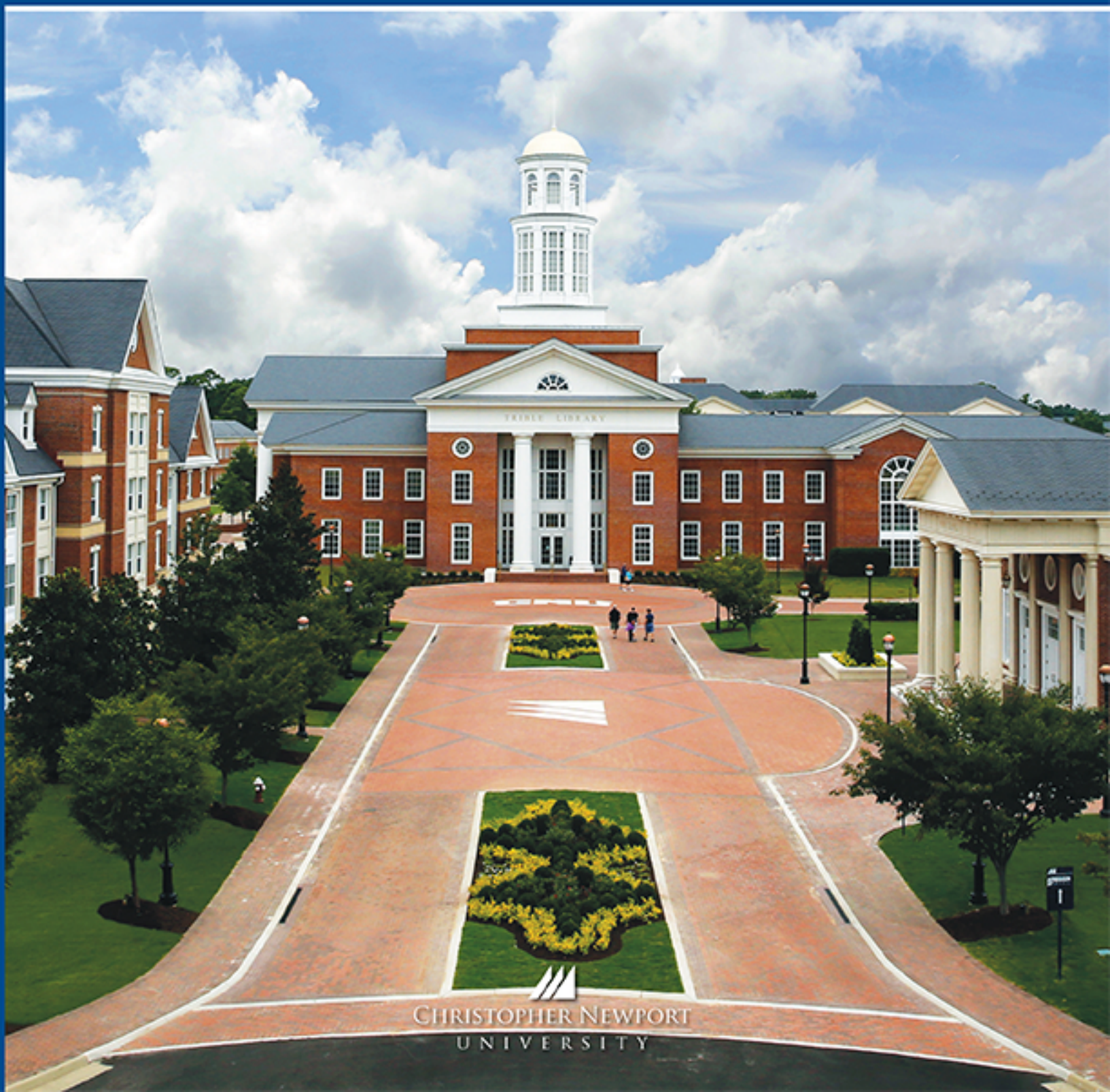
Christopher Newport University • 2014 – 2015 Graduate Catalog

Christopher Newport University

2014 – 2015 Graduate Catalog



CHRISTOPHER NEWPORT
UNIVERSITY

Graduate Catalog

2014-2015

The provisions of this catalog do not constitute a contract, expressed or implied, between any applicant or student and the Rector and Board of Visitors of Christopher Newport University. The University reserves the right to change any of the provisions, schedules, programs, courses, rules, regulations, or fees whenever the University deems it expedient to do so.

Christopher Newport University does not discriminate in admission, employment or any other activity, on the basis of race, gender, color, age, religion, veteran status, national origin, disability, sexual orientation or political affiliation. The University complies with all applicable state and federal constitutional provisions, laws and regulations concerning discrimination. Anyone having questions concerning these laws should contact the Director of Equal Opportunity.

1 Avenue of the Arts
Office of Graduate Studies
(757) 594 7544
McMurran Hall 159F
Newport News, VA 23606-3072
cnu.edu/gradstudies

Dear Prospective and Accepted Graduate Students:

Welcome to the graduate programs at Christopher Newport University. CNU prides itself in providing excellent instruction and intellectually challenging research opportunities to not only undergraduate students, but also students in our three graduate programs. We serve the commonwealth with three regionally accredited Master's degree programs: Master of Arts in Teaching (MAT), Master of Science in Environmental Science (MS-ENVS), and Master of Science in Applied Physics and Computer Science (MS-APCS).

The two MS programs emphasize strong intellectual exploration to enhance contributions to your profession and/or continued study towards a Ph.D. degree. The MS in Applied Physics and Computer Science has an excellent record of research and publication in nuclear physics, dynamical systems, artificial intelligence, instrumentation and advanced computer systems with strong connections to two national laboratories: the NASA Langley Research Center and the Thomas Jefferson National Accelerator Facility. The MS in Environmental Science provides an opportunity for students to work in the rapidly growing field of environmental monitoring and conservation. Students will work with top research scientists in such fields as wetland conservation, applied conservation biology, estuarine ecology, environmental microbiology, and atmospheric chemistry. In addition, the University offers five-year programs in which CNU students can complete both their undergraduate degree and the master's degree in five years.

The MAT program prepares students to become highly qualified, licensed teachers. Students take courses that will build on content knowledge and develop pedagogical tools for effective instructional practice. Faculty in our teaching program come from twelve departments across the University and the Newport News Public School System. The MAT faculty bring both excitement for teaching and practiced pedagogical instruction to the classroom. In addition to the traditional Master of Arts in Teaching degree, the program also offers an initial licensure only program and a five-year program for CNU students interested in earning a Bachelor's and Master's degree with Licensure.

The pages that follow explain each program in detail. We encourage you to visit each program's website for additional information. If you have any questions, do not hesitate to contact our Office of Graduate Studies via telephone (757) 594-7544 or email (gradstdy@cnu.edu).

Thank you for your interest in our graduate programs. We look forward to working with you as you progress towards the completion of your advanced degree.

Sincerely,

Geoffrey C. Klein

Geoffrey C. Klein, Ph.D.
Director of Graduate Studies
Vice Provost
Associate Professor of Chemistry

Student Responsibility for Graduate Catalog Information

Graduate students are held individually responsible for the information contained in the Christopher Newport University Graduate Catalog. Failure to read and comply with University regulations will not exempt students from whatever penalties they may incur. Students beginning their programs of graduate study at Christopher Newport University should retain this catalog as a reference.

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THE UNIVERSITY HONOR SYSTEM

The reputation and credibility of an institution of higher education requires the commitment of every member of the community to uphold and to protect its academic and social integrity. As such, all members of the Christopher Newport University community uphold and enforce the following:

The Honor Code:
"On my honor, I will maintain the highest standards of honesty, integrity and personal responsibility. This means I will not lie, cheat or steal, and as a member of this academic community, I am committed to creating an environment of respect and mutual trust."

Under the Honor Code of Christopher Newport University, it is expected that all members of the University community will demonstrate honesty and integrity in their conduct. Intentional acts of lying, stealing or cheating are violations of the Code that can result in sanctioning.

Each member of the University community is responsible for upholding and enforcing the Honor Code. The Honor System cannot function unless each member of the University community takes action when he or she believes that any person may have violated the Honor Code. Members of this University community are obligated to report violations to appropriate University personnel in order to ensure the efficacy of the system.

STUDENT ACADEMIC RESPONSIBILITIES

CNU is a community comprised of students who:

- Value higher education and the community of scholars;
- Understand the meaning and aims of liberal learning;
- Establish learning as their top priority;
- Take initiative to participate actively in their own learning;
- Prepare for class, and attend regularly and on time;
- Take learning seriously in thought, word and conduct;
- Complete assignments on time and with care;
- Respect all members of the academic community;
- Follow proper procedures and lines of authority for pursuing concerns and complaints;
- Know, understand and follow the *Code of Academic Work*, the *University Honor Code* and the *General Requirements for Graduation*;
- Take responsibility to seek help from faculty, staff and fellow students as needed to succeed academically.

