterans and 

select Department of Defense employees. 

This arrangement provides an opportunity 

for military and DoD students who have com- 

pleted selected NDU programs to transfer up 

to 15 credits in lieu of Capitol College gradu- 

ate coursework.

National Security Agency 

and Department of Homeland 

Security

The National Security Agency and the 

Department of Homeland Security initially 

designated Capitol College as a National 

Center of Academic Excellence in Information 

Assurance Education (CAEIAE) in 2003, after 

a thorough review of the master of science in 

information assurance (MSIA) curriculum. In 

2007, Capitol became one of only three insti-

tutions nationwide to be certified as meeting 

all six standards (at the most advanced levels 

where applicable) as determined by the Com-

mittee on National Security Systems. Today, 

Capitol College remains the only institution 

with this all-inclusive mapping that delivers its 

program fully online.
Students successfully completing the requirements for the degree are awarded, in addition to the graduate degree, a federally accepted certificate attesting that they studied the requirements of the six national training standards. In the process of earning the MSIA, students have the opportunity to earn three post-baccalaureate certificates; Network Protection, IA Administration, and Security Management. For more information on these certificates see the Post-baccalaureate Certificates section of the college catalog.

**Maryland Community College Partner Institutions**

Capitol College has collaborated with ten Maryland colleges to provide transfer/articulation agreements in certain degree fields. These colleges include Anne Arundel Community College, Baltimore City Community College, College of Southern Maryland, Community College of Baltimore County, Hagerstown Community College, Harford Community College, Montgomery Community College, Prince George’s Community College and WorWic Community College. These agreements allow students from these participating institutions to easily transfer credits to Capitol College.

**Online Learning**

Capitol College offers all graduate degrees and certificates entirely online. In addition, undergraduate third and fourth year courses leading to a BS in Business Administration, Information Assurance, or Management of Information Technology are available online for degree completion at a distance. Students enrolled in Capitol’s online programs meet in virtual classrooms using a web-based application that delivers interactive live classes. In addition, a course management system provides course materials, homework, grades, and discussion threads. Online students participate in real-time class sessions once or twice a week. During the live lectures, students view lecture slides while listening to professors and other students speaking in real-time. Student interactivity is encouraged and is made possible through chat and audio discussions. Similar to a traditional classroom, students can raise their hands using interface icons and ask questions using their microphones or by chatting. Outside of the live classroom, the knowledge exchange continues as students download and view course material, transmit homework assignments, post to discussion boards and collaborate with other classmates. A typical online course consists of 16 class sessions, alternating between synchronous (“live”) lectures and asynchronous sessions. Asynchronous sessions can be recorded lectures or assignments that supplement topics discussed during the live lecture.

Because software vendors constantly update the online platforms, Capitol College posts the latest computer system requirements for online learning on our support site, ask.CapTechU.edu. Use the search input box there to look for “minimum system requirements” or just “minimum.” In general, most computers manufactured after 2008 meet the minimum requirements for online learning. The computers will also need audio capabilities for speakers and microphones. Lecture audio uses Voice over Internet Protocol (VoIP), so students will need an Internet connection with sufficient bandwidth (usually DSL or cable Internet but even wireless mobile devices with data plans should be sufficient for most classes). Remember that minimum requirements are bare minimums: more memory, faster processing speed, and faster Internet connections will always improve the online class experience. Even though it is possible and convenient to attend online classes with mobile devices, they limit capacities required in some classes. For example, a student might be required to upload and present a PowerPoint presentation or use another application.

To fully participate in a Capitol LIVE! virtual classroom, students must have access to a Windows or Linux PC or a Mac configured with a full-duplex sound card and a headset (or microphone and speakers).

Note that graduate students in Information Assurance labs and selected advanced undergraduate courses are expected to have more recent Windows systems with considerable RAM memory and hard drive space.

Students can get technical assistance by phone or e-mail (ask@CapTechU.edu) and around-the-clock support via our website at ask.CapTechU.edu. Phone support is available every hour classes are in session including 8:30 a.m. until 10 p.m. Monday-Thursday; 8:30 a.m. until 5 p.m. Friday; and 8:30 a.m. until 2 p.m. Saturday at 888-960-9620.
Academic Policies and Procedures

Program Advisors
Degree-seeking students are assigned academic advisors before registration. Students are encouraged to work closely with advisors in developing their programs of study. Academic advisors are available for guidance, but each student must assume final responsibility for conforming to college regulations and curriculum requirements.

Registration Procedures
Detailed registration information is provided before the beginning of each semester. Registration dates are listed in the college calendar beginning on page 110 and online. Students must be in good financial standing with the college to be eligible for registration services.

Registration forms can be obtained and submitted at the Laurel campus or online.

Late registration occurs during the first two weeks of the semester for all semester-length courses, or between the first and second class meeting for all term-length courses (both undergraduate and graduate).

No term-length course registrations will be accepted after the second class meeting. The last day to add or drop a class is listed in the college calendar beginning on page 110 and online.

Cross Divisional Registration
Students pursuing an undergraduate degree who wish to enroll in graduate courses must meet with the dean responsible for the course and receive approval from the dean prior to registration. This includes concurrent undergraduate students taking graduate level coursework to meet graduate degree requirements and students substituting graduate courses for undergraduate degree requirements. Courses taken at the graduate level to satisfy undergraduate degree requirements will not be counted toward the graduate level should the student choose to pursue a graduate degree.Course substitutions will be necessary for completing graduate credit requirements. Students interested in cross divisional registration should submit the appropriate paperwork to the Office of Registration and Records.

Audited Courses
Students who register to audit a course are charged the same tuition as those who register for credit. The grade of X is awarded at the end of the semester and is not used in computing the cumulative grade point average. Half-time financial aid students that change to audit will have a portion of their aid returned to the federal government. Students receiving VA benefits will not receive payment for audited courses. Any student receiving financial aid contemplating an audit should contact the Office of Financial Aid.

Once registered for audit, students are not permitted to change to credit after the first two weeks of the semester. The last day to change from credit to audit is listed in the college calendar beginning on page 110 and online.

Independent Study
Independent study in a course will be granted in only the most extenuating circumstances. The professor who administers the independent study and the appropriate academic dean must give permission for the course. When permission is given, the professor organizes the course requirements, including exams, homework, lab assignments, research and position papers, to compensate for the absence of classroom participation. Students must be in good standing as recommended to petition for independent study. Students interested in independent studies should consult with the appropriate academic dean and submit all appropriate documentation to the Office of Registration and Records.

Change of Degree Program
Students who want to change their degree program must complete a change of degree program form. This may be obtained in the Office of Registration and Records or online. The academic dean must approve all changes of degree programs. Students who change their degree program are required to meet all requirements of the new programs that are, in effect at the time of the change. Transfer credits and courses that have already been completed will be applied toward the new degree program where appropriate. Any student receiving financial aid contemplating a change of degree should see the Office of Financial Aid. Completed documentation must be submitted to the Office of Registration and Records after academic dean approval.

Double Degree Requirements
Undergraduate students who are currently enrolled and want to pursue two degrees (AAS or BS) must have a cumulative GPA (grade point average) of 2.5 or higher. For a second BS degree, the student must complete a minimum of 150 credits, with a minimum of 18 credits distinction between majors, of which at least 12 must be upper-level credits completed at Capitol College. For a second AAS degree, the student must complete a minimum of 75 credits, with a minimum of nine credits distinction between majors, of which at least six must be 200-level or above.

Graduate students who are currently enrolled in an AAS program and a different BS program must complete nine credits of distinction between the two degrees.

Graduate students who want to obtain two degrees may overlap two to three courses, depending on the degree programs, but must otherwise complete all the requirements for both degrees. Should more courses overlap than is approved, the student must take additional courses to make up the credit requirement. Double-degree-seeking graduate students are encouraged to consult their academic dean for advisement.

All students declaring a second degree must have academic dean approval and complete the change of degree program form. This may be obtained in the Office of Registration and Records or online.

Course Drop
There are two course drop periods. The first course drop period occurs during the registration period and ends on the last day for a 25% refund. The second course drop period occurs following the period for 25% refund and continues until the date indicated on the academic calendar.

Failure to attend classes does not constitute withdrawal and does not eliminate students’ academic or financial responsibilities. Students cannot withdraw during the week of final exams.

Withdrawal from the College
Students who want to withdraw from the college or are dropping from all classes in a term or semester must complete a withdrawal form from the Office of Student Life or online.

Withdrawal from the college may affect financial aid awards. Anyone receiving financial aid or VA benefits must see a financial aid administrator before withdrawing. Consult the college calendar on page 110 for specific withdrawal dates.

Readmission
Students who withdraw from the college are eligible for readmission at any time, unless they have been in violation of the college’s academic regulations, or have been dismissed for disciplinary reasons. Students who have been admitted to the college and interrupt their attendance for more than one academic year (three consecutive semesters) must resubmit an application for admission. In this case, a readmitted student must meet the degree requirements in place at the time of readmission in order to qualify for graduation. Applications are available online.

Arrangements for payment of outstanding tuition balances must be made with the Business Office before readmission is approved.
Leave of Absence

Doctoral students may request a Leave of Absence (LOA) by completing the “Request for Leave of Absence” form on the myCapitol portal (Doctoral Student tab). When requesting an LOA, keep in mind all coursework must be completed within a five-year time period. Please note this does not include the additional two years allowed for dissertation completion.

All LOA requests must be submitted in writing, include the reason for the request and be signed and dated. In order to adhere to federal regulations of the Department of Education, the LOA, together with any additional leaves of absence, must not exceed a total of 180 days in any 12-month period. The 12-month period begins on the initial date of your LOA. If you have not returned at the end of the 180-day period, the school is required to notify the Department of Education of your last date of attendance. This will affect your federal financial aid and your loan repayment status.

Course Cancellation

The college can cancel a course for which an insufficient number of students are enrolled. Students will be notified of a cancellation by the first class session, and any payments made will be refunded in full or credited to your next term.

Course Prerequisites

When planning schedules for upcoming semesters, students should pay special attention to the course prerequisites. Students must obtain a grade of C or better in prerequisite courses. Those students not meeting the course criteria will not be allowed to register without approval from the appropriate academic dean.

Completion of English Courses

Students seeking bachelor’s degrees at Capitol College must complete EN-101 and EN-102 before being permitted to register for junior-level classes. Transfer students must have equivalent transfer credits for EN-101 and EN-102 before being permitted to register for junior-level classes. Transfer students of junior status who do not have equivalent transfer credits for EN-101 and EN-102 must meet with the dean of business and information management before registering.

Class Attendance

Each professor establishes regulations regarding class attendance at Capitol College. Regular class and laboratory attendance is necessary to achieve maximum success in college work. Students receiving financial aid who do not attend classes will lose their aid.

Transcripts

Student academic records are maintained exclusively by the Office of Registration and Records. These records are considered privileged documents between the student and the college and will be released only upon a signed, written request from the student, except as may be required by law.

Transcripts will be issued when the student submits a signed request form and the student’s financial account is current. A $10 transcript fee is assessed for each issuance. Transcript request forms are available in the Office of Registration and Records on the myCapitol portal.

Capitol College will neither issue a transcript that reflects only part of a student’s record nor make copies of transcripts on file from other colleges or universities. Federal guidelines prohibit the faxing or emailing of grades and transcripts.

Unofficial transcripts are available at any time with proper photo identification if the student’s financial account is current.

Summer Session

The undergraduate summer semester is composed of 8- and 11-week sessions with a week for final examinations. All summer sessions will contain the same amount of material normally covered during a semester. Class schedules will be modified to accommodate the shortened period. Please refer to the college calendar beginning on page 110 for the summer session schedule.

Graduate online courses offered in the summer session maintain the 8-week accelerated term and 16-week semester.

Identification Cards

All enrolled undergraduate students will receive a Capitol College identification card. ID cards are required to check out laboratory equipment or library materials.

The student activity fee covers the cost of the original ID card. At the beginning of each semester, information about obtaining an ID card is posted on campus and online.

Graduate students may request an ID card from the Office of Student Life.

Scholastic Standing

Grading System

The quality of a student’s academic performance is evaluated by letter grades that are assigned quality points as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Standard</th>
<th>Quality Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Excellent</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>Average*</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>Below average**</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>Failing</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>0</td>
</tr>
<tr>
<td>NG</td>
<td>No grade</td>
<td>0</td>
</tr>
<tr>
<td>P</td>
<td>Pass</td>
<td>0</td>
</tr>
<tr>
<td>R</td>
<td>Repeat</td>
<td>0</td>
</tr>
<tr>
<td>S</td>
<td>Satisfactory</td>
<td>0</td>
</tr>
<tr>
<td>U</td>
<td>Unsatisfactory</td>
<td>0</td>
</tr>
<tr>
<td>V</td>
<td>Validation credit</td>
<td>0</td>
</tr>
<tr>
<td>W</td>
<td>Withdrawn (officially)</td>
<td>0</td>
</tr>
<tr>
<td>X</td>
<td>Audit</td>
<td>0</td>
</tr>
<tr>
<td>T</td>
<td>Transfer credit</td>
<td>0</td>
</tr>
</tbody>
</table>

* A grade of C shows minimum expectations have been met at the graduate level.
**Grades of D will not apply toward graduate program requirements.

Grade Point Average

At the end of each semester, averages are computed for each student’s record to indicate the general level of his or her academic standing. The first is the scholarship level for the semester. The second is the cumulative grade point average, indicating the scholarship level for all work taken at the college to date.

In cases where a student retakes a course, only the highest grade is used in computing the CGPA. The previous grade remains on record as information only. To graduate, undergraduate students must have a minimum 2.0 CGPA and a 2.0 GPA in their degree program. Graduate students must have a minimum 3.0 CGPA and a 3.0 GPA in their current degree program.

Incomplete Grades

An incomplete (I) grade will not be given except in the case of a true emergency that can be documented by medical records, death certificates, etc. Even if a true emergency exists, a student will not be allowed an extension (an I grade) unless that student has been attending classes and has kept up with the work before the emergency.

When an I grade is submitted, the professor will complete an incomplete grade form in the Office of Registration and Records explaining the reasons for the I grade and listing the student’s grades in the course. The student must then complete the work by the end of the fourth week of the next term, or the I will be converted to an F (unless the professor has specified that the I be converted to a C or D). After six months, the Academic Affairs Council must approve changes in grades.

No Grade Mark

When it is not appropriate to award a grade, a mark of NG will be given. NG grades are not calculated in the student’s term or CGPA.

Grade Reports

Grade reports are available at http://mycapitol.captechu.edu within three weeks after the last day of final exams. Students who want to have grades sent to sponsors must complete the proper request form available in the Office of Registration and Records or online. Federal regulations prohibit the use of phone, email or fax for official grade distribution.

Grade Appeal

Students who believe their posted grade is incorrect should speak directly to the professor. If the student and professor cannot resolve the issue in a satisfactory manner, the student may write a letter clearly explaining the situation to the appropriate academic dean. If the academic dean and student are unable to resolve the issue in a satisfactory manner, the student may appeal in writing to the vice president for academic affairs. The vice president will review the situation and make a decision based on the advice of the Academic Affairs Council. The decision of the vice president is final and no further review will be granted. All
appeals must be filed by the fourth week of the next term.

**Grade Changes**

Occasionally, a grade must be changed as errors do occur. However, grade changes will not be accepted later than six months after a term has ended; therefore, if a student truly feels that a mistake has been made, he or she must investigate as soon as possible after the grade is issued. (see Grade Appeal above)

**Dean’s List for Full-time Students**

Full-time undergraduate students who have GPAs of 3.5 or higher, and no failing grades for the semester, qualify for the dean’s list. Dean’s list designation is included on the student’s permanent record.

**Dean’s List for Part-time Students**

Part-time undergraduate students taking at least six semester credits, who have GPAs of 3.5 or higher and no failing grades for the semester, qualify for the dean’s list for part-time students. Dean’s list designation is included on the student’s permanent record.

**Academic Performance**

**Academic Standing**

Students seeking a bachelor’s or associate degree are in good academic standing if they have a cumulative grade point average of at least 2.0 in their degree program and are not on academic suspension. Students seeking a master’s or doctoral degree are in good academic standing if they have a CGPA of at least 3.0 and are not on academic suspension.

**Repeating a Class**

A specific course may be repeated twice in order to improve a grade or replace a W or X. Therefore, a student may take a specific course only three times. Three-time enrollment is limited to a maximum of five different courses during a student’s academic career. The higher grade is used and the lower grade is omitted in computing the CGPA. All grades are recorded on the student’s transcript. Any student who has taken a course required for their degree three times and has not achieved a satisfactory grade will be dismissed from that academic program. The dismissed student is permitted to apply for any other program that does not require that specific course. An academically dismissed student with extenuating circumstances can appeal in writing to the departmental dean for recommendation to the vice president of academic affairs.

**Satisfactory Academic Progress for Students Receiving Financial Aid**

Undergraduate and graduate students receiving financial aid must meet satisfactory academic progress (SAP) standards or risk the cancellation of financial awards and repayment of funds already received. See page 25 for the policy.

**Academic Probation**

Academic probation alerts students that they are in academic trouble and will be suspended from the college if their GPA and CGPA are not brought up to good academic standing (see above).

Undergraduate students are placed on academic probation under the following conditions:

- If a student registers for MA-005 or EN-001 and does not complete the course with a P
- If the CGPA of an undergraduate student with fewer than 30 attempted credits falls below 1.7
- If the CGPA of an undergraduate student with more than 30 attempted credits falls below 2.0.

Undergraduate students on academic probation must have a mandatory meeting with their advisor before registration and may not register for more than 12 semester credits, or no more than four courses.

Master’s degree students whose cumulative GPA falls below 3.0 are placed on last warning. Students on academic probation will be given three semesters (registered for coursework) to raise their CGPA to 3.0 and must consult with their advisor on the best course options.

Doctoral students must maintain a 3.0 GPA. A grade of C or below is not acceptable and if obtained, the class must be repeated the next semester as an independent study or the student must move to a different cohort group. If a B or higher is not obtained on the third attempt, the student will be academically dismissed.

**Academic Suspension**

Undergraduate students who have not completed the prerequisites for MA-110 or MA-114 and EN-101 through placement testing, or successful completion of MA-005 and EN-001 after attempting 24 credit hours, will be suspended from the college until it is demonstrated to the faculty that they can achieve and maintain good academic standing at the college level.

Undergraduate students whose cumulative GPA has been below 2.0 for three consecutive semesters will be suspended from the college for one academic semester after which they may return to the college.

Students suspended from the college are not relieved of their financial obligations.

Upon return, students will remain on probation and must achieve and maintain good academic standing or be suspended from the college until it is demonstrated to the faculty that they can achieve and maintain good academic standing at the college level.

To demonstrate to the faculty that a student can achieve and maintain good academic standing at the college level, he or she must complete at least six academic courses (a minimum of 18 credits) with grades of a C or better at another accredited college or college. Before a student is readmitted to Capitol College, the director of admissions will review his or her file.

**Academic Dismissal**

After a second suspension, undergraduate students who have been readmitted to Capitol College after completing 18 credits at another institution must earn a 2.0 GPA each semester. If their GPA falls below 2.0 at any time, they will be dismissed and not permitted to return to Capitol College. Graduate students who fail to reach the 3.0 requirement in the allowed period will be automatically dismissed and may not be readmitted to the college for at least one year after the effective date of dismissal.

Students dismissed from the college are not relieved of their financial obligations.

The U.S. Department of Veterans Affairs regional office will be notified if students receiving VA educational benefits are suspended or terminated. The academic dean will consider re-entry requests on an individual basis from students who have been dismissed for unsatisfactory progress.

The Office of Registration and Records will maintain a record of each VA student’s grades in accordance with VA regulations. A student can request official transcripts from the Office of Registration and Records as long as his or her financial accounts are current.

**Disciplinary Dismissal**

The continued enrollment of any student is dependent upon proper conduct. Failure to comply with the college’s regulations, or conduct deemed by the faculty as inconsistent with general good order, is regarded as sufficient cause for irreversible dismissal. The college reserves the right to terminate a student’s enrollment at any time for cause. Students dismissed from the college are not relieved of their financial obligations.

**Matriculation**

Classification of Undergraduate Students

Freshman: 29 semester credits or fewer

Sophomore: 30-65 semester credits

Junior: 66-95 semester credits

Senior: 96 semester credits or more

Doctoral students are considered candidates for the D.Sc. upon approval of the doctoral proposal.

**Residency Requirements**

A minimum of 15 semester credits, including 12 semester credits in the student’s degree program, must be completed at Capitol College in order to receive an associate degree. At least 30 semester hours of academic credit must be earned by direct instruction. Direct instruction does not include instruction through correspondence, credit for prior learning, cooperative education activities, practica, internships, externships, apprenticeships, portfolio review, departmental examinations or challenge examinations.

A minimum of 30 semester credits, including 18 semester credits in the student’s degree program, must be completed at Capitol College in order to receive a bachelor’s degree. At least 60 semester hours of academic credit must be earned by direct instruc-
tion. Direct instruction means synchronous or asynchronous instruction for academic credit that allows regular interaction between student and instructor, such as lectures, laboratory instruction, interactive instructional television, delayed video online instruction and (if regular interaction is available from an instructor) independent study. An exception is made for undergraduate active duty military. The residency requirement is 25% of the degree requirements for campus based programs and 30% for online programs.

For all BS degrees, at least 27 credits must be 300 level or above to qualify for graduation.

Students who want to take courses at another institution for possible transfer after enrolling at Capitol College must receive prior written permission from the appropriate academic dean. Transfer credit approval forms are available at the Office of Registration and Records and online. Graduate degrees must be completed in their entirety at Capitol College, with the exception of students transferring courses in accordance with the transfer credit policy on page 18 of this catalog. Students pursuing a Capitol College certificate must complete all required coursework through Capitol College.

Enrollment Status

Undergraduate

1-11 credits is considered part time
12-18 credits is considered full time

Graduate

1-8 credits is considered part time
9 or more credits is considered full time

For federal and Veterans’ benefits enrollment requirements, see page 28.

Graduation Requirements

Capitol College conducts the annual commencement ceremony at the Laurel campus in May. Transcripts always reflect the exact semester the degree program is completed. The “date degree conferred” information on transcripts and diplomas coincides with the date of the May commencement ceremony for spring semester graduates and with the last day of classes in the semester for summer and fall semester graduates.

Undergraduate Requirements

Undergraduate students must have satisfactorily completed the curriculum requirements for the degree program GPA and degree program GPA of at least 2.0 and must have satisfied the Capitol College residency requirements as listed.

Undergraduate students who complete all degree requirements by the end of the summer session are permitted to take part in the commencement ceremonies as degree candidates. If a student is not enrolled for the summer by April 15, permission to participate as a degree candidate will not be granted.

Undergraduate students must file an application for graduation with the Office of Registration and Records no later than six months before the semester of completion. The student’s file is reviewed and forwarded to the appropriate academic dean for final approval. Students are subsequently notified of approval and status. Applications for graduation are available in the Office of Registration and Records and online. The graduation fee, due by April 15, cannot be waived.

Undergraduate students are considered degree candidates only when the above procedures have been completed. Students who change their plans for graduation must notify the Office of Registration and Records in writing.

Graduate Requirements

Graduate students must have a minimum 3.0 CGPA. Grades of D will not apply towards graduate program requirements. Graduate students must submit an application for graduation no later than the end of January to be considered and included in the May commencement ceremony. The graduation fee, due by April 15, cannot be waived. The form, available online and in the Office of Records and Registration, is required so that orders for diplomas and commencement regalia can be placed before commencement. Diplomas will be released only after graduation fees are paid.

Graduate students who complete all degree requirements by the end of the summer (term I, term II or in summer semester classes) are permitted to take part in commencement ceremonies as degree candidates. If a student is not enrolled for the summer by April 15, permission to participate as a degree candidate will not be granted.

Time Limit for Degree Completion

Graduate students are required to maintain satisfactory progress toward the completion of degree requirements, which must be accomplished within seven years. The seven-year period begins when the oldest course applied to the degree was completed. This includes any transfer credits from other institutions.

Doctoral students are required to maintain satisfactory progress toward the completion of course requirements, which must be accomplished within five years. Students then have an additional two years to complete their dissertation.

Graduation Clearance

In the final weeks of their last semester of study, students should check with the Business Office, the Office of Financial Aid, the Office of Residence Life and the Puente Library to be certain that they have no outstanding obligations. Diplomas and transcripts will not be issued for students who have outstanding library books or fines, outstanding balances in the Business Office, or for financial aid recipients who have not had exit interviews with the Office of Financial Aid.

Academic Honors

Honors are awarded and noted on the transcript of students who graduate with the following cumulative GPAs:

<table>
<thead>
<tr>
<th>Undergraduate</th>
<th>GPA</th>
<th>Honors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0 - 3.4999</td>
<td>summa cum laude</td>
<td></td>
</tr>
<tr>
<td>3.5 - 3.7499</td>
<td>magna cum laude</td>
<td></td>
</tr>
<tr>
<td>3.75 - 4.0</td>
<td>cum laude</td>
<td></td>
</tr>
<tr>
<td>Master’s</td>
<td></td>
<td>with honors</td>
</tr>
<tr>
<td>4.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If an undergraduate student is completing more than one degree, the overall CGPA is used to calculate honors for the multiple degree programs.

If a master’s student is completing more than one degree, the CGPA within their degree program is used to determine honors.

Honor Societies

Alpha Chi National Honor Society

The purposes of Sigma Beta Delta are to encourage and recognize scholarship and achievement among students of business, management and administration, and to encourage and promote personal and professional improvement and a life distinguished by honorable service to humankind. Members in Sigma Beta Delta is the highest national recognition a business student can

Academic Policies
receive at a college or college with a Sigma Beta Delta chapter. To be eligible for membership, a business student must rank in the upper 20 percent of the junior, senior, or master's class and be invited to membership by the faculty officers.

Transfer Credits

Undergraduate Transfer Policies

Unofficial transfer credit evaluations are completed during the admissions process in consultation with the academic departments. Once the transfer student is enrolled at Capitol College, an official evaluation is conducted by the assistant director of registration and records in consultation with the academic departments and approved by the director of registration and records. The approved transfer credits are then added to the student’s permanent academic record and the student will receive written notification of the official transfer evaluation from the Office of Registration and Records. Once students matriculate at Capitol College, they must meet the academic standards for their degree program. Capitol College will consider credit for transfer from coursework completed at a regionally accredited institution, ABET-accredited program, or, in special cases, other qualified institutions acceptable to the standards of Capitol College. Capitol College will consider transfer credit for courses taken at an unaccredited institution on a probationary status, in which the student must complete a minimum of 24 credits at Capitol College with a CGPA of 2.0 before the credits will transfer. Coursework must also meet the following requirements:

• Courses must be relevant to the Capitol College curriculum.
• Only a passing grade of C or higher will be considered for transfer (courses are evaluated and transferred individually).
• Grades do not transfer, therefore transfer credits are not used in computing the CGPA.
• Capitol College credit requirements are based on the semester-credit system. Transfer credits from other institutions operating on other academic calendar systems will be converted to semester credits.
• The grade of D will not be accepted for credit even when it is part of a degree.
• Comply with Residency Requirements as stated on page 16.

Capitol College will transfer a maximum of 70 semester-credit hours from any combination of the following:

• community or junior colleges*
• proprietary or technical schools
• the military
• College Level Examination Program (CLEP)
• Advanced Placement (AP)
• International Baccalaureate (IB)
• Massive Open Online Course (MOOC)**
* Credits transferred are limited to the first two years and up to 50% of the baccalaureate degree program.
** MOOC coursework will be considered for transfer credit if the courses are approved by the American Council of Education (ACE).

There is no maximum amount of credits that can be transferred from a four-year accredited institution as long as residency requirements are met.

Military Credits

Capitol College will award credit for military courses based on the American Council on Education’s Guide to the Evaluation for Educational Experiences in the Armed Forces and program relevancy. Applicants must present a certificate of completion and/or an official DD214 or DD295 to the Capitol College Office of Registration and Records.

Industrial Courses

Capitol College will not accept credits for courses taken at an industrial site unless the American Council on Education has approved the course. Students who have taken industrial courses may elect to take validation exams (see below).

Continuing Education Units

Capitol College will not accept continuing education units (CEU) for transfer.

CLEP Tests

The official results of all CLEP exams must be submitted to the Office of Registration and Records no later than two semesters before completion.

Validation Exams

Students who can demonstrate competence in a subject without having completed the specific coursework, due to relevant work or life experience, may take a specially arranged validation examination. Not every course, however, lends itself to the validation process, and the appropriate academic dean must grant permission for the examination to be given. Validation examinations are thorough and cannot be taken a second time.

After paying the proper fee in the Business Office, interested students may register for a validation exam in the Office of Registration and Records, where forms and procedures are available. Students who pass the validation examination receive a V on their transcript and the appropriate number of semester credits. No partial credit or quality points are awarded.

Professional Certifications

Capitol College will consider transfer credit for industry recognized certifications that are relevant to the program curriculum.

Waived/Substituted Courses

In some circumstances, transfer credits may count toward a waived or substituted course. If a Capitol College course is waived, the student must complete the equivalent number of credits in a related subject area to fulfill the requirements of the degree. If a course is substituted, the credit is transferred and the requirement is therefore considered complete. Waivers and substitutions are conducted by the assistant director of registration and records and approved in writing by the appropriate academic dean.

Engineering Programs

Students transferring credits into the engineering programs must follow additional guidelines.

Credits for military, vocational or technical training may be used to satisfy some electronics- and technology-based freshman and sophomore level EL courses.

Such courses do not fulfill the objectives of engineering, engineering science, or social science courses; they may be used as engineering electives in the engineering programs.

Graduate Transfer Policies

Unofficial transfer credit evaluations are completed during the admissions process in consultation with the academic departments. Once the student is enrolled at Capitol College, an official evaluation is conducted by the assistant director of registration and records in consultation with the academic departments and approved by the director of registration and records. The approved transfer credits are then added to the student’s permanent academic record and the student will receive written notification of the official transfer evaluation from the Office of Registration and Records.

Depending on the program, a maximum of six to nine semester credits of comparable accredited coursework taken elsewhere may be applied toward a graduate degree. Only courses with a B or better will be accepted for transfer. Capitol College will not accept continuing education units (CEUs) for transfer. Results from a certification exam may not be used for transfer. Validation exams for credit are not available at the graduate level. In some cases, military training and ACE-accredited government courses may be transferred. Official transcripts of such coursework may be submitted for evaluation of transfer credit. These materials should be submitted to the Office of Registration and Records for evaluation. The graduate programs will not award transfer credit for any course identified as correspondence. Credit that is part of a completed graduate degree may be used as transfer credit. Transfer credits are limited to six credits in 30-credit programs and nine credits in programs containing more than 30 credits except in the case of students who participated in selected NDU programs (see page 9 for details). Once the student enrolls at Capitol College, all remaining credits must be completed at Capitol College.

The time limit for degree completion applies to transfer credits. Therefore, any course that was taken more than seven years before the date of graduation will not fulfill graduation requirements at the master’s level and will be removed from the student’s transcript. At the doctoral level, courses taken within five years of admission will be considered for transfer. Once accepted, doctoral transfer credits do not expire. Transfer credits cannot be applied to any capstone or
Tuition and Fees

The following rates are in effect for the 2014-2015 academic year beginning fall 2014 and continuing through summer 2015. Tuition rates are subject to change without notice.

Undergraduate Tuition

Engineering, Computer and Technology Degree Programs

Full-time tuition, per semester (12-18 credits) 11,088
Full-time credits above 18 (per credit) 924
Part-time 1-11 credits (per credit) 726
Audited courses (per credit) 726
Southern Maryland Higher Education Center (per credit) 622

Business and Management Degree Programs

On-campus and Online (per credit) 398
Independent Study (per credit) 477
Southern Maryland Higher Education Center (per credit) 398
3-credit course, plus fees 1,194

Graduate Tuition

Master’s Programs

Online (per credit), plus fees 554
Independent study (per credit), plus fees 766
Southern Maryland Higher Education Center (per credit), plus fees 554
Online 3-credit course, including fees 1,707

Doctoral Program

Per credit 797
3-credit course 2,391

Fees

Admissions

Undergraduate (paper) application 25
Undergraduate online application free
Master’s program online application free
Processing fee for international students 150
Doctorate application 100

Registration

Late registration for continuing students 40
Drop/add (each form) 10
Deferred payment plan 30
Late payment 25
Returned check 40
Check stop payment request 40

Undergraduate On-campus Student Services, per semester

Resident students 60
Full-time commuter students (12+ credits) 36
Part-time commuter students (1-11 credits) 10

Information Technology, per semester

Undergraduate Full-time (flat fee, 12+ credits) 300
Undergraduate Part-time (per credit, 1-11 credits) 15
Southern Maryland Higher Education Center (per credit) 15
Master’s (per credit) 15

Academic Services

Transcripts (each) 10
Certificates (each) 25
Replacement of Diploma 75

Graduation (non-refundable)

AAS degree programs 75
BS, MS, MBA, DSc degree programs 150
Additional degrees 75

Validation exam 250

Doctorate entrance exam 100

Business and Management Degree Subscription Fee (per academic year) 16

Campus Residence Halls

Single room (per semester) 3,107
Double room (per semester) 2,682
Triple room (per semester) 2,195
Room reservation deposit, continuing students 50
Security deposit (refundable)* 200

Off-Campus College Housing

Single room (per semester) 2,826
*See Guide to Residence Life to determine eligibility for refund.

Full-time Student Tuition Lock

Capitol College offers a tuition-lock program for undergraduate students registered full time. Tuition is locked in from the students’ first full-time semester and remains unchanged for up to five years. To remain eligible for the tuition-lock rate, students must adhere to the following terms and conditions:

- Maintain continuous full-time enrollment during the academic year (minimum 12 credits per semester).
- Keep all financial accounts up to date. Consult the academic calendar on page 110 for due dates.
- Remain in good academic standing. (See page 15 for academic performance.)

If these terms are not met, the student will no longer be eligible for the tuition lock and will be subject to the prevailing tuition rate.

Payment Options

Undergraduate Payment Options

- Full payment at time of registration
- Deferred payment plan
- Financial aid (see page 24)
- VA Benefits (see page 28)
- Employer sponsorship

Undergraduate Deferred Payment Plan

The undergraduate deferred payment plan allows semester students to pay their tuition in three installments: one-third at registration, one-third on or before the end of the fourth week of classes and one-third on or before the end of the eighth week. Students taking 8-week classes may also pay their tuition in three installments: one-third at registration, one-third on or before the second week of classes and one-third on or before the sixth week of classes. The cost of the deferred payment plan is $30, which is due with the first installment.

Nonpayment of tuition deposits may result in registration cancellation. Failure to adhere to the arrangements of the deferred payment plan may result in immediate dismissal from the college. Students who abuse the deferred payment plan will not be allowed to defer their tuition in the future.

Students on academic last warning are not eligible to use the deferred payment plan and must pay their tuition in full at registration.

Undergraduate Employer Sponsorship

Undergraduate students who are sponsored by an employer or other appropriate third party must submit authorization forms to the Business Office at the time of registration. Sponsors will be billed directly. Tuition not covered will be the responsibility of the student.

Undergraduate Employer Tuition Reimbursement

Undergraduate Students who are reimbursed by their employers must pay in full or use the undergraduate deferred payment plan.

Master’s Program Payment Options

- Full payment at time of registration
- Deferred payment plan
- Financial aid (see page 24)
- VA Benefits (see page 28)
- Employer sponsorship
- Employer reimbursement

Doctorate Program Payment Options

- Full payment prior to start of classes
- Financial aid (see page 24)
- VA Benefits (see page 28)
- Employer sponsorship
- Employer reimbursement

Master’s Programs Deferred Payment Plan

Masters students are required to pay 50 percent of tuition upon registration. If tuition is not paid in full at the start of classes, students will be automatically enrolled in the deferred payment plan and assessed a $30 deferment fee. The remaining balance is due four weeks after classes begin. Nonpayment of tuition could result in cancellation of student registration.

Graduate Employer Sponsorship

Graduate students (masters and doctorate) who are sponsored by an employer or other appropriate third party must submit authorization forms to the Business Office.
Refund Policy

Dropping or Withdrawing from Classes
It is the students’ responsibility to officially drop any class in which they are enrolled. This includes situations in which the student never attended the first class meeting. Never attending or ceasing to attend classes does not constitute an official withdrawal or relieve students of their financial obligation to Capitol College.

Full tuition refunds are available only to students who officially drop a class before the first day of classes. After the first day of classes, any student who drops or withdraws from class will be subject to the tuition refund schedule, outlined below. Refunds are effective on the date the drop or withdrawal is submitted to the Office of Registration and Records.

Refunds are computed according to the following schedule and are a percentage based on the full tuition amount for each course. The percentage listed equates to the student refund in the event the balance was paid in full before the start of class. Students on company contract may be personally responsible for the balance of their tuition, in the event their company only pays for completed courses.

Please refer to the published semester and term calendars beginning on page 110 of this catalog or online for specific dates of refunds.

Tuition Refund Schedules

8-week Term Courses
- 100% Student drops before the first day of classes
- 75% Student drops during the first week of classes
- 50% Student drops during the second week of classes
- 25% Student drops during the third week of classes
- 0% Student drops after the third week of classes

16-week Semester Courses
- 100% Student drops before the first day of classes
- 75% Student drops during the first or second week of classes
- 50% Student drops during the third week of classes

25% Student drops during the fourth week of classes
0% Student drops after the fourth week of classes

Federal Return of Funds Policy

The Financial Aid Office is required by federal statute to recalculate federal financial aid eligibility for students who withdraw, drop out, or are dismissed or take a leave of absence before completing 60% of a payment period or term. The federal Title IV financial aid programs must be recalculated in these situations.

If a student leaves Capitol College before completing 60% of a payment period or term, the financial aid office recalculates eligibility for Title IV funds. Recalculation is based on the percentage of earned aid using the following Federal Return of Title IV funds formula:

Percentage of payment period or term completed = the number of days completed up to the withdrawal date divided by the total days in the payment period or term. (Any break of five days or more is not counted as part of the days in the term.) This percentage is also the percentage of earned aid.

Funds are returned to the appropriate federal program based on the percentage of unearned aid using the following formula:

Aid to be returned = (100% of the aid that could be disbursed minus the percentage of earned aid) multiplied by the total amount of aid that could have been disbursed during the payment period or term.

If a student earned less aid than was disbursed, the institution would be required to return a portion of the funds and the student would be required to return a portion of the funds. Keep in mind that when Title IV funds are returned, the student borrower may owe a debit balance to the institution.

If a student earned more aid than was disbursed, the institution would be entitled to the student a post-withdrawal disbursement that must be paid within 120 days of the student’s withdrawal.

Refunds are allocated in the following order:
- Unsubsidized Direct Stafford Loans
- Subsidized Direct Stafford Loans
- Federal Perkins Loans
- Direct PLUS Loans

Financial Aid

Capitol College understands that paying for college is a major hurdle for parents and students. To help families meet tuition and living expenses, the college offers a variety of financial assistance programs including loans, work-study, scholarships and grants to help cover tuition and living expenses. Regardless of income level, all degree-seeking students are encouraged to apply for assistance.

Financial aid is available to both full- and part-time undergraduate students who are U.S. citizens or eligible non-citizens. Audited courses, some repeated courses, and credit by examination are not counted as meeting enrollment requirements. A student receiving financial aid must demonstrate satisfactory progress toward degree completion.

The Capitol College student handbook contains additional information about financial aid at Capitol College.

Application Procedures

One of the most important aspects of the financial aid process is to apply for assistance as early as possible. The application due dates are priority deadlines. Students who meet the priority deadlines enjoy the security of having their award authorization ready in time for class registration.

1. You must complete and submit the Free Application for Federal Student Aid

Federal Pell Grants for which a return of funds is required
Academic Competitiveness Grant
National SMART Grant
Federal Supplemental Opportunity Grants for which a return of funds is required
According to federal regulation, a financial aid student who receives all F’s during a period of enrollment is considered not to have attended any of his or her classes; therefore, all financial aid received for that period of enrollment must be returned to the Department of Education. Financial aid will not have to be returned to the federal government if at least one of the student’s professors verifies that the student has been in class and really earns the failing grade. The return of financial aid does not relieve the student of financial obligations.
Continuing Eligibility

The Office of Financial Aid reserves the right to review or modify financial aid commitments at any time based on information affecting eligibility. This includes the availability of funds, changes in financial status, satisfactory academic progress, and changes in enrollment status.

Return of Federal Funds

Students who have received financial aid awards and withdraw from classes (officially or unofficially) may be required to return a portion of the federal funds. See the federal return of funds policy on page 24.

Federal Satisfactory Academic Progress (SAP) Standards

The Department of Education has passed a new federal satisfactory academic progress policy effective July 1, 2011.

This policy applies to both undergraduate and graduate students receiving federal financial student aid funds. This financial aid SAP policy is separate from the college’s general satisfactory academic progress policy.

Under the Federal SAP policy there are two components: a qualitative SAP component (Grade Point Average) and a quantitative SAP standard (earned credit hours versus attempted credit hours). Students receiving federal student aid must be in compliance with both standards in order to be considered making financial aid satisfactory academic progress.

Repeated Coursework

A student may repeat any coursework previously taken in the student’s program as long as the repeated course is not a result of more than one repetition of a previously passed course.

Undergraduate Student Requirements

Qualitative Standard (Grade Point Average Component)

A minimum cumulative Grade Point Average of 1.7 for undergraduate students who have attempted fewer than 30 semester credit hours; a minimum Grade Point Average of 2.0 for undergraduate students who have attempted 30 semester credit hours or more or have completed their second academic year, whichever comes first. Transfer credits are also counted in the earned credit hours.

Quantitative Standard (number of credit hours attempted versus number of credit hours earned)

Under the quantitative component of the financial aid satisfactory academic progress standard, an undergraduate student must successfully complete coursework within a certain time frame. Charts showing the minimum number of credits you must earn each enrollment period and year of study are in the table below and on the college website. Additionally, for an undergraduate the time frame cannot exceed 150% of the published length of the program measured in academic years or credit hours attempted, as determined by the college. For instance, if the published length of your academic program is 120 credit hours, the maximum period must not exceed 180 (120 x 1.5) attempted hours.

To be in compliance, you must complete your credit hours as listed in the chart to the right.

Not meeting these standards will place you on financial aid warning for one semester.

A student on financial aid warning will receive financial aid for one more semester. However, before registering for classes the student must meet with the college advisor to develop a successful plan and to receive approval for courses the student wishes to register for during the warning period.

A student under financial aid warning will have his/her financial aid terminated if the GPA standard is not met during the warning period.

Financial Aid Termination – Undergraduate and Graduate (Master’s and Doctoral) students

An undergraduate or graduate student whose financial aid is terminated following the warning period will not receive financial aid again unless the student has submitted an appeal requesting financial aid reinstatement. In your letter of appeal, you must explain the reason for your poor academic performance and provide medical documentation or other documents which help to explain your exceptional circumstances.

Financial Termination – Graduates

- 6 or more credits is considered half time
- 9-11 credits is considered three-quarter time
- 12+ credits is considered full time

Undergraduate – Veterans

- 3 to 5 credits is considered part time
- 6 to 8 credits is considered half time
- 9 to 11 credits is considered three-quarter time
- 12+ credits is considered full time

Graduate – Veterans

- 3 or more credits taken during an 8-week term session is considered full time
- 3 to 5 credits taken during a 16-week semester is considered greater than one-quarter but less than half time
- 6 or more credits taken during a 16-week semester is considered full time

Tuition/Financial Aid
Financial Aid Appeals Committee for review. You will be notified in writing of the Committee’s decision. If your appeal is granted you will be placed in a probationary status for one semester.

Types of Financial Aid

The financial aid program at Capitol College consists of grants, scholarships, loans and work-study employment. Detailed information about each aid program is available from the Office of Financial Aid.

Scholarships

The scholarship program at Capitol College is designed to reward students for their academic accomplishments, leadership qualities or other special talents. The scholarships come from a variety of sources and donors, and each scholarship has its own set of criteria and annual value, ranging from $2,000 to full tuition. Scholarships are available to full-time undergraduate students enrolled for 12 credits or more per semester. Scholarships do not have to be repaid.

Institutional Scholarships

Each full-time undergraduate degree applicant is automatically considered for an institutional scholarship when applying for admission to the college. Initial institutional scholarship notification is sent by the Office of Admissions and is based on prior academic performance and SAT scores. For eligibility requirements, contact the Office of Admissions. All of the scholarships are annually renewable to recipients who maintain at least a 3.0 GPA and complete 24 credits each year.

Richard J. Heiman Scholarship

Awards range from $10,000 to $12,000. Named in memory of a dedicated member of the Capitol College Board of Trustees, this scholarship is the highest offered by the college to new students.

Presidential Scholarship

Awards range from $7,000 to $9,000.

Board of Trustee Scholarship

Awards range from $4,000 to $6,000. The scholarship is named to recognize the service and support of the college Board of Trustees members.

Capitol College Scholarship

This scholarship is offered to qualifying community college students who are transferring to Capitol College, with awards ranging from $4,000 to $10,000.

Corporate and Foundation Scholarships

A number of corporations and foundations have invested funds with the college to be awarded annually to students meeting criteria specified by the donors, such as academic merit or financial need. Students continuing to meet the awarding criteria will be considered for subsequent scholarship awards. However, corporate and foundation scholarships are not automatically renewed.

Interest or other special talents. The scholarships do not have to be repaid.

Grants

Grants are available to undergraduate students. Grants do not have to be repaid.

Richard A. Wainwright Grant

This grant provides support for students who have academic ability and demonstrate financial need. The Richard A. Wainwright Grant is the highest level of institutional grant offered to the most qualified students.

Maryland State Scholarships

Maryland students seeking Maryland state scholarships should complete the FAFSA by the March 1 filing deadline.

Students who are residents of other states should check with their state scholarship agencies for available scholarships, proper application procedures and deadline dates.

Grants

Grants are available to undergraduate students. Grants do not have to be repaid.

Maryland Part-time Grant

These grants are funded by the state of Maryland and are awarded to Maryland residents enrolled on a half-time basis. Interested students enrolled on a half-time basis must complete the FAFSA. Funds are limited.

The Howard P. Rawlings Educational Excellence Awards

These grant program funds (Guaranteed Access Grant, Educational Assistance Grant, Part-time Grant and Professional Scholarship Program) are awarded to full-time eligible students who filed their FAFSA after the state's March 1 deadline. Funds are limited.

Loans

Loans are a serious financial obligation that must be repaid. Both undergraduate and graduate students can apply for loans. Students must be enrolled at least half-time (six credits each semester) and cannot borrow more than their cost of attendance minus other financial aid received. The Federal Family Education Loan Program (FFELP) includes the Federal Direct Stafford and graduate PLUS loans for students and the Federal Direct PLUS loan for parents. Students can apply for loans online through the college website.

Federal Perkins Loan

The Federal Carl Perkins Loan program is for undergraduate and graduate students with exceptional financial need. Eligibility is determined by the Department of Education, based on the information provided on the FAFSA. Funds are limited and are not awarded to graduate students.

Alternative Loan Programs

These loans are available if additional funds are needed over and above what you receive under the federal, state, and institutional financial aid programs.

Work-Study Employment

On-campus jobs are available to both undergraduate and graduate students under the Federal College Work-Study and Capitol College Work-Study programs. These work programs offer students the opportunity to earn money to meet educational and personal expenses during the year and to get on-the-job work experience.

Federal Work-Study

Federal Work-Study is funded by the federal government and awarded by the Office of Financial Aid to eligible students who have filed the FAFSA. It is the policy of Capitol College that while class is in session during fall and spring, students cannot work more than 20 hours each week.

Capitol College Work-Study

Students not awarded Federal Work-Study can consider employment under the Capitol College Work-Study Program. Funding for this program is provided by various campus departments. Admitted students can contact the Office of Financial Aid for more information. The employer decides the maximum hours students may work each week.

Other Aid Programs

Private Organizations

In addition to federal, state and institutional financial aid programs, there are private organizations that offer financial aid funds for a college education. Many local clubs, religious organizations and other groups provide scholarships for deserving students. Students should visit their public library to research these possible sources or contact organizations such as the American Legion, 4-H clubs, Kiwanis, Jaycees, Chamber of Commerce, Girl Scouts and Boy Scouts. Do not overlook organizations connected with family, friends, and field of interest, such as the American Society of Professional Engineers or the Society of Women Engineers.

Veterans’ Benefits

To qualify for financial aid, veterans’ benefits or both students must be enrolled in a degree program and submit all necessary transcripts. Non-degree students are not eligible for veterans’ benefits or federal financial aid. Certification and certificate courses are not eligible for veterans’ benefits or federal financial aid, unless they are taken as part of an approved degree program. A veteran
will not receive educational benefits for an audited course. Private loan programs can be used for these programs.
A counselor is available to assist veterans, active duty personnel and spouses, and children of deceased veterans who may be eligible for educational assistance through the VA. The counselor is located in the Office of Registration and Records.

Vocational Rehabilitation
Assistance is available to individuals with physical and/or mental disabilities. For further information, contact the Vocational Rehabilitation Service nearest you.

Additional Information
Course withdrawals (W) after the drop/add period are considered a non-completion of attempted credit hours.
An audit grade is not considered attempted coursework.
Incomplete grades are not included in the GPA calculation nor are they counted as attempted coursework. When the course is completed and a permanent grade is assigned the Office of Financial Aid will reevaluate the student’s academic progress.
Students will not receive financial aid for audited courses.
The Capitol College student handbook contains additional information about financial aid at Capitol College.

Student Complaints
A student who wishes to file a complaint against the college should contact the Maryland Higher Education Commission, 6 N. Liberty St., Baltimore, MD 21201, 410-767-3301 and/or the college’s accrediting agency: Commission on Higher Education, Middle States Association of Colleges and Schools, 3624 Market Street, Philadelphia, PA 19104 (215-662-5606).

Undergraduate Program Offerings

Bachelor of Science (BS) Degrees
- Astronautical Engineering
- Business Administration
- Computer Engineering
- Computer Engineering Technology
- Computer Science
- Electrical Engineering
- Electronics Engineering Technology
- Information Assurance
- Management of Information Technology
- Software Engineering
- Telecommunications Engineering Technology

Associate in Applied Science (AAS) Degrees
- Computer Engineering Technology
- Electronics Engineering Technology
- Telecommunications Engineering Technology

Programs of Study
Capitol College’s programs of study for associate in applied science and bachelor of science degrees are outlined beginning on page 35.

Undergraduate Certificates
Lower Division
- Object-Oriented Programming
- Programming and Data Management
- Web Programming

Upper Division
- Acquisitions Management
- Computer and Network Security
- Project Management
- Software Engineering
- Space Missions and Operations Specialist
- Website Development
Requirements for undergraduate certificates are outlined beginning on page 50.

Undergraduate Admissions

Degree-seeking Students

First-Time, Full-Time Freshman
A first-time, full-time freshman is defined as any applicant who has graduated from high school within one year of the proposed entrance term and is entering Capitol College on a full-time basis. A full-time student must carry 12 or more credits per semester.

Application Requirements
1. File a formal application for admission as far in advance of the proposed entrance date as possible. An application for admission can be obtained from the Office of Admissions or online.
2. Enclose a $25 nonrefundable admissions processing fee with the application. (Applications remain on file for one academic year.) The application fee is waived for those students submitting electronic applications through the college website.
3. Forward the official high school transcripts to the Office of Admissions.
4. Submit SAT or American College Test (ACT) scores to the Office of Admissions.

Admissions Requirements
All applicants receive a comprehensive evaluation of their previous school records. Admissions decisions are based on the applicant’s course preparation, high school grade point average (GPA), class rank and standardized test scores. Scholarship consideration is given based on GPA test scores, along with the admissions essay, letters of recommendation and a personal interview.

High school course preparation should include a minimum of four units of English, three units of mathematics (including plane geometry and Algebra II), two units of lab science and two units of social sciences.
Students whose GPA, course preparation and/or test scores do not meet the general admissions requirements may be further considered if they submit an admissions essay, letters of recommendation, placement tests and visit the campus for a personal interview.
The minimum GPA required for admission to Capitol College is 2.2 on a 4.0 scale. The
minimum SAT score is 800 composite. The minimum ACT score is 17 composite.

Undeclared Applicants
Students admitted to an AAS or BS degree who are undecided on their program study may complete up to 15 credits before they are required to declare a major. During this period, their account will reflect the 15-credit hold.

Engineering Applicants
Applicants to the engineering programs must have an additional unit of mathematics or entry into college calculus, an additional unit of laboratory science (physics or chemistry), an overall high school GPA of at least 2.8, and a minimum SAT score of 900 with at least a 500 on the Math section (or an ACT score of at least 19).

Applicants who do not meet these additional criteria, but meet the general admissions criteria, will be accepted into an engineering technology program for their freshman year. After successful completion of the freshman year, students may transfer into the engineering program with academic dean approval.

Tuition Deposit
Upon acceptance, all full-time applicants are required to pay a nonrefundable $200 tuition deposit or $200 housing deposit to the college. The tuition deposit is credited to the applicant’s first-semester tuition. The housing deposit is held until graduation, or permanent move to off-campus housing.

Full-Time Transfer Students
A full-time transfer student is defined as any applicant who is eligible to transfer 15 or more semester credits from an accredited higher education institution to Capitol College and will attend on a full-time basis. A full-time student must carry 12 or more credits per semester.

Application Requirements
1. File a formal application for admission as far in advance of the proposed entrance date as possible. An application for admission can be obtained from the Office of Admissions or online.
2. Enclose a $25 nonrefundable admissions processing fee with the application. (Applications remain on file for one academic year.) The application fee is waived for those students submitting electronic applications through the college website.
3. Forward all official transcripts to the Office of Admissions. Applicants who are completing, or who have already earned, an associate or bachelor’s degree from a regionally accredited college need only forward college transcripts. Applicants who have less than 30 college credits must forward an official high school transcript denoting graduation date or General Equivalency Diploma (GED) record and college transcripts, if applicable.
4. For transfer credit policies, see page 18 of this catalog.

Admissions Requirements
Full-time transfer applicants who have successfully completed an associate or bachelor’s degree are generally accepted into Capitol College once their application file is complete. Admissions requirements for all other students are based on previous academic coursework (including high school, college, proprietary institutions, the military or appropriate work experience), with an emphasis on postsecondary achievement. Students must be in good standing at all previous institutions. Students not in good standing are subject to further review.

If applicants are not eligible to transfer credits for MA-114 or EN-101, completion of a skills assessment test may be required.

Part-time Degree-seeking Students
A part-time degree-seeking student is defined as any student pursuing an undergraduate degree at Capitol College on a part-time basis. A part-time student may carry 1-11 credits per semester.

Application Requirements
1. File a formal application for admission as far in advance of the proposed entrance date as possible. An application for admission may be obtained from the Office of Admissions or online.
2. Enclose a $25 nonrefundable admissions processing fee with the application. (Applications remain on file for one academic year.) The application fee is waived for those students submitting electronic applications through the college website.
3. Forward all official transcripts to the Office of Admissions. Applicants who are completing, or who have already earned, an associate or bachelor’s degree from a regionally accredited college need only forward college transcripts. Applicants who have less than a degree or no college credits must forward an official high school transcript denoting graduation date or General Equivalency Diploma (GED) record and college transcripts, if applicable.
4. For transfer credit policies, see page 18 of this catalog.

Admissions Requirements
Part-time applicants who have successfully completed an associate or bachelor's degree are generally accepted into Capitol College once their application file is complete. Admissions requirements for all other students are based on previous academic coursework (including high school, college, proprietary institutions, the military or appropriate work experience). Students must be in good standing at all previous institutions. Students not in good standing are subject to further review.

If applicants are not eligible to transfer credits for MA-114 or EN-101, completion of a skills assessment test may be required.

Concurrent, Readmit and Other Types of Students

Concurrent Enrollment
Concurrent students are any qualified high school juniors or seniors who want to enroll in a limited number of courses at Capitol College while completing their high school graduation requirements. Concurrently enrolled students are not eligible for financial aid.

Application Requirements
1. File a formal application for admission as far in advance of the proposed entrance date as possible. An application for admission may be obtained from the Office of Admissions or online.
2. Enclose a $25 nonrefundable admissions processing fee with the application. (Applications remain on file for one academic year.) The application fee is waived for those students submitting electronic applications through the college website.
3. Forward an up-to-date official high school transcript to the Office of Admissions.
4. Forward a letter of recommendation from the high school principal or guidance counselor.
5. Meet with an admissions counselor at Capitol College for a personal interview.

Admissions Requirements
Once the application requirements have been completed, the applicant will be eligible for concurrent enrollment. Concurrent students are required to complete all prerequisites for courses in which they intend to enroll. Concurrent enrollment is considered a non-degree-seeking status, so the student will not be accepted into a specific degree program. If the student wants to apply for degree-seeking status after graduation, the student must complete the application requirements for a first-time, full-time freshman, outlined on page 30 of this catalog, and should do so as far in advance of the proposed start term as possible.

Concurrent students who want to enroll in MA-114 or EN-101 may be required to complete a skills assessment test.

Readmission
A readmit applicant is defined as any applicant who has previously completed any amount of coursework at Capitol College, has not attended Capitol College in at least one full academic year and wants to resume study. Students who were at any time in violation of the college’s academic, financial or disciplinary regulations may be denied readmission. Readmitted students may be required to submit or resubmit required documents, such as official transcripts. Readmitted students will enter Capitol College’s degree program under the current graduation requirements and will be subject to current policies and procedures. A course audit will be completed to determine what coursework must be fulfilled for graduation. Readmission is contingent upon an application for admission, which may be obtained from the Office of Admissions or online, and review by the admissions staff.

Other Types of Students
Applicants who do not match any of the undergraduate types discussed herein should contact the Office of Admissions to determine
the application and admissions requirements that apply. To reach the Office of Admissions, call 800-950-1992 or send email to admissions@CapTechU.edu.

Certificate Students

An undergraduate certificate student is any student pursuing one or more of Capitol College’s state-approved undergraduate certificates, maintaining less than 12 credits per semester and not pursuing a degree. Undergraduate certificate students are not eligible for financial aid.

Application Requirements

1. File a formal application for admission as far in advance of the proposed entrance date as possible. An application for admission can be obtained from the Office of Admissions or online.
2. Enclose a $25 nonrefundable admissions processing fee with the application. (Applications remain on file for one academic year.) The application fee is waived for those students submitting electronic applications through the college website.
3. Forward all official transcripts to the Office of Admissions. Applicants who are completing, or who have already earned, an associate or bachelor’s degree from a regionally accredited college need forward only college transcripts. Applicants who have less than a degree or no college credits must forward an official high school transcript denoting graduation date or General Equivalency Diploma (GED) record and college transcripts, if applicable.

Admissions Requirements

Undergraduate certificate applicants who have successfully completed an associate or bachelor’s degree are generally eligible to register for classes once their application file is complete. Admissions requirements for all other students are based on previous academic coursework (including high school, college, proprietary institutions, the military or appropriate work experience). Students must be in good standing at all previous institutions. Students not in good standing are subject to further review.

All certificates require that students have completed MA-110, MA-114 or have equivalent experience. All coursework must be completed through Capitol College. Students must complete the specific courses listed for the certificate; no substitutions are permitted. Once the course requirements are completed, students must apply for the certificate in the Office of Registration and Records. A $25 processing fee is due with the certificate request. A student must have a minimum cumulative GPA of 2.0 in all certificate coursework to be awarded the certificate.

Non-degree-seeking Students

A non-degree-seeking student is any student pursuing a non-degree certification program or taking individual courses not applying to a degree. Non-degree study is not eligible for financial aid.

Application Requirements

1. File a formal application for admission as far in advance of the proposed entrance date as possible. An application for admission can be obtained from the Office of Admissions or online.
2. Enclose a $25 nonrefundable admissions processing fee with the application. (Applications remain on file for one academic year.) The application fee is waived for those students submitting electronic applications through the college website.

Admissions Requirements

Once the application and processing fee are received, applicants are notified of their acceptance and may register for classes during the appropriate registration period. Information about registration is continually updated online.

After successful completion of 15 semester credits at Capitol College, non-degree students must complete the admissions procedure for degree-seeking status, or receive approval for continued non-degree status from the appropriate academic dean.

International Students

An international student is defined as any applicant from a country other than the United States who will be pursuing an undergraduate degree program on a student visa. Eligibility requirements, listed below, must be met for acceptance. International students are not eligible for institutional scholarships or federal financial aid.

Application Requirements

1. File a formal application for admission as far in advance of the proposed entrance date as possible. An application for admission can be obtained from the Office of Admissions or online.
2. Enclose a $150 nonrefundable admissions processing fee with the application. (Applications remain on file for one academic year.)
3. Verify that you meet the academic and financial requirements stated below.

Academic Requirements

Submit certified transcripts (with English translations) of secondary school and/or college records, or examination results when periodic grades are not used for measurement purposes. The college may require that you have your transcripts evaluated by a recognized credential evaluation service.

Applicants should have two years of college preparatory mathematics, such as algebra, geometry and trigonometry.

English proficiency for direct admission into a degree program:

TOEFL paper-based test score of 500 or computer-based test score of 173, or proof of completing a specified level of proficiency at an English language school, or satisfactory completion of English courses at an accredited college or college within the United States.

Financial Requirements

International students must submit evidence of sufficient financial resources for living and educational expenses. Support documents must be dated within the last six months. Proof of financial support can be in one of the following forms:

A letter of sponsorship or scholarship from a government agency or corporation. This letter of sponsorship must be an original and outline specific billing procedures.

Complete the declaration and certification of finances form. This form must be accompanied by supporting bank statements or employment verification. Include signatures or original letters of support from each sponsor.

Students who have not provided valid evidence of sponsorship from a government agency or corporation must make a tuition deposit of $500 prior to formal acceptance and issuance of F-1-20.

Applicants can expect an answer from the college three to five weeks after receipt of all necessary documents. All international students must join the college health insurance program, unless adequate coverage is proven.
Astronautical Engineering

The Astronautical Engineering program is structured to provide students with a balance between theory and practice. Students receive hands on design experience via the college’s high altitude balloon payload program, course assignments, laboratory exercises and the college’s Space Operations Institute. The focus is on spacecraft and ground systems design rather than research.

The main objectives of the program is to produce skilled systems oriented astronautical engineers to support the needs of NASA and the aerospace industry.

In order to achieve this objective, students study space systems engineering, orbital mechanics, spacecraft subsystems, spacecraft attitude and control, autonomous ground systems as well as other areas of satellite mission planning, design and operations. Graduates have the ability to work on multidisciplinary teams, meet the expectations of employers of astronautical engineers, and pursue an advanced degree if desired.

All engineering majors must take courses in humanities and social science to broaden their understanding of professional and ethical responsibilities and impact of their engineering solutions in a global context.

All bachelor of science students must complete a capstone where they propose, design, develop and deliver a satellite mission plan or other space related project.

Course Requirements

Bachelor of Science 130/131 Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Computer Sciences</td>
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<td>CS-130</td>
<td>Computer Science Fundamentals</td>
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<td>Engineering</td>
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<td>AE-150</td>
<td>Introduction to Space</td>
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<td>AE-311</td>
<td>Spacecraft Systems</td>
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<td>AE-350</td>
<td>Autonomous Ground Systems</td>
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<td>AE-351</td>
<td>Orbital Mechanics</td>
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<td>AE-361</td>
<td>Introduction to Satellite Imaging</td>
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<td>AE-411</td>
<td>Space Systems Engineering</td>
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<td>AE-454</td>
<td>Spacecraft Dynamics and Control</td>
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<td>AE-455</td>
<td>Satellite Communications</td>
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<td>AE-458</td>
<td>Senior Project in Space Science</td>
</tr>
<tr>
<td>EE-309</td>
<td>Circuit Design and Simulation</td>
</tr>
<tr>
<td>EE-453</td>
<td>Control I</td>
</tr>
<tr>
<td>AE-463</td>
<td>Spacecraft Simulations</td>
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<td>Astronautical Engineering electives (3)*</td>
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<tr>
<td>English Communications</td>
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<td>English Communications II</td>
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<td>Writing Seminar in Technical Research</td>
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<td>Humanities and Social Sciences</td>
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<td>FS-100</td>
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<td>HU-331 or HU-332 Arts and Ideas</td>
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<td>SS-351</td>
<td>Ethics</td>
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<td>CH-120</td>
<td>Chemistry</td>
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<tr>
<td>MA-261</td>
<td>Calculus I</td>
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<tr>
<td>MA-262</td>
<td>Calculus II</td>
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<td>MA-263</td>
<td>Calculus III</td>
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<td>MA-300</td>
<td>Mathematical Methods</td>
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<td>MA-340</td>
<td>Ordinary Differential Equations</td>
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<td>MA-360</td>
<td>Laplace and Fourier Analysis</td>
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<td>PH-261</td>
<td>Engineering Physics I</td>
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<td>Engineering Physics II</td>
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<td>Engineering Physics III</td>
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<tr>
<td>EE-159</td>
<td>Circuit Theory</td>
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<td>Electronic Devices and Circuits</td>
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<td>Digital Electronics</td>
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<td>EL-250</td>
<td>Advanced Analog Circuits</td>
</tr>
<tr>
<td>EL-261</td>
<td>Introduction to Communications Circuits and Systems</td>
</tr>
</tbody>
</table>
| *See appropriate department for approved list. All bachelor of science degrees require a minimum of 27 credits at the 300-level or above. For descriptions of required courses, see courses beginning on page 67. Business Administration

The business administration (BA) curriculum provides students with the knowledge necessary to integrate business, analytical and decision-making skills into a culturally, politically, socially and demographically diverse environment. Graduates will bring to the job market the ability to effectively apply the acquired skills and knowledge (theory, tools and models) to everyday work situations of current or future employers. The goals of the program are to give students an understanding of how private and public sector organizations function effectively and efficiently. Students will gain a clear picture of how the functional business areas work together to achieve organizational success in a global environment. Course content builds a solid business and management foundation to include marketing, accounting, finance, information technology and human resource management. The combined required and elective courses provide students with a breadth of skills important in today's technology-driven business climate.

Course Requirements

Bachelor of Science 120/121 Credits

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
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<td>BUS-200</td>
<td>Business Communications</td>
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<td>BUS-270</td>
<td>Financial Accounting I</td>
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<td>BUS-280</td>
<td>Macroeconomics</td>
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<td>BUS-281</td>
<td>Microeconomics</td>
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<td>BUS-376</td>
<td>Marketing Principles</td>
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<td>BUS-378</td>
<td>Legal Environment of Business</td>
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<td>BUS-384</td>
<td>Production and Operations Management</td>
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<td>BUS-386</td>
<td>Organizational Theory and Behavior or BUS-387 Logistics</td>
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<td>BUS-410</td>
<td>Strategic Management</td>
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<td>BUS-458</td>
<td>Senior Project</td>
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<td>Business Fundamentals</td>
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<td>BUS-174</td>
<td>Introduction to Business</td>
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</tbody>
</table>

*Any course may be taken to satisfy the general elective requirement.

All bachelor of science degrees require a minimum of 27 credits at the 300-level or above. For descriptions of required courses, see courses beginning on page 67.
Computer Engineering

The computer engineering (CE) program is structured to teach students to design and program computers and computer-based systems, including the latest embedded technology. The main objective of the computer engineering program is to produce practical design engineers who will be capable of analyzing the technical needs of society, and to create the next generation of integrated hardware and software solutions to meet systems requirements. CE majors study digital systems, computer organization and architecture, software design and testing, operating systems and programming languages, microcontroller systems, and the latest programmable chip technology. All engineering majors must take courses in humanities and social science to broaden their understanding of professional and ethical responsibilities and the impact of their engineering solutions in a global context. All students complete a capstone course in which they propose, design, build, test and deliver a computer-based system.

<table>
<thead>
<tr>
<th>Course Requirements</th>
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<tbody>
<tr>
<td>Bachelor of Science 131 Credits</td>
</tr>
<tr>
<td>Course</td>
</tr>
<tr>
<td>Computers and Programming</td>
</tr>
<tr>
<td>CS-150 Introduction to Programming Using C</td>
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<td>CS-200 Programming Using C++</td>
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<td>CS-220 Database Management</td>
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<td>CS-351 Assembly Language Programming</td>
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<td>CT-152 Introduction to Unix</td>
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<td>Engineering</td>
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<td>EE-304 Digital Design I</td>
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<td>EE-354 Digital Design II</td>
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<td>EE-362 Microcontroller System Design</td>
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<td>EE-364 Computer Architecture</td>
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<td>EE-404 Large-Scale Digital Design</td>
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<td>EE-452 Advanced Microcontroller System Design</td>
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<td>Design</td>
</tr>
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<td>EE-458 Senior Project</td>
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<tr>
<td>EL-452 Automated Test Systems</td>
</tr>
<tr>
<td>Computer or Engineering electives (3)*</td>
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<tr>
<td>English Communications</td>
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<tr>
<td>EN-101 English Communications I</td>
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<tr>
<td>EN-102 English Communications II</td>
</tr>
<tr>
<td>EN-408 Writing Seminar in Technical Research</td>
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<tr>
<td>Humanities and Social Sciences</td>
</tr>
<tr>
<td>FS-100 Freshman Seminar</td>
</tr>
<tr>
<td>HU-331 or HU-332 Arts and Ideas</td>
</tr>
<tr>
<td>SS-351 Ethics</td>
</tr>
<tr>
<td>Humanities electives (2)*</td>
</tr>
<tr>
<td>Social Science elective (2)*</td>
</tr>
<tr>
<td>Mathematics and Sciences</td>
</tr>
<tr>
<td>CH-120 Chemistry</td>
</tr>
<tr>
<td>MA-124 Discrete Mathematics</td>
</tr>
<tr>
<td>MA-261 Calculus I</td>
</tr>
<tr>
<td>MA-262 Calculus II</td>
</tr>
<tr>
<td>MA-300 Mathematical Methods</td>
</tr>
<tr>
<td>MA-340 Ordinary Differential Equations</td>
</tr>
<tr>
<td>MA-345 Probability and Statistics for Engineers</td>
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<tr>
<td>PH-261 Engineering Physics I</td>
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<tr>
<td>PH-262 Engineering Physics II</td>
</tr>
<tr>
<td>Physics or science elective</td>
</tr>
<tr>
<td>Technical Courses</td>
</tr>
<tr>
<td>EE-159 Circuit Theory</td>
</tr>
<tr>
<td>EL-200 Electronic Devices and Circuits</td>
</tr>
<tr>
<td>EL-204 Digital Electronics</td>
</tr>
<tr>
<td>EL-262 Microprocessors and Microassembly</td>
</tr>
<tr>
<td>IAE-201 Intro to Information Assurance</td>
</tr>
<tr>
<td>* See appropriate department for approved list.</td>
</tr>
</tbody>
</table>

All bachelor of science degrees require a minimum of 27 credits at the 300-level or above. For descriptions of required courses, see courses beginning on page 67.

Computer Engineering Technology

The Computer Engineering Technology (CET) program is structured to teach students to work at the interface between hardware and software linking digital technology to computer applications. The main objective of the program is to produce technologists who support industry in areas ranging from computers and computer manufacturing to networking and network programming. CET majors study software design and testing, operating systems programming languages, digital systems, computer organization and architecture, micro-controller systems, and the latest programmable chip technology. Students are trained to work in a wide range of technical jobs in the information technology industry. All bachelor of science students complete a capstone course in which they propose, design, build, test and deliver a computer-based system.

Associate in Applied Science Degree

The AAS degree program is designed to prepare graduates to work in technical positions of the computer technology industry. The program also provides further education for people who seek to broaden their base of knowledge and update their skills.

Bachelor of Science Degree

The BS degree program is designed to educate students for computer technology fields by providing a comprehensive understanding of computers. Academic instruction is augmented by requiring students to design and write programs, and through carefully planned laboratory exercises during which students build, interconnect, test, service and operate computer devices and systems.