CHRISTOPHER NEWPORT UNIVERSITY

Academic Calendar for Fall 2014 – Spring 2015

Fall 2014: August 25 - December 13

August	22	F	Freshman Convocation and Honor Code Induction Ceremony
	25	**M**	**Classes begin**
	25-29	M-F	Add/Drop period
	29	F	Last day to *Add/Drop* and elect *Audit* status
September	1	M	Labor Day – classes meet
	12	F	Deadline for faculty to submit *undergraduate* change or extension of *I* grades for Spring 2014 (5:00 p.m.)
	12	F	Deadline for faculty to submit *graduate* change or extension of *I* grades for Spring 2014 (5:00 p.m.)
October	6	M	Mid-term grade entry begins 8:00 a.m.
	10	F	Mid-term grades due by 12:00 noon
	10	F	*Fall Recess begins after last class meets*
	15	W	Classes resume
	29	W	Last day to *Withdraw* and elect *Pass/Fall* option
November	25	T	*Thanksgiving recess begins after last class meets*
December	1	M	Classes resume
	5	F	Classes end
	6-7	S-SU	University Reading/Study Day
	8	M	Final examinations begin
	8	M	Final grade entry begins 8:00 a.m.
	10	W	University Reading/Study Day
	13	S	Final examinations end
	17	W	GRADES DUE by 12:00 noon

Spring 2015: January 7 - April 28

January	**7**	**W**	**Classes begin**
	7-13	W-T	Add/Drop period
	13	T	Last day to *Add/Drop* and elect *Audit* status
	23	F	Deadline for faculty to submit *undergraduate* change or extension of *I* grades for Fall 2014 (5:00 p.m.)
	23	F	Deadline for faculty to submit *graduate* change or extension of *I* grades for Fall 2014 (5:00 p.m.)
February	23	M	Mid-term grade entry begins 8:00 a.m.
	27	F	Mid-term grades due by 12:00 noon
	27	F	*Spring Recess begins after last class*
March	9	M	Classes resume
	18	W	Last day to *Withdraw* and elect *Pass/Fall* option
April	21	T	Classes end
	22	W	University Reading/Study Day
	23	Th	Final examinations begin
	23	Th	Final grade entry begins 8:00 a.m.
	26	Su	University Reading/Study Day
	28	T	Final examinations end
May	1	F	**GRADES DUE by 10:00 a.m.**
	4-8	M-F	Commencement Week activities
	9	S	*Commencement*

Summer 2015

May 2015 Term Three-week session: M-F Classes May 11 - May 29

MAY	**11**	**M**	**Classes begin**
	12	T	Last day to *Drop/Add* and elect *Audi*t status-5:00 p.m.
	20	W	Last day to *Withdraw* and elect *Pass/Fail*-5:00 p.m.
	25	M	Holiday: no classes
	28	Th	Classes end
	29	F	Final grade entry begins 8:00 a.m.
June	2	T	GRADES DUE by 12:00 noon

Summer 2015 Extended Term: May 11 - August 7

May	**11**	**M**	**Classes may begin**
August	3	M	Final grade entry begins 8:00 a.m.
	7	F	Classes may end
	7	F	GRADES DUE by 12:00 noon

Summer 2015 Term 1 Four-week session: M-F Classes June 1 - June 26

June	**1**	**M**	**Classes begin**
	2	T	Last day to *Drop/Add* and elect *Audit* status-5:00 p.m.
June	15	M	Last day to *Withdraw* and elect *Pass/Fail*-5:00 p.m.
	24	W	Classes end
	25	Th	University Reading/Study Day
	26	F	Final examinations
	26	F	Final grade entry begins 8:00 a.m.
	30	T	GRADES DUE 12:00 noon

Summer 2015 Term 2 Five-week session: M-Th Classes July 6 - August 6

July	**6**	**M**	**Classes begin**
	7	T	Last day to *Drop/Add* and elect *Audit* status-5:00 p.m.
	20	M	Last day to *Withdraw* and elect *Pass/Fail*-5:00 p.m.
August	4	T	Classes end
	5	W	University Reading/Study Day
	6	Th	Final examinations
	6	Th	Final grade entry begins 8:00 a.m.
	11	T	GRADES DUE 12:00 noon

Note: Visit cnu.edu for the latest Academic Calendar updates.

CHRISTOPHER NEWPORT UNIVERSITY

1 Avenue of the Arts
Newport News, VA 23606-3072
(757) 594-7000
www.cnu.edu

Christopher Newport University is the youngest comprehensive university in the Commonwealth of Virginia. However, it came into being as part of the oldest academic institution in the Commonwealth. For this reason, it has a great sense of history and a strong vision of the future. Christopher Newport College was established by the Virginia General Assembly in 1960 as a two-year branch of The College of William and Mary. It became a four-year baccalaureate degree-granting institution in 1971 and became totally independent of The College of William and Mary in 1977.

The University began offering graduate programs in July 1991; and in July 1992 was renamed Christopher Newport University. The University derives its name from Captain Christopher Newport, who was put "in sole charge and command" of the squadron of three ships that landed at Jamestown in 1607. He was among the most important men connected with the permanent settling of Virginia.

Mission
The mission of Christopher Newport University is to provide educational and cultural opportunities that benefit CNU students, the residents of the Commonwealth of Virginia and the nation. CNU provides outstanding academic programs, encourages service and leadership within the community, and provides opportunities for student involvement in nationally and regionally recognized research and arts programs.

Our primary focus is excellence in teaching, inspired by sound scholarship. At CNU, personal attention in small classes creates a student-centered environment where creativity and excellence can flourish. Our primary emphasis is to provide outstanding undergraduate education. We also serve the Commonwealth with master's degree programs that provide intellectual and professional development for graduate-level students.

We are committed to providing a liberal arts education that stimulates intellectual inquiry and fosters social and civic values. CNU students acquire the qualities of mind and spirit that prepare them to lead lives with meaning and purpose. As a state university, we are committed to service that shapes the economic, civic, and cultural life of our community and Commonwealth.

Mission of Graduate Studies
The graduate programs at Christopher Newport University offer degrees at the master's level for the educational and professional enhancement and enrichment of students and in response to the needs of the CNU community. Graduate study at CNU requires students to extend their knowledge and intellectual maturity to a level of complexity and sophistication well beyond that of undergraduate education. Graduate students are required not only to gain an understanding of the subject matter and the nature of research in their discipline but also to engage in their own research projects (MS) or internship (MAT). The goal of this activity is to give the master's degree recipient greater ability to practice in and contribute to a profession or field of scholarship.

Graduate faculty members are active scholars in their fields who are recognized as productively engaged in their professions. As such, these faculty members serve as models for graduate students and provide for them an appropriate level of knowledge and research expertise. CNU's graduate programs are committed to teaching and scholarship of high quality and to the availability of faculty members to students.

Organization of the University
The faculty and academic departments of the University are organized into the College of Arts and Humanities, the College of Natural and Behavioral Sciences, and the College of Social Sciences that includes the Joseph W. Luter, III School of Business. The chief academic officer of the University is the Provost. The chief administrative officer of each college is the Dean, who reports directly to the Provost. Each academic department within a given college is responsible for the content and prerequisite structure of courses offered by the department and specifies the requirements for the department's degree and certification programs. The Chair is the chief administrative officer at the departmental level. The graduate program is administered by the Director of Graduate Studies. Instruction and research are carried out by the graduate faculty.

The University derives its financial support from the Virginia General Assembly and from tuition and fees paid by students. The Christopher Newport University Board of Visitors, appointed by the Governor of Virginia, directs the affairs of the University. The President of the University, appointed by the Board of Visitors, is the delegated authority over the administration and the courses of instruction.

Organization of the Academic Year
The University year is divided into two semesters, August to December (fall semester) and January to May (spring semester), May term and two summer terms. Graduate students may be admitted to the University for full or part-time study beginning the fall or spring semesters, or prior to the summer terms. **The Teacher Preparation Program admits students for spring semester and summer terms only**.

Accreditation
Christopher Newport University is accredited by the the Southern Association of Colleges and Schools Commissionon Colleges to award degrees at the baccalaureate and master's degree levels. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, GA 30033-4097 or call (404) 679-4501 for questions about the accreditation of Christopher Newport University.

Location
The University is located in suburban Newport News, midway between Williamsburg and Norfolk. Air service is available at the nearby Newport News/Williamsburg International Airport and at the Norfolk International Airport.

The Campus: Present and Future
CNU's campus encompasses 260 acres within a park-like setting in Newport News. We take pride in building everything to the highest standards. CNU also ranks as one of the safest campuses in Virginia.

We have completed nearly $1 billion in new capital construction over the past 16 years, including the David Student Union. The Paul and Rosemary Trible Library, with its 14-story tower lighted day and night, is the intellectual center of campus. It features a gourmet coffee shop with study rooms for quiet collaboration with friends, spacious reading rooms, and quiet corners for reflection and study.