Course Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Communications</td>
<td>6 Credits</td>
</tr>
<tr>
<td>EN-101 English Communications I</td>
<td>3</td>
</tr>
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<td>EN-102 English Communications II</td>
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<tr>
<td>Humanities and Social Sciences</td>
<td>7 Credits</td>
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<td>History/Humanities/Philosophy elective (1)*</td>
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<tr>
<td>Social Sciences elective (1)*</td>
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<tr>
<td>Mathematics and Sciences</td>
<td>20 Credits</td>
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<tr>
<td>MA-112 Intermediate Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MA-114 Algebra and Trigonometry</td>
<td>4</td>
</tr>
<tr>
<td>MA-124 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MA-261 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>PH-201 General Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PH-202 General Physics II</td>
<td>3</td>
</tr>
<tr>
<td>Technical Courses</td>
<td>32 Credits</td>
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<tr>
<td>CS-150 Introduction to Programming Using C</td>
<td>3</td>
</tr>
<tr>
<td>CS-200 Computer Science Fundamentals II</td>
<td>3</td>
</tr>
<tr>
<td>CT-152 Introduction to Unix</td>
<td>3</td>
</tr>
<tr>
<td>EL-100 Introductory DC/AC Circuits</td>
<td>3</td>
</tr>
<tr>
<td>EL-200 Electronic Devices and Circuits</td>
<td>4</td>
</tr>
<tr>
<td>EL-204 Digital Electronics</td>
<td>3</td>
</tr>
<tr>
<td>EL-262 Microprocessors/Microassembly</td>
<td>3</td>
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<td>TC-110 Introduction to Telecommunications</td>
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<tr>
<td>NT-100 Computer Architecture and Construction</td>
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<tr>
<td>NT-110 Computer Networking</td>
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Bachelor of Science 132 Credits

All requirements for the associate in applied science degree, plus the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>English Communications</td>
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<td>EN-408 Writing Seminar in Technical Research</td>
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<td>Humanities and Social Sciences</td>
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<td>SS-351 Ethics</td>
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<tr>
<td>History/Humanities/Philosophy elective (1)*</td>
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<td>Social Science elective (1)*</td>
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<td>Mathematics and Sciences</td>
<td>13 Credits</td>
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<tr>
<td>CH-120 Chemistry</td>
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<td>MA-128 Introduction to Statistics</td>
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<tr>
<td>MA-262 Calculus II</td>
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<tr>
<td>Math or Science elective (1)*</td>
<td>3</td>
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</table>

Technical Courses | 39 Credits |
| CS-220 Database Management | 3 |
| CS-418 Operating Systems | 3 |
| CT-240 Network Routers and Switches | 3 |
| EE-304 Digital Design I | 3 |
| EE-354 Digital Design II | 3 |
| EE-362 Microcontroller System Design | 3 |
| EL-452 Automated Test Systems | 3 |
| IAE-201 Intro to Information Assurance | 3 |

Associate in Applied Science Degree

64/65 Credits

<table>
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<td>EN-102 English Communications II</td>
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<td>Humanities and Social Sciences</td>
<td>7 Credits</td>
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<td>FS-100 Freshman Seminar</td>
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<tr>
<td>History/Humanities/Philosophy elective (1)*</td>
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<tr>
<td>Social Sciences elective (1)*</td>
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<tr>
<td>Mathematics and Sciences</td>
<td>20 Credits</td>
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<tr>
<td>MA-112 Intermediate Algebra</td>
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<td>MA-114 Algebra and Trigonometry</td>
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<td>PH-202 General Physics II</td>
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<tr>
<td>Technical Courses</td>
<td>32 Credits</td>
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<tr>
<td>CS-150 Introduction to Programming Using C</td>
<td>3</td>
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<tr>
<td>CS-200 Computer Science Fundamentals II</td>
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<tr>
<td>CT-152 Introduction to Unix</td>
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<tr>
<td>EL-100 Introductory DC/AC Circuits</td>
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<td>EL-200 Electronic Devices and Circuits</td>
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<td>EL-204 Digital Electronics</td>
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<td>NT-100 Computer Architecture and Construction</td>
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<tr>
<td>NT-110 Computer Networking</td>
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</table>

Bachelor of Science 132 Credits

All requirements for the associate in applied science degree, plus the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>English Communications</td>
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<td>EN-408 Writing Seminar in Technical Research</td>
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<tr>
<td>HU-331 or HU-332 Arts and Ideas</td>
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<tr>
<td>SS-351 Ethics</td>
<td>3</td>
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<td>History/Humanities/Philosophy elective (1)*</td>
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<td>Social Science elective (1)*</td>
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<tr>
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<td>CH-120 Chemistry</td>
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</tr>
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<td>MA-128 Introduction to Statistics</td>
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<td>MA-262 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>Math or Science elective (1)*</td>
<td>3</td>
</tr>
</tbody>
</table>

Technical Courses | 39 Credits |
| CS-220 Database Management | 3 |
| CS-418 Operating Systems | 3 |
| CT-240 Network Routers and Switches | 3 |
| EE-304 Digital Design I | 3 |
| EE-354 Digital Design II | 3 |
| EE-362 Microcontroller System Design | 3 |
| EL-452 Automated Test Systems | 3 |
| IAE-201 Intro to Information Assurance | 3 |
Computer Science

The computer science (CS) program is structured to teach students to design and program computers and computer-based systems to meet the needs of all areas of society. The main objective of the computer science program is to produce practical computer system specialists who can apply computer theory and algorithmic principles to the design of computer-based systems that meet requirements. In order to meet this objective, CS majors study programming languages, computational science, algorithms and complexity, the architecture and organization of computers, software engineering, human-computer interaction, intelligent systems, information management, and the social and professional issues associated with the practice of computer science. All CS students must take courses in the humanities and social sciences to broaden their understanding of professional and ethical responsibilities and the impact of their CS solutions in a global context. All students complete a capstone course in which they propose, design, build, test and deliver a computer-based system.

Course Requirements

Bachelor of Science 129 Credits

<table>
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Computers and Engineering Science 47 Credits

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<tr>
<td>CS-150 Introduction to Programming Using C*</td>
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<tr>
<td>CS-220 Database Management</td>
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<tr>
<td>CS-225 Intermediate Java Programming</td>
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<td>CS-230 Computer Science Fundamentals II</td>
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<td>CS-310 Computer Algorithms</td>
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<td>CS-316 Intelligent Systems</td>
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<tr>
<td>CS-330 iPhone Application Development</td>
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<tr>
<td>CS-351 Assembly Language</td>
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<tr>
<td>CS-406 Introduction to Software Design with UML</td>
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<tr>
<td>CS-418 Operating Systems</td>
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<tr>
<td>CT-152 Introduction to Unix</td>
<td>3</td>
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<tr>
<td>CT-376 Javascript</td>
<td>3</td>
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<tr>
<td>SE-458 Senior Project</td>
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Computer Science Electives 12 Credits

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Computer Science electives (3)**</td>
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Humanities and Social Sciences 22 Credits

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>FS-100 Freshman Seminar</td>
<td>1</td>
</tr>
<tr>
<td>HU-331 or HU-332 Arts and Ideas</td>
<td>3</td>
</tr>
<tr>
<td>SS-272 Group Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>SS-351 Ethics</td>
<td>3</td>
</tr>
<tr>
<td>History/Humanities/Philosophy elective (2)**</td>
<td>6</td>
</tr>
<tr>
<td>Social Science elective (1)**</td>
<td>3</td>
</tr>
<tr>
<td>Social Science/Management elective (1)**</td>
<td>3</td>
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</tbody>
</table>

Mathematics and Sciences 30 Credits

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>MA-114 Algebra and Trigonometry</td>
<td>4</td>
</tr>
<tr>
<td>MA-124 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MA-128 Introduction to Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MA-261 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MA-262 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PH-201 General Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PH-202 General Physics II</td>
<td>3</td>
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</tbody>
</table>

Technical Courses 9 Credits

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EL-204 Digital Electronics</td>
<td>3</td>
</tr>
<tr>
<td>EL-262 Microprocessors/Microassembly</td>
<td>3</td>
</tr>
<tr>
<td>CT-110 Introduction to Telecommunications</td>
<td>3</td>
</tr>
</tbody>
</table>

All bachelor of science degrees require a minimum of 27 credits at the 300-level or above. For descriptions of required courses, see courses beginning on page 67.
Electrical Engineering

The electrical engineering (EE) program is structured to teach students a blend of theory and practice directed at engineering design, rather than research. The main objective of the program is to produce practical design engineers who are capable of analyzing the technical needs of society, and to create the next generation of electrical and electronic circuits to meet systems requirements. To meet this objective, students start in the program with basic circuit theory and laboratory projects that provide them a practical background. The students are then taught to use increasingly sophisticated design and testing techniques to conduct experiments, and interpret data. As students progress through the program they are taught more theoretical methods of circuit modeling and computer-aided circuit simulation tools that enable them to design, build, test and analyze sophisticated circuits and systems. There are elective courses that allow for specialization in communications systems, micro-controller system design, signals and systems, digital signal processing, microwave engineering, VHDL and telecommunications. All engineering majors must take courses in humanities and social science to broaden their understanding of professional and ethical responsibilities and the impact of their engineering solutions in a global context. All students complete a capstone course in which they propose, design, build, test and analyze a working prototype circuit to meet engineering standards and realistic constraints.

Course Requirements

Bachelor of Science 136 Credits

Course Credits

Electrical Engineering 48 Credits
EE-304 Digital Design I 3
EE-309 Circuit Design and Simulation 3
EE-359 High Frequency Circuit Design 3
EE-362 Microcontroller System Design 3
EE-406 Signals and Systems 3
EE-409 Network Analysis and Synthesis 3
EE-419 Electrodynamics 3
EE-453 Control I 3
EE-456 Digital Signal Processing 3
EE-458 Senior Project 3
EE-459 Electromagnetic Field Theory 3
EE-461 Communications Theory 3
EE-463 Control II 3
Computer elective (1)* 3
Engineering elective (2)* 6

English Communications 9 Credits
EN-101 English Communications I 3
EN-102 English Communications II 3
EN-408 Writing Seminar in Technical Research 3

Humanities and Social Sciences 19 Credits
FS-100 Freshman Seminar 1
HU-331 or HU-332 Arts and Ideas 3
SS-351 Ethics 3
Humanities electives (2)* 6
Social Science electives (2)* 6

Mathematics and Sciences 39 Credits
CH-120 Chemistry 3
MA-261 Calculus I 4
MA-262 Calculus II 4
MA-263 Calculus III 4
MA-300 Mathematical Methods 3
MA-340 Ordinary Differential Equations 3
MA-345 Probability and Statistics for Engineers 3
MA-360 Laplace and Fourier Analysis 3
PH-261 Engineering Physics I 4
PH-262 Engineering Physics II 4
PH-263 Engineering Physics III 4

Technical Courses 21 Credits
EE-159 Circuit Theory 4
EL-200 Electronic Devices and Circuits 4
EL-204 Digital Electronics 3
EL-250 Advanced Analog Circuits 4
EL-261 Introduction to Communications Circuits and Systems 3
EL-262 Microprocessors and Microassembly 3

*See appropriate department for approved list.

All bachelor of science degrees require a minimum of 27 credits at the 300-level or above. For descriptions of required courses, see courses beginning on page 67.

Electronics Engineering Technology

The electronics engineering technology (EET) program is structured to teach students a foundation in electronics technology with a strong emphasis on laboratory work and further the students’ knowledge with more advanced studies in theoretical analysis and design. The main objective of the program is to produce technologists who support industry in areas ranging from circuit analysis to digital design to control and robotics. To meet this objective, EET majors study circuit design and simulation, network analysis and synthesis, transmission lines, micro-system design and fiber-optic communications with options for specialization in areas such as communications, computer design, control theory, micro-controllers and telecommunications. Students are trained to work in a wide range of practical electronics jobs and conduct design and theory work in the electronics field. All EET students must take courses in humanities and social science to broaden their understanding of professional and ethical responsibilities and the impact of their engineering solutions in a global context. All bachelor of science students complete a capstone course in which they propose, design, build, test and deliver a working electronic project.

Associate in Applied Science Degree

The AAS degree program is designed to provide students a foundation in electronics technology with a strong emphasis on laboratory work and to prepare graduates to work in technical positions of the electronics technology industry. Some theoretical courses are included to prepare students who are continuing with the bachelor’s degree.

Bachelor of Science Degree

The BS degree program is designed to build on the AAS program with more advanced studies in theoretical analysis and design. Courses in design, modeling and simulation provide students with the necessary background to do design work in the electronics field and to pursue continued studies in order to avoid technical obsolescence.
Bachelor of Science  133 Credits

All requirements for the associate in applied science degree, plus the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Communications</td>
<td>3</td>
</tr>
<tr>
<td>EN-408 Writing Seminar in Technical Research</td>
<td>3</td>
</tr>
<tr>
<td>General Electives</td>
<td>6</td>
</tr>
<tr>
<td>Humanities/Social Sciences</td>
<td>12</td>
</tr>
<tr>
<td>HU-331 or HU-332 Arts and Ideas</td>
<td>3</td>
</tr>
<tr>
<td>SS-351 Ethics</td>
<td>3</td>
</tr>
<tr>
<td>Humanities elective (1)**</td>
<td>3</td>
</tr>
<tr>
<td>Social Science elective (1)**</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics and Sciences</td>
<td>16</td>
</tr>
<tr>
<td>CH-120 Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>MA-262 Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MA-300 Mathematical Methods</td>
<td>3</td>
</tr>
<tr>
<td>MA-340 Ordinary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MA-360 Laplace and Fourier Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Technical Courses</td>
<td>36</td>
</tr>
<tr>
<td>EE-304 Digital Design I</td>
<td>3</td>
</tr>
<tr>
<td>EE-309 Circuit Design and Simulation</td>
<td>3</td>
</tr>
<tr>
<td>EE-354 Digital Design II</td>
<td>3</td>
</tr>
<tr>
<td>EE-362 Microcontroller System Design</td>
<td>3</td>
</tr>
<tr>
<td>EE-409 Network Analysis and Synthesis</td>
<td>3</td>
</tr>
<tr>
<td>EE-453 Control I</td>
<td>3</td>
</tr>
<tr>
<td>EE-458 Senior Project</td>
<td>3</td>
</tr>
<tr>
<td>EL-301 Advanced Communications</td>
<td>3</td>
</tr>
<tr>
<td>EL-307 Noise and Shielding</td>
<td>3</td>
</tr>
<tr>
<td>OP-301 Fiber Optic Communications</td>
<td>3</td>
</tr>
</tbody>
</table>

* Any course may be taken to satisfy the general elective requirement.
** See appropriate department for approved list.

All bachelor of science degrees require a minimum of 27 credits at the 300-level or above. For descriptions of required courses, see courses beginning on page 67.

Information Assurance

The information assurance (IA) program is designed to meet current and anticipated needs for highly skilled information assurance professionals, particularly as it relates to securing information and defending the information systems that store it. As society becomes increasingly reliant on information in electronic form, identifying and addressing vulnerabilities where information resides is vital to any public, private or government organization. The BSIA degree develops and builds upon students’ mastery in computer networking and programming, so that they become effective technologists for managing information security risk. In addition, BSIA students complete courses by the end of their sophomore year that prepare them to pass industry certification exams to include A+, Network+, CEH, CISSP and Security+. By attaining a combination of the BSIA degree and one or more of the industry certifications, graduates will not only possess the professional knowledge required for a successful career in information assurance, but also have the credentials to prove it.

Course Requirements

Bachelor of Science  127/130 Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming and Computer</td>
<td>31</td>
</tr>
<tr>
<td>CS-130 Computer Science Fundamentals I</td>
<td>4</td>
</tr>
<tr>
<td>CS-150 Introduction to Programming Using C</td>
<td>3</td>
</tr>
<tr>
<td>CS-220 Database Management</td>
<td>3</td>
</tr>
<tr>
<td>CS-230 Computer Science Fundamentals II</td>
<td>3</td>
</tr>
<tr>
<td>CS-320 Database Administration</td>
<td>3</td>
</tr>
<tr>
<td>CS-418 Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>CT-152 Introduction to Unix</td>
<td>3</td>
</tr>
<tr>
<td>CT-206 Scripting Languages</td>
<td>3</td>
</tr>
<tr>
<td>CT-240 Internetworking with Routers and Switches</td>
<td>3</td>
</tr>
<tr>
<td>SE-458 Senior Project</td>
<td>3</td>
</tr>
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</table>

Information Assurance Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAE-201 Introduction to Information</td>
<td>27</td>
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</tbody>
</table>

IAE-301 Comprehensive Computer and Network Security
IAE-315 Secure System Administration and Operation
IAE-321 Applied Wireless Network Security
IAE-325 Secure Data Communications and Cryptography
IAE-402 Introduction to Incident Handling and Malicious Code
IAE-405 Malware Analysis / Reverse Engineering
IAE-406 Digital Forensics and the Investigative Process
IAE-410 Penetration Testing

Mathematics and Sciences  17 Credits

MA-114 Algebra and Trigonometry  4
MA-124 Discrete Mathematics  3
MA-128 Introduction to Statistics  3
MA-261 Calculus I  4
Science elective (1)**  3

Management  6 Credits

BUS-174 Introduction to Business and Management  3
BUS-301 Project Management  3

English Communications  9 Credits

EN-101 English Communications I  3
EN-102 English Communications II  3
EN-408 Writing Seminar in Technical Research  3

Humanities and Social Sciences  18-19 Credits

FS-100 Freshman Seminar  1
HU-331 or HU-332 Arts and Ideas  3
SS-351 Ethics  3
History/Humanities/Philosophy electives (2)**  6
Social Sciences electives (2)**  6

General Electives  19-21 Credits

* Offered online only.
** See appropriate department for approved list.

All bachelor of science degrees require a minimum of 27 credits at the 300-level or above. For descriptions of required courses, see courses beginning on page 67.
Management of Information Technology

The management of information technology (MIT) program prepares students for positions in the information technology industry or in businesses that rely on the use of sophisticated information resources and tools. Students are trained to understand the demands of technical jobs and to facilitate, from a managerial standpoint, an effective and efficient working environment for employees. The main objective of the program is to produce systems thinkers with both management expertise and technical competence. MIT majors study principles of management, organizational behavior, production and operations management, business telecommunications analysis, marketing and personnel management. All students complete a capstone course in which they propose, design, test and deliver a management project.

Course Requirements

Bachelor of Science 121/122 Credits

Course Credits
Business Foundations 21 Credits
BUS-174 Introduction to Business and Management 3
BUS-200 Business Communications 3
BUS-270 Financial Accounting I 3
BUS-275 Human Resource Management 3
BUS-280 or BUS-281 Macro/Microeconomics 3
BUS-372 Financial Management 3
BUS-400 Research Methods 3

Business Administration 21 Credits
BUS-208 Internet and the Law 3
BUS-279 Introduction to Leadership 3
BUS-301 Project Management 3
BUS-386 Organizational Theory and Behavior 3
BUS-410 Strategic Management 3
BUS-454 International Business 3
BUS-458 Senior Project 3

Information Technology 34 Credits
BUS-250 Database for Managers 3
BUS-362 Information Systems for Managers 3

CS-130 Computer Science Fundamentals I 3
CS-150 Introduction to Programming Using C 3
CT-101 Computer Applications 3
CT-152 Introduction to Unix 3
CT-152 Introduction to Unix 3
IAE-201 Introduction to Information Assurance Concepts 3
IAE-301 Comprehensive Computer and Network Security 3
IAE-402 Introduction to Incident Handling and Malicious Code 3
IAE-405 Malware Analysis/Reverse Engineering 3
TC-110 Introduction to Telecommunications 3

General electives (2)* 6
English Communications 9 Credits
EN-101 English Communications I 3
EN-102 English Communications II 3
EN-408 Writing Seminar in Technical Research 3

Humanities and Social Sciences 19 Credits
FS-100 Freshman Seminar 1
HU-331 or HU-332 Arts and Ideas 3
SS-351 Ethics 3
History/Humanities/Philosophy electives (2)* 6
Social Sciences electives (2)* 6

Mathematics and Sciences 32 Credits
MA-124 Discrete Mathematics 3
MA-261 Calculus I 4
MA-262 Calculus II 4
PH-261 Engineering Physics I 4
PH-262 Engineering Physics II 4
Science elective (1)* 3

Computer Science 30 Credits
CS-130 Computer Science Fundamentals I 3
CS-150 Introduction to Programming Using C 3
CS-220 Database Management 3
CS-225 Intermediate Java Programming 3
CS-230 Computer Science Fundamentals II 3
CS-310 Computer Algorithms 3
CS-330 iPhone Application Development 3
CS-376 Javascript 3
CS-405 Introduction to Software Design with Unified Model Language 3
CS-418 Operating Systems 3
CT-152 Introduction to Unix 3
IAE-201 Intro to Information Assurance 3
SE-458 Senior Design Project 3

Software Engineering

The software engineering (SE) program is structured to teach students to design and program computers and computer-based systems to meet the needs of all areas of society. The main objective of the program is to produce practical software engineers who can analyze and determine the needs of a system and apply engineering principles to create software and hardware solutions. SE majors study modern programming languages and applications, algorithm development, and software design and testing in the software component, computer organization and architecture, micro-controller system design and the latest programmable chip technology in the hardware portion, and modern approaches to knowledge acquisition using UML in both individual and team environments. All engineering majors must take courses in humanities and social science to broaden their understanding of professional and ethical responsibilities and the impact of their engineering solutions in a global context. All students complete a capstone course in which they propose, design, build, test and deliver a working software application.

Course Requirements

Bachelor of Science 131 Credits

Course Credits
Computers and Software 37 Credits
CS-130 Computer Science Fundamentals I 4
CS-150 Introduction to Programming Using C 3
CS-220 Database Management 3
CS-225 Intermediate Java Programming 3
CS-230 Computer Science Fundamentals II 3
CS-310 Computer Algorithms 3
CS-330 iPhone Application Development 3
CS-376 Javascript 3
CS-405 Introduction to Software Design with Unified Model Language 3
CS-418 Operating Systems 3
CT-152 Introduction to Unix 3
IAE-201 Intro to Information Assurance 3
SE-458 Senior Design Project 3

Engineering 21 Credits
EE-304 Digital Design I 3
EE-362 Microcontroller System Design 3
EE-364 Computer Architecture 3
SE-321 Human Computer Interaction 3

Software or Engineering electives (2)* 6
English Communications 9 Credits
EN-101 English Communications I 3
EN-102 English Communications II 3
EN-408 Writing Seminar in Technical Research 3

General Electives 6 Credits
General electives (2)** 6

Humanities and Social Sciences 19 Credits
FS-100 Freshman Seminar 1
HU-331 or HU-332 Arts and Ideas 3
SS-351 Ethics 3
Social Sciences electives (2)* 6

Mathematics and Sciences 32 Credits
CH-120 Chemistry 3
MA-114 Algebra and Trigonometry 4
MA-124 Discrete Mathematics 3
MA-128 Introduction to Statistics 3
MA-261 Calculus I 4
MA-262 Calculus II 4
PH-261 Engineering Physics I 4
PH-262 Engineering Physics II 4
Science elective (1)* 3

Technical Courses 6 Credits
EL-204 Digital Electronics 3
EL-262 Microprocessors and Microassembly 3

* See appropriate department for approved list.
** Any course may be taken to satisfy the general elective requirement.

All bachelor of science degrees require a minimum of 27 credits at the 300-level or above. For descriptions of required courses, see courses beginning on page 67.
Telecommunications Engineering Technology

The telecommunications engineering technology (TET) program is structured to teach students to design, build, maintain, troubleshoot and expand networks of all types. The main objective of the program is to produce technologists who support industry in areas ranging from data communications and networking to routers and switches to network modeling and design. To achieve this objective, TET majors study digital electronics, noise and shielding, fiber-optic communications, microprocessors and micro assembly, and may specialize in either data communications and networking or RF and satellite communications. Students are trained to work in a wide range of telecommunications and computer networking jobs on both the technical and the design sides. TET majors must take courses in humanities and social science to broaden their understanding of professional and ethical responsibilities and the impact of their technological solutions in a global context. All bachelor of science students complete a capstone course in which they propose, design, build, test and deliver a working telecommunications project.

Associate in Applied Science Degree

The AAS degree program is designed to teach students about the design and construction of networks by giving them a broad foundational background in the field of telecommunications. Students at the AAS level will be able to construct and test telecommunications circuits and networks using many different types of test equipment. Some theoretical courses are included to prepare students who are continuing with the bachelor’s degree.

Bachelor of Science Degree

The BS degree program is designed to build on the AAS program with more advanced studies in simulation, analysis and modeling of communications circuits and networks. Courses in optical communications, data communications and networking and Internet networks provide students with the necessary background to do network design and administration work and to pursue continued studies in engineering, engineering technology or information technology.

Course Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Communications</td>
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<tr>
<td>EN-101 English Communications I</td>
<td>3</td>
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<tr>
<td>EN-102 English Communications II</td>
<td>3</td>
</tr>
<tr>
<td>Humanities and Social Sciences</td>
<td>7 Credits</td>
</tr>
<tr>
<td>FS-100 Freshman Seminar</td>
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</tr>
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<td>Humanities elective (1)*</td>
<td>3</td>
</tr>
<tr>
<td>Social Sciences or MIT elective (1)*</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics and Sciences</td>
<td>17 Credits</td>
</tr>
<tr>
<td>MA-114 Algebra and Trigonometry</td>
<td>4</td>
</tr>
<tr>
<td>MA-128 Introduction to Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MA-261 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>PH-201 General Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PH-202 General Physics II</td>
<td>3</td>
</tr>
<tr>
<td>Technical Courses</td>
<td>35 Credits</td>
</tr>
<tr>
<td>CS-130 Computer Science Fundamentals</td>
<td>4</td>
</tr>
<tr>
<td>CS-150 Introduction to Programming Using C</td>
<td>3</td>
</tr>
<tr>
<td>CT-152 Introduction to Unix</td>
<td>3</td>
</tr>
<tr>
<td>CT-240 Internetworking with Routers and Switches</td>
<td>3</td>
</tr>
<tr>
<td>EL-100 Introductory DC/AC Circuits</td>
<td>3</td>
</tr>
<tr>
<td>EL-200 Electronic Devices and Circuits</td>
<td>4</td>
</tr>
<tr>
<td>EL-204 Digital Electronics</td>
<td>3</td>
</tr>
<tr>
<td>IAE-201 Introduction to Information Assurance Concepts</td>
<td>3</td>
</tr>
<tr>
<td>NT-100 Computer Architecture and Construction</td>
<td>3</td>
</tr>
<tr>
<td>NT-150 Computer Networking</td>
<td>3</td>
</tr>
<tr>
<td>TC-110 Introduction to Telecommunications</td>
<td>3</td>
</tr>
</tbody>
</table>

* See appropriate department for approved list.

Bachelor of Science 129 Credits

All requirements for the associate in applied science degree, plus the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Communications</td>
<td>3 Credits</td>
</tr>
<tr>
<td>EN-408 Writing Seminar in Technical Research</td>
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<tr>
<td>General Electives</td>
<td>6 Credits</td>
</tr>
<tr>
<td>General electives (2)*</td>
<td>6</td>
</tr>
<tr>
<td>Humanities/Social Sciences</td>
<td>12 Credits</td>
</tr>
<tr>
<td>HU-331 or HU-332 Arts and Ideas</td>
<td>3</td>
</tr>
<tr>
<td>SS-351 Ethics</td>
<td>3</td>
</tr>
<tr>
<td>Humanities elective (1)**</td>
<td>3</td>
</tr>
<tr>
<td>Social Science elective (1)**</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics and Sciences</td>
<td>13 Credits</td>
</tr>
<tr>
<td>CH-120 Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>MA-128 Introduction to Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MA-262 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MA-340 Ordinary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>Technical Courses</td>
<td>30 Credits</td>
</tr>
<tr>
<td>CS-250 Intro to Network Programming in C</td>
<td>3</td>
</tr>
<tr>
<td>EL-261 Introduction to Communications Circuits and Systems</td>
<td>3</td>
</tr>
<tr>
<td>EL-307 Noise and Shielding</td>
<td>3</td>
</tr>
<tr>
<td>IAE-301 Comprehensive Network Security</td>
<td>3</td>
</tr>
<tr>
<td>OP-301 Fiber Optic Communications</td>
<td>3</td>
</tr>
<tr>
<td>TC-309 Network Simulation</td>
<td>3</td>
</tr>
<tr>
<td>TC-312 Voice over IP</td>
<td>3</td>
</tr>
<tr>
<td>TC-359 Network Modeling and Design</td>
<td>3</td>
</tr>
<tr>
<td>TC-458 Senior Design Project</td>
<td>3</td>
</tr>
<tr>
<td>Technical elective (1)**</td>
<td>3</td>
</tr>
</tbody>
</table>

* Any course may be taken to satisfy the general elective requirement.
** See appropriate department for approved list.

All bachelor of science degrees require a minimum of 27 credits at the 300-level or above. For descriptions of required courses, see courses beginning on page 67.
Web Development

The web development (WD) degree program is structured to prepare students to understand and effectively respond to the entire spectrum of Internet issues and challenges, with a strong emphasis on web development. The main objective of the program is to produce well-rounded web development experts who can design the visual aspect of web sites on the front end while possessing the more technical development and programming knowledge that resides on the back end. Front end instruction includes HTML, Flash, Javascript and Javascript libraries (jQuery, Prototype, Scriptaculous), complemented by back end instruction that includes Unix, SQL, PHP, Java Server Pages, Java Servlets, and .NET (C#). Students also study courses in business and entrepreneurship to enable them to develop websites and support. Web development majors must take courses in humanities and social science to broaden their understanding of professional and ethical responsibilities and the impact of their web development solutions in a global context. All students complete a capstone course in which they propose, design, test and deliver a web-based project.

Course Requirements

Bachelor of Science 126 Credits

Course Credits

Computers 50 Credits
CS-130 Computer Science Fundamentals I 4
CS-150 Introduction to Programming Using C++ 4
CS-220 Database Management 3
CS-230 Computer Science Fundamentals II 3
CS-225 Intermediate Java Programming 3
CS-321 Computer Human Interaction 3
CS-356 Dynamic Web Page Development 3
CT-102 Introduction to Internet Applications 3
CT-152 Introduction to Unix 3
CT-201 Multimedia Applications 3
CT-206 Scripting Languages 3
CT-376 Javascript 3
CT-406 Web Programming Languages 3
IAE-201 Intro to Information Assurance 3
IAE-301 Comprehensive Network Security 3
SE-458 Senior Design Project 3
English Communications I 3
EN-101 English Communications II 3
EN-408 Writing Seminar in Technical Research 3

General Electives 12 Credits
General electives (4)** 12

Humanities and Social Sciences 19 Credits
FS-100 Freshman Seminar in Computers 1
HU-331 or HU-332 Arts and Ideas 3
SS-351 Ethics 3
History/Humanities/Philosophy electives (2) 6
Social Sciences/Management electives (2) 6

Mathematics and Sciences 12 Credits
MA-112 Intermediate Algorithms 3
MA-124 Discrete Mathematics 3
MA-128 Introduction to Statistics 3
Science elective (1) 3

Option 12 Credits
Choose four related courses (4)** 12

* Students who validate CS-150 may replace this course with any technical course not already required for the WD degree.
** Examples of options:
  - Gaming option: HU-210, CS-305, CS-330, CS-430
  - IA option: CS-320, IAE-315, IAE-325, IAE-402
  - System hardware option: NT-100, NT-150, CT-240 and NT-250

Students may create their own option. Students should consult with an advisor in selecting an option.

All bachelor of science degrees require a minimum of 27 credits at the 300-level or above. For descriptions of required courses, see courses beginning on page 67.

Undergraduate Certificates

The undergraduate certificates are targeted at specialized jobs in distinct information technology and management fields. The courses required for these certificates are offered in a standard 16-week format. Consult the schedule of classes for more information. Students seeking an undergraduate certificate must complete all coursework at Capitol College.

For descriptions of required courses, see courses beginning on page 67.

Acquisitions Management (12 credits)

This upper-level certificate is designed to provide students with knowledge of the broad concepts and strategies of procurement and contract management, which contributes to the ability to make sound business decisions. Major topics include the foundations of pricing and negotiations, basic aspects of contracting, procurement of services and products, software acquisitions, and mergers and acquisitions.

Required Courses

BUS-301 Project Management 3
BUS-385 Federal Acquisitions Management 3
BUS-387 Mergers and Acquisitions 3
BUS-388 Software Acquisitions 3

Computer and Network Security (13 credits)

This upper-level certificate provides students with a fundamental knowledge of general network security concepts, which can then be applied to an advanced training program in specific security software and platforms. Students learn the basics of practical and theoretical network and computer security. The first course introduces students to introductory computer programming to support the advanced courses. The remaining courses provide students with an understanding of computer and network security issues, including encryption, SSL, privacy issues, directory services protocols such as LDAP, intrusion detection, viruses, firewalls and network management.

Required Courses

CS-130 Computer Science Fundamentals I 4
IAE-201 Introduction to Information Assurance 3
IAE-301 Comprehensive Network Security 3
IAE-315 Secure System Administration and Operation 3

Object-Oriented Programming (13 credits)

This lower-level certificate provides a solid grounding in object-oriented programming to students with no prior programming experience. Students learn to analyze and design programs from the object-oriented perspective. Implementing object-oriented solutions to problems in two languages, C++ and Java, helps to reinforce an understanding of object-oriented concepts from coupling and cohesion to inheritance and polymorphism. In addition, Java provides students with the tool necessary to implement graphical user interfaces as well as a variety of features and classes useful in webpage and Internet programming. C++ requires students to develop object-oriented solutions to problems in two languages, C++ and Java, helps to reinforce an understanding of object-oriented concepts from coupling and cohesion to inheritance and polymorphism.

Required Courses

CS-130 Computer Science Fundamentals I 4
CS-150 Introduction to Programming Using C++ 4
CS-220 Database Management 3
CS-230 Computer Science Fundamentals II 3
CS-225 Intermediate Java Programming 3
CS-321 Computer Human Interaction 3
CS-356 Dynamic Web Page Development 3
CT-102 Introduction to Internet Applications 3
CT-152 Introduction to Unix 3
CT-201 Multimedia Applications 3
CT-206 Scripting Languages 3
CT-376 Javascript 3
CT-406 Web Programming Languages 3
IAE-201 Intro to Information Assurance 3
IAE-301 Comprehensive Network Security 3
SE-458 Senior Design Project 3

English Communications I 3
EN-101 English Communications II 3

IAE-201 Introduction to Information Assurance 3
IAE-301 Compr. Computer & Network Security 3
IAE-315 Secure System Administration and Operation 3

BUS-375 Human Resource Management 3

BUS-301 Project Management 3
BUS-302 Methods of IT Project Management 3
BUS-303 Project Management Competitive Advantage 3
BUS-375 Human Resource Management 3
Programming and Data Management (13 credits)

This lower-level certificate provides a good understanding of how programmers store and manage computer data. Students learn the fundamental aspects of the storage and management of computer data. Courses in C++ and Java introduce the student to the object-oriented paradigm and the underlying principles of the structures and methods associated with data management. In addition, Oracle is used in the database management course, which introduces students to relational databases and the techniques for analyzing and designing database solutions. Finally, a course in advanced data structures teaches students the theory and underlying techniques used to store, search, sort and access computer data.

Required Courses

- CS-130 Computer Science Fundamentals I 4
- CS-220 Database Management 3
- CS-225 Intermediate Java Programming 3
- CS-310 Computer Algorithms 3

Space Missions and Operations Specialist (12 credits)

This upper-level certificate provides students with a general overview of satellites, including simple physics of satellite orbits and the history of NASA and scientific mission operations. Students will learn satellite design with emphasis on power management, heating and cooling considerations, telemetry and communications and control systems. Coursework includes the study of orbital mechanics and the physics of the instruments used to monitor and analyze the earth and atmosphere. Prerequisites for the certificate include an understanding of math through differential equations with basic engineering physics.

Required Courses

- AE-150 Introduction to Space 3
- AE-250 Ground Systems Engineering 3
- AE-350 Autonomous Ground Systems 3
- AE-411 Space Systems Engineering 3

Software Engineering (13 credits)

This upper-level certificate introduces students to relational databases software design, and user interaction with technology. Students learn the practical aspects of programming and database management, as well as the theoretical issues involved in analyzing, designing and implementing computer applications that are accessible, reliable and maintainable. The software engineering course allows students to apply basic engineering principles to help them understand software performance, modularity, portability and reliability. A course in human-computer interaction investigates the relationship between the functionality and usability of computer systems in order to maximize their efficiency by selecting appropriate input-output devices and interaction styles.

Required Courses

- CS-130 Computer Science Fundamentals I 4
- CS-230 Computer Science Fundamentals II 3
- CS-310 Computer Algorithms 3
- CS-405 Introduction to Software Design with Unified Modeling Language 3

Web Programming (12 credits)

This lower-level certificate provides students the foundation to write programs that support transactions conducted over the Internet. Students learn about the web and the basic tools used for webpage construction, including HTML, DHTML, scripting, CSS and an overview of XML. The database management course provides students with an understanding of relational databases, how they are designed, how data is stored in them, and how that data can be accessed. The final two courses, Intermediate Java Programming and Web/CGI Programming Using Perl, provide students with the programming techniques and tools needed to create truly dynamic webpages.

Required Courses

- CT-102 Introduction to Internet Applications 3
- CT-201 Multimedia Applications 3
- CT-376 Javascript 3
- CT-406 Web Programming Languages 3

Prerequisite: CT-115, CS-130 or equivalent.

Website Development (12 credits)

This upper-level certificate is designed for students interested in building websites. Students learn a variety of tools and applications such as HTML, Java Script, ASP, PHP, Microsoft FrontPage and Macromedia Director used to build webpages and add multimedia content to them. The website construction course deals with website and browser requirements, platform selection issues, web server functions, client and server side applications, cookies and other topics. In the website administration course, students learn concepts in the use of software to monitor and optimize website operations, alternatives to CGI such as ASP and website security.

Required Courses

- CT-152 Introduction to Unix 3
- CS-130 Computer Science Fundamentals I 4
- CS-220 Database Management 3
- CS-320 Database Administration 3

Prerequisite: CT-115, CS-130 or equivalent.
Graduate Program Offerings

Doctor of Science (DSc) Degree
- Information Assurance

Doctoral classes are taught in real-time, accelerated 8-week classes except for three residency courses which are held on campus over three weekends.

Master of Business Administration (MBA) Degree

Master of Science (MS) Degrees
- Astronautical Engineering
- Computer Science
- Electrical Engineering
- Information Assurance
- Internet Engineering
- Information and Telecommunications Systems Management

All master's degrees and certificates are taught online in real-time alternating between regularly scheduled live lectures and asynchronous learning sessions. The majority of courses are offered in 8-week accelerated terms. However, some courses in the MSCS, MSIA and MSIE programs are offered only in the 16-week semester format. All courses in the MSEE program are the 16-week semester format.

Post-baccalaureate Certificates
- Acquisitions Management
- Client/Server and Wireless Devices
- Component Technologies and Online Collaboration
- Information Assurance Administration
- Information Technology
- Project Management
- Network Protection
- Security Management

Doctorate Admissions

Requirements
- Master's degree in information assurance, computer science, information technology or related field from a regionally accredited college or university
- Minimum of five years of direct work experience
- Three letters of recommendation
- Currently hold one of the following industry certifications: CISSP, GSE, CGEIT or CISM. Applicants who do not have one of these certifications must pass a comprehensive entrance exam.

Application Deadline
All application materials must be submitted by the following dates to be considered for admission to the program:
- Spring: Oct. 1 (classes start early Jan.)
- Fall: July 1 (classes start late Aug.)

Once an applicant's file is complete, it will be sent to the Admissions Committee for review. Applicants will be notified of their acceptance status.

Master's Degree Admissions

Applications for admission are accepted at any time and are processed and reviewed upon receipt of all necessary documents, on a case-by-case basis. Students whose application packages are incomplete will be classified as decision-pending.

Full Acceptance Status
For full acceptance, students must have a completed undergraduate degree from a regionally accredited institution, with a cumulative GPA of no less than 3.0 on a 4.0 scale. In addition, students must also meet the program-specific prerequisites for their intended program.

Program-Specific Prerequisites

Astronautical Engineering
- Bachelor of science in astronautical engineering with a minimum cumulative GPA of 3.0; or, a bachelor of science in a closely related field with minimum GPA of 3.0 and a minimum of three years of work experience.
- A current resume
- Personal essay describing your vision for achieving your career goals in the field of astronautical engineering.

Business Administration (MBA)
- Applicants who possess an undergraduate degree in business are waived from completing MBA-600 "Fundamentals of Professional Management." All other MBA-students must complete it. MBA-600 provides a broad foundation in accounting, finance, economics and statistics.

Computer Science
- Bachelor of science in computer science or related field preferred, but not required
- Proficiency in computer topics including: object oriented programming, multiple languages, algorithm development, operating systems, databases, software architecture, distributed programming and other advanced work
- Fluency in mathematics: Calculus I, Calculus II and Linear Algebra

Electrical Engineering
- Bachelor of science in electrical engineering is preferred, but not required
- Engineering and Science: upper level courses in Control Theory, Signals and Systems, Communication Theory and Microprocessors required. Students

Graduate Program Offerings

Doctor of Science (DSc) Degree
- Information Assurance

Doctoral classes are taught in real-time, accelerated 8-week classes except for three residency courses which are held on campus over three weekends.

Master of Business Administration (MBA) Degree

Master of Science (MS) Degrees
- Astronautical Engineering
- Computer Science
- Electrical Engineering
- Information Assurance
- Internet Engineering
- Information and Telecommunications Systems Management

All master's degrees and certificates are taught online in real-time alternating between regularly scheduled live lectures and asynchronous learning sessions. The majority of courses are offered in 8-week accelerated terms. However, some courses in the MSCS, MSIA and MSIE programs are offered only in the 16-week semester format. All courses in the MSEE program are the 16-week semester format.

Post-baccalaureate Certificates
- Acquisitions Management
- Client/Server and Wireless Devices
- Component Technologies and Online Collaboration
- Information Assurance Administration
- Information Technology
- Project Management
- Network Protection
- Security Management

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- Bachelor of science in computer science or related field preferred, but not required
- Proficiency in computer topics including: object oriented programming, multiple languages, algorithm development, operating systems, databases, software architecture, distributed programming and other advanced work
- Fluency in mathematics: Calculus I, Calculus II and Linear Algebra

Electrical Engineering
- Bachelor of science in electrical engineering is preferred, but not required
- Engineering and Science: upper level courses in Control Theory, Signals and Systems, Communication Theory and Microprocessors required. Students
with a BSET or equivalent are likely missing these course pre-requisites, and can gain access to the curriculum by completing the summer bridge course, EE-500 Advanced Signals and Systems.

Information Assurance

Courses are written to accommodate students with backgrounds in computer information systems, computer networking, telecommunications, information technology, network security, or computer science. Students are expected to have a working knowledge of servers, routers, hubs, switches, TCP/IP, etc. CCNA, Security+, SSCP, or CISSP certifications provide an excellent foundation for preparation, but are not required.

Information and Telecommunications Systems Management

• Working knowledge of statistics, economics, finance and accounting
• An undergraduate course in each topic is preferred

Internet Engineering

• Working knowledge of object-oriented programming
• C++ or Java is preferred, but not required

Doctor of Science in Information Assurance

The Doctor of Science in Information Assurance degree program integrates content from academia, government, and industry into a challenging curriculum that adheres to high federal standards, prepares individuals for the rigors of federal agencies and industry, and results in graduates who are prepared to lead the field’s top organizations.

Students take courses in small cohort groups comprised of government, industry, and military personnel. Upon graduation, doctoral students are able to conduct research as a foundation for executive action, demonstrate innovation and creativity as it relates to the strategic performance of an agency or organization, and apply a local, national, and global perspective to the decision-making process.

The program provides students an academic environment to support the development of high-level critical thinking and leadership skills, technical skills and research experience in order to provide significant contributions to the IA body of knowledge. The program maintains balance between a strong theoretical foundation, hands-on experience and innovative research.

See page 17 for matriculation information.

Course Sequence of Study

Doctor of Science 54-66 Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>YEAR 1</strong></td>
<td></td>
</tr>
<tr>
<td>First Semester</td>
<td></td>
</tr>
<tr>
<td>RSC-801 Fundamentals of Doctoral Learning (Term One/Two)</td>
<td>6</td>
</tr>
<tr>
<td>Second Semester</td>
<td></td>
</tr>
<tr>
<td>IAE-830 IA Research Literature (Term One)</td>
<td></td>
</tr>
<tr>
<td>RSC-810 Professional Research: Theory and Practice I (Term Two)</td>
<td></td>
</tr>
<tr>
<td>RSC-820 Situation Awareness Analysis and Action Plan Processes</td>
<td>3</td>
</tr>
<tr>
<td>(Residency Course, 3-day weekend)</td>
<td></td>
</tr>
<tr>
<td>Third Semester</td>
<td></td>
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<tr>
<td>RSC-825 Applied Research in IA (Term One)</td>
<td></td>
</tr>
<tr>
<td>RSC-813 Professional Ethics and Leadership (Term Two)</td>
<td>3</td>
</tr>
<tr>
<td><strong>YEAR 2</strong></td>
<td></td>
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<tr>
<td>First Semester</td>
<td></td>
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<tr>
<td>IAE-860 Advanced Research Methods (Term One)</td>
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<tr>
<td>Elective (Term Two)</td>
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<tr>
<td>Second Semester</td>
<td></td>
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<tr>
<td>RSC-812 Professional Research: Theory and Practice II/Comp Exam I</td>
<td>3</td>
</tr>
<tr>
<td>(Term One)</td>
<td></td>
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<tr>
<td>IAE-880 Special Topics in IA (Term Two)</td>
<td>3</td>
</tr>
<tr>
<td>DSR-925 Dissertation Preparation (Residency Course, 3-day weekend)</td>
<td>3</td>
</tr>
<tr>
<td>Third Semester</td>
<td></td>
</tr>
<tr>
<td>Electives (Term One)</td>
<td></td>
</tr>
<tr>
<td>Electives (Term Two)</td>
<td></td>
</tr>
<tr>
<td>YEAR 3 – First 16 weeks/Term One/Term Two</td>
<td></td>
</tr>
<tr>
<td>First Semester</td>
<td></td>
</tr>
<tr>
<td>DSR-900 Writing the Doctoral Dissertation, Part I: Proposal/Comp Exam II (Term One)</td>
<td>3</td>
</tr>
<tr>
<td>Elective (Term Two)</td>
<td>3</td>
</tr>
<tr>
<td>Second Semester</td>
<td></td>
</tr>
<tr>
<td>DSR-935 Dissertation Preparation, Part II: Proposal (Term One)</td>
<td>3</td>
</tr>
<tr>
<td>DSR-950 Dissertation Presentation and Oral Defense (Residency Course, 3-day weekend)</td>
<td>3</td>
</tr>
<tr>
<td>Electives 12 Credits</td>
<td></td>
</tr>
</tbody>
</table>

- IAE-690 Healthcare Information Security 3
- IAE-835 Information Assurance Strategic Management 3
- IAE-837 Contemporary Issues in IA 3
- IAE-845 Pedagogy and Information Assurance 3
- IAE-871 Software Assurance Assessment 3
- IAE-872 Software Assurance Development 3
- IAE-873 Syllabus Software Assurance Management 3
- IAE-874 Assured Software Analytics 3
- IAE-880 Special Topics in IA 3
- IAE-881 Special Topics in IA, Part II 3
- IAE-882 Special Topics in IA, Part III 3
- IAE-883 Special Topics in IA, Part IV 3
- IAE-884 Special Topics in IA, Part V 3
- RSC-815 Problem Solving and Decision Making with Quantitative Methods 3
- DSR-940 Proposal Writing I (as needed) 3
- DSR-941 Proposal Writing II (as needed) 3
- DSR-942 Proposal Writing III (as needed) 3

As new electives are added, this list will expand. Please consult the IA department to inquire about new elective offerings or to propose new ones.

For descriptions of required courses, see courses beginning on page 67.
### Master of Business Administration

The master of business administration (MBA) program is crafted to support professionals who are seeking credentials necessary to qualify for high level management and leadership positions, both in government and industry. MBA-core coursework and project work focus on strengthening your leadership skills, enhancing your understanding of new technologies, expanding your ability to use technology to solve business problems, and understanding the process of innovation. Specialization options include leadership, information assurance, information technology, or technology management law and policy. An additional specialization option emphasizing federal acquisition and DoD contracting is under development. Students complete the 36-39 credit hour program through a combination of accelerated 8-week terms and 16-week semesters.

#### Course Requirements

**Master of Business Administration**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBA-600 Fundamentals of Professional Mgmt</td>
<td>3*</td>
</tr>
<tr>
<td>MBA-615 Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>MBA-620 Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>MBA-625 Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>MBA-630 Marketing Process and Strategy</td>
<td>3</td>
</tr>
<tr>
<td>MBA-635 Production and Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>MBA-640 Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>MBA-646 Project Management</td>
<td>3</td>
</tr>
<tr>
<td>MBA-650 Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td><strong>Core Courses</strong></td>
<td><strong>24-27 Credits</strong></td>
</tr>
</tbody>
</table>

**Leadership**

The leadership specialization combines the best theories with proven strategies to help leaders manage change and achieve organizational objectives.

- MBA-657 Transformational Leadership and Innovation | 3 |
- MBA-658 Legal, Political, and Ethical Implications for Leadership | 3 |
- MBA-659 Leadership and Managing Human Capital | 3 |

**Information Assurance**

The IA specialization emphasizes information assurance challenges, to include general security issues, protection methodologies, and malicious software defense.

- IAE-682 Internal Protection | 3 |
- IAE-677 Malicious Software | 3 |

**Information Technology**

The information technology specialization provides a broad overview of IT management issues, to include the supporting role of info systems, telecommunications fundamentals, and the role of computers in management.

- SM-563 Managing Information Systems | 3 |
- SM-567 Business Data Communications and Networking | 3 |
- SM-569 Decision Support and Expert Systems | 3 |

**Technology Management Law & Policy**

This specialization focuses on regulatory compliance, to include transacting and marketing law, cyber security law, and the law that governs the legal use of intellectual property.

- IAE-671 Legal Aspects of Computer Security and Information Privacy | 3 |
- IE-717 Invention, Innovation, and the Use of Intellectual Property | 3 |
- SM-587 Law and Regulation of E-Commerce | 3 |

*MBA-600 is waived for students with a recent undergraduate degree (completed within the past 5 years) in business.

Courses are offered only online in 16-week or 8-week accelerated formats. For descriptions of required courses, see courses beginning on page 67.

### Master of Science in Astronautical Engineering

The astronautical engineering (AE) degree is structured to focus on satellite and mission operations, and systems engineering. Coursework focuses on project management, remote sensing, systems engineering, satellite operations and mission planning.

AE majors study all phases of a satellite mission design, planning and operations, and systems engineering. Concepts relating to cybersecurity in Astronautical engineering are also stressed.

The master of science in astronautical engineering is a 30-credit degree program. All students complete two capstone classes involving research methods and, in consultation with faculty, develop a project-based research paper by integrating prior coursework and experiences. Students may choose to use two elective courses in conjunction with the capstone courses to specialize in one area of astronautics.

#### Course Requirements

**Master of Science**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE-602 Spacecraft Mission Architecture and Management</td>
<td>3</td>
</tr>
<tr>
<td>AE-611 Space Systems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>AE-652 Orbital Mechanics II</td>
<td>3</td>
</tr>
<tr>
<td>AE-654 Spacecraft Propulsion</td>
<td>3</td>
</tr>
<tr>
<td>AE-655 Spacecraft Sensors</td>
<td>3</td>
</tr>
<tr>
<td>IA-572 Software Assurance Development</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE-602 Spacecraft Mission Architecture and Management</td>
<td>18 Credits</td>
</tr>
<tr>
<td>AE-611 Space Systems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>AE-652 Orbital Mechanics II</td>
<td>3</td>
</tr>
<tr>
<td>AE-654 Spacecraft Propulsion</td>
<td>3</td>
</tr>
<tr>
<td>AE-655 Spacecraft Sensors</td>
<td>3</td>
</tr>
<tr>
<td>IA-572 Software Assurance Development</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses are offered only online in 16-week or 8-week accelerated formats. For descriptions of required courses, see courses beginning on page 67.
Master of Science in Computer Science

The computer science (CS) degree is structured to focus on new technologies, graphics aimed at virtual realities, and the Internet. The main objective of the program is to provide students with the advanced knowledge and skills necessary to design and use modern computer-based systems, with an emphasis on emerging technologies such as embedded languages, wireless technologies, miniaturization (PDAs), and data security.

CS majors study computer language design, intelligent systems design, and multithreaded and distributed programming and may specialize in an area of their choice, including information architecture, network security or advanced computer science.

The master of science in computer science is a 30-credit degree program. All students complete a capstone course pair of Research Methods and the Capstone Research Project in which they identify a research topic in consultation with the faculty and develop a major project-based research paper by integrating prior coursework and personal experiences.

Course Requirements

Master of Science 30 Credits

Course Credits
Core Courses 12 Credits
CS-504 Theory of Computation 3
CS-512 Computer Language Design 3
CS-701 Designing Intelligent Systems 3
CS-705 Multithreaded and Distributed Programming 3
Elective Courses 12 Credits
Choose any four below.
CS-507 Database Systems Implementation 3
CS-511 Numerical Methods 3
CS-513 Gaming Theory – Real-time 3D Graphics 3
IAE-670 Network Systems Security Concepts 3
IAE-673 Secure Information Transfer and Storage 3
IAE-677 Malicious Software 3
IAE-682 Internal Protection 3
IAE-684 Complimentary Security 3
IE-705 Comparison of Operating Systems and Web Servers 3
IE-707 Network Architecture Convergence Using Wireless Technology 3
IE-713 Multimedia and Web Casting 3
IE-719 Capstone Course 3

Capstone Courses 6 Credits
CS-712 Research Methods 3
CS-714 Capstone Research Project 3

Courses are offered only online in 16-week formats. For descriptions of required courses, see courses beginning on page 67.

Master of Science in Electrical Engineering

The electrical engineering (EE) degree is structured to educate students to design and develop applications from the inception stage through the manufacturing, testing, and delivery of a product. The main objective of the program is to provide traditional engineers with the fundamentals of circuit modeling and design, circuit analysis, circuit construction and testing, government and industry regulations, and the advanced knowledge and skills necessary to design and use modern computer-based design and analysis software.

EE majors study mathematical modeling and analysis, electromagnetic interference and compatibility, and advanced concepts of design for reliability, manufacturability and testability with the emphasis of the program on the practical applications of theoretical principles to the design and construction of circuits to meet industrial, military and international standards.

The master of science in electrical engineering is a 30-credit degree program. All students complete a capstone course pair in which they choose a project in consultation with the faculty and carry the research of the project through proposal, design, testing and delivery. Students may choose to use the two elective courses in conjunction with the capstone courses to obtain a four-course certificate in an area of specialization.

The college has developed a bridge course, EE-500 Advanced Signal Processing, to allow students who do not meet the upper-level prerequisites an opportunity to qualify for acceptance. Credit for EE-500 is not awarded toward MSEE degree completion.

Course Requirements

Master of Science 30 Credits

Course Credits
Core Courses 18 Credits
EE-600 Mathematical Modeling and Analysis 3
EE-601 Modern Circuit Design and Simulation 3
EE-606 Signal Processing 3
EE-607 Electromagnetic Interference and Compatibility 3
EE-710 Designing for Reliability and Manufacturability 3
EE-720 Designing for Testability 3

Electives 6 Credits
Choose any two courses below.
AE-611 Space Systems Engineering 3
AE-614 Large Scale Integrated Design 3
EE-651 Communications Theory 3
EE-652 Microcontroller System Development 3
EE-653 Analog and Digital Control Theory 3
EE-656 Image Processing 3
EE-685 Microwave Circuit Theory and Design 3
IAE-621 Applied Wireless Network Security 3
IE-701 Principles of Designing and Engineering Computer Networks 3
IE-707 Network Architecture Convergence Using Wireless Technology 3

Capstone Courses 6 Credits
EE-708 Master’s Project Research 3
EE-758 Master’s Project 3

Courses are offered only online in 16-week or 8-week accelerated formats. For descriptions of required courses, see courses beginning on page 67.
Master of Science in Information Assurance

The information assurance (IA) degree is structured to meet the needs of government and industry to understand, prepare for, respond to, and recover from threats to our information infrastructures. The main objective of the program is to provide information system and security professionals with in-depth instruction on new security ideas, concepts, and techniques to prevent and react to malicious intrusion and to secure information assets. The National Security Agency and Department of Homeland Security have designated Capitol College a National Center of Academic Excellence in Information Assurance Education. The Master of Science in Information Assurance (MSIA) curriculum is mapped to all current federal domains at the most advanced level specified in the standards, and also covers the 10 domains of the CISSP (Certified Information Systems Security Professional), considered the gold-standard of industry IA certification. Some students may be required to take IAE-500 and CS-620; however, waivers may be granted in some cases with department chair or dean approval. CS-620 can be used as an elective.

Course Requirements

Master of Science 36-39 Credits

Course Credits

Core Courses 24-27 Credits
IAE-500 Intro/Information Assurance* 3
CS-620 Operating System Principles for Information Assurance* 3
IAE-671 Legal Aspects of Computer Security and Information Privacy 3
IAE-673 Secure Information Transfer and Storage 3
IAE-677 Malicious Software 3
IAE-680 Perimeter Protection 3
IAE-682 Internal Protection 3
*IAE-500 and CS 620 may be waived with department chair or dean approval

Capstone Course
IAE-674 Security Risk Management (Should be taken after IAE-680)

Elective Courses 12 Credits

Choose any combination of four courses from the following list of electives or, with permission, choose any courses from graduate course inventory:

Computer Network Operations Electives
CNO-679 Intro/Computer Network Operations 3

Information Assurance Electives
IAE-610 Advanced Penetration Testing 3
IAE-611 Mobile Computing Security 3
IAE-620 Mobile Device Forensics 3
IAE-621 Applied Wireless Network Security 3
IAE-630 SCADA Networks and ICS Security 3
IAE-640 Access and Identity Management 3
IAE-670 Network Systems Security Concepts 3
IAE-672 Cryptography 3
IAE-6763 Secure Information Transfer and Storage 3
IAE-679 Vulnerability Mitigation 3
IAE-684 Managing Information Security 3

Network Engineering Electives
IE-701 Principles of Designing and Engineering Computer Networks 3
IE-707 Network Architecture Convergence Using Wireless Technology 3
IE-712 Design and Practice of Secure Information Networks 3
IE-730 SCADA Networks and Industrial Control Systems 3

Project Management Electives
MBA-501 Professional Writing Practicum 3
MBA-646 Project Management 3
MBA-647 Methods of Project Management 3
MBA-648 Project Management/Competitive Advantage 3

Software Assurance Electives
IAE-571 Software Assurance Assessment 3
IAE-572 Software Assurance Development 3
IAE-573 Software Assurance Management 3
IAE-574 Assured Software Analytics 3

Courses are offered only online in 16-week or 8-week accelerated formats. For descriptions of required courses, see courses beginning on page 67.

Master of Science in Information and Telecommunications Systems Management

The online Master of Science in Information & Telecommunications Systems Management (ITSM) degree is structured as an interdisciplinary study of systems management theory and practices. As a technology management oriented degree, the main objective of the program is to develop student abilities to anticipate, recognize, and solve organizational and technological problems, optimize their own capabilities and the capabilities of others, allocate and effectively use resources, and apply systems management theory to organizational situations. Specialization options include leadership, information assurance, or technology management law and policy. ITSM is a 36-credit degree program. All students complete the 27-credit core and select three remaining elective options of their choice.

Course Requirements

Master of Science 36 Credits

Course Credits

Core Courses 27 Credits
MBA-625 Organizational Behavior 3
MBA-640 Managerial Economics 3
MBA-646 Project Management 3
SM-513 Systems Management and Organization Theory 3
SM-517 Psychological Factors in Systems Management 3
SM-518 Principles of Systems 3

Specialization Options 9 Credits
Complete a 9-credit specialization option, or with permission, choose any three graduate-level courses from the college inventory.

Leadership
MBA-657 Transformational Leadership and Innovation 3
MBA-658 Legal, Political, and Ethical Implications for Leadership 3
MBA-659 Leadership and Managing Human Capital 3

Information Assurance
IAE-670 Network Systems Security Concepts 3
IAE-677 Malicious Software 3
IAE-682 Internal Protection 3

Technology Management Law & Policy
IAE-671 Legal Aspects of Computer Security 3
IE-717 Invention, Innovation, and the Use of Intellectual Property 3
SM-587 Law and Regulation of E-Commerce 3

Courses are offered only online in 16-week or 8-week accelerated formats. For descriptions of required courses, see courses beginning on page 67.
Master of Science in Internet Engineering

Technological advances are driving the convergence of separate voice, data, message switch and video networks onto a single, network-based platform using TCP/IP technology. To stay competitive, companies must if they want to integrate their existing network or rebuild from scratch. The master of science in Internet engineering degree (IE) prepares students to choose the best option.

The 30-credit graduate program is designed to fill the need for professionals who know how to build new networks or migrate existing ones onto platforms based primarily on TCP/IP technology. Network reliability, survivability and outage-recovery design techniques are also featured in the program, as is the practical use and integration of wireless networks.

Network security is taught and practiced throughout the degree program.

Graduates of this degree program are prepared for career opportunities as senior network administrators, engineers and consultants, chief technical officers and chief information officers.

Many of the courses use OPNET, recognized by network engineers and planners as the most advanced network modeling software in the world. Throughout the MSIE program, students will practice network convergence and migration techniques by accessing the OPNET lab applications remotely from personal computers. OPNET lab exercises also include network design techniques that increase the security, survivability and recoverability of networks.

Course Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>IE-701 Principles of Designing and Engineering Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>IE-703 Thin and Fat Client Deployment with Multitiered/Service-Oriented Architecture and Web 2.0</td>
<td>3</td>
</tr>
<tr>
<td>IE-705 Comparison of Operating Systems and Web Servers</td>
<td>3</td>
</tr>
<tr>
<td>IE-707 Network Architecture Convergence Using Wireless Technology</td>
<td>3</td>
</tr>
</tbody>
</table>

IE-709 Comparison of Object-Oriented and Scripting Languages 3
IE-712 Design and Practice of Secure Information Networks 3
IE-713 Multimedia and Web Casting 3
IE-715 Identifying and Integrating Component Collaboration Technologies 3
IE-717 Invention, Innovation, and the Use of Intellectual Property 3

Capstone Course 3 Credits
IE-719 Capstone Course* 3

* Students may substitute an elective according to their specific career goals.

Courses are offered only online in 16-week or 8-week accelerated formats. For descriptions of required courses, see courses beginning on page 67.

Post-baccalaureate Certificates

The post-baccalaureate certificates are targeted toward systems managers and information assurance professionals seeking to augment or update their skills and career with graduate-level credentials. Certificate students must complete the specific courses listed for the certificate; no substitutions are permitted.

Once the course requirements are completed, students must apply for the certificate through the Office of Registration and Records. A $25 processing fee is due with the certificate request. A student must have a minimum cumulative GPA of 3.0 in all certificate coursework to be awarded the certificate.

The courses required for these certificates are offered only online in accelerated 8-week terms and 16-week semesters. Consult the schedule of classes for more information.

For descriptions of required courses, see courses beginning on page 67.

Acquisition Management (12 credits)

This certificate is designed to provide students with knowledge of the broad concepts and strategies of procurement and contract management, which contributes to the ability to make sound business decisions. Major topics include the foundations of pricing and negotiations, basic aspects of contracting, procurement of services and products, software acquisitions, and mergers and acquisitions.

Required Courses

MBA-646 Project Management 3
MBA-701 Federal Acquisitions Management 3
MBA-702 Mergers and Acquisitions 3
MBA-703 Software Acquisitions 3

Client/Server and Wireless Devices (12 credits)

This certificate provides students with a specialization in the hardware and software that drive local, Internet and wireless computing. Students learn the technical aspects of network and wireless devices and the standards and protocols of connectivity. An introductory course in network devices explores the technologies that link personal computers to servers and servers to servers. The three additional courses explore the movement from cable-connected terminals to remote server technology, the similarities and differences between operating systems and web servers, and the various wireless technologies and devices for personal and business communications.

Required Courses

IE-701 Principles of Designing and Engineering Computer Networks 3
IE-703 Thin and Fat Client Deployment with Multitiered/Service-Oriented Architecture and Web 2.0 3
IE-705 Comparison of Operating Systems and Web Servers 3
IE-707 Network Architecture Convergence Using Wireless Technology 3

Component Technologies and Online Collaboration (12 credits)

This certificate provides students with an advanced understanding of the sophisticated technologies used to develop, integrate, and deploy e-business solutions. Students learn aspects of programming tools for online applications, technologies and policies of multimedia products, and component integration for on-demand communications. Courses in object-oriented and scripting languages and component collaboration technologies explore the development and optimization of electronic commerce applications. A multimedia and web casting course and a policy course in intellectual property explore the technical, marketing and legal aspect of online multimedia.

Required Courses

IE-709 Comparison of Object-Oriented and Scripting Languages 3
IE-713 Multimedia and Web Casting 3
IE-715 Identifying and Integrating Component Collaboration Technologies 3
IE-717 Invention, Innovation, and the Use of Intellectual Property 3
Information Technology (12 credits)

This certificate provides students with a foundational knowledge of systems management with respect to telecommunications systems as well as the computer systems that support managerial decision-making. Students learn principles of technology management and information systems. Introductory courses in systems management and telecommunications networks provide the fundamental principles applied in the decision support and expert systems course. A course in strategic management of business technology lays the foundation for business management in a global environment with specific attention given to electronic commerce management goals.

Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>MBA-650</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>SM-563</td>
<td>Managing Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>SM-567</td>
<td>Business Data Communications and Networking</td>
<td>3</td>
</tr>
<tr>
<td>SM-569</td>
<td>Decision Support and Expert Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Project Management (12 credits)

The graduate certificate in Project Management is built on core processes defined in the Project Management Body of Knowledge (PMBOK). The certificate consists of four core courses, which provide students the opportunity to learn the basic concepts and strategies of project management required to successfully manage projects in both government and private industry.

Required Courses

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>MBA-645</td>
<td>Project Management</td>
<td>3</td>
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<tr>
<td>MBA-647</td>
<td>Methods of IT Project Management</td>
<td>3</td>
</tr>
<tr>
<td>MBA-648</td>
<td>Project Management Competitive Advantage</td>
<td>3</td>
</tr>
<tr>
<td>MBA-659</td>
<td>Leadership and Managing Human Capital</td>
<td>3</td>
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</table>

Security Management (12 credits)

This certificate provides students with a fundamental understanding of network systems security as it applies to the overall enterprise mission. Students learn aspects of detection, recovery and damage control methods as well as the laws and rights to privacy. An introductory course in network systems security concepts introduces students to the terminology, principles and special issues facing industries, including the importance of user involvement, security training, ethics, trust and informed management. The three additional courses focus on secure data transfer and storage with a history of cryptography and a study of public- and private-key algorithms, risk management with detailed instruction in contingency/disaster recovery planning research and security policy formulation and enforcement, and computer forensics and incident handling with a focus on legal and ethical issues of privacy associated with information and intellectual property and managing trouble tickets and analyzing events.

Required Courses

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>IAE-611</td>
<td>Mobile Computing Security</td>
<td>3</td>
</tr>
<tr>
<td>IAE-670</td>
<td>Network Systems Security Concepts</td>
<td>3</td>
</tr>
<tr>
<td>IAE-673</td>
<td>Secure Information Transfer and Storage</td>
<td>3</td>
</tr>
<tr>
<td>IAE-684</td>
<td>Managing Information Security</td>
<td>3</td>
</tr>
</tbody>
</table>

Credit Bearing Courses

The numbers in parentheses indicate the following: for undergraduate, (in sequence) class hours – laboratory hours – semester credit hours; for graduate, the number of semester credit hours. Students must have completed the listed prerequisite or its equivalent before registering for a course.

Course Descriptions

AE-100 Introduction to Astronomy

Provides a general overview of topics in astronomy. Includes the history and evolution of our understanding of the solar system, stars, galaxies and cosmos. Basic processes that explain observations of phenomena in our universe are discussed. May be used as a science elective.

Corequisite: MA-114. Offered fall semester only. (3-0-3)

AE-150 Introduction to Space

Introduces the student to elements of astronomy and space sciences, the history of NASA and earth missions and operations and simple physics of satellite orbits, types of orbits and orbital terminology. Space environment and its effects on satellite and equipment. Discussion of satellites, types of satellites and their uses. Prerequisite: MA-114 or Corequisite: MA-261. Offered fall semester only. (3-0-3)

AE-200 High Vacuum Testing Techniques

This course covers the basic theory and practical knowledge to use, operate, manage or conduct tests in vacuum chambers. Terminology, equipment and methods of obtaining and maintaining vacuum environments, especially in regards to space simulation testing are covered. Topics will include types of vacuum pumps, system components, vacuum gauges, fittings, flanges, materials and their integration. Basic test procedures and standards. Offered fall semester only in even years. (3-0-3)

AE-205 CubeSat Engineering

End-to-end rapid development of a CubeSat-type satellite sensor system, power bus, and Arduino-based CPU. Students will form multi-disciplinary teams to collectively build, integrate and test a working design. Emphasis on design formalism, key trades, resource calculations, and integration of systems. Recipes and hardware components will be provided. Prerequisites: AE-150 or CS-130 or EI-100 (3-2-2)

AE-250 Ground Systems Engineering

Provides an introduction to the components that make up a satellite ground system. Included is the design and analysis of ground system components. Provides an introduction into satellite telemetry, command and control subsystems, as well as the software needed to build and run a ground system. Introduction to CCSDS standards and mission planning. Corequisite: CS-130, Prerequisite: AE-150. Offered spring semester only. (3-0-3)

AE-311 Spacecraft Systems

Design of spacecraft for different applications and missions. Passive and active devices. Designing with redundancy and reliability. Heating and cooling thermal issues. Power handling, telemetry and communications with onboard antenna design. Propulsion, Thrusters and maneuvering. Command and control systems. Prerequisite: AE-150 or equivalent background. Offered fall semester only. (3-0-3)

AE-350 Autonomous Ground Systems

Provides an in-depth introduction to the components that compose satellite ground systems in the commercial, military, and civil sectors from the inception of the space program to present day. Discusses conceptual and planned software development, integration and testing, launch operations, sustainment engineering, decommissioning of ground systems components and the system engineering processes involved in these activities. Introduces students to the tools and methods needed to create dynamic ground system components based on automation and autonomous principles. Cover CCSDS, ISO-900X, CMMI, UML, mission planning, flight dynamics principles and risk mitigation/anaomaly resolution practices. Provides an introduction to STOL, CECIL, XML, and XTCE languages. Prerequisite: AE-150, AE-311, CS-130 (or equivalent), and EN-102. Offered fall semester in even years only. (3-0-3)

AE-351 Orbital Mechanics

Newton’s equations and Kepler’s laws. Use of spherical coordinates to solve for orbital equations. Corrections to basic equations caused by earth’s geometry, the moon and the sun. Other effects depending on orbital parameters. Prerequisite: MA-340 and MA-263. Offered fall semester only. (3-0-3)

AE-361 Introduction to Satellite Imaging

This is an introductory remote sensing and sensor course with a focus on methods, instruments and techniques used to obtain satellite imagery. Students will be introduced to physical principles of remote sensing, Earth and other planetary observing systems and sensors, and various digital processing techniques related to satellite sensing.
imagery. Topics include optics, solar radiation, principles of satellite imaging, image quality analysis, introduction to charged coupled devices (CCDs), and basics of sensor design. Prerequisite: PH-263 and AE-311. Offered spring semester only in even years. (3-0-3)

AE-400 Special Topics in Astronautical Engineering Research into astronautical engineering subjects. Student primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with different projects. (1-4)

AE-401 Computational Dynamics Advanced Orbital Mechanics: Effects of various gravitational variations of the earth, moon, sun and other bodies on orbital equations. Perturbation and modeling of orbital equations. Use of numerical methods and commercial computer modeling to determine orbital paths. Prerequisites: MA-300 and AE-351. Offered spring semester only in even years. (3-0-3)

AE-402 Special Topics in Astronautical Engineering II Research into astronautical engineering subjects. Student primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with different projects. (3)

AE-410 Spacecraft Contamination To understand the effective implementation of contamination control (CC) from component level to spacecraft level for mission success, including missions with planetary protection requirements. The importance of winning management and team support for the CC program will be emphasized. Definitions; nomenclature; symbols; units of measure; similarities and differences between aerospace, semiconductor and pharmaceutical cleanrooms. Discuss the ISO 14644 family of cleanroom standards. Missions lost or compromised by contamination from the early days to present. Prerequisites: CH-120, PH-263, MA-340. AE-311. Offered fall semester only in even years. (3-0-3)

AE-411 Space Systems Engineering Understand the basic principles and processes for designing effective systems, including how to determine customer needs vs wants, translate customer requirements into designs for systems that provide required performance and that are reliable, supportable and maintainable throughout the system life-cycle. Explore illustrative case studies. Team projects are assigned. Written reports and oral presentations are required. This is the undergraduate version of AE-611. Prerequisites: AE-311, AE-351 or permission of instructor. (3-0-3)


AE-455 Satellite Communications Analysis of satellite communications systems. Communications subsystems, telemetry, tracking and monitoring, data handling, satellite link design, propagation effects, modulation techniques and performance, error control. Satellite control networks. TDRSS, systems positioning command and control. Prerequisites: EL-261 and MA-262 or equivalent. Offered fall semester only in even years. Prerequisite: AE-311. (2-2-3)

AE-458 Senior Project in Space Science Continuation of EN-408 into project implementation phase of project. Students work on senior project and submit progress reports and design reviews. Presentation of final project with written and oral report required. Prerequisite: EN-408 (3-0-3)

AE-602 Spacecraft Mission Architecture and Provides an overview of all aspects of space mission design for practical approaches to reducing cost. Also, will examine the different programmatic/conceptual/design/choice creation methods for space missions. Aerospace system engineering/architecture tools will be used to create innovative projects (3)

AE-611 Space Systems Engineering Understand the basic principles and processes for designing effective systems, including how to determine customer needs vs wants, translate customer requirements into designs for systems that provide required performance and that are reliable, supportable and maintainable throughout the system life-cycle. Explore illustrative case studies. Team projects are assigned. Written reports and oral presentations are required. This is the graduate version of AE-411. (3)

AE-621 Satellite Ground Systems Operation Provides an introduction to satellite control centers in both the NASA and NOAA environments. Examines the role of flight operations, communications, mission planners, and other entities needed to perform successful satellite ground systems operations. (3)

AE-652 Orbital Mechanics II Continuation of Orbital Mechanics I. Theory of perturbations of orbits; numerical methods in orbital mechanics; satellite dynamics; averaging methods; resonance; mission analysis. Prerequisite: AE-351 (3)

AE-654 Space Propulsion Introduction to rocket engineering, space missions and thrust requirements, liquid and solid-fueled rockets, nuclear and electric propulsion, propellant thermodynamics. Prerequisites: AE-351 or equivalent, AE-311 or equivalent (3)

AE-655 Spacecraft Sensors The operation, accuracy, resolution, and application of instruments which either produce images of ground scenes or probe the atmosphere as viewed primarily from space. Design of thermal and other satellite detectors and instrumentation as related to remote sensing applications. (3)

AE-661 Remote Sensing II This course will build on the understanding and concepts of remote sensing introduced in the AE-361, Remote Sensing I, course. The course will emphasize the use of remote sensing data and information for operational decision making and processing techniques for environmental and urban applications. The main objective of this course is to provide students with the conceptual foundations and technical skills to work on remote sensing missions in the NASA and NOAA environments. Through laboratory projects students will be able to practice the concepts learned in lecture. Weekly discussion of peer reviewed journal articles or book chapters. (3)

AE-662 Atomic and Molecular Spectroscopy The course will cover topics in Atomic and Molecular Spectroscopy applied to satellite-borne remote sensing instruments designed to study and monitor the earth system. The topics will include: Structure of one-electron and many electron atomic systems; influence of external magnetic and electric fields on atomic systems; Spectra of molecules and the signatures for rotational and vibrational energy transitions; Atmospheric scattering processes including Rayleigh, Mie and Raman scattering; Spectroscopic instruments including spectrometers, detectors, and filters; Fourier spectroscopy; Optical properties of materials. (3)

AE-700 Research Topics in AE Research into astronautical engineering subjects. Students primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. (3)

AE-701 Project Management Provides an introduction of planning, scheduling, and controlling a system project during its life cycle. Focus on ethical, theoretical, and practical challenges of the project management framework, including the basic project management phases from initiation to closure and interactions. Projects will focus on the integration of project management and strategic management of satellite missions. (3)

AE-708 Master’s Project Research This course will cover all aspects of proposing and executing a research and development task. Pin response to Broad Agency Announcements. Creating Preliminary response, including quad charts and white papers. Techniques for providing a rough order of magnitude (ROM) cost. Preparing the full final proposal, including abstract, statement of work, schedule, milestones, deliverables, risk mitigation, preplanned follow-on efforts, procurement, subcontracts, describing the labor mix, and developing a full cost proposal. Attention will be given to protection of proprietary information, protection of intellectual property, and to compliance with Federal Acquisition Regulations (the FAR). The course will culminate with the execution of a mock project, with final deliverables, and final closeout of the project. Examples from Federal R&D projects in public domain will be used throughout the course. (3)

AE-711 Space Mission Analysis and Design Spacecraft mission design, space environment, attitude determination, telecommunication, propulsion, structures and mechanisms, thermal control, power systems, launch systems and facilities. System components; vehicle structure, propulsion systems, flight dynamics, thermal control, power systems, telecommunication, interfaces and trade-offs between these components. Testing, system reliability, and integration. Emphasis on studying NASA and NOAA past and current space mission. (3)

AE-712 Principles of Space Navigation Statistical orbit determination: least squares, batch and Kalman (sequential) processing, online ephemeris generation, determination of potentially hazardous bodies/objects; launch vehicles, payloads, and staging. Prerequisites: AE-401 and EE-600 (3)

AE-720 Space Mission Design Focus is on the development of human spacecraft from Vostok to the International Space Station. Spacecraft design requirements based on the
space environment and human physiology will be discussed and a design process will be with the help of simulations and modeling.