Lewis Archer McMurran, Jr. Hall is home to our superb liberal arts programs. Mary Brock Forbes Hall, our new integrated science center, provides a 21st-century hub for education and discovery. Luter Hall houses the Luter School of Business; economics, sociology, social work and anthropology; leadership and American studies; mathematics; and physics, computer science and engineering.

State-of-the-art laboratories in computer science, computer engineering, physics, instrumentation and the natural sciences enhance the close interaction between professors and students.

CNU's residence halls win rave reviews from students and parents alike. Basic cable, a built-in micro-fridge, Internet access, carpeting, air conditioning and suite-style rooms make campus living attractive. CNU also offers wireless service in all public areas.

CNU Village, one of two elegant apartment complexes on campus, provides private rooms with private baths, kitchens, washers and dryers, living rooms, cathedral ceilings, and your own private parking space! CNU Village is home to numerous eateries — including Panera Bread, Schooner's, Subway, Moe's Southwest Grill and Tropical Smoothie. Thanks to our dazzling residential facilities, including a new residential hall currently under construction, 3,500 students now make CNU their home.

The Freeman Center, for sports and convocations, features a 200-meter indoor track, three basketball courts and personal recreation/fitness space in the Trieshmann Health and Fitness Pavilion. The Freeman Center is one of the nation's finest facilities of its kind and recently underwent further expansion. The building now houses the 400-seat Gaines Theatre, as well as the James C. Windsor Center for Health and Counseling Services.

Surrounded by beautiful neighborhoods, CNU is a great place for walking, jogging or cycling, and you're only a few short blocks from the James River and a pleasant bicycle ride to a public white sand beach and park. CNU is also adjacent to pristine Lake Maury, surrounded by Mariners' Museum Park with 600 acres of trails and woodlands.

JAMES C. WINDSOR CENTER FOR HEALTH AND COUNSELING SERVICES

Bill Ritchey, PsyD.
Executive Director of Health and Counseling Services
Freeman Center H230
(757) 594-7047
cccc@cnu.edu

UNIVERSITY HEALTH AND WELLNESS SERVICES

Freeman Center H155
(757) 594-7661
uhws@cnu.edu

University Health and Wellness Services (UHWS) is a health-care partnership between CNU and the Riverside Health System. UHWS, through a contractual arrangement with Riverside, offers many services to support healthy living as well as helping students learn to take responsibility for their own wellness. Its main objective supports the CNU liberal learning mission through teaching a diverse student population how to assess their own health status, access medical resources, know their rights and responsibilities as patients, and become informed medical consumers. Professional support services are available to assist all graduate and undergraduate students when they become sick or injured.

Free Clinic Services:

First aid
Blood pressure monitoring
Assistance in finding local physicians, dentists, psychologists, psychiatrists and other medical resources can be found on the UHWS Website: studentclinic.cnu.edu.

Clinic Services Requiring a Fee:

All physicals and visits with the Nurse Practitioner- (by appointment only)
Lab Tests
Immunizations and injections
Tuberculosis Screens and TB testing
Flu shots
Stitch and staple removal
Allergy Injections
Wound Care

Free Health and Wellness Education Opportunities:

Educational materials and resources
Nutrition and fitness counseling
CNU Quit – a smoking cessation program
Quit Kits – for people who want to stop their tobacco use
Health screenings
Campus outreach programs on various health and wellness topics

THE OFFICE OF COUNSELING SERVICES

Freeman Center H230
(757) 594-7047
cccc@cnu.edu

The Office of Counseling Services provides a wide range of free professional services to help students succeed at the University by creating a safe, confidential and supportive environment in which personal development can occur. Counseling services assist students with self-knowledge, facing challenges, confronting short-term personal issues, and through crisis intervention. All of our services contribute to helping students learn new skills, enhance personal success, set and achieve goals and get the very best out of life. Additionally, the office supports CNU faculty, staff, clubs and organizations, parents, and the community through consulting and educational outreach services.

Students are referred to resources outside the University when long-term counseling or other professional support is needed. Students are ultimately responsible for their decisions and actions and must assume responsibility for their personal choices. Using Counseling Services wisely will assist student's adjustment to the University and can help develop skills they will need to meet the various challenges a student may encounter. Listed below are many of the services offered through the Office of Counseling Services.

Counseling Services:

Individual Counseling
Crisis Intervention
Relationship Counseling
Support Groups
Group Seminars and Workshops
Self-help Pamphlets
Referral Services

Consulting Services:

Participation in the Faculty Early Alert System
Myers-Briggs Type Indicator Presentations
Faculty/Staff Training

Educational Outreach:

Classroom presentations
Residence Life presentations
Programming for clubs and organizations
Awareness Weeks
Community talks and workshops

INFORMATION TECHNOLOGY SERVICES

Stephen Campbell, Chief Information Officer
Ratcliffe Hall 125
(757) 594-7663

Christopher Newport University has made a commitment to provide a strong information technology infrastructure to enhance the teaching and learning environment of the university. A gigabit Ethernet network electronically links all parts of the campus to the worldwide network of educational and research institutions. All students receive accounts on the university academic server. With these accounts, students can obtain access to the Internet, electronic mail, web hosting services and many other services to support the education process.

Internet Services

The University maintains two 500 megabyte connections allowing for high-speed access to the Internet from all campus facilities including residence halls.

Central Computing Systems

CNU IT systems and services can be accessed from all networked computers on campus as well as through the Internet for email, calendaring, online registration, online course system and other services.

Open PC Labs/Classrooms

Personal computer labs are maintained at a variety of locations on campus including the Trible Library, McMurran Hall, Forbes Hall, and Luter Hall. These PCs run Microsoft Windows operating systems and provide a variety of application software including web browsers and Microsoft Office products.

Wireless

Information Technology Services is in the midst of a significant expansion in wireless capability for the CNU campus. Most residential and academic spaces now have wireless access.

DISABILITY SUPPORT SERVICES

Office of the Dean of Students
David Student Union 3142
(757) 594-7160 Fax: (757) 594-7505
dosa@cnu.edu

Services for Students with Disabilities

CNU provides reasonable accommodations to make education accessible to students with disabilities. Students with disabilities may consult with the Office of the Dean of Students before or during their active enrollment at CNU. New students, especially new freshmen, will want to contact the Office of the Dean of Students well before beginning their first semester if special services are required. While consultation with the Office of the Dean of Students is always available, students who request accommodation by the University must formally declare their disability by completing a form obtained from the Office of the Dean of Students.

In order to determine needs and provide the best services possible, students must provide recent documentation (from within the last three years) concerning their disability. Such documentation must be provided in writing from a qualified professional source. It should include the nature of the disability and suggestions for possible accommodation to enhance student access to the programs and activities of the University. Documentation should be mailed to:

Office of the Dean of Students
Christopher Newport University
1 Avenue of the Arts
Newport News, VA 23606-2998

Evaluation information concerning a student's disability is private. Such information will be provided to instructional or staff members only when they have a legitimate "need to know" or at the request of the student.

CENTER FOR CAREER PLANNING

Libby Westley, Director
David Student Union 3100
(757) 594-8887
ccp@cnu.edu

Christopher Newport University (CNU) recognizes career planning as a critical component in the education of its students. CNU provides opportunities and support to engage students in exploring, discovering, evaluating and choosing academic programs and careers. Committed to the ideals of scholarship, leadership and service within a liberal learning environment, CNU understands the importance of preparing its students to become leaders and active participants in a global setting. The Center for Career Planning (CCP) supports students' transition to CNU in the clarification of academic focus and in the successful translation of credentials as preparation for graduate school and/or their career paths. From Setting Sail through Commencement and beyond, CCP career coaches encourage students to participate in programs and activities that assist them in making educated career decisions, developing career-related skills, and pursuing graduate study and/or professional employment. The Center also facilitates collaboration among students, alumni, employers, faculty, graduate school recruiters, and the community in developing a diverse global network, which supports attainment of students' career goals.

Career Development Topics:

Academic Major Choice
Career Exploration
Interest and Personality Type Assessment
Internship and Job Search
Graduate School Planning
Interview Preparation
Resume and Cover Letter Writing
Networking

Developing a Diverse Global Network:

CNU Career Connect, Online Recruitment Database
Employer Site Visits
Alumni Networking Opportunities
Employer & Graduate School Information Sessions and Tables
Career and Industry Panels
LinkedIn Training
Web-based Job Search Resources
Career Center Library
Career, Internship, and Graduate School Fairs
On-Campus Interviews

Assistance for CNU Alumni:

Career related appointments on campus or by phone
Access to CNU Career Connect

STUDY ABROAD

Amanda Pierce, Coordinator
McMurran Hall 104
(757) 594-8851
studyabroad@cnu.edu

All academically qualified CNU students are encouraged to participate in study abroad, and may do so for a full academic year, a semester, or during extended summer session. Participation in any study abroad endeavor must be approved by university officials. Students may study for a semester or for a full year through CNU programs, partnerships or affiliations; through direct application to a university overseas; or through other approved sponsoring universities or organizations. Coursework earned through non-CNU program providers must be approved prior to the study abroad term. CNU faculty lead a number of outstanding short term programs during summer session. Students are eligible to participate in these programs if they:

- demonstrate good academic and social standing at the University;
- are 18 years or older by the first day of the intended semester or summer abroad;
- enroll in and complete the associated course.