Students will study the designs of a spacecraft for a human interplanetary exploratory mission and will include technical design and program management. Course includes a student space craft system design project with presentation of proposals, design reviews and completed design projects. Prerequisite: AE-711 (3) AE-758 Master’s Project

Students integrate prior course work and personal experiences into a master’s project. Students develop a full final proposal, including abstract, statement of work, schedule, milestones, deliverables, and budget. Proposal must be delivered to class and approval of project advisor required. Regular progress reports required. Final presentation will be live over the Internet. Prerequisite: AE-708. (3)

BUS-174 Introduction to Business and Management

This course presents a survey of the general business and management environment. Topics include an introduction to the various forms of business organization, and their legal implications. Modern management and supervision concepts, history and development of theory and practice, the roles of managers, and the relationship between manager and employee are examined. This is a seminar course with emphasis on class discussion and collaborative learning. Prerequisite or Corequisite EN-001 or EN-101. (3-0-3)

BUS-200 Business Communications

This course includes preparation for various kinds of both written and oral business communication. The course will develop and sharpen the critical thinking ability of business and social studies students including report/proposal preparation and presentation, needed in the workplace. Strategies for effective communication will also be explored. Prerequisite: EN-101. (3-0-3)

BUS-208 E-Commerce and the Law

This course examines legal concepts that arise out of conducting business through the Internet. This course examines a wide variety of concepts and issues that have a significant influence on the use of the Internet for business or personal gain. In addition to basic legal terms, topics such as how courts assert personal and subject matter jurisdiction, the use of long-arm statutes, the state and federal court systems, patents, copyrights, trademarks, trade secrets, and statutes that deal with hacking, on-line privacy and the protection of data are introduced. International jurisdiction issues will also be discussed. The class is structured as a seminar course with an emphasis on in-class discussion and collaborative learning. Prerequisite: EN-101 (3-0-3)

BUS-250 Database for Managers

A course that introduces the student to the basic concepts, organization, and implementation models of databases, with an emphasis on the relational model. Projects include hands-on work with entity-relationship and relational models. (3-0-3)

BUS-270 Financial Accounting I

This is an introductory accounting course that will provide students with a strong basic knowledge of accounting terms, concepts, and procedures. Analyzing business transactions as they relate to the General Ledger accounts. Emphasis of this course will be addressed as well as the various processes and procedures related to the full accounting cycle. The accounting principles described are those endorsed by the Financial Accounting Standards Board. Corequisite: MA-110. (3-0-3)

BUS-271 Financial Accounting II

This course continues the focus on accounting principles, theories, and applications introduced in Financial Accounting I. It builds on additional skills in ledger entry and organization, payroll accounting, and the development of financial statements. The foundation acquired in Accounting I is integral to exploring topics such as accounting for partnerships and corporations, promissory notes, and valuation of assets. Prerequisite: BUS-270. (3-0-3)

BUS-275 Human Resource Management

Human Resource Management is a course with dual purposes. First, the development of employer-employee relations in both the private and public sector in order to facilitate organization productivity. Second, the management of scarce human resources in terms of planning and development techniques in both the private and public sector will be covered. Wage and salary administration, forecasting employment needs, recruiting and selection, evaluation, and training issues will be the focus of discussion and lecture. Prerequisites: EN-102 and BUS-279. (3-0-3)

BUS-279 Introduction to Leadership

This course overviews the disciplines and competencies associated with leadership in the 21st Century. In particular, the study and application of skills, theories, and concepts in a multicultural society will be examined. This is a seminar course with emphasis on class discussion and collaborative learning. Prerequisite: BUS-174 Corequisite EN-101.

BUS-280 Macroeconomics

This course is an introduction to macroeconomic concepts and analysis. It deals with the relationships between government, business, and the overall economy. The key areas focused on include gross domestic product, the public sector, unemployment, and aggregate supply and demand. The global economy is covered with discussion of issues such as international trade and protectionism. Prerequisite: EN-101 (3-0-3)

BUS-291 Microeconomics

This course is an introduction to microeconomic concepts and analysis. The course focuses on competitive market dynamics including individual and firm behavior through the study of market structure and economic decisions regarding product, pricing, and personnel. Labor markets and labor unions are addressed as well as regulatory and distributional issues. Prerequisite: EN-101. (3-0-3)

BUS-283 Managerial Accounting

This course is focused on budgeting and planning. Emphasis is on the use of accounting information to plan and redirect allocations to support business decisions. Managerial Accounting is designed to follow Principles of Accounting. Prerequisite: BUS-270. (3-0-3)

BUS-299 Entrepreneurship and Small Business Management

This course provides an overview of the principles and processes of entrepreneurship and small business management. Students learn to identify characteristics of entrepreneurs; identify business innovations; conduct feasibility analyses; develop formal business plans; and finance, organize, and operate a small business. Prerequisite: EN-101. (3-0-3)

BUS-301 Project Management

This course is a full range introduction to project management. It covers the origins, philosophy, methodology, and involves actual applications and use of tools such as MS Project. The System Development Cycle is used as a framework to discuss project management in a variety of situations. Illustrative cases are used and project leadership and team building are covered as integral aspects of good project management. Prerequisite: BUS-174 and EN-101, or permission of department chair (3-0-3)

BUS-302 Methods of IT Project Management

Methods of IT Project Management focuses on IT project management and is built around the Project Management Body of Knowledge (PMBOK). You will learn how IT projects differ from other kinds of projects and how the methods and techniques of project management must be modified/adapted for IT projects. In addition, you will gain an increased understanding of what managers do (or should be doing) and why managers ask you to do the things that they do. The course presents methods, tools, and techniques that can be used to effectively manage IT projects, both large and small. Prerequisite: BUS-301, Project Management, or equivalent (3-0-3)

BUS-350 Decision Models with Spreadsheets

The main objective of this course is to teach how to solve modern business problems using a spreadsheet application. Popular spreadsheet applications are examined. Students will use the case study method to solve problems. Prerequisites: MA-128, BUS-301 and BUS-384. (3-0-3)

BUS-362 Information Systems for Managers

Computer-based information systems and online information systems to increase individual and organizational efficiency and productivity constitute the foundation of this course. Topics include information systems for database management, transaction processing, knowledge worker, office automation, information management, decision support, and executive support. The course also includes system security, troubleshooting, and disaster recovery in the context of a variety of server issues. Prerequisites: EN-102 and BUS-279. (3-0-3)

BUS-372 Financial Management

This course is designed to familiarize the student with the principles that guide a firm’s financial resources management. The primary philosophy around which this course is organized is wealth maximization and the decision criterion used to achieve such a state. Topics such as capital management, fixed-asset investment, cost of capital, capital structure, long-term finance, mergers, leasing, and multinational finance are covered. In addition, accounting terminology and concepts relevant to financial analysis and decision making will be presented. Prerequisite: BUS-270, MA-111 or MA-114. (3-0-3)
BUS-376 Marketing Principles
The role of marketing and the strategies used by marketing managers to solve problems is the content of this course. Emphasis is placed on the relationship among consumers, business, and government is regard to product, promotion, pricing, and distribution strategies. Industry standards and ethical practice are focal points of the course. Prerequisites: BUS-386 and MA-128. (3-0-3)

BUS-377 Special Topics in Marketing
This is an advanced course in selected issues in the theory and application of marketing. Actual topics and cases will be chosen by the instructor and may vary from term to term. Prerequisites: BUS-200, BUS-375, BUS-386 and BUS-208 or BUS-378. (3-0-3)

BUS-378 Legal Environment of Business
This course introduces the student to legal reasoning; ethical norms; the legal process and the American legal system; administrative law process and the role of business people in that process; the study of selected areas of public and private law, such as securities regulation, antitrust, labor, product liability, contracts, and consumer and environmental law; and international dimensions of the legal environment of business. The purpose of the course is to establish legal literacy and to develop an understanding of legal dynamics, particularly in the business world. Prerequisites: EN-102 and BUS-279. (3-0-3)

BUS-379 Integrated Marketing Communications
This course examines the development of marketing strategies and creative campaigns utilizing multiple marketing disciplines (paid advertising, public relations and media; print, broadcast, online and social). Emphasis is placed on the coordinated impact of these communications tools in reaching target audiences. Prerequisite: BUS-376. (3-0-3)

BUS-384 Productions and Operations Management
This course stresses the decisions that managers make in increasing productivity in a world economy, productions and operations management examines the processes by which goods and services are produced. Strategies, techniques and problems in forecasting, statistical quality control, total quality management, inventory management, scheduling, maintenance and reliability, product, process, technology, location, layout, and purchasing are the core topics of this course. Prerequisites: BUS-386 and MA-128. (3-0-3)

BUS-385 Federal Acquisitions and Contracting
This course covers the fundamentals of federal acquisitions and contracting and will provide a comprehensive understanding of the acquisition environment. Students will develop professional skills for making business decisions and advising other acquisition team members to successfully meet customers’ needs. Participation in small group simulation exercises will prepare students to provide contracting support within the overarching business relationships of government and industry. Prerequisite: BUS-301 and BUS-384 or equivalent. (3-0-3)

BUS-386 Organizational Theory and Behavior
The content of this course represents a synthesis of behavioral sciences providing a broad framework for management. Topics include organizing, authority, leadership, motivation and morale, work groups and group dynamics, communications, planning and management by objectives, concepts of organizational development, organizational structure and processes, and organizational conflict and change. Prerequisites: BUS-279 and EN-102. (3-0-3)

BUS-387 Mergers and Acquisitions
This course surveys the drivers of success in mergers and acquisitions (M&A) and develops your skills in the design and evaluation of these transactions. The M&A transactions will cover the foundation for a wide range of mergers and acquisition fields including corporate development, investment banking, consulting, and advising senior management. Prerequisites: BUS-301 and BUS-384 or equivalent. (3-0-3)

BUS-388 Software Acquisitions
This course covers the acquisitions of open systems and commercial off-the-shelf (COTS) products including vital elements of corporate and government software development. Properly managed software acquisition offers potential for significant time and cost savings over a system's lifetime. The transition from proprietary, custom-built systems to systems based on standards and commercial products is not easy, however. Managers and their staff must understand the risks and opportunities associated with this acquisition approach. Prerequisite: BUS-301 and BUS-384 or equivalent. (3-0-3)

BUS-389 Logistics & Supply Chain Management
This course examines the efficient flow of materials, products and information within and among organizations. Logistics management examines a wide variety of activities that have a significant influence on customer service, including inventory control, transportation, warehousing, facility location analysis, packaging, materials handling, parts and service support and product returns. Supply chain management examines the integration of business processes across organizations, from material sources and suppliers through manufacturing and processing, to the final consumer. Prerequisites: BUS-386 and MA-128. (3-0-3)

BUS-390 eMarketing
This class will prepare students for the dynamic and evolving field of Internet Marketing. Through classroom and hands-on activities, students will gain experience with e-marketing approaches including websites, search engine marketing, online advertising, email marketing, various forms of social media, and mobile commerce. Emphasis is placed on the practical application of e-marketing technologies, including promotional methods, web analytics tools, and customer relationship management (CRM) processes used for consumer, business, and institutional markets. Students will study both current and emerging online marketing methods, along with their benefits and limitations. The objective is for students to develop an understanding of Internet marketing both in terms of strategy and tactics. Prerequisite: BUS-174, BUS-376 (3-0-3)

BUS-391 eCommerce
This course examines the opportunities and challenges faced in an increasingly digital world. More and more product information and selling strategies are now provided on the internet. Prerequisites: BUS-372. (3-0-3)

BUS-392 Retail Management
This course examines retailing theory and research to understand the way retailing works. Methods, strategies, resources and techniques required for retail management are stressed. BUS-392 meeting is required for all students. Prerequisites: BUS-372, BUS-375, BUS-384 and BUS-208 or BUS-378. (3-0-3)

BUS-393 Consumer Analysis
This course examines the identification and evaluation of distinguishing customer characteristics so as to better segment them in the marketplace and target marketing efforts to them. Prerequisites: BUS-376, MA-128 and SS-171. (3-0-3)

BUS-400 Research Methods
Introduction to business research methods. Through the coursework students will learn elements of the research process including problem definition, literature review, hypothesis development, types of research design and data collection methods; causality; data analysis and interpretation; qualitative research approaches; ethical issues in research; and the reporting of research results. The course encourages students to step outside the classroom and engage in research projects based on the real-life case studies. Prerequisites: EN-102 and MA-128. (3-0-3)

BUS-410 Strategic Management
This senior level course is designed to provide students with a general overview of systematic and continuous planning processes used by management to gain strategic and competitive advantage. The students are exposed to the fundamental concepts of the complex interrelationships between strategic, structure, culture, and management. Strategic and tactical strategies are explored using case studies, projects and discussions. Students develop and assess the role of management in strategy formulation, implementation and evaluation. Prerequisites: BUS-372, BUS-375, BUS-384 and BUS-208 or BUS-378. (3-0-3)

BUS-454 International Business
Drawing upon previous management and business courses, this course studies the nature and scope of international trade and investment, international institutions, the international monetary system and exchange markets, and the cultural factor affecting international business operations and their influence on the principal business functions. The effects of the revolution in electronic technologies on global business are also examined. Case study analysis and a variety of current media are used in this course. Prerequisites: BUS-372, BUS-376 and BUS-386. (3-0-3)

BUS-458 Senior Project
This is a BA/MIT capstone course designed to challenge students as they work individually or in small teams on a real-world business/industry problem requiring technical expertise and management acumen. Drawing upon the coursework in technical report writing, students are required to submit a major report outlining and analyzing the problem and proposing management solutions. Prerequisite: BUS-400, BUS-410 and EN-408. EN-408 should be taken immediately before this course. (3-0-3)

BUS-460 Special Topics in Business
Research into business subjects. Student primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with academic dean. This course may be repeated with Permission required from the instructor and academic dean. This course may be repeated with academic dean. This course may be repeated with academic dean.

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CH-120 Chemistry
Metric system and significant figures; stoichiometry; fundamental concepts of atomic structure and its relationship to the periodic table; electron configuration; bonds and electronegativity; gases; oxidation states and redox; solutions, acids and bases, changes of state, thermodynamics, chemical kinetics and equilibrium. (2-2-3)

CS-100 Introduction to Programming Logic
This course will introduce students to the various techniques used in computer programming. The purpose of this course is to build baseline skills in the building of logic for procedural and object oriented programming with minimal coding but with an in-depth approach to design. This course is an excellent choice for programming beginners who want to obtain a good foundation to program in various languages using various programming approaches. (3-0-3)

CS-130 Computer Science Fundamentals I
Introduces students to the discipline, methodologies, and techniques of software development. The emphasis is on developing essential programming skills, an understanding of object-oriented design and good software engineering practices using the Java programming language. Prerequisites are selected upon review. Students will be provided an overview of the principles of object oriented programming with minimal coding but with an in-depth approach to design. This course is an excellent choice for programming beginners who want to obtain a good foundation to program in various languages using various programming approaches. (3-0-3)

CS-150 Introduction to Programming Using C
This introductory course in programming will enable students to understand how computers translate basic human instructions into machine executable applications. The language of choice for this course is C. The course will cover C syntax that will be covered includes functions; variables and memory allocations including pointer notation; conditional statements and looping. Students will also learn binary to hexadecimal and decimal conversions along with basic computer architecture. Memory management, data input output and file manipulation will be among some other topics discussed and applied during this course. (3-2-2)

CS-200 Intro to Object-Oriented Programming in C++
Students learn how to program in C++ using an object oriented approach. Design of classes and objects, Inheritance and polymorphism: Use of pointers and data structured based projects. Prerequisite: CT-115 or CS-130 or CS-150. (2-2-3)

CS-220 Database Management
An overview of database systems, with an emphasis on relational databases. Terminology, basic analysis and design using Entity-Relationship diagrams and relational schemas. Database implementation, queries and updates using SQL Client/server and middleware. An overview of database administration, transactions and concurrency. Data warehouses. Projects, which are assigned as homework, are implemented in Oracle. Prerequisite: A grade of C or better in CS-130 or CT-115. You may take this course and CS-130 concurrently. (3-0-3)

CS-225 Intermediate Java Programming
This course provides a deeper look into the Java language with a special emphasis on object oriented design. Topics include multidimensional arrays, inheritance, interfaces, polymorphism, graphical user interfaces, exception handling, I/O, multithreading and Java Database Connectivity (JDBC). Programming projects are assigned as homework. Prerequisite: CS-130 Corequisite: CS-220. Offered spring semester only. (3-0-3)

CS-230 Computer Science Fundamentals II
Advance pointers and dynamic memory usage. Concepts of object-oriented design and programming, includes classes, friend functions, templates, operator overloading, polymorphism, inheritance, exception handling, containers, iterators and the standard template library. Applications involve the use of simple data structures such as stacks, queues, linked lists and binary trees. Recursion, searching and sorting algorithms. The above concepts are implemented through a series of hands-on programming projects, all of which are completed as part of the homework requirements. Prerequisite: CS-130. (3-0-3)

CS-250 Introduction to Network Programming Using C
An introductory network programming course using the C programming language. Students will be provided an overview of the principles of computer networks with a detailed look at the OSI reference model and the TCP/IP stack. The emphasis is on understanding UNIX interprocess communication and developing network programs using connectionless and connection-oriented sockets. Extensive programming assignments will include the development of client/server and peer-to-peer network applications. Prerequisite: CS-150 (2-2-3)

CS-305 Android Application Development
Writing applications for mobile devices using the Android operating system. Installing and using the Android SDK. Creating GUI layouts, menus and dialog boxes. Graphics and event handling. Interfaces with built-in GPS, accelerometer, audio and video. User file and input output. Web interfaces and sockets. Writing native applications. Debugging native applications from a host. Preparing an application for publication. High-level program will be performed using Java and XML. Native programming will be performed in C++. Programming in ARM-7 assembly language will be introduced. Prerequisites: CS-115 or CS-230. Some Unix/Linux experience is recommended. (3-0-3)

CS-310 Computer Algorithms
Mathematical fundamentals of algorithms and algorithmic techniques. Running Time Analysis of an algorithm. Searching, Sorting, and other techniques associated with retrieving information. Advanced Data structures such as Binary Search Trees and Heaps. Graph algorithms. Dynamic Programming (Knapsack, Floyd, DNA Algorithms). Greedy algorithms (Coins, Scheduling, Huffman encoding). Course requires written programming assignments. Prerequisites: CS-230 and MA-124. Offered fall semester only. (3-0-3)

CS-316 Intelligent Systems
Fundamental techniques and concepts of intelligent systems: tree searching techniques including recursive searches, minimax algorithms, heuristics, alpha beta pruning, LISP and Prolog program- ming languages. Genetic and a priori algorithms. Homework and programming assignments. Prerequisites: CS-230 and MA-124. Offered spring semester only. (3-0-3)

CS-320 Database Administration
This course covers the tasks performed by a database administrator. Topics include database architecture, database design, transaction management, backup and recovery, security, performance tuning and other administrative functions. Students will work with an Oracle database server. Prerequisite: CS-220 (3-0-3)

CS-330 iPhone App Development
Introduction to objective C, the programming language used for iPhone app development. Overview of the xcode development environment, including debugging tools, versioning tools, object library, object attributes tools. Object oriented programming using Objective C. Model-View-Controller architecture in xcode. Graphical User Interface libraries and components. File system on the iPhone; SQLite and the iPhone. Students learn how to make a complete iPhone app with significant functionality and industry-standard user interface from scratch. Security issues with iPhone software development. Prerequisite: CS-230 (3-0-3)

CS-351 Assembly Language Programming
This course introduces the student to assembly language, specifically which is used with the Intel 80x86 computer architecture. Topics include data representation, branching and looping, procedures, string operation, bit manipulation and macros. Secure coding techniques will be taught by exploring integer overflow and buffer overflow attacks. By learning to write in assembly language, the student will better understand how programs are executed in a computer and how to optimize performance of programs written in high-level languages, such as C++. The student will be assigned programming projects as homework. Prerequisite: CS-130 (3-0-3)

CS-356 Dynamic Web Page Development
This course teaches the student how to generate dynamic web pages using data from a database. The course begins with an overview of the C# programming language and object-orientation. Using ASP.NET, this course explores the processing of web forms and controls, state management, validation and error handling, SQL database access and secure web site coding. Programming projects, including a group project, are assigned as part of the homework requirements. Prerequisites: CS-220 or understanding of SQL. (3-0-3)

CS-400 Special Topics in CS
Applications of computer science principles or research into computer science subjects. Student primarily works in a self-directed study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with different projects. (1-4)

CS-405 Introduction to Software Design with UML
Undergraduate version of CS-505. Object Oriented principles and concepts, classes, objects and interfaces; as well as inheritance, encapsulation, polymorphism and aggregation; Students will explore the Unified Process and Object Oriented software life cycle. CASE tools and iterative and incremental software development approaches are also covered. Advantages of Object Oriented design patterns are demonstrated. Prerequisite: CS-225 or CS-230. (3-0-3)

CS-407 Database Systems Implementation
This is an undergraduate version of the graduate database course CS-507. Emphasis on DBMS architecture and implementation issues such as storage structures, multidimensional index structures, query optimization, concurrency control and recovery, distributed processing, database security, and parallel database systems. Prerequisite: CS-220 or equivalent. (3-0-3)
CS-418 Operating Systems

Principles underlying computer operating systems are presented from a computer designer’s perspective. Concepts explained include process concurrency, synchronization, resource management, input/output scheduling, job and process scheduling, scheduling policies, deadlock, semaphore, consumer/producer relationship, storage management (real storage management policies in a multiprogramming environment), virtual memory management (segmentation and paging), secure memory management, access control lists and kernel protection. An overview of contemporary operating systems with these principles. Students program in a high-level language. Projects are assigned as part of the homework requirements. Prerequisite: CS-150 and senior status. Offered fall semester only. (3-0-3)

CS-430 Game Programming on iPhone Platform

Students learn how to develop a game on the iPhone/iPad portable. Students learn the xcode development environment and use the Model-View-Controller architecture. Students will learn animation of objects, control of characters, collision avoidance and tracking the state of a game. Real world projects will be assigned as part of requirements. Prerequisite: CS-330. (3-0-3)

CS-432 Computer Graphics

Discussion of some basic types of computer graphic devices. Graphics and text modes, point plotting and line drawing, area filling image array plotting, mathematics and generation off two and three-dimensional translations. Rotations, scaling, reflections, orthogonal and perspective transformations. Projects are assigned as part of the homework requirements. Prerequisite: MA-262 and either CS-230 or CS-225. Offered on demand. (3-0-3)

CS-504 Theory of Computation

An investigation into the fundamental ideas and models underlying computing. Automata languages, determinism, Chomsky hierarchy, computability, Turing machines, Church’s Thesis, complexity, NP-completeness, intractability. (Offered as a full semester course.) (3)

CS-505 Software Design with UML

Object oriented principles and concepts, such as classes, objects and interfaces; as well as inheritance, encapsulation, polymorphism and aggregation; etc. Students will explore the Unified Process and Object Oriented software life cycle. CASE tools and iterative and incremental software development approaches are also covered. Advantages of Object Oriented design patterns are demonstrated. (3)

CS-507 Database Systems Implementation

Emphasis on DBMS architecture and implementation issues such as storage structures, multi-dimensional index structures, query optimization, concurrency control and recovery, distributed processing, database security, and parallel database systems. (3)

CS-511 Numerical Methods

Analysis of errors in numerical computations, solution of linear algebraic systems of equations, matrix inversion, eigenvalues, roots of nonlinear equations, interpolation and approximation. (3)

CS-512 Computer Language Design

Using parsers and code generation techniques to fashion new mini-languages that can be used to creatively modify the interface between a user and the computer. Topics include language design; grammars; regular expression grammars; parsers and parser construction; parsing expressions; tokenizing; assemblers; engines vs. interpreters; logic, query and imperative language parsers and assemblers. (3)

CS-513 Gaming Theory-Real-Time 3D Graphics

The growing importance of virtual realities in training, scientific modeling, and communication comes on the heels of increasing processor capabilities, new innovations in hardware, increasingly sophisticated programming languages, and advanced graphics-based modeling techniques. Real-time 3D graphics as they are at the leading edge of these developments. Topics include mathematical foundations and modeling techniques, mapping, anti-aliasing, real-time rendering, Binary Space Partition Trees, object control issues. Uses C++ and the OpenGL graphics interface. (Offered as a full semester course.) (3)

CS-620 Operating System Principles for IA

This course is an overview of the UNIX operating system. The content will include shell programming, memory management, process management, processor management, storage management, scheduling algorithms, resource protection and system programming. The course will include programming projects focused on Information Assurance problem solving utilizing the C programming language primarily. Note: Student familariization with virtual machines, the Linux/UNIX command line and a basic programming language would be helpful. (3)

CS-701 Designing Intelligent Systems

The artificial intelligence revival of the late 1980s has produced many new and innovative approaches to the creation of intelligent systems. Such systems permeate today’s computer environment supporting everything from computer games to autonomous robotic systems and intelligent agents. The focus of this course will vary over time. Topics include formal knowledge representation and rule-based systems, fuzzy-logic systems, learning systems such as artificial neural networks and genetic algorithms, genetic programming and evolutionary computing, hybrid intelligent systems, and intelligent agents. (3)

CS-705 Multi-threaded and Distributed Program

Modern applications such as GUI interfaces use multi-threading to achieve responsiveness and to make efficient use of computer resources. In addition, the Internet has made distributed programming an integral part of almost every computing system. In today’s world programmers and computer professionals must understand the principles underlying these paradigms. Topics include concepts and applications of multi-threaded and distributed programs. Process interaction using shared variables and message passing; systematic development of correct programs; general problem solving techniques; scientific computing; distributed systems. (3)

CS-710 Big Data Warehousing and Analytic Systems

This advanced course will equip the student with the necessary skills to solve complex problems and design solutions using Big Data. The student will be able to gain an understanding of how to design databases to manage large volumes of data, and how that data can be analyzed and translated into meaningful results. The student will be introduced to the field of Analytics, gain an understanding of Enterprise Data Warehousing models, be introduced to Data Mining techniques and tools used for mining the data warehouse, and build specific Data Marts. The student will be introduced to predictive analysis, and will be expected to develop models to extract data, perform trend analysis, establish patterns, and make projections. Prerequisite: Understanding of Database base Design and Statistics. (3)

CS-712 Research Methods

This is part one of a two course sequence in research and writing. In part one, students will learn how to identify a research topic and, as initial research begins, they investigate the requirements for maintaining a research journal, writing a research paper, and presenting a research paper. (3)

CS-714 Capstone Research Project

This is part two of a two course sequence in research and writing. The course is in graduate seminar format. Students integrate prior course work and personal experiences into researching an approved topic to produce a project-based paper. (Offered as a full semester course.) (3)

CSP-101 Introduction to Engineering Methods I

Students are introduced to MATLAB. Using MATLAB to do calculations, solving systems of equations. Using data for data analysis statistics, graphing with applications in engineering. Special focus on trig and advanced trig functions, precalculus. Prerequisite placement exam. (2-2-3)

CSP-102 Introduction to Engineering Methods II

Students are introduced to MATLAB. Using MATLAB to do calculations, solving systems of equations. Using data for data analysis statistics, graphing with applications in engineering. Introduction to C++, classes and objects, CGI programming, Graphics and GUI’s. Prerequisite placement exam. (2-2-3)

CT-101 Introduction to Software Applications

This is an introductory course on software that is essential for the successful use of a Windows-based PC system. Students are introduced to the basic features and functions of the Windows operating system, word processing, the use of spreadsheets and tools that accompany spreadsheets, setting up a simple database and the creation of PowerPoint presentations. Students will learn how to use and integrate the various applications into one larger document and produce a written, electronic and oral presentation. (3-0-3)

CT-102 Introduction to Internet Applications

Introduces students to dynamic HTML, Web pages, Real time designed using tables, style sheets, cascading style sheets (CSS), images, and dynamic images, with emphasis on page layout, navigation bars and forms. Scripting languages are used to enhance Web page features. Graphic, video and audio file standards, such as GIF, TIF, JPEG, WAV and MIDI are discussed. SGML and XML are defined, and role of XML in enabling the communication of data between disparate applications is discussed. Students are required to complete assignments as part of the homework requirements. (3-0-3)

CT-152 Introduction to UNIX

Unix file and operating system. Understanding multi-user and multitasking concepts. Editors, X-windows, Awk, email, Internet commands, shell commands and shell scripts. Projects, which provide practical experience, are completed as part of the homework requirements. (3-0-3)

CT-201 Multimedia Applications

Use online and resident window tools to create, edit and enhance text, audio, and video for multimedia applications, including multimedia Web pages and presentations. Study the philosophy, aesthetics and theory behind the layout, construction and display of multimedia material. Flash
projects that include drawing, painting tools, color animation, buttons and actionscript are completed as part of the coursework requirements. Prerequisite: CT-102 or equivalent. (3-0-3)

CT-206 Scripting Languages
Introduces students to the use of scripting and the scripting languages of Perl, Python, and Ruby on Rails. The class will cover the use of scripting to solve short problems, automate routine tasks, integrate across pieces of software, and prototype code ideas. The mechanics of code-complete design versus on-the-fly coding as well as coding and code documentation styles will be discussed. Tasks involving input/output, regular expressions, and file operations are included. Students are expected to fully script solutions for real-world tasks assigned as part of the course. Prerequisites: CS-130 or CS-150 or permission of instructor. (3-0-3)

CT-240 Internetworking with Routers/Switches
Configuring routers and switches to build multiprotocol internetworks. OSI reference model, basic LAN and WAN design, dial access services, TCP/IP protocol suites, IP addressing, subnetting, static and dynamic routing. WAN technologies such as HDLC, PPP, Frame Relay, ATM and ISDN. Prerequisites: NT-150 or professor approval. (2-2-3)

CT-376 Javascript
This course introduces the student to client-side web programming. Students learn javascript. Topics include programming fundamentals using javascript, functions, event handlers, how to create and use javascript libraries. Labs include how to use the prototype and scriptable libraries for visual effects. Use of google maps from a programmer’s perspective. Debugging of javascript code. Other topics include CSS style sheets, XML, JSON and AJAX. Programming projects are assigned as part of the homework requirements. Prerequisites: CS-150 or CS-130. (2-2-3)

CT-406 Web Programming Languages
This course will explore how to make a dynamic website using five programming languages: Perl, PHP, Java, JavaScript, Java Server Pages and C#. Students will have access to a Unix server including an Apache Web Server and a MySQL Database. Prerequisites: CS-220 and CS-225. (3-0-3)

CT-451 Special Topics
Students research current trends in telecommunication and emerging technologies. Oral presentation required. Prerequisite: Senior status. (3-0-3)

DSR-900 Writing the Doctoral Dissertation
Students work individually with the dissertation mentor to complete the dissertation proposal and prepare for the competency examination. (3)

DSR-920 Dissertation Workgroup
This dissertation workshop course is set up for Blackboard access. It is on a no credit, no grade and no charge basis. (3)

DSR-925 Dissertation Preparation I (Residency) Students will generate significant portions of the dissertation proposal and receive faculty feedback on completed sections. (3)

DSR-935 Dissertation Preparation II Students complete the dissertation milestones developed by the student and the mentor. Students who are not prepared to defend after completing DSR-935 must enroll in DSR-940. Prerequisite: DSR-900. (3)

DSR-940 Proposal Writing I This course focuses on completion of chapters one and two. (3)

DSR-941 Proposal Writing II This course focuses on completion of chapters two and three. (3)

DSR-942 Proposal Writing III This course focuses on submission of the proposal to IRB and ARB. (3)

DSR-950 Dissertation Presentation and Oral Defense Learners prepare the dissertation for publication. Learner research is examined through an oral defense. Prerequisite: DSR-935. (3)

DSR-951 Dissertation Research I This course is a continuation of research in preparation for the submission of a doctoral dissertation proposal. (3)

EE-159 Circuit Theory
Network analysis, mesh analysis, nodal analysis, Thevenin, Norton equivalent, reciprocity, capacitors, inductors, RC circuits, RL circuits, RLC circuits. Steady state and transient conditions involving RC time constants, RL time constants. AC circuit analysis involving sine waves, phasors, reactance, impedance in series circuits, parallel circuits, and series-parallel circuits. Thevenin, Norton, network theorems. Power, effective power, resonance and filter circuits. Prerequisite: MA-114. Students who have taken EL-100 and EL-150 may not take this course for credit. (3-2-4)

EE-300 Power Supply and Regulator Design
Design and analysis of power supplies and regula- tors. Includes special adjustable and fixed voltage regulator ICs, three-pin regulators, switch-mode supplies. DC to DC converters. Supply topologies, power handling, current limiting methods. Prerequisites: EL-250 and MA-261. (2-2-3)

EE-304 Digital Design I

EE-309 Circuit Design and Simulation
An advanced circuit analysis course that introduces students to computer-aided electronics packages and automated design. Students design and analyze circuits both mathematically and with computer simulation build and test circuits. Students build the circuits and compare predicted results with measured results obtained in the laboratory. Prerequisites: MA-261 and EL-250 or equivalent. (2-2-3)

EE-353 Power System Engineering

EE-354 Digital Design II
Continuation of Digital Design I. Students explore larger-scale digital arithmetic and logic circuits using PAL programmer and related software. Extension to VHDL design and implementation. Programming CPLDs and FPGAs. Students design and build circuits according to design objectives in two parts: students first design, compile and verify their circuits using timing simulation on computer then students build and test circuits. Final project involves design, assembly, and testing of a PLD-based system. Prerequisite: EE-304. Offered during spring semester only. (2-2-3)

EE-359 High Frequency Circuit Design
Students are taught to design, build and test microwave amplifiers using S-parameters and Smith Charts in conjunction with modern circuit design and simulation software. Both bipolar and field effect transistors are used to design amplifiers to specifications regarding signal flow gain, noise figure and intercept point. Students fabricate microstrip circuit boards using an in-house mill-and-turn machine and then test the completed amplifiers in the laboratory. Actual and simulated results are presented. Prerequisite: EE-309. (2-2-3)

EE-362 Microcontroller System Design

EE-364 Computer Architecture
Design and architecture of modern computers. System components: processor, memory and interfaces. Instruction sets and operations. Reduced instruction sets (RISC) and RISC architecture. Processor design to support RISC instruction set. Evolution to parallel processing and multiprocessing. Prerequisite: EE-304. Offered during spring semester only. (2-2-3)

EE-382 Robotic Systems
An introduction to the design and control of autonomous robots. Mechanical considerations and review. Interfacing issues and programming. Sensors for perception and environmental detection and navigational ability. Students will develop algorithms and use machine learning techniques to generate programs to control electromechanical systems to perform tasks. Team based projects and laboratories. Prerequisites: EL-262. (2-2-3)

EE-400 Special Projects in Engineering
Application of engineering principles of research into a special project. Projects vary from semester to semester. Students primarily work in a guided team environment with a faculty mentor. Prerequisites: permission of instructor and department chair and at least junior standing. This course may be repeated with different projects. (1-4-3)

EE-404 Large-Scale Digital Design
Analysis and modeling of digital systems, VLSI, VHDL timing, objects and classes. VHDL-based design processes, concurrent and sequential assignments. Variable and array operators, entities and architectures, behavioral oral descriptions. Dataflow, synchronous and asynchronous processes using procedures and sub-functions. Library support packages and generation of test-bench data. Prerequisite: EE-354. Offered during fall semester only. (2-2-3)
EE-406 Signals and Systems
Mathematical models, systems, signal classifications, I/O differential and difference equations, block diagram realizations, discrete-time systems. Convolutions: discrete-time and continuous-time. The Z-transform in linear discrete-time systems, transfer functions. Trigonometric Fourier series, polar and rectangular forms, odd/even functions, response of a linear system to periodic input. Fourier transform, symmetry properties, transform theorems, linear filtering, modulation theorem. Prerequisite: MA-360. Offered during fall semester only. (3-0-3)

EE-409 Network Analysis and Synthesis

EE-415 Microwave Theory and Devices

EE-419 Electrostatics
Stationary electric and magnetic fields. Gauss’s law, Laplace and Poisson’s equations. Solutions to static field problems using complex variable techniques. Faraday’s law. Prerequisites: PH-263 and MA-340. Offered during fall semester only. (3-0-3)

EE-452 Advanced Microcontroller System Design
Extension of EE-362. Project course utilizing commercially available microcontroller EVB boards. Fuzzy logic introduction. Programming using fuzzy logic rules and high performance design languages. Keil MORDU5 IDE, and generate code for microcontroller-based systems. Prototypes are evaluated and debugged before final assembly. Written report and oral presentation required. Prerequisite: EE-362. Offered spring semester only. (1-4-3)

EE-453 Control I
Introductory concepts. Feedback control systems and derivation of transfer function. System response for undamped and damped systems. Testing for system stability, coefficient test, Routh-Hurwitz technique. System performance, system types, steady state error and error coefficients design. Calculation of designer. Symbolic body codes, crossover frequencies, gain and phase margins. The course will stress use of a variety of famous industrial computer-aided control system design software packages. Prerequisite: MA-360 or knowledge of Laplace transforms. (2-2-3)

EE-456 Digital Signal Processing

EE-458 Senior Design Project
Students propose design, create and test a functioning product using engineering standards and realistic constraints. This is a major design experience based on the knowledge and skills acquired in earlier course work. The project includes design reviews as scheduled by the professor, progress reports, and a final project defense. Evaluation criteria are based on oral presentation. Issues such as cost, maintainability, environmental impact, ethical, social, manufac-turability and safety must be considered in developing the final product. For EE, TET, EET, CE and CET programs, CE and CET students should see advisor before registering. Prerequisites: EN-408 and Senior standing. (1-4-3)

EE-459 Electromagnetic Field Theory
Continuation of EE-419. Time-varying electric and magnetic fields. Boundary conditions, Maxwell’s equations and applications to wave phenomena. Relation of classical circuit theory to Maxwell’s equations. Prerequisite: EE-419. Offered during spring semester only. (3-0-3)

EE-461 Communications Theory

EE-460 Mathematical Analysis
Advanced mathematics for engineers and engi-neers as either a review or an advanced introduc-tion to different equations, Laplace transforms, linear algebra, vector analysis, introduction to tensor analysis, complex variables and probability. Many calculation techniques using MATLAB are introduced. Projects are performed using MATLAB and Simulink. Offered during fall semester. (3)

EE-461 Modern Circuit Design and Simulation
A study of the various SPICE based software tools used by engineers to design and simulate circuits. Analog, digital and mixed-signal design. Component selection and modeling use of libraries and customizing components and models. Software development tools will be used. High level language compilers will be discussed. Students are required to purchase an evaluation board and deliver a final project for testing. Availability of course based on demand. (3)

EE-465 Digital Signal Processing

EE-467 Electromagnetic Interference and Compatibility

EE-468 Large-Scale Integrated Design
Introduction to VLSI and VLSI CAD software tools. Digital design and logic verification, layout, timing analysis and programing, with synthesis, simulation and verification. Applications change from semester to semester. Subjects include designing ASIC’s, DSP, and processor chips. Students design very simple logic portions based on demand. Prerequisite: Advanced course in digital chip design equivalent to EE-354. (3)

EE-561 Communications Theory
State-Space Model of Signals. Calculation of bit-error-rate for BPSK, QPSK, M-ary PSK, M-ary Orthogonal Signals. Trellis-Code Modulation and Demodulation (using trellis diagrams). Fading channels and random phase in analog systems. Offered during spring semester. Prerequisite: EE-600 or equivalent. (3)

EE-652 Microcontroller System Development
The course covers both the hardware and soft-ware aspect of the 16-bit Motorola microcontroller. Overview of onboard chip components and avail-able instruction sets with emphasis on the newer and enhanced version. Student is required to develop a hardware application and write and test modular code. Software development tools will be employed. High level language compilers will be discussed. Students are required to purchase an evaluation board and deliver a final project for testing. Availability of course based on demand. (3)

EE-653 Analog and Digital Control Theory
terion, Discretization of Continuous-Time Design. Prerequisite: EE-600 and EE-601 or equivalent. (3)

**EE-656 Image Processing**
Prerequisite: EE-606. (3)

**EE-665 Microwave Circuit Theory and Design**

**EE-708 Master’s Project Research**
This course will cover all aspects of proposing and executing a research and development task, in response to Broad Agency Announcements. Creating preliminary reports, including quad charts and white papers. Techniques for providing a rough order of magnitude (ROM) cost. Preparing the final full proposal, including abstract, statement of work, milestones, deliverables, risk mitigation, preplanned follow-on efforts, procurement, subcontracts, describing the labor mix, and developing a full cost proposal. Attention will be given to protection of proprietary information, proposal contents, proposal preparation, and general compliance with Federal Acquisition Regulations (the FAR). The course will culminate with the execution of a mock project, with final deliverables, and final closeout of the project. Examples from Federal R&D or public domain will be used throughout the course. Offered during fall semester. (3)

**EE-710 Design for Reliability and Manufacturing**
Design methodology and standards applied in the construction and assembly of electronic circuits for reliability. Redundancy, parallel structure and majority rule circuits. Materials and component selection. Vibrational analysis, thermal analysis and packaging. Hardware for commercial, military or space applications. MIL-spec and IPC standards discussed. Normally offered during summer semester. (3)

**EE-720 Designing for Testability**
Design for testability. Types of testing, functional testing, and structural testing. Automatic test pattern generation. Scanning and scan based design rules. Critical paths. Memory test and diagnostics. Built-in self-testing. ATE equipment, local and remote testing and limitations. Students will have access to on-line test workstations. Normally offered during summer semester. (3)

**EE-758 Master’s Project**
Students integrate prior course work and personal experiences into a master’s project. Students develop a full proposal, including abstract, statement of work, schedule, milestones, deliverables as learned in EE-708. Proposal must be delivered to class and approval of project advisor required. Regular progress report (Smith Chart). Voltage and power calculations on transmission lines. Matching techniques for transmission lines and discrete circuits. Measurements using vector network analyzers. Prerequisites: EE-150 or EL-150. Offered spring semester only. (2-2-3)

**EL-121 Transmission Lines**
Study of transmissions lines: characteristic impedance, propagation constant, standing wave ratio and reflection coefficient, Transmission line response to transients. Bounce diagrams. Lossless and lossy line analysis using classical approach and graphical approach (Smith Chart). Voltage and power calculations on transmission lines. Matching techniques for transmission lines and discrete circuits. Measurements using vector network analyzers. Prerequisites: EE-150 or EL-150. Offered spring semester only. (2-2-3)

**EL-220 Fabrication and Troubleshooting**
Covers the basic methods of circuit construction and troubleshooting, including IC fabrication, wire wrapping, soldering, etching and chassis layout. Identification and removal of components; project oriented; may be used as a technical elective. Prerequisite: EL-100. (1-4-3)

**EL-250 Advanced Analog Circuits**

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**2014-2015 Catalog Capit?l College Courses**

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**Courses**

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**EE-656 Image Processing**
Prerequisite: EE-606. (3)

**EE-665 Microwave Circuit Theory and Design**

**EE-708 Master’s Project Research**
This course will cover all aspects of proposing and executing a research and development task, in response to Broad Agency Announcements. Creating preliminary reports, including quad charts and white papers. Techniques for providing a rough order of magnitude (ROM) cost. Preparing the final full proposal, including abstract, statement of work, milestones, deliverables, risk mitigation, preplanned follow-on efforts, procurement, subcontracts, describing the labor mix, and developing a full cost proposal. Attention will be given to protection of proprietary information, proposal contents, proposal preparation, and general compliance with Federal Acquisition Regulations (the FAR). The course will culminate with the execution of a mock project, with final deliverables, and final closeout of the project. Examples from Federal R&D or public domain will be used throughout the course. Offered during fall semester. (3)

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**EL-220 Fabrication and Troubleshooting**
Covers the basic methods of circuit construction and troubleshooting, including IC fabrication, wire wrapping, soldering, etching and chassis layout. Identification and removal of components; project oriented; may be used as a technical elective. Prerequisite: EL-100. (1-4-3)

**EL-250 Advanced Analog Circuits**
Amplifier theory. Analysis of circuits in small signal operation, equivalent circuit models, frequency response and Bode plots. Cascaded stages with direct, capacitor and transformer coupling of amplifier stages, loads and signals sources. Analysis of power transfer, efficiency, thermal effects, and distortion of amplifier circuits in large signal operation, amplifier operating classes and push-pull amplifier circuits. Operational Amplifier applications. Regulators. Oscillators: Wein Bridge, RC phase shift, Hartley, Colpitts, Clapp, Negative resistance and crystal types, Prerequisites: EE-150 or EL-150 and EL-200. (3-2-4)

**EL-255 Introduction to Control and Robotics**
Open and closed loop control systems compared with examples. Conditions, which determine a robot. Permanent magnet, brushless, series and shunt motors. Stepper motors. Reversing circuits and speed control techniques. Gear trains and effect on speed, acceleration and torque. Robot power supplies, robot arm and gripper, degrees of freedom and work envelope. Frequency response of control system components. Introduction to Power electronics. Transducers used in robotics. Prerequisites: EL-150 or EE-159 and EL-200. (2-2-3)

**EL-261 Introduction to Communication Circuits and Systems**
Fundamental concepts in communications. Amplitude and frequency modulation. Waveform and waveform analysis. Spectral content of signal. Circuits used to generate signal. Signal recovery circuits. Introduction to quadrature and digital waveforms. Students build and test circuits. Prerequisites: EL-150 or EE-159, and EL-200. Corequisites: MA-261. Offered during spring semester only. (2-2-3)

**EL-262 Microprocessors and Microassembly**
Introduction to microprocessors. Architecture. Fetch and execute cycles. Microprocessor instruction set and assembly language. Hardware configuration, pin functions and modes of operation of a typical microprocessor. Basic I/O timing, control and memories. Prerequisite: EL-204. (2-2-3)

**EL-301 Advanced Communication Circuits and Systems**
A continuation in the study and analysis of communications circuits as they apply to communications systems. Circuits such as voltage controlled oscillators, modulators, mixers, phase-locked loops, frequency synthesizers, passive and active filters are analyzed and mathematically discussed. Students build and test their circuits. Prerequisites: EL-250, EL-261 and MA-261. Offered during fall semester only. (2-2-3)

**EL-307 Noise and Shielding**

**EL-400 Special Projects in Technology**
Guided Study. Project-oriented course. Students are expected to design and build electronic systems in their specialization. Students will produce a final project including a written report and an oral presentation. Prerequisite: permission of instructor. (0-6-3)

**EL-452 Automated Test Systems**
Systems design course for automating the testing of electronic circuits and systems in both the engineering and production environments; stresses both hardware design and system software development. Begins with simple PC-based systems assembly for circuit testing as part of the design process and progresses to the design and development of full-scale systems for testing of large production volumes. Detailed study of the operation of the IEEE STD-488 and its use in test sys-
EN-001 Basic Writing Skills
Course in the basic skills of written expression, reading comprehension and vocabulary building, which will enable the students to clearly present feelings, ideas and opinions. It includes a review of spelling, punctuation, and word usage plus sentence construction and other basic writing skills. Students will be expected to complete numerous short writing assignments with an emphasis on paragraphs. Study skills are also stressed. This course is required of all students whose test scores and writing samples indicate the need. This course provides three semester credits but does not meet the AAS, BS degree requirements for graduation. Grades given will be P-Pass or R-repeat. (3-0-3)

EN-002 Reading Development
This course is designed to provide students with the skills they need to develop their comprehension of the written word. Content will include: expansion of written and spoken vocabulary, improved reading comprehension and the promotion of critical thinking. The course will focus on teaching students to use active strategies such as graphic organizers, SQ3R, Cornell Note-Taking, text-marking and annotating. The reading will be focused on non-fiction materials to increase knowledge in specialized areas. This course provides three semester credits but does not meet the AAS, BS degree requirements for graduation. Grades given will be P-Pass or R-repeat (3-0-3)

EN-101 English Communications I – Intensive
This introductory college-level course focuses on effective oral and written communication skills and the development of analytical abilities through various reading and writing assignments. Students must be able to demonstrate competence in writing mechanics, including grammar, structure and logical content development when writing essays, summaries, and short reports. Rhetorical modes may include description, compare/contrast, personal experience, definition, illustration and process demonstration. Oral presentation skills are developed throughout the delivery of knowledge on related topics. Prerequisite: acceptance based on placement test scores. (3-0-3)

ENI-LAB English Communications Intensive Lab
Based on placement test scores, students in this lab will focus on specific areas for improvement including punctuation, grammar, verb formation and usage. Must be taken with EN-001 and EN101, and can be taken with EN 101. (0-1-0)

FS-100 Freshman Seminar
Throughout this course students will learn skills to better prepare them for the rigors and challenges of college. Students will learn various proven techniques and tools to help them be successful with college level work. Additionally students will explore the personal characteristics necessary for success, learn about the college culture, and develop a support network. (2-0-1)

HP-252 Critical Issues US History I
This is a survey course designed to give students an overall view of the development of the United States from the time of its founding through the Civil War. This course is directed toward the emergence of American political, economic, and social traditions through critical analysis and student research. Prerequisite: EN-101. (3-0-3)

HP-253 Critical Issues in US History II
This is survey course designed to give students an overall view of the United States from after the Civil War until recent history. This course is directed toward the emergence of American political, economic, and social traditions through critical analysis and student research. Prerequisite: EN-101. (3-0-3)

HU-163 Horror Fiction
This course offers students a survey of horror fiction beginning with Edgar Allan Poe and ending with present day writers such as Stephen King. Students read short stories as well as novels. The translation of horror literature into film is also examined. Prerequisite or Corequisite: EN-101. (3-0-3)

HU-164 Science Fiction
This course will examine science fiction from the early 20th century to the present, with some attention to the cultural and historical issues that shaped its development. Special attention will be placed on the role of science in science fiction. The relationships between literature, film and television as expressions of science fiction will also be studied. Prerequisite/Corequisite: EN-101 (3-0-3)

HU-165 History Through Fiction
This course provides a broad survey of a selected historical period and compares/contrasts fictional historical accounts with what is generally regarded as historical fact. Both oral and written presentations are required of students. The selected time period and associated literature is chosen by the professor, and will vary over time. Students will learn to distinguish between historical fact and fiction, as well as to apply critical thinking toward identifying the fine lines that often exist between disparate accounts of history. Prerequisite: EN-101. (3-0-3)

HU-175 Ancestral Research
This course offers students a survey of library research methods and tools to do research on their family through the use of electronic resources. Students will learn how to document their finds, conduct oral interviews and utilize governmental records and resources. Students will conduct genealogical research to find their “roots” both in the United States as well as overseas. Students will be required to do oral and written presentations discussing their family research. Students will be required to do oral and written presentations discussing their family research. Assignments will direct students in documenting research, utilizing proper research methods and forms and developing their own “family tree.” Corequisite: EN-001 or EN-101. (3-0-3)

HU-205 Twenty-First Century Mass Media
A broad survey of contemporary mass media such as film, radio and television with particular attention paid to emerging media such as the Internet, related technological and commercial infrastructures, as well as the globalization of the new media. Corequisite: EN-101. (3-0-3)

HU-210 Game Design and Theory
This course teaches how to design a standalone game that is balanced, playable and has that intangible of “fun”. Topics include history of games, player presence, mathematical game theory, topology, statistics, multiplayer interactions, and art and aesthetics. We also cover the milestones needed to produce a game. Each student will take their concept from idea to creating their own version of a tabletop game or a paper prototype for a future marketable game. (3-0-3)

HU-220 Critical Thinking
This course explores the process of thinking critically and guides students in linking more clearly, insightfully and effectively. Concrete examples from personal experience and contemporary issues help students develop the abilities to solve problems, analyze arguments and issues, as well as make informed decisions in their academic career and personal lives. Readings, structured writing assignments and ongoing discussions help students develop sophisticated thinking abilities. Prerequisite: EN-102 (3-0-3)

HU-225 Writing for the Internet
This course introduces students to writing for the Internet allowing more effective online communication in such forums as blogs and Websites. Students will learn how to write in a more active voice, bringing more energy and vibrancy to their articles and commentaries. Course material examines the work flow and demands of Internet writing and publishing. Students will learn how to launch their own blog and develop an audience as well learn how to prepare articles for other blogs and web sites. This course is designed for all students, regardless of their communication, writing, or journalism experience. This is not a Web design course. Prerequisite: EN-101. (3-0-3)

HU-310 African American Literature
Introduction to African American literature will trace the development of an African American literary tradition. Study includes major genres of black writers: plays, poetry and fiction. Prerequisite: EN-102. (3-0-3)

HU-331 Arts and Ideas
This course enables students to study and appreciate various forms of art, including painting, sculpture, architecture, music, drama, film, and
literature through in-class and on-site experiences. The arts are also surveyed from a historical perspective, focusing primarily on eras in Western civilization. This enables students to sense the parallel development of the arts, of philosophy, and of sociopolitical systems and to recognize various ways of viewing reality. Prerequisite: EN-102. (3-0-3)

H-332 Arts and Ideas: Special Topics This course has the same general requirements as HU-331, but the orientation of the course will be on alternate traditions to the Western canon. Students will study various forms of art, including painting, sculpture, architecture, music, drama, film, and literature through in-class and on-site experience. Students will gain an appreciation for the arts as they are represented by a particular culture or national identity. The course will concentrate on how the arts are shaped by cultural/social forces that result in distinct philosophies and ideologies. Prerequisite: EN-102. (3-0-3)

H-364 Science Fiction Literature This course will examine science fiction and social commentary. Special attention will be placed on critical analysis of science fiction and the role of science fiction in determining the impact of social growth and events in modern society. Prerequisite: EN-102 (3-0-3)

H-365 Mystery Literature This course will examine the genre of mystery literature from the early 20th century to the present, with some attention to writers prior to the one-time period who built the foundation of the genre. Special attention will be given to the elements of a mystery story, the characters and plot development of the “who done it” through reading of popular authors as well as classical authors. Also the class will look at the relationships between mystery literature, film and television as literary art forms. (3-0-3)

HU-400 Humanities: Special Topics Research into humanities. Student primarily works in a guided study format with a mentor. Permis- sion required from the instructor and academic dean. Prerequisite: EN-101. (3)

IAE-301 Comprehensive Computer and Network Security Building on IAE-201, this course provides learners with detailed and hands-on knowledge of com- puter and network security. The course empha- size current topics such as network security, compliance and operational security, threats and vulnerabilities, application security, access con- trol, as well as cryptography. Additionally, underly- ing theory and concepts are presented in order to extend learners’ understanding of computer and network security. Weekly laboratory exercises are utilized to reinforce practical, real-world security techniques. Classes are a mixture of lecture, cur- rent event discussions, and laboratory exercise review and will prepare learners for the CompTIA Security+ certification. Prerequisite: IAE-201 (3-0-3)

IAE-310 Strategies for Cyber Competition This course prepares students to participate in national and international cyber competitions. Two competition areas are PDA and GSS devices, and tablet computers. This course will explore strategies of game play within the competition archetypes, review the skills necessary to compete in cyber competitions, as well as the cognitive science that empowers competitors as learning devices. Individual classes will be a mixture of lecture, laboratory exercises, as well as puzzle solving. The course will conclude with students participating in a real cyber competition. Prerequisites: IAE-201, IAE-301 or permission from Professor.

IAE-311 Mobile Computing Security Emphasizing wireless computing security, this course addresses how to secure mobile wireless computing devices and applications, and wire- less network security as it impacts those portable computing devices. Wireless network security is discussed as it pertains to decisions on which network security works most effectively, how security works or mobile devices (Bluetooth, 3G, 4G, and WiFi). Students will evaluate emerg- ing business and technical initiatives, such as bring your own device (BYOD) and securely imple- ment mobile IP networks based on IPv4, IPv6 and the transition to IPv6. Students will learn penetration testing strategies to effectively evaluate currently imple- mented security controls, utilizing cutting edge tools such as BackTrack 5, Vistumbler, WireShark, and inSIIDer for network discovery and packet analysis. Additionally, students will be exposed to the site survey, network management and analysis capabilities of industry leading software such as Air Magnet, Ekahau and OmniPeek. Prerequisites: IAE-301 and CT-240 (3-0-3)

IAE-320 Mobile Device Forensics Mobile device forensics is a branch of digital forensics relating to recovery of digital evidence or data from a mobile device under forensically sound conditions. The scope of devices can include mobile phones and any digital device that has both internal memory and communication abilities such as PDAs, smartphones, and tablet computers. This course focuses on the forensic study of mobile devices due to the rapid proliferation of smartphones and applications such as contacts, photos, calendars and notes, SMS and MMS messages, video, text, email, web, browsing information, location information, and social networking. This increased usage has also seen a marked increase in cybercrime involving smartphones. Students will learn how to perform the forensic examination of mobile devices using the most advanced tools available. Note: Students are required to purchase a mobile device specific- ally to fulfill course lab requirements. Prerequisites: IAE-301, and 311 (3)

IAE-321 Applied Wireless Network Security This course will explore the unique challenges presented by wireless networking, including the analysis of mobile and mobile networks devices (Bluetooth, 3G, 4G, and WiFi). Students will evaluate emerging business and technical initiatives, such as bring your own device (BYOD) and securely implement mobile IP networks based on IPv4, IPv6 and the transition to IPv6. Students will learn penetration testing strategies to effectively evaluate currently implemented security controls, utilizing cutting edge tools such as BackTrack 5, Vistumbler, WireShark, and inSIIDer for network discovery and packet analysis. Additionally, students will be exposed to the site survey, network management and analysis capabilities of industry leading software such as Air Magnet, Ekahau and OmniPeek. Prerequisites: IAE-301 and CT-240 (3-0-3)

IAE-325 Secure Data Communications and Cryptog- raphy This course follows the protocol education provided in IAE-301 with more detailed and practical look at secure transactions and cor-respondence, as well as protection of data in storage. Within the confines of the ISO-OSI model, this course discusses data communication with emphasis on the security available at the layers, secure sockets layer, and both wired and wireless security topics. One-way message digests/hashes and encryption history and protocols are explored in-depth. Topics include virtual private networks, one-way hashes/message digest network signatures, secret-key and public key cryptography pro- cesses and algorithms. Prerequisite: IAE-301 and CT-152 (3-0-3)

IAE-351 Intro to Cyber Network Operations Full spectrum information superiority and domi- nance is key to influencing operations associated with war or Military Operations Other Than War (MOTW). This surveys Cyber Network Operations (CNO) introduces the concept of how Com- puter Network Attack (CNA), Computer Network Defense (CND) and Computer Network Exploita- tion (CNE) are leveraged to collect information, disrupt, deny, degrade or destroy the information within computers and computer networks and/or the computers/networks that host them. Strategic and operational considerations will be considered to affect an adversary’s decision cycles with infor- mation superiority. (3-0-3)

IAE-372 Cryptography Cryptography is indispensable for providing confi- dentiality of information in computer systems. This course explains the inner workings of cryp- tographic primitives and how to correctly use them. Students will learn how to reason about the security of cryptographic constructions and how to apply this knowledge to real-world applications. Students will examine many deployed protocols and analyze mistakes in existing systems. The course discusses public-key techniques that let two or more parties generate a shared secret key. Students will cover the relevant number theory and discuss public-key encryption and basic key-exchange. Prerequisite: IAE-301, MA 114 (3)

IAE-400 Special Topics in Information Assurance Cryptography is indispensable for providing confi- dentiality of information in computer systems. This course explains the inner workings of cryp- tographic primitives and how to correctly use them. Students will learn how to reason about the security of cryptographic constructions and how to apply this knowledge to real-world applications. Students will examine many deployed protocols and analyze mistakes in existing systems. The
IAE-600 Special Topics in Information Assurance
Research into information assurance subjects. Student primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with different projects. Prerequisite varies. (1-4)

IAE-610 Advanced Penetration Testing
This course explores the foundational concepts, methods and techniques in preparing and conducting penetration tests. Throughout the course you will be introduced to various tools as well as unique complex methods outside of existing code, service side and privilege escalation attacks. Most importantly you will learn how to construct a final report outlining discovered vulnerabilities, make suggested recommendations to remediate and/or mitigate those vulnerabilities. You will also learn how to describe the findings wherein non-technical personnel understand the ramifications of these vulnerabilities in a business sense. Prerequisite: IAE-402. (3-0-3)

IAE-611 Mobile Computing Security
Emphasizing wireless computing security, this course addresses how to secure mobile wireless computing devices and applications, and wireless networks as it impacts those portable computing devices. Wireless network security is discussed as it pertains to decisions on which network security works best with particular applications loaded into wireless computing devices. The course covers security of CMRS and PCS (Cellular Mobile Radio Service and Personal Communications Service), CMRS and PCS second, third and fourth generations (2G, 3G and 4G), laptops equipped with Wireless Network Interface Cards (WNICs), Personal Digital Assistants (PDAs), Bluetooth and Zigbee devices, and Radio Frequency Identity (RFID) devices. Retail store security and proximity payment application security are also discussed. Prerequisite: IAE-610 or IAE-670 or permission. (3)

IAE-620 Mobile Device Forensics
Mobile device forensics is a branch of digital forensics relating to recovery of digital evidence or data from a mobile device under forensically sound conditions. The scope of devices can include mobile phones and any digital device that has both internal memory and communication ability such including PDA and GPS devices and tablet computers. This course focuses on the forensic study of mobile devices due to the rapid proliferation of smartphones and applications such as contacts, photos, calendars and notes, SMS and MMS messages, video, email, web

IAE-574 Assured Software Analytics
This course covers methods for assuring the security and functionality of existing software and services, whether legacy, internally developed, or externally acquired, with emphasis on detection of vulnerabilities and malicious content. It also discusses assurance considerations for system architectures, networks and databases in their role as underlying enablers of software operations. Methods for structuring and reverse engineering of existing software are covered, as are techniques for acquiring and assured software and services through suppliers, service-oriented architectures and cloud computing environments. (3)

IAE-572 Software Assurance Development
This course covers the fundamentals of incorporating assurance practices, methods, and technologies into software development and acquisition life-cycle processes and models. With this foundation, the course provides students with rigorous methods for eliciting software and system assurance requirements, using threat identification, characterization, and modeling; assurance risk assessment; assurance case abstraction; assurance case assessment methods; defining product measures, measures to assess whether the required level of assurance exists. Students will also learn how to evaluate methods and environments for creating software and systems that meet their functionality and security requirements. (3)

IAE-573 Software Assurance Management
This course covers the fundamentals of software and system assurance management, including making the business case for assurance; planning introduction and implementation of assurance activities and projects that include assurance practices; compliance with laws, regulations, standards and policies related to assurance; and risk assessment, identification, analysis, mitigation and monitoring for assurance. The focus is on how to manage business and technical requirements. (3)

IAE-571 Software Assurance Assessment
This course covers the fundamentals of establishing a reliable level of software and system assurance, applying methods and determining measures to assess whether the required level of assurance has been achieved. Topics include assessment methods; defining product measures, process measures and other performance indicators; measurement processes and frameworks; performance indicators for business survivability and continuity; and comparing selected measures to determine whether the software/system meets its requirements level. These fundamental assessment methods are applied to newly developed software and systems as well as during the acquisition of software and services. (3)

IAE-557 Digital Forensics and the Investigative Process
This course explores the rudimentary foundations of data structures, encoding, FAT16/32, exFAT, NTFS, EXT2/3/4, and UFS1/2 file systems as well as a look into volume analysis, including multiple disk volumes and volume spanning. This course also discusses the basic fundamentals of hard disk drives and solid state drives, their components and their role in information systems. Prerequisites: MA-111 or MA-114 and IAE-315 (3-0-3)

IAE-540 Secure Access and Identity Management
Students will learn fundamental and advanced IdM (Identity Management) topics, concepts, and current issues. The course will prepare the students for real-world IdM challenges faced by professionals in industry and government today. Students will leave the course with an awareness and understanding of a variety of topics pertaining to IdM, including broad technical aspects, legal and policy issues, implementation scenarios, case studies, and industry and government applications of IdM components. Students will be provided hands on design, implementation and operations of IAM systems in a lab environment. Prerequisite: IAE 301 (3)

IAE-480 Perimeter Protection
In this Defense-in-Depth course, firewalls and network IDS issues will be discussed. A detailed understanding of firewall configuration and rule sets, load balancing, web farms, wireless access, web security issues and network detection will be explored to prepare the student with the basic tools to coordinate the design and implementation of perimeter network defenses for a high-volume, high-access site. Prerequisite: IAE-402 and IAE-406. (3-0-3)

IAE-500 Intro to Information Assurance
This course will provide the requisite computer, data communications, Internet and web technologies skills to students embarking on careers in information assurance (IA), at the senior levels. It is designed primarily for professionals who seek concentrated professional education in one or more of the many fields of computer science. Prerequisites: IAE-301 and IAE-315. Recommended co-requisite: IAE-402. Recommended co-requisite: IAE-402. (3-0-3)

IAE-412 File System Analysis
This course explores the rudimentary foundations of data structures, encoding, FAT16/32, exFAT, NTFS, EXT2/3/4, and UFS1/2 file systems as well as a look into volume analysis, including multiple disk volumes and volume spanning. This course also discusses the basic fundamentals of hard disk drives and solid state drivers, their components and their role in information systems. Prerequisites: MA-111 or MA-114 and IAE-315 (3-0-3)

IAE-440 Secure Access and Identity Management
Students will learn fundamental and advanced IdM (Identity Management) topics, concepts, and current issues. The course will prepare the students for real-world IdM challenges faced by professionals in industry and government today. Students will leave the course with an awareness and understanding of a variety of topics pertaining to IdM, including broad technical aspects, legal and policy issues, implementation scenarios, case studies, and industry and government applications of IdM components. Students will be provided hands on design, implementation and operations of IAM systems in a lab environment. Prerequisite: IAE 301 (3)

IAE-480 Perimeter Protection
In this Defense-in-Depth course, firewalls and network IDS issues will be discussed. A detailed understanding of firewall configuration and rule sets, load balancing, web farms, wireless access, web security issues and network detection will be explored to prepare the student with the basic tools to coordinate the design and implementation of perimeter network defenses for a high-volume, high-access site. Prerequisite: IAE-402 and IAE-406. (3-0-3)

IAE-402 Introduction to Incident Handling and Malicious Code
This course provides a detailed understanding of incidents from attacks of malicious software. This course addresses the history and practice of coding that occurs in viruses, worms, spyware, Trojan horses, remote management back doors and root kits. Students explore current representative measures and tools, and explore how to rid systems of malicious software and prevent re-infection. Recovery processes and backup methods are explored. In addition to covering basic incident handling preparation, recovery practices, and the course goes into detail regarding malicious software. Prerequisite: IAE-315 (3-0-3)

IAE-406 Digital Forensics and the Investigative Process
Students explore forensics and the investigation processes. Students explore current computer forensic tools, conduct live computer forensic analysis, conduct e-mail investigations, recovery of graphics files and data carving, and engage in report writing for high-tech investigations. Prerequisites: IAE-315 and CT-152. (3-0-3)

IAE-410 Penetration Testing
This course explores the foundational concepts, methods and techniques in preparing and conducting penetration tests. Throughout the course students are introduced to various tools as well as unravel complex methods for exploiting client-side, service side and privilege escalation attacks. Most importantly students learn how to construct a final report outlining discovered vulnerabilities, make suggested recommendations to remediate and/or mitigate those vulnerabilities. Students also learn how to describe the findings wherein non-technical personnel understand the ramifications of these vulnerabilities in a business sense. Prerequisites: CT-240 and IAE-315. Recommended co-requisite: IAE-402. (3-0-3)

IAE-400 Special Topics in Information Assurance
Research into information assurance subjects. Student primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with different projects. Prerequisite varies. (1-4)

IAE-571 Software Assurance Assessment
This course covers the fundamentals of establishing a reliable level of software and system assurance, applying methods and determining measures to assess whether the required level of assurance has been achieved. Topics include assessment methods; defining product measures, process measures and other performance indicators; measurement processes and frameworks; performance indicators for business survivability and continuity; and comparing selected measures to determine whether the software/system meets its requirements level. These fundamental assessment methods are applied to newly developed software and systems as well as during the acquisition of software and services. (3)