Financial Aid may be available to students who participate in a study abroad semester or academic year. The Office of Financial Aid will guide students in processing aid, but early planning is a must – the student should schedule an appointment with the Office of Financial Aid as early as possible in the study abroad planning process.

PAUL AND ROSEMARY TRIBLE LIBRARY

Mary K. Sellen, University Librarian
(757) 594-7132
library@cnu.edu

The Paul and Rosemary Trible Library is the intellectual center of Christopher Newport University. The library staff helps students develop research skills relating to their curriculum and builds a collection which supports and enhances the essential elements of the university curriculum and our students' personal development. Students find collections geared to their areas of study, as well as broader collections supporting the intellectual and personal growth so essential to a core of liberal arts studies.

Opened in spring 2008, the Trible Library doubles the size of the previous Smith Library. The Trible Library combines the best of a traditional library with a state-of-the-art technology center to create an interactive learning experience for the 21st century. Significantly enhanced and enlarged study areas offer students a wide variety of environments for study and intellectual activity. Students can choose from group study rooms, two large quiet study rooms, wireless café, and a 24/7 secured study environment to meet their academic needs. Access to the Internet and the electronic collection is available throughout the building through wireless connections, and books and media are readily available through an open stacks arrangement. Trible Library houses 207,932 volumes and over 46,400 periodical titles in hard copy and electronic format. Eight professional librarians and ten library assistants provide students and faculty easy access to its resources and services. The Library's web page: (library.cnu.edu/) connects students to the library's electronic and Internet resources and services as well as keeps them informed on events happening in the library.

Reference

Trible Library offers professional reference services to provide aid with student information needs. It houses a reference collection of over 5,400 volumes, plus an extensive online collection. Special services are offered through reference, including individualized consultation on term papers and research projects.

Library Instruction

Through its instruction programs, Trible Library seeks to provide basic orientation in the use of the library and to teach students to deal critically with information. As students increasingly use the Internet to find research information, an ability to analyze information becomes a vital skill in the development of an informed citizen.

Internet Services

Trible Library provides access to numerous Internet services, including ProQuest, EBSCOHost, and JSTOR. It has access to over many bibliographic and full-text databases in the areas of science, business, law, economics, the social sciences, and the humanities. The library is one of the founding members of VIVA, the Virtual Library of Virginia. VIVA is a consortium of 39 academic libraries which facilitates the sharing of library collections and electronic resources throughout the Commonwealth of Virginia.

Interlibrary Loan

If materials needed for research are not located in Trible Library, they may be requested through Interlibrary Loan. The library uses one of the major library networks, OCLC, to process interlibrary loans efficiently. Christopher Newport is located in an area rich in library resources as well. The Tidewater Consortium for Higher Education allows students to access [academic] library collections from Williamsburg to Virginia Beach. Through these arrangements the library resources of the nation are available to Christopher Newport University students.

Special Collections

The University's archives and special collections house institutional and historical documents back to the 1960's, student and faculty publications, and a Virginia Authors collection of autographed books. Several music collections comprising original and published scores are cataloged and maintained as well.

In January 2009 the library of Mariners' Museum was moved to the Trible Library. One of the top five nautical research collections in the world, the collection of over a million items enhances the Trible Library collection across a number of subject areas. It also offers students internships in manuscript and archival work.

ADMISSION TO GRADUATE STUDIES

ADMISSION TO GRADUATE STUDIES

The decision to admit an applicant to graduate studies at Christopher Newport University is determined by the graduate faculty members in the appropriate academic department(s). Graduate Admission collects the application materials and submits the complete application packet with all required documentation to the Office of Graduate Studies (OGS) for distribution to the appropriate Graduate Program Coordinator (GPC). The decision is made by the GPC and the graduate faculty members in his/her department and returned to the OGS. A letter is sent to the applicant.

Applicants must read the information regarding the master's degree program to which they are applying for specific admission and academic requirements. MS students may be admitted to the University for full or part-time study beginning the fall or spring semesters or any summer term. MAT students may be admitted to the University for full or part-time study beginning the spring semester or a summer term. Applicants are encouraged to apply and submit all documents well in advance of the admission deadline corresponding to the semester/term in which they plan to enroll.

ADMISSION REQUIREMENTS

Application and Fees

Applicants must submit electronically a completed *Graduate Application*, the *Application for Virginia In-State Tuition Rates* (if applying for in-state tuition rate eligibility), and the appropriate non-refundable application fee. The *Graduate Application* is online and available on the Graduate Studies website: www.cnu.edu/gradstudies/prospective/admissions.asp. Select the tab 'Application Forms.'

College Records

Applicants must submit an official transcript of their baccalaureate degree from a regionally accredited college or university. The transcript must indicate the date of the applicant's graduation, the degree received, and a complete list of courses taken and grades received. Applicants also must submit official transcripts of graduate work taken at other institutions.

Grade Point Average

Degree-seeking and non-degree applicants must have a baccalaureate degree from a regionally accredited college or university with a minimum grade point average (GPA) of 3.00 on a 4.00 scale. Those applying to the Initial Licensure program apply in a non-degree status and must have a baccalaureate degree from a regionally accredited college or university with a minimum grade point average of 2.80 on a 4.00 scale.

Educational and Professional References

Degree-seeking applicants must provide three recommendation forms completed by persons qualified to judge the applicant's potential to complete the graduate program successfully. **Refer to the master's degree program section for any specific reference requirements.** The recommendation forms are part of the electronic application**.** If a recommendation form has to be submitted in paper form, it must be received by CNU Graduate Admission in a sealed envelope with the reference's signature across the envelope flap.

Entrance Examinations

Examination scores are used as one of several indicators of the applicant's ability to succeed in graduate studies. The **Graduate Record Examination, Praxis Core/VCLA, and PRAXIS II** are offered on an individually scheduled basis through the Prometric Testing Center: www.prometric.com. **Refer to the master's degree program section in this catalog for the specific examination requirements**.

Admission Deadlines

The application, the application fee and all supporting documents must be received by Graduate Admission by the following deadlines:

Fall Semester	Deadline
M.S. APCS Program or	July 15
M.S. ENVS Program	July 15
There is no Fall admission for the MAT Program.	

Spring Semester	Deadline
MAT Program	October 15
M.S. APCS Program or	November 1
M.S. ENVS Program	November 1

Summer Terms	Deadline
MAT Program	December 10
M.S. APCS Program or	March 15
M.S. ENVS Program	March 15

SUBMISSION OF APPLICATION MATERIALS

All application materials are to be submitted electronically (preferred) to:

CNU Graduate Admission
1 Avenue of the Arts
McMurran Hall, Room 159B
Newport News, VA 23606-3072

- To determine the status of your application package, email gradques@cnu.edu.
- **Applications cannot be processed until the application fee and all documents have been received.**
- A decision letter can be expected approximately three weeks after the complete application package is submitted to the appropriate Graduate Program Coordinator for evaluation.

Reactivated Applications

Students who were accepted as degree-seeking but did not enroll may reactivate their applications within a period of two semesters of the original application.

Readmission to Graduate Studies

Students must apply for readmission if they have not enrolled for two consecutive regular semesters (fall and spring). After that period of time the complete set of application materials must be resubmitted along with a new application fee. Competitive admission standards in effect at the time of readmission are used. Students who left the University while not in good academic standing are referred to the 'Appeal Process for Suspension or Dismissal' section of this catalog**.**

ADMISSION STATUS

Degree-seeking Status

Applicants approved to participate in a graduate program leading to a master's degree will be admitted as degree-seeking students. Upon acceptance, a degree-seeking student will be assigned a graduate faculty advisor to assist the student in formulating his/her academic Plan of Study.

Students planning to use financial aid must be admitted in degree-seeking status.

Admission Requirements for Degree-seeking Status

- Completed electronic *Graduate Application*
- $50 Non-refundable Application Fee
- Completed *Application for Virginia In-State Tuition Rates* if applying for in-state tuition rate eligibility
- Official baccalaureate transcript from a regionally accredited college or university, indicating the successful completion of all degree requirements and listing all courses taken with grades received.
- Minimum grade point average of 3.0 on a 4.0 scale
- Official transcripts for other graduate work
- Three recommendation forms submitted electronically.
- Graduate Record Examination or Praxis Core/VCLA and Praxis II scores
- Refer to the master's degree program section for **specific or additional admission requirements**
- Refer to the **Checklist** at www.cnu.edu/gradstudies/pdf/checklist.pdf.

Non-degree Status

Applicants approved to take graduate courses apart from any program leading to a graduate degree may be admitted as non-degree students. Such students earn academic credit in the same manner as degree-seeking students, and prerequisites for individual courses must be met unless excused by the Graduate Program Coordinator. Credit received as a non-degree graduate student may be applied to a graduate degree if and when the student becomes a degree-seeking graduate student. A maximum of 12 credits may be earned while in non-degree status with the exception of those in the Initial Licensure program.

Admission Requirements for Non-degree Status

- Completed electronic *Graduate Application*
- $50 Non-refundable Application Fee
- Completed *Application for Virginia In-State Tuition Rates* if applying for in-state tuition rate eligibility
- Official baccalaureate transcript from a regionally accredited college or university, indicating the successful completion of all degree requirements and listing all courses taken with grades received.
- Minimum grade point average of 3.0 on a 4.0 scale
- Official graduate transcripts for other graduate work.
- Recommendation forms and examination scores are not required for the non-degree applicant.

Changing from Non-degree to Degree-seeking Status

In order to petition for the change in status a non-degree student must submit to Graduate Admission the *Request for Status Change to Degree-seeking Status* form. All required documentation for degree-seeking status within a specific master's degree program must be on file. In addition, the non-degree student must present his/her CNU transcript and meet the following criteria for the specific master's degree program:

MAT completion of 12 hours of MAT graduate courses with a cumulative 3.5 GPA or above and submission of a passing score for the Praxis II exam, if required;

M.S. completion of 12 hours of CNU graduate credits with a minimum cumulative 3.0 GPA, a status of Good Academic Standing, and submission of passing scores from the Graduate Record Exam.

The amount of credit received as a non-degree student which is applicable toward a graduate degree will be determined by the appropriate Graduate Program Coordinator at the time the student changes to degree-seeking status.

Teachers in the Commonwealth of Virginia Applying for Graduate Non-degree Status

Any regular or provisionally licensed Virginia teacher who desires to enroll in a graduate course for relicensure or continued professional development does so in a graduate non-degree status. This status allows a teacher to enroll in a graduate (500 - 600 level) course at the University, as long as the prerequisites have been met. Registration is on a space-available basis. Graduate classes will be posted on a graduate transcript with the grades and associated graduate credit hours earned.

Admission Requirements for Virginia Teachers in Non-degree Graduate Status

- Completed electronic *Graduate Application*
- $50 Non-refundable Application Fee
- Completed *Application for Virginia In-State Tuition Rates*
- A transcript must be submitted verifying the baccalaureate degree was completed with a cumulative GPA of 3.0 or higher. (A copy of the transcript is acceptable.)

Transcripts may be presented to either of the following:

Lyn Sawyer, M.Ed., Associate Director of Graduate Admission & Records, McMurran Hall 159F or
Dr. Marsha Sprague, MAT Graduate Program Coordinator, McMurran Hall 253A

INTERNATIONAL STUDENTS

Students from other countries with adequate preparation for graduate study are invited to apply for admission to Christopher Newport University. The University is authorized by federal law to enroll non-immigrant alien students. Because the University is a state-supported institution, it cannot provide financial aid to international students.

Admission Deadlines

Applications cannot be processed until the application fee and all documents have been received.

The application, the application fee and all supporting documents must be received by Graduate Admission by the following deadlines:

Semester/Term of Entry	Deadline
Fall Semester	**April 1**
Spring Semester	**October 1**
Summer Terms	**March 1**

Admission Requirements for International Students

An international student must apply as degree-seeking by submitting the specific master's degree program admission documents. An international applicant who is not a U.S. citizen is required to:

1. Submit a *Graduate Application for International Students* with the required non-refundable $50 application fee. International students applying for admission will download / print the *Graduate Application for International Students* application form: www.cnu.edu/gradstudies/prospective/admissions.asp Select the tab for 'Application Forms.'
2. Submit all documents required for degree-seeking admission to the specific master's degree program by the admission deadline. **Refer to the master's degree program section in this catalog.**
3. Submit an official transcript of his or her baccalaureate degree and official transcripts of graduate work. If these documents are not in English, you are required to include certified English translations.
4. Submit an official World Education Services (WES) *Credential Evaluation Report.* **International students must submit official transcripts translated into English to WES to have their education credentials evaluated.** WES prepares an objective, analytical report that describes the credentials and interprets them in terms of their U.S. equivalents. Access the WES website at www.wes.org, or email info@wes.org, or call 1-800-937-3895.
5. Submit a minimum score of 92 for the Internet-based TOEFL, or an equivalent score of 237 on the computer-based Test of English as a Foreign Language (TOEFL) or an equivalent score of 580 on the paper-based TOEFL.
6. Complete a *Financial Resource Statement* and provide an official bank affidavit guaranteeing that adequate funds are available for university study prior to coming to the United States.
7. Interview may be required. English proficiency in reading, writing and speaking is expected.

CONTACT INFORMATION

The Office of Graduate Studies is located in McMurran Hall 159F and may be contacted by email at gradstdy@cnu.edu or by phone at (757) 594-7544.

Graduate Admission is located in McMurran Hall 159B and may be contacted by email at gradques@cnu.edu or by phone at (757) 594-7297.

GRADUATE ACADEMIC POLICIES

IMMUNIZATION REQUIREMENT
In an effort to provide a healthy environment in which to live and learn, CNU has created an immunization policy that incorporates the guideline for immunizations set forth in the *Code of Virginia*, Section 23-7.5. Students may have received these immunizations as a child or later in life. **All entering full-time students must provide a completed *Certificate of Immunization*, which must be signed or stamped by a licensed health care professional.** Failure to do so will result in the student's inability to register for and attend the next semester at CNU. In some cases, students may sign a waiver of the recommended immunization and be in compliance with the University and state policy. The *Certificate of Immunization* form is required of all new students when they are admitted to the University. The form may be obtained from the Office of the Registrar website cnu.edu/regis/forms/index.asp) or by contacting the Office of the Registrar, Gosnold Hall, Christopher Newport University, 1 Avenue of the Arts, Newport News, VA 23606-3072. Questions about this requirement or the waiver should be directed to the Office of the Registrar at (757) 594-7155 or via email at register@cnu.edu.

REGISTRATION
The University's registration system is a Web-based registration procedure. Dates and times for registration periods are published on the Office of the Registrar website prior to each semester/term (Fall, Spring and Summer). A student must be admitted as a graduate student to receive graduate credit.

Registered students should log in to their CNU Live account to review their charges as paper bills are no longer mailed. The balance must be paid by the deadline noted on the online billing statement and announced on the CNU Business Office website. Students are not considered officially registered until tuition and fee payments have been received in the Business Office. The University reserves the right to cancel registrations if bills are not paid.

Newly admitted students are expected to meet with their graduate academic advisors prior to registration to discuss class scheduling, and are expected to attend the orientation programs when scheduled by their respective Graduate Program Coordinators.

Students who have not registered/nor attended for two consecutive regular semesters (Fall and Spring) will become inactive. Inactive students who wish to register must seek readmission to the University.

Students who have a 'hold' on their account may not register or make any schedule adjustments (including adds,drops, and/or course withdrawals) for courses until the 'hold' has been resolved with the office issuing the hold.

Students are also responsible for ensuring that they have met the appropriate course prerequisites for entrance into a course. Students who have not met the course prerequisites and/or registration restrictions, as detailed in this catalog, will not be allowed to register for the course without special permission.

Schedule Adjustment (Add/Drop)
After registering for classes, students may make changes to their class schedules via the 'CNU Live' link within their 'CNU Connect' account during published schedule adjustment periods. If a student has a 'hold' on his/her account, he/she will not be able to make schedule adjustments until the 'hold' has been resolved with the appropriate office. Schedule adjustment periods are published on the Office of the Registrar website. Courses dropped during this period do not become part of the student's permanent academic record.

Withdrawal from a Course
During the withdrawal period, students may withdraw from a course by completing a *Withdrawal from Course* form obtained in the Office of the Registrar or available on the Office of the Registrar's website. Students are encouraged to obtain the signature of the instructor of record for the course on the *Withdrawal from Course* form. If the student is unable to obtain the instructor's signature on the *Withdrawal from Course* form he/she should indicate such on the form when it is submitted to the Office of the Registrar. Course withdrawals will be recorded with a grade of *W* on the student's academic record. A student who stops attending a class and who does not complete a *Withdrawal from Course* form will be assigned the earned grade in that course. Course withdrawal periods are published on the Office of the Registrar's website and in the academic calendar. A total number of 3 course withdrawals (grades of *W*) are permitted during a student's graduate academic career at CNU. A student may initiate an appeal by submitting a letter of appeal to the Director of Graduate Studies.