IAE-572 Software Assurance Development
This course covers the fundamentals of incorporating assurance practices, methods, and technologies into software development and acquisition life-cycle processes and models. With this foundation, the course provides students with rigorous methods for eliciting software and system assurance requirements, using threat identification, characterization, and modeling; assurance risk assessment; assurance case abstraction; assurance case assessment methods; defining product measures, measures to assess whether the required level of assurance exists. Students will also learn how to evaluate methods and environments for creating software and systems that meet their functionality and security requirements. (3)

IAE-573 Software Assurance Management
This course covers the fundamentals of software and system assurance management, including making the business case for assurance; planning introduction and implementation of assurance activities and projects that include assurance practices; compliance with laws, regulations, standards and policies related to assurance; and risk assessment, identification, analysis, mitigation and monitoring for assurance. The focus is on how to manage business and technical requirements. (3)

IAE-574 Assured Software Analytics
This course covers methods for assuring the security and functionality of existing software and services, whether legacy, internally developed, or externally acquired, with emphasis on detection of vulnerabilities and malicious content. It also discusses assurance considerations for system architectures, networks and databases in their role as underlying enablers of software operations. Methods for structuring and reverse engineering of existing software are covered, as are techniques for acquiring and assured software and services through suppliers, service-oriented architectures and cloud computing environments. (3)

IAE-600 Special Topics in Information Assurance
Research into information assurance subjects. Student primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with different projects. (1-4)
IAE-621 Applied Wireless Network Security
This course provides students with practical, real-world experience with an understanding of wireless fundamentals, wireless network threats, tools to test wireless security, and safeguards. Specifically, this course addresses the most popular hacking, cracking and wireless network security analysis tools and trains students to use them to test and secure wireless networks. Current industry best practices for managing wireless networks in a secure environment are addressed. Students need access to a second computer (for hacking) and will be required to purchase a home wireless network equipment to create a home wireless network for the purpose of conducting experiments on various wireless security vulnerabilities and countermeasures. NOTE: students must have access to a computer network they personally own and can modify. Case studies will be used throughout the course. Prerequisite: IAE-675 (3)

IAE-630 SCADA Networks and ICS Security
Industrial Control Systems (ICS) have been in existence for decades in the United States. These systems are relatively unknown to the general public and were designed to control our critical infrastructure such as utilities (electricity, nuclear power, and water treatment plant). Until recently, these systems were connected to company networks by privately owned IT networks based on private line technology. Public utility companies have begun to connect ICS networks to public networks such as the Internet as they transition to TCP/IP based networks. This trend is accomplishing the much needed modernization of the nation’s IT networks supporting the critical infrastructure and setting the groundwork for developing the federally mandated Smart Grid. The ICS network transition to public networks has many benefits and risks. The increased risk to the smart grid must be addressed by the USG partnering with private industry;
Prerequisite: IAE-684 (3)

IAE-652 Identity Management
Students will learn fundamental and advanced IDM (Identity Management) topics, concepts, and current issues. The course will prepare the students for real-world IDM challenges faced by professionals in industry and government today. Students will leave the course with an awareness and understanding of a variety of topics pertaining to IDM, including broad technical aspects, legal and policy issues, implementation scenarios, case studies, and the development and application of IDM components. Prerequisite: IAE-684 (3)

IAE-671 Legal Aspects Computer Security and Information Privacy
This course provides an overview of the legal rights and liabilities associated with operation and use of computers and information, including the legal and regulatory compliance issues critical for chief information security officers. It discusses the key statutes, regulations, treaties, and court cases (in the United States and abroad) that establish legal rights and responsibilities as to computer security and information privacy. The course also helps students to learn how to reduce their risk of potential legal liability for computer security or information privacy failures, and how to enforce their security and privacy rights against other parties. Case studies and lessons learned from information security failures are used throughout the course. Corequisite: IAE-684 (3)

IAE-673 Secure Information Transfer and Storage
This course provides the student a history of cryptography from Caesar’s cipher to elliptic-curve cryptography of today. Students study applications and private key algorithms and understand their functionality, and how they work with network protocols. One-way hashes and digital signatures are discussed, and used by the students in submissions to the instructor. Public key infrastructures with certificate authorities and web-of-trust infrastructure methods are addressed. Corequisite: IAE-670 (3)

IAE-674 Security Risk Management
This course begins with an understanding of why risk management evaluations are useful. The general methodologies for security risk assessment and security test and evaluation, including the interviews are discussed. Once the research necessary, the student is provided practical lab exercises to provide a hands-on analysis of a fictitious site. Detection, recovery, and damage control methods in contingency/disaster recovery planning research, documentation and training, methods of and procedures for contingency planning and security policy formulation and enforcement. Prerequisites: Completion of at least 24 credit hours of IAE coursework. This class is best completed in the last term. (3)

IAE-675 Computer Forensics and Incident Handling
This course begins with lectures discussing the laws and rights to privacy of individuals and what organizations may or may not do. Online ethics are considered. It then moves on to understanding incident handling and how incident response teams work, managing trouble tickets, and basic analysis of events to determine if an incident has occurred. Students will also learn and reactive and proactive computer forensics issues and practices, and rules of evidence. Corequisite: IAE-673. (3)

IAE-677 Malicious Software
This course provides a comprehensive overview of Malicious Software including conventional execut- able viruses, Scripting/Macro viruses, Root Kits, Back Doors, Worms and Botnets. Students will learn about the Cybersecurity Attack Lifecycle to understand how malicious attacks are planned, delivered and executed by Advanced Persistent Threats. Students will learn about how different classes of malicious software function including techniques to avoid detection, propagate and infect applications, operating systems, peripheral devices and network components. Students will learn about NIST sponsored National Vulnerability Database initiatives including Common Vulnerabilities and Exposures (CVE), Common Weakness Enumeration (CWE) and Common Attack Pattern Enumeration and Classification (CAPEC). Students will learn about proactive and reactive techniques to detect malware including whitelisting and blacklisting. Understanding of malicious software function, the course material includes reviews of computer hardware architecture, operating systems, computer networking, Cloud Computing, Mobile Devices, and Supervisory Control and Data Acquisition (SCADA) Systems. Students will learn about methodologies for static analysis of malicious software and other vulner- ability assessment techniques.

IAE-679 Vulnerability Mitigation
This “defense-in-depth” course provides the student detailed understanding of the need for internal and external vulnerability assessment. An integral technical part of any risk management analysis, risk assessment, policy formulation, security planning, and integrating technologies. Students will gain an appreciation for systems, networks, processes, methodologies, documentation requirements, recovery processes, certification and accreditation processes as well as best practice implementation, training, and continuous improvement. Discussions in this course will give the correct acumen of personnel security, physical security, and technical security as the theoretical and practical security principles relate and interface with information security principles. Defense-in-depth principles will also be covered for designing proper physical security programs. (3)

IAE-680 Perimeter Protection
In this “defense-in-depth” course, firewalls and network IDS issues are discussed. A detailed understanding of firewall configuration and rule sets, load balancing, web farms, wireless access, web security issues and network intru- sions is explored to prepare the student with the basic tools to coordinate the design and implementation of perimeter network defenses for a high volume, high access site. Prerequisite: Completion of at least 24 credit hours in IAE coursework. (3)

IAE-682 Internal Protection
This course explores the protections available to the practitioner through host operating systems and third party equipment and software, to pro- tect the inner network from the attacker who has successfully circumvented the perimeter or from the attacker already in the network. Methods include host-based intrusion detection methods, audit settings and review PC Firewalls, host oper- ating hardening for Linux and Windows 2000, and Virtual LANs will be reviewed. Corequisite: IAE-670 and IAE-673. (3)

IAE-684 Complementary Security
This class explores the overarching security dis- ciplines that are important to understand and practice. Understanding of information assurance and cyber defense. Discussions in this course will present the other, or complimentary, function areas of information assurance including personal security, physical security, operational security, physical infrastructures, policy and standards, biometrics technologies, disaster recovery and business continuity, and certification accreditation and accreditation as these principles relate and interface with technology based information security / cyber security principles. Segments in this course will further address unethical behaviors, risk management and mitigation, and security liabilities from the trusted insider threat perspectives and the need to enhance security. Vetting practices to be considered for positions of trust are also discussed. Authentication standards in practice will discuss such things as operational security, and the considerations of ethical behaviors as it relates to the user community of an enterprise or system. This is the first course of the MSIA program. (3)

IAE-685 Managing Information Security
This class explores the overarching security architec- tures and vectors of information assurance from a management perspective. The course will provide a basic understanding of all aspects involving IA management, needs analysis, risk assessments, policy formulation, security planning, and integrating technologies. Students will gain an appreciation for systems, networks, processes, methodologies, documentation requirements, recovery processes, certification and accreditation processes as well as "best practice" implementation, training, and continuous improvement. Discussions in this course will give the correct acumen of personnel security, physical security, and technical security as the theoretical and practical security principles relate and interface with information security principles. Defense-in-depth principles will also be covered for designing proper physical security programs. (3)

IAE-690 Healthcare Information System Security
This course addresses Healthcare IS within the framework of the guiding principles of Information Assurance (Confidentiality, Integrity, and Availability). This course covers the security and
privacy controls covering healthcare information systems, preventing loss and unauthorized access to healthcare information. This course covers the fundamentals of clinical information systems, and the importance of ensuring privacy and confidentiality of healthcare information. Students will also be able to identify and manage risks, and conduct Information Risk Assessments pertaining to healthcare information. Prerequisite: IAE 684 (3) or permission.

IAE-820 Situation Awareness Analysis

This is a course in operational leadership from the long-term perspective to crisis intervention. Class activities will be designed to enhance student awareness of action plan processes leading to effective strategy execution. (3)

IAE-825 Applied Research in Information Assurance

This course prepares students to select topics and conduct successful research in information assurance’s many fields. Topics include research such as the Computer Fraud and Abuse Act, the Electronic Frontier Act and the National Security Act. Special considerations governing research using human subjects will be given in-depth treatment. The productive and legally sufficient use of the Department of Homeland Security and the National Research Act. This course will address the design and operation of an OC’s to include Mission, Network, Intelligence, and continuity; and comparing selected measures to determine whether the software/system meets its required level of assurance. These fundamentals are applied to newly developed software and systems as well as during the acquisition of software and services. (3)

IAE-871 Software Assurance Assessment

This course covers the fundamentals of establishing a required level of software and system assurance, applying methods and determining measures to assess the required level of assurance. The course includes assessment methods; defining product measures, test measures and other performance indicators; measurement processes and frameworks; performance indicators for business sustainability and continuity; and comparing selected measures to determine whether the software/system meets its required level of assurance. These fundamentals are applied to newly developed software and systems as well as during the acquisition of software and services. (3)

IAE-872 Software Assurance Development

This course covers the fundamentals of incorporating assurance practices, methods, and technologies into software development and acquisition life-cycle processes and models. With this foundation, the course provides students with rigorous methods for eliciting software and system assurance requirements, using threat identification, characterization, and modeling; assurance risk assessment, and misuse/abuse cases. Students will also learn how to evaluate methods and environments for creating software and systems that meet their functionality and security requirements. (3)

IAE-873 Software Assurance Management

This course covers the fundamentals of software and system assurance management, including making the business case for assurance; planning and managing development projects that include assurance practices; compliance with laws, regulations, standards and policies related to assurance; and risk assessment, identification, analysis, mitigation and monitoring for assurance. The focus is on how to manage business and technical requirements. (3)

IAE-874 Assured Software Analytics

This course covers methods for assuring the security and functionality of existing software and services, whether legacy, internally developed, or externally acquired, with emphasis on detection of vulnerabilities and malicious content. It also discusses assurance considerations for system architecture, networks and databases in their role as underlying enablers of software operations. Methods for constructive and reverse engineering of existing software are covered, as are techniques for acquiring and assuring software and services through support, service-oriented architectures and cloud computing environments. (3)

IAE-875 IA Implementation

This course focuses on the practical design and implementation of information systems, including security and privacy controls covering healthcare information systems, preventing loss and unauthorized access to healthcare information. This course provides the opportunity to examine in-depth issues relevant to information assurance. Students must request a faculty member who is a topic specific expert to facilitate the course. This course may result in a publishable paper in the IA field. Prerequisite: IAE 684 (3) or permission.

IAE-880 Special Topics in Information Assurance

This course provides the opportunity to examine in-depth issues relevant to information assurance. Students will also be able to identify and manage risks, and conduct Information Risk Assessments pertaining to healthcare information. Prerequisite: IAE 684 (3) or permission.

IAE-890 Healthcare Information System Security

This course is designed to provide training for system administrators and security professionals. It covers the fundamentals of establishing a required level of software and system assurance, and applying methods and determining measures to assess the required level of assurance. This course provides the opportunity to examine in-depth issues relevant to information assurance. Students must request a faculty member who is a topic specific expert to facilitate the course. This course may result in a publishable paper in the IA field. (3)

IAE-883 Special Topics IV in Information Assurance

This course provides the opportunity to examine in-depth issues relevant to information assurance. Students must request a faculty member who is a topic specific expert to facilitate the course. This course may result in a publishable paper in the IA field. (3)

IAE-885 Special Topics in Human Resource Management

Learners examine human resource policies and practices in the context of the complex environment of information assurance. (3)

IAE-886 Special Topics in Information Assurance

Learners are introduced to the fundamentals of teaching information assurance. Learners gain experience in course and syllabus development. The development and integration of online labs as an academic component is explored. Learners examine the professional development and training that supports IA. (3)

IAE-895 Information Assurance Strategic Management

This course focuses on contemporary issues in strategic management of information assurance. Students will also be able to identify and manage risks, and conduct Information Risk Assessments pertaining to healthcare information. Prerequisite: IAE 684 (3) or permission.

IE-418 Design and Management of Operations Centers (MOC/NOC/SOC)

Modern organizations operate in a very dynamic and fast moving environment which requires collaboration with personnel both internally and externally via state of the art communications systems and technologies. Operations Centers (OC) can be chartered for daily operations as well as response to specific crisis or situations. This course will address the design and operation of an OC’s to include Mission, Network, Intelligence and Security missions. This course is designed to address how such OC’s are charted, designed, built, operated, and maintained. This course can be taught in multi-disciplinary or departmental approach. The course is built upon a virtualized infrastructure which gives learners a look at the systems, databases, applications, personnel, and procedures required to perform the assigned
mission. Tours of local OC’s will be scheduled and students will conclude the course with a capstone exercise which they will plan and execute. Prerequisite: Permission (3)

IE-701 Principles Design Engineering Computer Networks

Networking and the Internet have introduced us to a new world of devices and protocols that link personal computers to servers, and servers to servers. This course explores all the hardware and software that drives local and Internet computing. Special emphasis on connectivity and throughput is explored. (3)

IE-703 Thin and Fat Client Deployment with SOA

Client/Server has been extended to multi-tiered environments, distributed communications via CORBA.COM/DCOM, service-oriented architecture (SOA) and Cloud computing models. To examine this shift and to understand the technologies involved, this course focuses on how these models are used to enable thin-and fat-clients as well as Web-based clients on desktops, servers and PDAs. This class will examine the mechanisms employed to bring legacy as well as modern computing to the information economy. (3)

IE-705 Comparison of Operating Systems and Web Servers

This course explores the operating software underlying Internet and intranet computing. The similarities and differences between operating systems and web servers are investigated with a view to choosing the best technology and optimization practices. Topics include NT, 2000 Server, Advanced Server, Windows CE, Unix and versions, Linux, IIS, Apache, third party, and public domain. (3)

IE-707 Network Architecture Convergence Using Wireless

This course investigates the techniques used by successful network engineers to create converged network architectures and provide optimum information access to their users. The course will provide an in-depth study of the current and contemplated mobile technologies that can facilitate network convergence. Students will test these mobile technologies and their applications via the virtual laboratory concept using OpNet, the most advanced network modeling software currently available. Technical information on specific equipment and software will be provided as instruction supplemental to the textbook, and case studies will be used throughout the course. (3)

IE-709 Comparison of Object-Oriented and Scripting Languages

For the first time in two decades, software developers now have to use proficiencies in multiple programming languages to deploy thin client or fat client Internet-based applications. Choosing the right set of languages has a dramatic impact on application performance and e-commerce. This course is designed to compare and contrast the various language tools for crafting Internet-based and Web-based applications. (3)

IE-712 Design of Cloud Networks and Services

This course examines Internet security concerning two key network design issues: information security and information privacy. Students learn and understand the technical tools to protect information from external compromise, internal and external threats, various network security technologies and protection systems, apply network design techniques capable of providing information security to local and wide-area networks, general information encryption techniques and protocols including symmetric and asymmetric cryptograph methodologies, one-way hashes and digital signatures, secure sockets layer and Internet Protocol Security (IPSEC), learn to evaluate and create corporate policies regarding company networks, the adoption of cloud computing and information network security. Prerequisite: IE-701 or department permission (3)

IE-713 Multimedia and Web Casting

The Internet and increased bandwidth management technologies has brought us a new venue to communicate with each other in either full duplex, half-duplex, or simplex modalities. Dot Com companies and networks are realizing the many benefits, on demand streaming audio and video, and live casting of audio and video. To understand the integration, deployment, and optimization of these technologies, this course compares technical aspects, market positioning, and strengths, and weaknesses of various media products in the market. (3)

IE-715 Identifying and Integrating Component Collaboration Technologies

Software and hardware companies have utilized a component approach to product development in order to address the requirement that Internet and intranet communications applications operate in a on-demand mode. This is the technical underpinning of the “any where, any time” mantra of the Internet. However, these components do not always integrate easily. This course identifies the various component technologies, standards, and issues with integrating a wide on-demand communication capabilities. (3)

IE-717 Invention and the Use Intellectual Property

The Internet’s ability to share ideas between millions of people instantly, and the ability of Internet users to improve upon those ideas and share them with everyone on the Internet instantaneously, has challenged intellectual property’s status quo. This course examines the legal and regulatory limits of an e-business’s ability to exploit intellectual value in the new paradigm. In addition, the latest changes to intellectual property law and regulation as a result of Internet commerce will be examined. (3)

IE-719 Capstone Course

The capstone course is in graduate seminar format. Students will integrate the prior course work and personal experiences into a major or a project. (5)

IAE-730 SCADA networks and Industrial Control Systems

Industrial Control Systems (ICS) have been in existence for decades in the United States. These systems are relatively unknown to the general public and were designed to control our critical infrastructure such as utilities (electricity, nuclear power, and water treatment plant). Until recently, these systems were connected to company networks by privately owned IT networks based on private line technology. Public utility companies have begun to connect ICS networks to public networks such as the Internet as they transition to TCP/IP enabled networks. This trend is accomplishing the much needed modernization of the nation’s IT networks supporting the critical infrastructure and setting the groundwork for developing the federally mandated Smart Grid. The ICS network traffic presents many security and reliability concerns and presents many benefits, on demand streaming audio and video, and live casting of audio and video. To understand the integration, deployment, and optimization of these technologies, this course compares technical aspects, market positioning, and strengths, and weaknesses of various media products in the market. (3)
Successful completion of this course will enable students with the necessary writing skills to be successful writers in a professional environment. Emphasis is on development and implementation of marketing plans and programs. (3)

MBA-635 Operations Management
This course provides an analysis of the role of operations management in a global environment. Focus is on the integration of production and operations management with other functional systems in the organization. Incorporates quantitative and qualitative tools to support the decision-making process. (3)

MBA-640 Managerial Economics
Application of relevant economic theory to business problems. Examines general principles that can be applied to the business decision-making process in the presence of risk and uncertainty. Analysis of demand, costs, productivity, pricing policies, market structure, and government policies toward business within various marketing structures. Prerequisite: undergraduate degree in business (3)

MBA-646 Project Management
This course provides an overview of the theory and practice of managing a project in an organizational setting. Fundamental concepts are covered to provide a solid understanding and foundation of managing each phase of the project life cycle, adhering to organizational and cost constraints, setting goals and milestones, and utilizing best practices to complete the project on time and within budget. (3)

MBA-647 Methods of IT Project Management
Methods of IT Project Management focuses on IT project management and is built around the Project Management Body of Knowledge (PMBOK). You will learn how IT projects differ from other kinds of projects and how the methods and techniques of IT project management must be modified/adapted for IT projects. In addition, you will gain an increased understanding of what managers do (or should be doing) and why managers ask you to do the things that they do. The course presents methods, tools, and techniques that can be used to effectively manage IT projects, both large and small. Prerequisite: MBA-646 or equivalent (3)

MBA-648 Project Management/Competitive Advantage
Project Management takes decision-making and project management with other functional systems in the organization. Incorporates quantitative and qualitative tools to support the decision-making process. (3)

MBA-650 Fundamentals of Professional Management
A bridge course designed for students without a degree in business, this course addresses foundations of accounting, finance, statistics, and economics. Students are provided a broad overview of each of these topics for later application in the MBA program. This course is waived for students with an undergraduate degree in business management or business administration. (3)

MBA-601 Special Topics in Business Administration
Research into business administration subjects. Students primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with different projects. (1-4)

MBA-615 Financial Management
Provides an understanding of the business decision framework in the context of the economic environment in which decisions are made. Covers topics in capital investment policy, financing and capital structures, dividend policy, financial statement analysis, forecasting, and working capital management. It is preferable to complete MBA 620 before MBA 615. Prerequisite: MBA 600 or undergraduate degree in business. (3)

MBA-620 Managerial Accounting
The course examines the use of accounting data in corporate planning and control. The aim is student proficiency in the analysis and design of control systems in order to make decisions that allow management attention to be focused on long-term strategic issues. Covers internal and external auditing systems, financial reporting, and tax planning. Prerequisite: MBA-600 or undergraduate degree in business. (3)

Mathematics of Cryptography
This course gives an introduction to the mathematics of cryptography. A survey of cryptography from Roman times up to today’s current techniques. Cryptographic content for the course includes classical ciphers and their decryption (shift, affine and Vigenere ciphers), key exchange protocols (main example: Diffie-Hellman), public key ciphers (main example: RSA), block ciphers, modes of operation, hash functions and digital signatures. Mathematical formulations of security goals will be discussed as a method for determining weaknesses in designs. Prerequisites: MA-124 and CS-130 or CS-150. (3-0-3)

Ordinary Differential Equations
Methods of solving first order equations with applications to mechanics and rate problems. Solutions of second order equations by undetermined coefficients and variations of parameters. Applications to circuits. Introduction to systems of equations and operational and numerical methods. Prerequisite: MA-262. (3-0-3)

Probability and Statistics Engineers

Numerical Analysis
Number systems, floating-point arithmetic and error analysis. Taylor, interpolating and mini-max polynomials. Integration and differentiation. Methods of solving equations, systems of linear equations. Prerequisite: MA-262, and CT-115 or CS-130. (2-2-3)

Laplace and Fourier Analysis
Definition of transform: Laplace transform of algebraic, exponential and trigonometric functions; basic theorems including shifting, initial and final-value theorems; unit-step, periodic and delta functions; methods of inverting transforms; solutions of differential equations by transform methods. Fourier series and coefficients; expansion of functions in Fourier series; complex Fourier coefficients; Parseval’s Theorem; Fourier transform and its properties. Prerequisite: MA-340. (3-0-3)

Professional Writing Practicum
This course is designed to provide masters level students with the necessary writing skills to be successful writers in a professional environment. (3)

Fundamentals of Professional Management
A bridge course designed for students without a degree in business, this course addresses foundations of accounting, finance, statistics, and economics. Students are provided a broad overview of each of these topics for later application in the MBA program. This course is waived for students with an undergraduate degree in business management or business administration. (3)

Special Topics in Business Administration
Research into business administration subjects. Students primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with different projects. (1-4)

Financial Management
Provides an understanding of the business decision framework in the context of the economic environment in which decisions are made. Covers topics in capital investment policy, financing and capital structures, dividend policy, financial statement analysis, forecasting, and working capital management. It is preferable to complete MBA 620 before MBA 615. Prerequisite: MBA 600 or undergraduate degree in business. (3)

Managerial Accounting
The course examines the use of accounting data in corporate planning and control. The aim is student proficiency in the analysis and design of control systems in order to make decisions that allow management attention to be focused on long-term strategic issues. Covers internal and external auditing systems, financial reporting, and tax planning. Prerequisite: MBA-600 or undergraduate degree in business. (3)

Organizational Behavior
Analyzes the elements of organizational behavior. Theory and research in behavior science are explored. Topics include motivation, group dynamics, power, communication, ethics, conflict resolution, stress management, workforce diversity, and managing change. Cases are analyzed to develop skills in applying theories to common managerial problems. Students will apply ethical decision-making skills they learn in class to business matters involving conflicts of interest, work requirements, work conditions, and dealing with work-related problems. (3)

Marketing Process and Strategy
Explains key marketing concepts and their significance in domestic and international activities. Analyzes marketing problems and efforts regarding the organization’s product and services, pricing activities, channel selection, and promotion strategies. Emphasis is on development and implementation of marketing plans and programs. (3)
MBA-650 Strategic Management
Examines the objectives, elements and framework of analysis for strategic management. Case studies will be used as the primary tool of learning and analysis. Working well with others, synthesizing information, applying sound business judgment, and communicating crisply are key skills for this class. This class should be taken as the last core class prior to the capstone project. (3)

MBA-657 Transformational Leadership and Innovation Leadership is the process of influencing others to achieve results and this course examines leadership concepts applied to managing people, organizations and strategic processes. Leadership perspectives and philosophies of organization development, functions and systems are examined. Finally, students will examine how they can provide innovative leadership based on both leadership theory and practice. Students will be expected to apply the various leadership skills and techniques to address challenges and opportunities they face through the term project. (3)

MBA-658 Legal, Political and Ethical
As the comprehensive business law course, areas of law critical to the success of managers and entrepreneurs are examined. Topics include contract issues, torts and product liability, business crimes, intellectual property, the law and structure of business organizations, employment, and bankruptcy. These issues are also explored in the context of rapidly changing technology and business practices. (3)

MBA-659 Leadership and Managing Human Capital
This course examines the concept of leading an increasingly diverse and global workforce. Emphasis is placed on creating a work environment adaptable to the new challenges of the 21st century. This course is based on the understanding that human capital is critical to creating competitive advantage. Course material is examined from a systems perspective. Theory and practice will be explored by comparing and contrasting effective use of leadership in both the private and public sectors. (3)

MBA-660 Special Projects in MBA
Research into business administration and related subjects. Student primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with different projects to a maximum of 9 credits. (3 credits)

MBA-665 Entrepreneurship
Course focuses on all aspects of starting a new business. Emphasis is on the critical role of recognizing and creating opportunities. Topics include attributes of entrepreneurs and entrepreneurial careers, evaluating opportunities, writing business plans, and financing the venture. (3)

MBA-700 Capstone Project
Students complete a research project in the field of major concentration. The research is supervised by a faculty member and must be defended by the student in an oral examination. Internships under the supervision of an academic advisor are an option. This course is to be taken last or next to last as the student applies accumulated knowledge of both core and concentration classes to this effort. (3)

MBA-701 Federal Acquisitions and Contracting
This course covers the fundamentals of Federal acquisitions and contracting and will provide a comprehensive understanding of the acquisition environment. Students will develop professional skills for making business decisions and advising other acquisition team members to successfully meet customers’ needs. Participation in small group simulation exercises will prepare students to provide contracting support within the overarching business relationships of government and industry. Prerequisite: MBA-646 or equivalent. (3)

MBA-702 Mergers and Acquisitions
This course surveys the drivers of success in mergers and acquisitions (M & A) and develops your skills in the design and evaluation of these transactions. The M & A transactions will cover the foundation for a wide range of mergers and acquisition fields including corporate development, investment banking, consulting and advising senior management. (3)

MBA-703 Software Acquisitions
This course covers the acquisition of open systems and commercial off-the-shelf (COTS) products, an increasingly vital element of corporate and government software development. Properly managed software acquisition offers potential for significant time and cost savings over a system’s lifetime. The transition from proprietary, custom-built systems to systems based on standards and commercial products is not easy, however. Managers and their staff must understand the risks and opportunities associated with this acquisition approach. (3)

NT-100 Computer Architecture and Construction
Basic introduction to the design and construction of a current model PC including operating systems and some diagnostic software. Students build, configure, test and troubleshoot PCs in the laboratory. This material can be used as a basis for studying for the CompTIA A+ exam. (1-4-3)

NT-150 Computer Networking
This course is a continuation of NT-100 with major emphasis on local network equipment, network software and addressing schemes. Students build, configure, test and troubleshoot a network in the laboratory. Routers and switches are included. This material can be used as a basis for studying for the CompTIA Network + exam. (1-4-3)

NT-250 Microsoft Infrastructure Planning and Design
This course will address the design processes for Microsoft infrastructure technologies and services. These technologies include Windows server, workstation, and active directory to name a few. Students will also implement VPN’s, firewalls, IDS’s, PKI, and AAA servers to protect the infrastructure will be discussed. Students will be challenged in a lab environment with unique infrastructure technology scenarios to design and implement to both meet customer requirements and satisfy security policies to protect sensitive customer data. Prerequisite: NT 100, 150 or Permission (3)

NT-150 Computer Networking
This course is a continuation of NT-100 with major emphasis on local network equipment, network software and addressing schemes. Students build, configure, test and troubleshoot a network in the laboratory. Routers and switches are included. This material can be used as a basis for studying for the CompTIA Network + exam. (1-4-3)

NT-350 Virtualized Networks and Data Centers
Cloud computing services allow users to lease computing resources from large scale data centers operated by service providers. Using cloud services, users can deploy a wide variety of applications dynamically and on-demand. Most cloud service providers use machine virtualization to provide flexible and cost-effective resource sharing. This course will take the proper steps and transition to virtualized services by first consolidating their server farms, then virtualize infrastructure such as servers and work stations and databases. This course will use an intensive hands on approach to teach students to plan, design and build such a virtualized infrastructure to meet the needs of the organization on a cost effective, efficient and secure manner. Prerequisite: NT 100, 150, 250 or Permission (3)

OP-301 Fiber-Optic Communications
Lightwave propagation in fiber optics, including modal conditions, numerical aperture, attenuation and signal distortion in step-index and graded-index fibers. Connectors, splices and analysis of coupling losses. Operating principles and characteristics of optical sources and detectors. Transmitter and receiver circuits for analog and digital communication. Design consideration for practical optical communication links using power budget and rise-time analysis. Discussion and comparison of latest multiplexing and coupling techniques used in optical networks. Contains labs. Prerequisites: EL-261 and MA-261. (2-2-3)

PH-201 General Physics I
Non calculus-based physics intended for credit in engineering technology courses. Use PH-261 for electrical, computer and software engineering courses. Mechanics: units, conversion factors: vector diagrams, translational equilibrium, friction, torque and rotational equilibrium: uniformly accelerated motion, projectile motion, Newton’s Law, work energy and power: kinetic and potential energy, conservation of energy; impulse and momentum. Heat: temperature scales, thermal properties of matter, heat and temperature change, heat and change of phase, physics of heat transfer; applications. Prerequisite: MA-114. Fall-only; Spring/daytime only. (2-2-3)

PH-202 General Physics II
Non calculus-based physics intended for credit in engineering technology courses. Use PH-262 for electrical, computer and software engineering courses. Light and sound: wave motion, nature of light, reflection and mirrors, refraction, prisms, dispersion lenses; simple harmonic motion; sound transmission, resonance, interference, Doppler Effect. Electricity and magnetism: Static electricity, electric fields, magnetic fields, electric potential, capacitance; electricity in motion; magnetic induction; electromagnetic relations; Alternating currents. Prerequisite: PH-201. Fall - daytime only; Spring - evening only. (2-2-3)

PH-253 Energy and the Environment
This course covers fundamentals of energy generation (conversion), current diversity of energy resources from fossil fuels to renewable and alternative sources, and environmental impact of the generation and use of energy. Topics include the availability, economics and environmental consequences of energy generation, distribution and consumption from oil, coal, gas, hydrogen, nuclear, wind, solar, geothermal, hydro, biomass and other alternative sources currently under development and study by the scientific and engi-
neering communities. Efficient use of energy in the domestic, transportation and industrial sectors will be discussed. This course may be used as a general, technical, science or engineering elective. Prerequisite: PH-201 (3-0-3)

PH-261 Engineering Physics I
Calculus-based physics. Displacement, velocity and acceleration, equations of motion, Newton’s laws of motion and their applications, gravitation, work and energy, impulse and momentum, conservation laws, rotational motion, rotational dynamics, equilibrium, elasticity, periodic motion. Prerequisite: MA-261. Corequisite: MA-262. Fall—daytime only; spring—daytime only. (3-2-4)

PH-262 Engineering Physics II
Calculus-based physics. A continuation of PH-261. Topics include wave motion, vibration and sound, electricity and magnetism, Coulomb’s Law, electrical fields, induction. Prerequisite: PH-261. Fall—daytime only; spring—evening only. (3-2-4)

PH-263 Engineering Physics III
Calculus based. Introduction to light, lens and diffraction. Photon and their interaction with matter. Wave-particle duality. Basic quantum discoveries leading the Bohr atom and atomic spectra. Interaction of electrons and photons with matter with special emphasis on the design of detectors and electronic devices that use quantum effects. Prerequisite PH-262. (3-2-4)

PH-400 Einstein’s Theory of Relativity
Introduction to Einstein’s Special and General Theory of Relativity. Topics covered: the physical basis of Lorentz contraction, time dilation, the “twin paradox” and energy, momentum in Special Relativity; mass in Relativity, Schwarzschild metric, Black Holes and Cosmology, behavior of light and applications to Global Positioning Systems. Prerequisites: PH-263 and MA-340 or permission of instructor. (3-0-3)

PH-463 Quantum Physics
Fundamentals of quantum physics: wave – particle duality, the Heisenberg uncertainty principle. Schrodinger’s wave equation and solutions. WK approximation, and time-dependent perturbation theory methods. Interaction of matter with radiation. Application to atomic and molecular spectra, Lasers and quantum computing. Prerequisites: MA-262 Calculus II and PH-262 Engineering Physics II, or permission of instructor. (3-0-3)

RSC-601 Professional Writing Practicum
This course is designed to provide doctoral learners the necessary writing skills to be successful at the doctoral level. (3)

RSC-801 Fundamentals of Doctoral Learning
Doctoral programs educate students for highly specialized careers in academe or practice. Students of doctoral level programs are taught the ability to create knowledge through original research in their areas of specialization. This course will orient new doctoral students to learning at the doctoral level and prepare them for the entire program of study. Students will develop a Doctoral Learning Contract (DLC) that will serve as guides through graduation. (3)

RSC-805 IA Standards and Frameworks
This course covers Information Assurance (IA) umbrella standards and frameworks for cyber security and the broad areas of knowledge considered important for practicing professionals in information assurance. Students will acquire the means to identify a body of core knowledge and skills that all programs should contain as well as the ability to work with models of scope and assurance standards and practices. With this foundation, the course provides students with rigorous methods for eliciting information assurance requirements using identification, characterization, categorization and modeling. Prerequisite: RSC-801. (3)

RSC-810 Professional Research Theory and Practice I
Students will examine the research process in the context of quantitative and qualitative methods. Students will develop a purpose statement, problem statement, and research question. Prerequisite: RSC-801. (3)

RSC-812 Professional Research Theory and Practice II
This course takes the foundational research designs established in IAE-860 and provides students with practical applications of research design in chapters one and three of the dissertation. Students will generate significant portions of the writing in these areas. Prerequisite: RSC-825 and IAE-860 (3)

RSC-813 Professional Ethics and Leadership
This course examines the role of ethics. Cultural diversity, legal behaviors and the impacts of moral behaviors on business, corporations and agencies are presented in case studies. The various roles and impacts of unethical behaviors by system users, managers, executives and consultants will be analyzed and the positive and negative impacts discussed as they pertain to the overall trustworthiness. IRB requirements as it relates to research and human subjects will be examined in this course. Prerequisite: RSC-801. (3)

RSC-815 Problem Solving and Decision Making Using Quantitative Methods
The objective of this course is to provide students with the necessary knowledge to design and implement quantitative data analysis as part of scholarly research. The focus is on crafting research questions, hypotheses and proper data collection schemes. Students will explore a range of data analysis techniques useful for testing hypothesis and answering research questions. Research topics include: survey design, correlational design, causal-comparative design and experimental designs. Statistics topics include: types of data, parametric versus non-parametric classes of tests, descriptive statistics and inferential statistics. Prior experience with statistics is not required. (3)