Medical, Administrative and Military Withdrawals
Students who petition to withdraw from the semester for medical reasons (*medical* withdrawal) must complete a *Withdrawal from Semester Form* and submit a letter to the Director of Graduate Studies and to the Office of the Registrar outlining the justification for the request. Requests for medical withdrawals should be submitted as close as reasonably possible to the incident/situation causing the need for the withdrawal. The student must also provide a written statement on official letterhead from his/her physician certifying that the student is incapable of completing the term due to medical reasons. After the Director of Graduate Studies reviews the request, the student will be notified in writing of the decision. It is rare that two consecutive medical withdrawals will be approved or that a medical withdrawal will be approved retroactively for a previous period of enrollment.

In other extenuating (non-medical) circumstances requiring the student to withdraw from the semester, the student must complete a *Withdrawal from Semester Form* and submit a letter outlining the extenuating circumstances along with justification for an *administrative* withdrawal. The form and documentation must be submitted to the Director of Graduate Studies and the Office of the Registrar. After the Director of Graduate Studies reviews the request, the student will be notified in writing of the decision. It is rare that two consecutive administrative withdrawals will be approved or that an administrative withdrawal will be approved retroactively for a previous period of enrollment.

If the petition for medical or administrative withdrawal is approved, all grades for the semester in question will be noted as ***M*** on the student's transcript. The ***M*** will not be counted toward the maximum course withdrawals permitted and is not computed in the student's GPA. Students may not exercise the medical/administrative withdrawal option to withdraw from individual courses.

Students who are called to active duty (deployed) after the final drop/add period may pursue a *military* withdrawal from all courses. Students should complete a *Withdrawal from Semester* form along with a copy of their official military orders calling them to active duty and forward both to the Director of Graduate Studies and the Office of the Registrar for approval and processing. Students who have reached the ninth week of a regular semester should contact the Director of Graduate Studies for assistance in securing grades of *I* (Incomplete) in their courses whenever possible. Except in cases where students have received authorization for grades of *I*, all grades for the semester in question will be noted as *M* on the student's transcript. The *M* will not be counted toward the maximum number of course withdrawals permitted and will not be computed in the student's grade point average (GPA). Additional information regarding the required process is available at registrar.cnu.edu.

Auditing a Course
Students auditing courses are subject to attendance regulations specified by the instructor but are not required to take tests or final examinations in the audited courses. By permission of the instructor, students may complete any of the required assignments. Rather than the regular letter grade at the completion of an audited course, auditing students' academic records will indicate *AU* for such courses. (See "Fees and Financial Information" for additional details concerning audit charges.) **Changes from audit to credit status and credit to audit status may be made only during published Schedule Adjustment periods and in compliance with established deadlines**.

Advanced Topics (SUBJ 595)
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

Independent Study (SUBJ 599)
The purpose of independent study is to enable qualified students to enrich their programs through directed reading or independent research under faculty supervision and for University credit. The student and faculty member directing the Independent Study agree upon goals, prerequisites, stages and grading procedures in writing. Students may take a maximum of three credit hours of independent study in a given semester or session, and a maximum of six credit hours in their total academic program.

The graduate *Independent Study Authorization Form* is available on the CNU Graduate Studies website: www.cnu.edu/gradstudies/pdf/gradindepstudy.pdf. It must be completed by the student and the faculty member directing the Independent Study. Within five days of being signed by both parties, the *Independent Study Authorization Form* must be forwarded to the appropriate Graduate Program Coordinator and the chair of the department. The completed form goes electronically to the Director of Graduate Studies. If presented electronically, the Director of Graduate Studies will forward the approved form electronically to the Office of the Registrar. If presented in paper form, the student must then present the approved form to the Office of the Registrar no later than the end of the registration period or the schedule adjustment period for the semester/term in which the Independent Study is to occur. Incomplete forms and forms submitted after the registration and/or the schedule adjustment period will not be processed.

Class Attendance
The University expects that students will regularly attend all of their scheduled classes. An educational

system based largely upon classroom instruction and analytical discussion depends upon the faithful attendance of all students. The University does not, however, establish specific attendance policies. These are established at the discretion of the individual colleges, departments and/or instructors. Students with excessive absences will receive a grade of *F* upon the instructor's recommendation. If excessive absences are caused by an extreme emergency and the instructor penalizes the student, the student may appeal the grade through the Grade Appeal Policy (see *Student Handbook* for details).

Other regulations are:

1) Missing a class meeting does not in any way lessen the student's responsibility for that part of the course that has been missed.
2) Instructors may differentiate between excused and unexcused absences and authorize makeup tests when appropriate.
3) Students who miss classes to represent the University must notify the class instructors in advance of those absences. Given prior notice, instructors will allow students to make up class work or complete work in advance of the class absence. In cases of disagreement about whether or not the activity represents the University, the Director of Graduate Studies will make the determination.
4) Student who receive federal financial aid and who discontinue class attendance without formally withdrawing from the course(s) may jeopardize current and/or future financial aid awards. The student should contact the Office of Financial Aid for more information.

Final Examinations

The examinations given at the end of each semester take place at times announced on the examination schedule published on the Office of the Registrar website. Students are required to take all final examinations at the times scheduled unless excused as noted below (see *Absence from Final Examinations*). The University does not authorize re-examination nor will changes be permitted unless the student has three or more examinations scheduled in a 24-hour period. To request a change, the student must make the request to the Director of Graduate Studies through the Graduate Program Coordinator or the instructor of the course.

Absence from Final Examinations

Students may request to be excused from taking an examination at the scheduled time by presenting an acceptable reason for the expected absence to the instructor before the examination. An excuse on the grounds of illness will be accepted when verified by a physician and received by the Office of Graduate Studies. The student should notify the instructor as soon as possible, unless physically unable to do so. If the instructor cannot be notified, the student must notify the Office of Graduate Studies at gradstdy@cnu.edu or (757) 594-7544 as soon as possible.

ACADEMIC STANDARDS

Grade Point Average

Two grade point averages (GPAs) are maintained. The term GPA is the total number of grade points earned for CNU courses in a term divided by the total number of CNU credit hours attempted that term. The cumulative GPA is the total number of grade points earned for all CNU courses divided by the total number of CNU credit hours attempted. Transfer credit (including that for five-year students) is not included in the grade points and credit hours attempted; however, transfer credit is included in credit hours earned toward a degree.

Grading System

Letter Grade	Meaning	Numerical Value
A	Excellent	4.00
A-		3.70
B+		3.30
B	Good	3.00
B-		2.70
C+		2.30
C	Passing (Poor)	2.00
C-		1.70
F	Failing	0.00
I	Incomplete	
W	Withdrew	
S	Satisfactory (for thesis in progress)	
U	Unsatisfactory (for thesis in progress)	
AU	Audit	

NOTE: Graduate courses may not be taken on a pass/fail basis.

Incomplete Grade

The grade of Incomplete, *I*, is a temporary grade that the instructor may assign when exceptional, documented circumstances prevent the student from completing required assignments or from taking the final examination. If the grade of Incomplete is assigned, the student must complete the work and the professor must submit the *Grade Change Form* (or *Extension of Incomplete Form*, if appropriate) to the Office of the Registrar by the third Friday of the next regular semester. If a *Grade Change Form* or *Extension of Incomplete Form* is not submitted as indicated, the grade of *I* automatically will be converted to a grade of *F* on the following business day. The change of grade deadlines are:

- Incomplete grades given in the fall must be removed by the above indicated deadline in the following **spring** semester.
- Incomplete grades given in the spring must be

removed by the above indicated deadline in the following **fall** semester.
- Incomplete grades given in the summer must be removed by the above indicated deadline in the following **fall** semester.

Extensions of the grade of Incomplete require the signature of the Director of Graduate Studies.

Grade of Satisfactory/Unsatisfactory
A grade of Satisfactory (*S*) or Unsatisfactory (*U*) will be given for thesis credit while the thesis is in progress. After the thesis has been written, defended and accepted, the thesis advisor will replace the *S* and/or *U* designation with a grade of numerical value. Until that time, the *S* or *U* designation assigned for thesis work in progress will not affect the student's grade point average. Thesis credit beyond the minimum required by the program will remain with an *S* and/or *U* designation.

Grades for Repeated Courses
For courses that are repeated, only the grade, credit and grade points for the **most recent** course enrollment will be counted toward graduation requirements, credit hours earned, and included in the computation of grade point averages. Any graduate course taken at CNU in which a grade is earned may be repeated no more than once (total of two enrollments). Graduate courses completed at CNU with a grade of *C* or *F* cannot be repeated at another institution for transfer credit to CNU. Students who, after their second attempt, do not successfully complete a course required for a specific degree at CNU may not be allowed to graduate with that degree.

Final Grade Reports
Students may access their final grade reports by accessing their web-based 'CNU Connect' account and clicking on the 'CNU Live' link. Final grades are available at the end of each semester and summer terms.

Request to Take Classes Elsewhere
Admitted students are expected to complete all of their course work in residence. In those unique situations when a student seeks to enroll in credit courses at another institution concurrently, the student must obtain **advance approva**l from the University by submitting the *Request to Take Graduate Course Elsewhere* form, available on the CNU Graduate Studies website cnu.edu/gradstudies/pdf/gradcourseelsewhere.pdf. Students must submit the completed form, including all required signatures, to the Office of the Registrar. The University grants students permission to take courses for credit at other institutions only when such action is academically necessary to meet scheduling requirements of their programs that cannot be met in residence at CNU.

Transfer credits for courses taken elsewhere will be granted only if the student has prior written approval and earns a grade of *B*- or better. Pass/fail grades are not accepted for transfer credit. A graduate student is limited to a maximum of twelve credit hours that may be transferred into the University.

Degree-seeking students who are on academic probation or academic suspension will not be approved to take courses elsewhere without written permission from their Graduate Program Coordinator and the Director of Graduate Studies. Credit hours earned elsewhere while on probation or suspension will not be accepted for credit by Christopher Newport University unless prior written permission was granted.

Graduate Students Taking Undergraduate Courses
A graduate student may enroll in a course that carries undergraduate credit if, in the graduate advisor's opinion, the student should be familiar with the subject matter of that course. A student registered for a course for undergraduate credit must complete all the requirements of the course and receive a grade for it. The grade will be noted on the graduate record but will not count toward a graduate degree nor be computed in any graduate grade point average.

A graduate student may take an undergraduate course on a pass/fail basis with the written approval by the Graduate Program Coordinator. A maximum of two courses are allowed, and limited to one course per semester

Course Numbering
Courses numbered 500 through 699 may be applied to a graduate degree. Courses numbered 400/500 may be taken at either an undergraduate or graduate level. Additional work and/or a higher standard will be required for those taking a course at the 500 level. A student who has taken a course numbered 400/500 as a 400-level course may not retake it as a 500-level course.

The three hyphenated numbers enclosed in parentheses following the title of the course, (4-3-4) for example, have the following meanings: the first number refers to the number of credit hours awarded for successful completion of the course; the second number refers to the number of weekly lecture hours in the course; and the third number refers to the number of weekly laboratory or practicum hours in the course.

ACADEMIC PERFORMANCE POLICIES

Minimum Standards for Academic Continuance
The University expects a degree-seeking student to make reasonable progress toward earning a degree. Both degree-seeking and non-degree-seeking students must demonstrate the incentive and ability to meet the minimum performance

standards in order to remain in 'good standing' for academic continuance at the University. Academic performance is measured by the grade point average (GPA), and graduate students are expected to maintain a cumulative grade point average of 3.0 for each semester for which the student is enrolled. In addition, graduate students are expected to earn grades of *B*- or higher.

Attempted credit hours are defined as those hours for which a student has enrolled in and earned a permanent grade. Attempted credit hours are cumulative.

Academic status is assessed at three points each year: the end of fall semester, the end of spring semester, and the end of the summer term(s).

Academic Probation
If a degree-seeking student is not making satisfactory progress toward a graduate degree when academic status is assessed that student may be placed on academic probation. Degree-seeking and non-degree students will be placed on academic probation for:

- a cumulative graduate grade point average below 3.0; or
- one grade of *C*, to include *C*+, *C*, and *C*-; or
- more than six credit hours of *U*.

The notation *Academic Probation* will appear on the student's web-based grade report and his/her permanent academic record. A student who is on academic probation will be required to raise his or her grade point average above 3.0 or to earn at least a grade of *B* in all graduate courses attempted in the next semester of enrollment in order to avoid being placed on academic suspension. The *Academic Probation* notation will appear for each semester until the student is in good standing. Good standing is defined as having a cumulative GPA of greater than or equal to 3.0 and being in non-probationary status. Credit for courses taken at other institutions while on probation will not be transferred to CNU.

Academic Suspension
Graduate students will be suspended following the first semester in which they do not meet the minimum standards for continuance. Degree-seeking and non-degree-seeking students will be placed on academic suspension for:

- a cumulative graduate grade point average below 3.0 for a second consecutive semester; or
- two grades of *C*, to include *C*+, *C*, and *C*-; or
- one grade of *F*; or
- nine or more credit hours of *U*.

The notation *Academic Suspension* will appear on the student's web-based grade report and his/her permanent academic record.

A suspended student is not permitted to register for additional credits in any semester or summer term until the conditions of the suspension are completed. The student may not register for any classes until after the next regular semester (i.e., fall or spring) following the suspension, and may not register for summer terms if the suspension includes the following fall semester.

Students who wish to return to CNU after their one semester of suspension must:

- make an appointment to develop a Plan of Study with their Graduate Program Coordinator before November 1 for a return in the spring semester and before April 1 for a return in the summer or fall semester;
- include in the Plan of Study credit hour limits the student must observe and a schedule of courses to be taken each semester following the suspension;
- register for the semester immediately following their suspension semester, not including summer terms.

If the student follows this Plan of Study and earns a GPA of 3.0 or higher and earns no grade of *F* or any additional grade(s) of *C*, then the student will not be suspended the next semester even if the cumulative GPA is below that required for minimum standing. If the student does not follow the Plan of Study, or does not earn a GPA of 3.0 or higher in each subsequent semester, the student will be suspended from the University.

Academically suspended students who do not return for two or more consecutive semesters (not including summer terms) must apply for readmission through Graduate Admission. These applications will be judged by the graduate admission standards current at the time of application for readmission.

Upon reinstatement, the student will be on academic probation. If a student who has been reinstated receives a grade of *C*, *F* or *U* in any graduate course, that student will be suspended from the University.

Academic Dismissal
Students who fail to meet minimum standards for continuance will be academically dismissed from the University upon receiving the second academic suspension. Additionally degree-seeking and non-degree graduate students who earn two or more grades of *F* during one semester will be academically dismissed from the University. Students who have been academically dismissed may not apply for readmission to the University for at least two calendar years. Such applicants' academic records at CNU will be considered as part of the relevant materials for readmission to the University. The notation *Academic Dismissal* will be placed on the student's web-based grade report and his/her permanent academic record.

Appeal Process For Suspension or Dismissal
A suspended or dismissed student may initiate an appeal for immediate reinstatement by submitting the *Graduate Student Petition for Immediate Academic Reinstatement* and all supporting documents to the Office of Graduate Studies. The petition must be received at least two weeks prior to the beginning of the semester for which the student seeks reinstatement. The Office of Graduate Studies forwards the petition and documentation to the Director of Graduate Studies.

- On receipt of the petition initiating an appeal, the Director of Graduate Studies selects a committee of not more than three members of the graduate faculty – for most cases, this committee will be the Graduate Program Coordinators.
- This committee reviews the student's record and the evidence contained in the petition and recommends acceptance or rejection of the appeal for immediate reinstatement.
- The committee forwards its recommendation to the Director of Graduate Studies who will render a final decision on the appeal.
- The Director of Graduate Studies notifies the student of the decision and, in those cases where the student is reinstated, notifies the Office of the Registrar and the Office of Graduate Studies.
- A student whose appeal is accepted meets with his/her Graduate Program Coordinator to develop a Plan of Study, which is submitted to the Director of Graduate Studies.

Upon reinstatement, the student will be on academic probation. If a student who has been reinstated receives a grade of *C*, *F* or *U* in any graduate course, that student will be suspended. After two suspensions, the student is dismissed.

An academically suspended student whose appeal is rejected must follow the requirements listed under the heading 'Academic Suspension.' A dismissed student whose appeal is rejected must wait at least one year to appeal again.

DEGREE REQUIREMENTS

The following represent the minimum University requirements for the master's degree. Individual programs may impose additional requirements.

Credits
To receive the master's degree, all graduate students, including those enrolled in the five-year baccalaureate to master's programs, must present on the graduate transcript successful completion of a minimum of 30 hours of graduate credits. However individual programs may require additional hours. No more than twelve semester hours of graduate credit may be transferred from another regionally accredited institution and/or be taken elsewhere by a degree-seeking student as described below. Credit transferred from another institution will be counted toward the total number of credits required for the graduate degree but will not be computed in the student's cumulative graduate grade point average. If no thesis, internship or culminating project is required as a part of the degree requirements, a minimum of 36 graduate credits will be required for the degree. The number of credit hours on the graduate transcript must total at least 30 overall.

Transfer Credit
A maximum of twelve semester hours of graduate credit from another regionally accredited institution may be included in a degree-seeking student's graduate record if all of the requirements are met. Transfer of credit is allowed in two ways: acceptance of **previously earned credit**; and/or **requesting to take a course at another regionally accredited institution while enrolled as a CNU degree-seeking graduate student**.