RSC-820 Situational Awareness, Analysis and Action (Residency) Students will generate a purpose statement, problem statement, and research question within their selected dissertation topic area. Prerequisite/Corequisite: RSC-810. (3)

RSC-825 Applied Research in IA
Building on RSC-810 and RSC-820, students will engage in formal research in order to develop a background of their topic problem statement and to locate seminal research for the topic. Prerequisite: RSC-820. (3)

RSC-900 Writing the Doctoral Dissertation
Students work individually with the dissertation mentor to complete the dissertation proposal and prepare for the competency examination. Prerequisite: RSC-925. (3)

RSC-925 Dissertation Preparation I
(Residency) Students will generate significant portions of the dissertation proposal and receive faculty feedback on completed sections. Prerequisite: RSC-812. (3)

RSC-935 Dissertation Preparation II
Students complete the dissertation milestones developed by the student and the mentor. Students who are not prepared to defend after completing DSR-395 must enroll in DSR-940. Prerequisite: RSC-900. (3)

RSC-950 Dissertation Preparation III and Oral Defense
Learners prepare the dissertation for publication. Learner research is examined through an oral defense. Prerequisite: Approval of department dean. (3)

SE-301 Software Engineering
Introduction to software design. Software performance, modularity, portability and reliability. Students apply engineering principles to create software solutions to specified problems. Software testing and CASE tools introduced. Emphasis on UML and object-oriented code. Prerequisite: CS-220. Offered during fall semester only. (2-2-3)

SE-321 Human Computer Interaction
Students learn user-centered design of computer systems with the goal of high usability. Emphasis is on designing systems that are efficient, easy-to-use, enjoyable and effective. Explores the selection of interaction styles, hardware, and the use of color, font, text and images. Explores design implications due to user characteristics such as age, dexterity, experience and disabilities. Students learn requirements gathering, prototype building and user testing. A group project is assigned. Prerequisite: CS-220 or BUS-250. Offered during Spring semester only. (3-0-3)

SE-351 Software Testing
Covers the techniques and concepts required for software testing. Topics covered include software testing at the unit, module, subsystem and system levels; coverage criteria, manual and automated techniques for test validation and data generation; formal testing processes and standards (with an emphasis on CMMI); rational tools suite; inspections; black box vs. white box testing; functional testing; and testability analysis. Prerequisites: SE-301 and CS-220 or permission of the instructor. (2-2-3)

SE-458 Senior Design Project
Student proposes, designs, builds, and tests a working software project. Students write a report according to specifications and deliver an oral presentation for review. For SE, WD, CS, CE and CET programs. CE and CET students should see advisor before registering. Prerequisites are EN-406 and senior standing. (3-0-3)

SM-513 Systems Management and Organization
Basic concepts applied to managing large-scale systems. Perspectives and philosophies of organization, functions and processes of systems management and organizational leadership. (3)

SM-513 Systems Management & Organization
Basic concepts applied to managing large-scale systems. Perspectives and philosophies of organization, functions and processes of systems management and organizational leadership. (3)

SM-517 Psychological Factors in Systems Management
Human characteristics and their bearing on systems management critical review of theory
and research on personality, motivation, values, stress, leadership skills and power bases. (3) SM 518 Principles of Systems

Systems theories, methodologies, thinking and practice; hard and soft systems approaches; multidisciplinary approaches to organizational problem solving, feedback loops and system change. (3)

SM 563 Managing Information Systems

This course provides the student with an understanding of principles, practices, methodologies, and terminology used in planning, designing, implementing, operating, and managing information systems in government and industry. The overall approach is to examine the technology and roles of information systems within the organization, concentrating on how information systems are designed and how they operate. Knowledge of computer concepts will be provided to students new to this field. (3)

SM 567 Business Data Communications and Networking

This course is designed to develop skills and proficiency in information systems which use telecommunications facilities, computer networks, data communications, distributed processing, interactive systems and the planning, design and analysis of telecommunications-based information systems for systems management. This course was formerly entitled “Telecommunications and Computer Networks.” (3)

SM 569 Decision Support and Expert Systems

This course helps the student understand techniques, terminology, principles, concepts and methodologies for using computers in decision making in business, aerospace, and government. The overall approach examines the nature and processes of decision making, using a framework of Decision Support Systems (DSS) and Expert Systems, and explores specific computer applications in a variety of management decision situations applying learned techniques in a project. (3)

SM 587 Law and Regulation of E-Commerce

The course is an examination of the complex political, legal and regulatory compliance issues influencing electronic commerce. This course will attempt to make sense of the status quo ante of electronic law and regulation to enable students to conduct business online. The future landscape, based upon developments in technology, applications, proposed legislation and administrative rule making, is discussed. (3)

SM 600 Special Topics in Systems Management

Research into systems management subjects. Student primarily works in a guided study format with a mentor. Permission required from the instructor and academic dean. This course may be repeated with different projects. (1-4)

SP 358 Internship Program

This is an elective course intended to provide students an alternate educational experience in industry and government that complements and strengthens their classroom education. Internship positions must be related to the students major and be creative and analytical in nature, for a minimum of eight weeks. The intern is under the supervision or mentorship of an experienced professional. Prerequisites: junior or senior status. Cumulative GPA 2.8+ and 3.0+ in major. Approval of appropriate dean required. (3-0-3)

SP 400 Special Topics in Business and Technology

Students are provided the opportunity to examine topics of special interest in the field of business, management and technology. The student works in a guided study format with a mentor. Permission is required from the instructor and the academic dean. This course may be repeated with different projects. (3-0-3)

SS 171 Introduction to Psychology

This course is a fundamental study of human behavior exploring such topics as learning and cognition, the early, intelligences, and emotional, consciousness, personality, and abnormal behavior. A discussion of the scientific character of psychology and the research methodology employed in the discipline will be included. Prerequisite or Corequisite: EN 001 or EN 101. (3-0-3)

SS 175 Introduction to Sociology

A survey of the basic concepts and principles of sociology, culture, human nature, personality and the self, socialization, society, group, norms and deviance, and institutions. The topic of social problems will be addressed by an in-depth examination of a contemporary issue. A primary text and newspapers, magazines and journals will be used for this unit in addition to the textbook. Prerequisite: EN 101. (3-0-3)

SS 181 Human Development

This course provides a comprehensive and integrated overview of human development from a psychological perspective. The lifespan model provides a coherent time-line approach for students to study, observe, and reflect on personal life developments as well as how relationships with individuals, families, and communities are integral to our development as humans. Prerequisite or Corequisite: EN 101. (3-0-3)

SS 272 Group Dynamics

Focuses on interpersonal relations and skills development; cross-cultural relations and communication; organizational climate and culture and their relationship and impact on individuals and groups; personality traits and learn building and character; group norms and functions in high-tech organizations both in the United States and abroad. Corequisite: EN 102. (3-0-3)

SS 275 History of Modern Culture

This course offers students a review and survey of world history and how it affected culture from 1946 to present through the use of the Internet. Students will learn the important historical events during this time period and how they impacted society, culture and politics. Students will learn major historical events, their geographical location and their world impact. Students will select a subject and throughout the semester be able to discuss their subject as it relates to the time period covered. Students may do oral and written presentations covering 1946 to modern times. Corequisite: EN 101. (3-0-3)

SS 301 History of Technology

This is a survey course designed to give students an overall view of the development and effect of technology on American economic trends, social trends and cultural traditions through critical analysis. The focus of the course will be on the present day. Prerequisite: EN 102. (3-0-3)

SS 351 Ethics

This course is designed to help students improve their ability to make ethical decisions in business. This is done by providing a framework that enables the student to identify, analyze, and resolve ethical issues that arise when making decisions in business. Case analysis is a primary tool of this course. Prerequisite: EN 102. (3-0-3)

SS 400 Social Science: Special Topics

Research into social sciences. Student primarily works in a guided study format with a mentor. Permission is required from the instructor and academic dean. Prerequisite: EN 101. (3)

TC 110 Introduction to Telecommunications


TC 309 Network Simulation and Modeling

Provides an introduction to probability, statistics, and discrete event simulation. Topics include survey of discrete and continuous simulation languages, elementary queuing theory, discrete and continuous random variable selection applied to computer networks. Information is used to generate random variables to study network traffic, network utilization, response time, throughput, capacity, and queuing delay for discrete event simulation models. Emphasis is placed on student design development. An introduction to the use of simulation software is included. Prerequisites: MA 128 or MA 345 and MA 261 and TC 110 or equivalent. (2-2-3)

TC 359 Networking Modeling and Design

A continuation of TC 309 where students are expected to design model, simulate and analyze networks to meet real-world situations. Networks are designed and tested for traffic handling capabilities and robustness. Alternate network solutions are proposed and tested. Virtual simulation software is used throughout course. Prerequisite TC 309 (2-2-3)

TC 400 Special Projects in Telecommunications

Guided study. This course is a project course in which students research a problem in the field of telecommunications under the guidance of a professor or member of the academic staff. Students are required to produce a final written and oral presentation of their effort. Prerequisite: Permission of instructor. (0-6-3)

TC 401 Advanced Topics in Telecommunications

Layered protocol models. Ethernet, TCP/IP with mathematical throughput analysis. SMTP, POP, HTTP analyzed using Ethernet. Number theory, encryption and authentication. The RSA algorithm. Routing algorithms (RIP, OSPF). Optimal capacity assignment. Laboratory exercises performed using actual constructed networks (Windows/Linux) and virtual networks (in VMware). Prerequisites: CT 152 and MA 128 or equivalent. (2-2-3)

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Addie Plavetzky
Faculty
Andres David Aguirre
Adjunct Professor
BA, Ashford University
MS, Capitol College
Audrey L. Andrews
Professor of Practice
BA, Norfolk State University
MBA, DM, University of Phoenix
MS, Capitol College
Alex “Sandy” Antunes
Assistant Professor
BS, Boston University
MS, Pennsylvania State University
PhD, George Mason University
Andres Aguirre
Adjunct Professor
MS, Capitol College
James A. Arida
Adjunct Professor
BS, MS, Polytechnic University
Hasna Banu
Adjunct Professor
BS, University of Dhaka
MS, University of Dhaka
PhD, University of London
Tommy J. Bargaory
Adjunct Professor
BA, University of Texas, Austin
MBA, George Washington University
Helen G. Barker
Dean, School of Business and Information Sciences
BA, BS, Thomas Edison State College
MA, Strayer University
DM, University of Phoenix
Charles E. Bass
Adjunct Professor
BA, University of Massachusetts, Amherst
JD, Golden Gate University
Malcolm W. Beckett
Adjunct Professor
BS, Bluefield College
MS, Capitol College
Kristen Ward Broz
Adjunct Professor
BA, University of Virginia
JD, George Washington University
Juanita A. Butler
Adjunct Professor
BA, National University
MS, National University
MS, Washington University
William H. Butler
Chair, Information Assurance
Assistant Professor
BS, Brenau College
MS, University of Maryland, College Park
Valentin Buzduga
Adjunct Professor
MS, G.H. Asachi Technical University
PhD, University Politecnica of Bucharest
Susanna Carey
Adjunct Professor
BA, Messiah College
MLS, Drexel University
Jami M. Carroll
Adjunct Professor
BA, National University
MBA, Southern New Hampshire University
MS, Capitol College
Charles E. Case
Professor
BS, Capitol College
MS, Loyola College
Marshal of the College
Charles L. Cayot
Adjunct Professor
BS, New York University
MS, Polytechnic University
Kellep Arnold Charles
Adjunct Professor
BS, North Carolina A&T State University
MS, University of Maryland – Univ. College
Karim J. Chichakly
Adjunct Professor
BA, Skidmore College
BE, ME, Dartmouth College
PhD, University of Vermont
Peter H. Christensen
Adjunct Professor
BA, Linfield College
MS, U.S. Naval Postgraduate School
Wallace M. Ciepiela
Adjunct Professor
BA, Buffalo State College
MS, Florida Institute of Technology
Rodney A. Colton
Adjunct Professor
BS, University of Nevada
MS, U.S. Naval Postgraduate School
Charles D. Conner
Professor
BS, MS, University of Maryland, College Park
PhD, The Catholic University of America
John Cordani
Adjunct Professor
BS, MS, State University of New York, New Paltz
MED, EdD, Columbia University
EJD, Kaplan University
Max Dolinsky
Adjunct Professor
BS, MS, PhD, Ecole Polytechnique
Charles K. Edwards
Adjunct Professor
BS, Capitol College
MS, Loyola College in Maryland
PhD, Nova Scotia University
Randy N. Esner
Adjunct Professor
BS, Wayland Baptist University
MED, Towson University
PhD, University of Maryland, College Park
Andrew H. Exner
Adjunct Professor
BA, BS, Messiah College
MBA, Capitol College
Danielle E. Faison
Assistant Professor
BS, James Madison University
MS, Capitol College
Howard Feldmesser
Adjunct Professor
BS, Rutgers University
MS, The Johns Hopkins University
Jack M. Felsher
Adjunct Professor
BS, University of Evansville
MS, Embry Riddle Aeronautical University
Amanda-Diana Raye Fennel
Adjunct Professor
BS, Radford University
MS, George Washington University
Navon C. Ferrell
Adjunct Professor
BS, Capitol College
William H. Flood
Assistant Professor
BS, M.Ed, University of Delaware
MA, Regent University
Daniel R. Ford
Adjunct Professor
BS, Strayer University
MS, Capitol College
DSc, Capitol College
Hervé J. Franceschi
Professor
BS, Ecole Polytechnique
BS, Ecole Nationale
MS, Stanford University
MS, University of Maryland, Baltimore County
James W. Genovese
Adjunct Professor
BA, MA, State University of New York, Stony Brook
MS, Villanova University
PhD, State University of New York, Albany
Justin M. Gensel
Adjunct Professor
BS, Capitol College
ическая Академия, Москва
PhD, University of Maryland, College Park
James Haughton  
Adjunct Professor  
MA, George Mason University

Robert A. Herschbach  
Adjunct Professor  
BS, University of Virginia  
MA, University of Southern Mississippi  
MFA, University of Iowa  
PhD, University of New Hampshire

Bradley J. Hewitt  
Adjunct Professor  
BS, MBA, Capitol College

Dan Hickey  
Adjunct Professor  
BS, State University of New York  
MA, Webster University

George Hoffman  
Adjunct Professor  
BS, Clemson University  
MS, Capitol College

Warren Holt  
Adjunct Professor  
BS, Park University

Daniel G. Jablonski  
Adjunct Professor  
BS, MS, Massachusetts Institute of Technology  
PhD, University of Cambridge

Ilya Kerzhner  
Adjunct Professor  
MS, PhD, Ural State University

Barbara Key  
Adjunct Professor  
ME, Stevens Institute of Technology

Jamy D. Klein  
Adjunct Professor  
BS, University of Phoenix  
MS, Capitol College

Juanita Koilpillai  
Adjunct Professor  
MA, University of Kansas

Warren Drew Lerner  
Adjunct Professor  
BS, University of Maryland  
MS, Florida Institute of Technology  
DSc, Capitol College

Darryl J. Lesesne  
Adjunct Professor  
BA, Howard University  
MS, University of Maryland

Rosana M. Lemus  
Adjunct Professor  
BA, University of Missouri  
MA, University of Missouri

Ray A. Letteer  
Adjunct Professor  
BA, University of Maryland  
MS, Capitol College  
D.Sc, Capitol College

Priscilla A. Lewis  
Adjunct Professor  
BA, University of Maryland  
MBA, University of Maryland  
DM, University of Maryland

William P. Littleton  
Adjunct Professor  
BS, Capitol College  
MS, Capitol College

Mary M. Magrohan  
Adjunct Professor  
BS, Capitol College

Rishabh Yogendra Maharaja  
Adjunct Professor  
BS, Capitol College  
MS, Capitol College

Ronald Martin  
Adjunct Professor  
MS, Frostburg State University

Vera McKee  
Adjunct Professor  
MSc, University of Oxford

Andrew A. Mehri  
Professor  
AAS, Montgomery County Community College  
BS, MS, Capitol College

Kenneth I. Mayer  
Adjunct Professor  
BA, Brown University  
MS, PhD, University of Texas at Austin

Adam N. Meyer  
Adjunct Professor  
BS, American Military University  
MS, Capitol College

Anthony G. Miller  
Adjunct Professor  
BS, Clarion University of Pennsylvania  
MBA, Capitol College

John P. Minogue  
Adjunct Professor  
BA, St. Mary’s Seminary  
MA, DePaul University  
MDiv, DeAndreis Institute of Theology  
DMin, St. Mary of the Lake Seminary

David M. Monahan  
Adjunct Professor  
MS, Capitol College  
MS, North Carolina State University

Sandra D. Moore  
Adjunct Professor  
BS, University of Arizona  
BS, Utica College-Syracuse University  
MS, Utica College

Scott A. Moser  
Adjunct Professor  
AAS, BS, Capitol College  
MA, MS, Hood College  
PhD, Clemson University

Mark B. Moss  
Adjunct Professor  
BS, Massachusetts Institute of Technology  
MS, Stanford University  
PhD, Georgia Institute of Technology

Heather Marie Myles  
Adjunct Professor  
BA, Oakwood College  
MS, Columbia University

Vincent J. Nestler  
Adjunct Professor  
BA, State University of New York College, New Paltz  
MA, Columbia University  
PhD, Idaho State University

Pamela J. Opeka  
Assistant Professor  
BS, Indiana University of Pennsylvania  
MED, University of Maryland, College Park

Charles R. Parsons  
Adjunct Professor  
BS, Rice University  
PhD, University of Texas, Austin

Jason Michael Pittman  
Assistant Professor  
BA, Malone College  
MS, DSc, Capitol College

Lauren E. Player  
Adjunct Professor  
BS, Radford University  
MA, Towson University

Jeffrey Pullen  
Adjunct Professor  
MBA, DeVry University  
MS, DeVry University  
MS, Strayer University  
MS, University of Maryland

Claude A. Rankin  
Chair, Business and Humanities  
Associate Professor  
BA, George Washington University  
MA, University of Maryland, College Park

Calvin Reed  
Adjunct Professor  
BA, Michigan State University, Lansing  
MS, Capitol College

Thomas Reid Rivenburgh  
Adjunct Professor  
BS, Capitol College  
BS, MS, Embry Riddle Aeronautical University
Refer to Capitol College’s online calendar at www.capitol-college.edu for an updated calendar.
**Graduate Classes**

**Semester-long Classes**

- **Aug. 22** Final day of registration
- **Aug. 25** Classes begin
  - Last day for 100% refund
  - First 50% tuition installment due
- **Sept. 1** Labor Day – college closed
  - (Online classes will meet asynchronously.)
- **Sept. 8** Last day for 75% refund
  - Last day to add a course
- **Sept. 15** Last day for 50% refund
- **Sept. 22** Last day for 25% refund
  - Final 50% tuition installment due
- **Oct. 29** Registration for spring semester begins
- **Nov. 3** Last day to drop or audit course
  - College closes at 5 p.m.
  - (Online classes will meet asynchronously.)
- **Nov. 27-30** Thanksgiving – college closed
  - (Online classes will meet asynchronously.)
- **Dec. 5** Last day to withdraw
- **Dec. 12** Classes end
- **Dec. 17** College closes at 5 p.m.
- **Dec. 19-Jan. 1** Winter recess – college closed

**Fall – Term I**

- **Aug. 22** Final day of registration
- **Aug. 25** Classes begin
  - Last day for 100% refund
  - First 50% tuition installment due
- **Sept. 1** Labor Day – college closed
  - (Online classes will meet asynchronously.)
- **Sept. 8** Last day for 75% refund
  - Last day to add a course
- **Sept. 15** Last day for 50% refund
- **Sept. 22** Last day for 25% refund
  - Final 50% tuition installment due
- **Oct. 10** Last day to withdraw
- **Oct. 17** Classes end

**Fall – Term II**

- **Oct. 17** Final day of registration
- **Oct. 20** Classes begin
  - Last day for 100% refund
  - First 50% tuition installment due
- **Oct. 27** Last day for 75% refund
  - Last day to add a course
- **Oct. 29** Registration for spring semester begins
- **Nov. 3** Last day for 50% refund
- **Nov. 10** Last day for 25% refund
- **Nov. 11** Last day to drop or audit course
- **Nov. 17** Final 50% tuition installment due
- **Nov. 26** College closes at 5 p.m.
  - (Online classes will meet asynchronously.)
- **Nov. 27-30** Thanksgiving – college closed
  - (Online classes will meet asynchronously.)
- **Dec. 5** Last day to withdraw
- **Dec. 12** Classes end
- **Dec. 17** College closes at 5 p.m.
- **Dec. 18-Jan. 1** Winter recess – college closed

**Spring Semester 2015**

**Undergraduate Classes**

**Semester-long Classes**

- **Jan. 2-9** Registration for part-time students
- **Jan. 2** College opens
- **Jan. 8** Residence hall check-in for new students
- **Jan. 9** Final day of registration
  - Graduation applications due for Class of 2014
  - Orientation and registration for new students
- **Jan. 10** Residence hall check-in for returning students
- **Jan. 12** Classes begin
  - Last day for 100% refund
  - First tuition installment due
  - Library opens
  - Co-op work period begins
- **Jan. 19** Martin Luther King Jr. Day – college closed
- **Jan. 20** Electronics, physics and chemistry labs open
  - Learning Center opens
  - All library materials are due
- **Feb. 2** Last day for 50% refund
- **Feb. 9** Last day for 25% refund
  - Last day to drop course without W
- **Feb. 10** Second tuition installment due
  - Final 50% tuition installment due
- **Feb. 16** Registration for summer semester begins for continuing students
- **May 4** Classes end
  - Last day to withdraw
  - Financial Aid Disbursement Week/Pell Census
- **May 5-11** Final examinations
- **May 21** Library closes
- **May 24** Residence halls close at 7 p.m.
- **May 26** Commencement

**Fall – Term I**

- **Aug. 22** Final day of registration
- **Aug. 25** Classes begin
  - Last day for 100% refund
  - First 50% tuition installment due
- **Sept. 1** Labor Day – college closed
  - (Online classes will meet asynchronously.)
- **Sept. 8** Last day for 75% refund
  - Last day to add a course
- **Sept. 15** Last day for 50% refund
- **Sept. 22** Last day for 25% refund
  - Final 50% tuition installment due
- **Oct. 10** Last day to withdraw
- **Oct. 17** Classes end

**Fall – Term II**

- **Oct. 17** Final day of registration
- **Oct. 20** Classes begin
  - Last day for 100% refund
  - First 50% tuition installment due
- **Oct. 27** Last day for 75% refund
  - Last day to add a course
- **Oct. 29** Registration for spring semester begins
- **Nov. 3** Last day for 50% refund
- **Nov. 10** Last day for 25% refund
- **Nov. 11** Last day to drop or audit course
- **Nov. 17** Final 50% tuition installment due
- **Nov. 26** College closes at 5 p.m.
  - (Online classes will meet asynchronously.)
- **Nov. 27-30** Thanksgiving – college closed
  - (Online classes will meet asynchronously.)
- **Dec. 5** Last day to withdraw
- **Dec. 12** Classes end
- **Dec. 17** College closes at 5 p.m.
- **Dec. 18-Jan. 1** Winter recess – college closed

**Fall – Term II**

- **Dec. 18-Jan. 1** Winter recess – college closed

Refer to Capitol College’s online calendar at www.capitol-college.edu for an updated calendar.
Refer to Capitol College’s online calendar at www.capitol-college.edu for an updated calendar.
Graduate Classes

Semester-long Classes

Apr. 24  Final day of registration
Apr. 27  Classes begin
May 11  Last day for 75% refund
May 16  Commencement
May 18  Last day for 50% refund
May 25  Memorial Day – college closed

(Online classes will meet asynchronously.)

Apr. 24  Final day of registration
Apr. 27  Classes begin
May 11  Last day for 75% refund
May 16  Commencement
May 18  Last day for 50% refund
May 25  Memorial Day – college closed

(Online classes will meet asynchronously.)

Summer – Term I

July 4  Independence Day – college closed
July 6  Last day to drop or audit course
Aug. 7  Last day to withdraw
Aug. 14  Classes end

Summer – Term II

June 19  Final day of registration
June 22  Classes begin
June 29  Last day for 75% refund
June 19  Classes end

Fall Semester 2015

Undergraduate Classes

Semester-long Classes

Aug. 10-14  Registration for part-time students
Aug. 12-14  Orientation, registration and residence hall check-in for new students
Aug. 14   Final day of registration
Dec. 7-11  Final examinations
Aug. 15   Residence hall check-in for returning students
Dec. 11   Library closes
Aug. 17   Classes begin
Dec. 16   Residence halls close at 5 p.m.
Aug. 31   Last day for 75% refund
Dec. 17-Jan. 3 Winter recess – college closed
Sept. 7   Labor Day – college closed
Sept. 8   Last day to add a course
Sept. 14  Last day for 25% refund
Sept. 20   Last day to drop without a W
Second tuition installments due
Sept. 14-21  Financial Aid Disbursement Week/ Pell Census
Oct. 9   Final tuition installment due
Oct. 26   Last day to drop course with W or audit course
Registration for spring semester begins for continuing students
Nov. 25   Classes canceled – college closes at 5 p.m.
Nov. 26-29  Thanksgiving recess – college closed
Dec. 4   Classes end

Refer to Capitol College’s online calendar at www.capitol-college.edu for an updated calendar.
Spring Semester 2016

Undergraduate Classes

Semester-long Classes

Jan. 4-8 Registration for part-time students
Jan. 4 University opens
Jan. 7 Residence hall check-in for new students
Jan. 8 Final day of registration
Graduation applications due for Class of 2016
Orientation and registration for new students
Jan. 9 Residence hall check-in for returning students
Jan. 11 Classes begin
Last day for 100% refund
First tuition installments due
Library opens
Co-op work period begins
Jan. 18 Martin Luther King Jr. Day -- university closed.
Online courses will meet asynchronously.
Jan. 19 Electronics, physics and chemistry labs open
Learning Center opens
Jan. 25 Last day for 75% refund
Last day to add a course
Feb. 1 Last day for 50% refund
Feb. 8 Last day for 25% refund
Last day to drop course without W
Second tuition installments due
Feb. 8-15 Financial Aid Disbursement Week/
Pell Census
Mar. 4 Final tuition installment due
Spring recess (service offices open)
Mar. 14-18 Classes resume
Mar. 21 Last day to drop course with W or audit course
Apr. 6 Registration for summer semester begins for continuing students
Apr. 13 Pre-registration for fall semester begins for continuing students
May 2 Classes end
Last day to withdraw
Electronics, physics and chemistry labs close
Learning Center closes
All library materials are due
Last day for cooperative education work
Final examinations
Library closes
Residence halls close at 7 p.m.
Commencement

Refer to Capitol College’s online calendar at www.capitol-college.edu for an updated calendar.

Graduate Classes

Semester-long Classes

Jan. 4 University opens
Jan. 5 Classes begin
Last day for 100% refund
First 50% tuition installment due
Graduation applications due for Class of 2016
Jan. 18 Martin Luther King Day -- university closed. (Online courses will meet asynchronously.)
Jan. 20 Last day for 75% refund
Last day to add a course
Jan. 26 Last day for 50% refund
Feb. 2 Last day for 25% refund
Final 50% tuition installment due
Mar. 7 Registration for summer session begins
Mar. 15 Last day to drop or audit course
Apr. 11 Pre-registration for fall semester begins
Apr. 18 Last day to withdraw
Apr. 25 Classes end
May 14 Commencement

Spring -- Term I

Jan. 4 University opens
Jan. 5 Classes begin
Jan. 12 Last day for 75% refund
Jan. 18 Martin Luther King Day -- university closed. (Online courses will meet asynchronously.)
Jan. 20 Last day for 75% refund
Last day to add a course
Jan. 26 Last day for 50% refund
Feb. 2 Last day for 25% refund
Feb. 29 Classes end
Mar. 7 Final 50% tuition installment due
Mar. 8 Registration for summer session begins
Mar. 15 Last day for 50% refund
Mar. 22 Last day for 25% refund
Mar. 29 Final 50% tuition installment due
Apr. 11 Pre-registration for fall semester begins

Spring -- Term II

Feb. 29 Final day of registration
Mar. 1 Classes begin
Last day for 100% refund
Mar. 7 Registration for summer session begins
Mar. 8 First 50% tuition installment due
Last day for 75% refund
Last day to add a course
Mar. 15 Last day for 50% refund
Mar. 22 Last day for 25% refund
Mar. 29 Final 50% tuition installment due
Apr. 11 Pre-registration for fall semester begins

Refer to Capitol College’s online calendar at www.capitol-college.edu for an updated calendar.
## Summer Session 2016

### Undergraduate Classes

#### Session-long Classes

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>May 13</td>
<td>Final day of registration</td>
</tr>
<tr>
<td></td>
<td>August graduates notify Office of Registration and Records</td>
</tr>
<tr>
<td></td>
<td>Cooperative education work period begins</td>
</tr>
<tr>
<td>May 16</td>
<td>Classes begin</td>
</tr>
<tr>
<td></td>
<td>Last day for 100% refund for 8- and 11-week courses</td>
</tr>
<tr>
<td></td>
<td>First tuition installments due</td>
</tr>
<tr>
<td>Library</td>
<td>opens</td>
</tr>
<tr>
<td>May 23</td>
<td>Last day for 75% refund for 8-week courses</td>
</tr>
<tr>
<td></td>
<td>Electronics, physics and chemistry labs open</td>
</tr>
<tr>
<td></td>
<td>Last day to add a course</td>
</tr>
<tr>
<td>May 30</td>
<td>Memorial Day – university closed</td>
</tr>
<tr>
<td>May 31</td>
<td>Second tuition installments due for 8-week courses</td>
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<tr>
<td></td>
<td>Last day for 50% refund for 8-week courses</td>
</tr>
<tr>
<td></td>
<td>Last day for 75% refund for 11-week courses</td>
</tr>
<tr>
<td>June 6</td>
<td>Last day for 25% refund for 8-week courses</td>
</tr>
<tr>
<td></td>
<td>Last day to drop 8-week course without W</td>
</tr>
<tr>
<td></td>
<td>Last day for 50% refund for 11-week courses</td>
</tr>
<tr>
<td>June 7</td>
<td>Last day to drop 8-week course with W or audit 8-week course</td>
</tr>
<tr>
<td>June 13</td>
<td>Last day for 25% refund for 8-week courses</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 20</td>
<td>Financial Aid Disbursement Week/ Pell Census</td>
</tr>
<tr>
<td>June 27</td>
<td>Final tuition installment due for 8-week courses</td>
</tr>
<tr>
<td>June 27</td>
<td>Final tuition installment due for 11-week courses</td>
</tr>
<tr>
<td>July 1</td>
<td>Last day to withdraw from 8-week courses</td>
</tr>
<tr>
<td></td>
<td>Last day to drop 11-week course with W or audit 11-week course</td>
</tr>
<tr>
<td></td>
<td>Classes end for 8-week courses</td>
</tr>
<tr>
<td>July 4</td>
<td>Independence Day – university closed</td>
</tr>
<tr>
<td>July 5-11</td>
<td>Final exams for 8-week courses</td>
</tr>
<tr>
<td>July 11</td>
<td>Final tuition installment due for 11-week courses</td>
</tr>
<tr>
<td>July 26</td>
<td>Classes end for 11-week courses</td>
</tr>
<tr>
<td></td>
<td>Electronics, physics and chemistry labs close</td>
</tr>
<tr>
<td></td>
<td>All library materials are due</td>
</tr>
<tr>
<td></td>
<td>Last day to withdraw from 11-week courses</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>July 27 - Aug. 2</td>
<td>Final exams for 11-week courses</td>
</tr>
</tbody>
</table>

### Graduate Classes

#### Semester-long Classes

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>Apr. 26</td>
<td>Final day of registration</td>
</tr>
<tr>
<td>Apr. 27</td>
<td>Classes begin</td>
</tr>
<tr>
<td>May 12</td>
<td>Last day for 100% refund</td>
</tr>
<tr>
<td></td>
<td>First day for 50% tuition installment due</td>
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<tr>
<td>May 12</td>
<td>Last day for 75% refund</td>
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<tr>
<td>May 14</td>
<td>Commencement</td>
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<tr>
<td>May 19</td>
<td>Last day for 50% refund</td>
</tr>
<tr>
<td>May 26</td>
<td>Last day for 25% refund</td>
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<tr>
<td></td>
<td>Final 50% tuition installment due</td>
</tr>
<tr>
<td>May 30</td>
<td>Memorial Day – university closed</td>
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<td>(Online classes will meet asynchronously.)</td>
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<tr>
<td>July 4</td>
<td>Independence Day – university closed</td>
</tr>
<tr>
<td></td>
<td>(Online classes will meet asynchronously.)</td>
</tr>
<tr>
<td>July 6</td>
<td>Last day to drop or audit course</td>
</tr>
<tr>
<td>Aug. 7</td>
<td>Last day to withdraw</td>
</tr>
<tr>
<td>Aug. 14</td>
<td>Classes end</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<tr>
<td>Apr. 26</td>
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<td>May 5</td>
<td>Last day for 100% refund</td>
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<td></td>
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<td></td>
<td>(Online classes will meet asynchronously.)</td>
</tr>
<tr>
<td>June 15</td>
<td>Final 50% tuition installment due</td>
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</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 22</td>
<td>Classes begin</td>
</tr>
<tr>
<td>July 1</td>
<td>Independence Day – university closed</td>
</tr>
<tr>
<td></td>
<td>(Online classes will meet asynchronously.)</td>
</tr>
<tr>
<td>July 4</td>
<td>Last day to drop or audit course</td>
</tr>
<tr>
<td>Aug. 10</td>
<td>Last day to withdraw</td>
</tr>
<tr>
<td>Aug. 16</td>
<td>Classes end</td>
</tr>
</tbody>
</table>

### Summer – Term I

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr. 26</td>
<td>Final day of registration</td>
</tr>
<tr>
<td>Apr. 27</td>
<td>Classes begin</td>
</tr>
<tr>
<td>May 5</td>
<td>Last day for 100% refund</td>
</tr>
<tr>
<td></td>
<td>First day for 50% tuition installment due</td>
</tr>
<tr>
<td>May 12</td>
<td>Last day for 75% refund</td>
</tr>
<tr>
<td>May 14</td>
<td>Commencement</td>
</tr>
<tr>
<td>May 19</td>
<td>Last day for 50% refund</td>
</tr>
<tr>
<td>May 26</td>
<td>Last day for 25% refund</td>
</tr>
<tr>
<td>May 30</td>
<td>Memorial Day – university closed</td>
</tr>
<tr>
<td></td>
<td>(Online classes will meet asynchronously.)</td>
</tr>
<tr>
<td>June 15</td>
<td>Final 50% tuition installment due</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 21</td>
<td>Classes begin</td>
</tr>
<tr>
<td>July 1</td>
<td>Independence Day – university closed</td>
</tr>
<tr>
<td></td>
<td>(Online classes will meet asynchronously.)</td>
</tr>
<tr>
<td>July 8</td>
<td>Last day for 50% refund</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 15</td>
<td>Last day for 25% refund</td>
</tr>
<tr>
<td>July 22</td>
<td>Last day to drop or audit course</td>
</tr>
<tr>
<td>Aug. 10</td>
<td>Last day to withdraw</td>
</tr>
<tr>
<td>Aug. 16</td>
<td>Classes end</td>
</tr>
</tbody>
</table>

### Summer – Term II

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 21</td>
<td>Final day of registration</td>
</tr>
<tr>
<td>June 22</td>
<td>Classes begin</td>
</tr>
<tr>
<td>July 1</td>
<td>Independence Day – university closed</td>
</tr>
<tr>
<td></td>
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<tr>
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</tr>
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<tr>
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<tbody>
<tr>
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</tbody>
</table>

Refer to Capitol College’s online calendar at www.capitol-college.edu for an updated calendar.
Directions from Washington, DC and points south of Laurel, MD:
Take the Baltimore/Washington Parkway (Exit 22, north off I-95) to the Beltsville Powder Mill Road exit. Turn left on Powder Mill Road and take the first right onto Springfield Road. Follow Springfield Road one mile. Capitol College is on the right.

Directions from Baltimore, MD and points north of Laurel, MD:
Take the Baltimore/Washington Parkway (Exit 7, south off I-695) to the Beltsville Powder Mill Road exit. Turn right on Powder Mill Road and take the first right onto Springfield Road. Follow Springfield Road one mile. Capitol College is on the right.