Previously Earned Credit
A degree-seeking graduate student may transfer a graduate course from another regionally accredited institution and apply the credit toward a degree at Christopher Newport University provided that the intended transfer of credit meets all of the requirements as stated below:

Transfer of Credit Requirements

- An earned grade of *A* or *B*.
- Pass/fail or satisfactory/unsatisfactory grades are ineligible for transfer credit.
- Courses submitted for transfer credit must have been applicable toward a similar degree at the institution awarding them.
- Submit an official transcript from a regionally accredited institution showing the course and the grade earned.
- Evidence of the course applicability toward a graduate degree must be forwarded to the Graduate Program Coordinator.
- Transfer credit must have been taken within six years prior to the award of the CNU master's degree.
- The Graduate Program Coordinator must approve the transfer of credit.
- The request for transfer of previously earned credit must be made during the student's first semester as a degree-seeking student.
- No transfer credit will be allowed for courses that have been used to fulfill the requirements of another earned degree.
- Only formal course work hours, *but not thesis or research hours*, may be used as transfer credit.

Transfer Credit Earned While Enrolled at CNU
A degree-seeking graduate student may take a graduate course at another regionally accredited institution and apply the credit toward a degree at Christopher Newport University provided that the intended transfer of credit

meets all of the 'Transfer of Credit Requirements' as stated in the above section and all the processes are followed and approved.

The student must complete a *Request to Take Graduate Course Elsewhere* form available on the CNU Graduate Studies website at www.cnu.edu/gradstudies/pdf/grad-courseelsewhere.pdf **and complete all the steps in the approval process** in a timely manner **prior to registering for the course**, or the course will not be eligible for transfer. The class format and course length should be equivalent to what is offered at CNU. For additional information refer to 'Request to Take Classes Elsewhere' section on page 19 of this catalog.

Generally, permission to take a course elsewhere will not be given during the student's last semester at CNU, or if the course is offered at CNU during that semester.

Change of Graduate Program (Thesis/Non-thesis/Endorsement/Concentration)
To declare a change of program, for example thesis to non-thesis, or change in an endorsement area or concentration, students must complete the *Change of Graduate Program* form available from the Office of Graduate Studies website. The form must be submitted upon the completion of 21 hours or prior to the last semester of degree completion. After receiving the appropriate signatures on the form, the student submits the form to the Office of the Registrar and a copy to the Office of Graduate Studies. Degree requirements of the program change are based on the catalog in effect at the time of your admission/readmission.

Time Limit
Graduate students must complete all of their work toward a master's degree within a period of six calendar years. This applies to both degree-seeking and non-degree graduate students. This period begins with the student's initial registration as a graduate student. Academic work, including transfer credit, taken more than six years prior to the award of the master's degree cannot be credited toward that degree. In extenuating circumstances a student may petition for an exception to this academic policy. The petition must be approved by the student's Graduate Program Coordinator and the Director of Graduate Studies. The graduate petition for exception to an academic policy form is available on the graduate studies website. Additional conditions, imposed to verify the currency of knowledge involved in the courses for which the six-year limit might be waived, may be imposed.

Plan of Study
Each student in consultation with his or her advisor should develop a Plan of Study showing a reasonable concentration of interrelated subjects. This plan should be formulated and approved by the student's advisor before the student has completed 15 hours of graduate study. The student's advisor must approve any change in the student's Plan of Study. In case of changes in program requirements subsequent to the year the student became degree-seeking, the degree's Program Coordinator and the Director of Graduate Studies must approve changes to the standard degree program.

Full-time Status
Students who enroll in nine (9) or more graduate credits in a given semester or a total of at least six (6) credits for all summer sessions combined will be considered a full-time student. S**tudents need approval of the Director of Graduate Studies to take more than 13 graduate credits in a given semester or more than 6 graduate credits in a summer session.**

FULL Time	
Minimum of 9 hours	Fall or Spring Semester
Minimum of 6 hours	within the May Term/Summer Sessions
HALF Time	
Minimum of 5 hours	Fall or Spring Semester
Minimum of 3 hours	within the May Term/Summer Sessions

Comprehensive Examination
A degree program for a master's degree may require a comprehensive examination to evaluate the student's proficiency in his or her field. This comprehensive examination may be written and/or oral. The nature of the comprehensive examination is determined by the department(s) involved in administering the degree. At the time of the comprehensive exam or at a specifically designated time, each student will be asked questions that specifically assess the student's mastery of course-related objectives. A student failing the comprehensive examination may request a re-examination within six months of the failure. Only one additional examination is permitted. For MAT degree candidates, the Praxis II is the comprehensive examination.

Thesis
Research resulting in the presentation of a thesis may be required by the degree program. **Thesis students are required to enroll in at least one thesis credit hour during any semester in which they are working on the thesis and must enroll in at least one thesis credit hour during the semester of degree completion.** The defense of the thesis may be considered as part of the comprehensive examination. All theses presented must meet the requirements as listed in the *Policy and Style Manual for Thesis Proposals and Master's Theses* The manual is available at Graduate Studies/Current Students/Forms and Thesis Manual website www.cnu.edu/gradstudies/current/index.

asp. Theses may be placed in the CNU library as research sources available to the academic community.

For the **Thesis Format Review** and **Final Copy Due Date**s access Graduate Studies Dates and Deadlines website at www.cnu.edu/gradstudies/current/index.asp.

Intent to Graduate Form
Students must file the *Intent to Graduate* form with the Office of the Registrar by the following dates:

Graduation Date	Due Date
May Graduation	**September 15 preceding graduation date**
August Graduation	**February 1 preceding graduation date**
December Graduation	**February 1 preceding graduation date**

The *Intent to Graduate* form is available at the Graduate Studies website at cnu.edu/gradstudies/pdf/intent-2grad_graduate.pdf. If your anticipated date of graduation changes for any reason, you are required to submit a new *Intent to Graduate* form to the Office of the Registrar by the appropriate due date.

Commencement Exercises

Commencement exercises are held once each year in May. Students who complete degree requirements in August and December are eligible to participate in the *following* Spring Commencement ceremony. Diplomas for August graduates will be available on the first business day after the end of the last summer term. Diplomas for December graduates will be available approximately 21 calendar days after the semester ends. For August and December graduates who do not pick up their diplomas as designated and who plan to participate in the Spring Commencement ceremony, diplomas will be available immediately following the ceremony.

All prospective graduates will be contacted before the Spring Commencement ceremony by the Office of the Registrar and/or the Dean of Students concerning rehearsal and attendance. **Those students planning to attend Commencement must notify the University by the announced deadline so that seating arrangements can be finalized for all who plan to participate.** Students who plan to attend Commencement must keep the Office of the Registrar informed of any address and/or phone number changes so that students can receive important information concerning graduation. **Degrees will not be conferred for students unless all graduation requirements, including courses, degree requirements, GPAs, credits, and financial obligations have been satisfied**.

Assessment Requirements

The University engages in a number of assessment processes in order to gauge the effectiveness of its educational programs and administrative operations. These processes may require students to participate in examinations, surveys, interviews, or other information gathering activities that are not part of any specific course. Each student will be given at least a 10-day notification for any assessment and evaluation activity that requires scheduling prior to participation. The satisfactory completion of assessment and evaluation is a general requirement for graduation from the University.

GRADUATION REQUIREMENTS
All master degree programs require:

- Successful completion of minimum hours of the master's degree program coursework;
- Cumulative graduate grade point average of 3.00 in all CNU courses submitted for graduate credit with no more than two grades of *C;*
- Submission of the *Intent to Graduate* form by the published due dates;
- Successful completion of the comprehensive examination, if applicable;
- Thesis students are required to enroll in at least one thesis credit hour during any semester in which they are working on the thesis and must enroll in at least one thesis credit hour during the semester of degree completion;
- Successful defense of a culminating project or thesis (if applicable) and presentation of the appropriate number of approved copies to the Office of Graduate Studies by the published deadline on the Graduate Studies website: cnu.edu/gradstudies/current/.

STUDENT ACCOUNTS AND CASH SERVICES
Office Hours:
Monday - Friday:
8:00 a.m. - 5:00 p.m.

TUITION, FEES AND FINANCIAL INFORMATION

Current tuition and fees can be found on the CNU Business Office website at: businessoffice.cnu.edu.

The tuition and fee rates are determined annually and approved by the Board of Visitors, which are established and announced in May for the following Academic year.

Interpretation of matters concerning fees is the responsibility of the Executive Vice President. The President of Christopher Newport University has final authority in the interpretation.

Tuition
The tuition charge is based on a per-credit-hour rate. Tuition and fees for auditing a course are the same as the tuition and fees for taking a course for credit. Questions concerning payments and fees should be directed to the Office of Student Accounts (757) 594-7195.

General Fees
Current fees can be found on the CNU Business Office website at: businessoffice.cnu.edu.

A student who wishes to be admitted as a graduate student must pay a $50 non-refundable application fee. If the student does not enroll in the term for which he or she originally applied, the fee may be carried forward only to the next term.

The University charges a late payment fee on all amounts owed to the University that are not paid by the payment due date.

A non-refundable **applied music instruction fee** is charged per one credit hour course.

A **late fee penalty** is charged for additional charges and balances billed and not paid by the applicable payment deadline.

Schedule Changes (Add/Drop)
Any schedule change that results in additional funds due to the University is due and payable on the date the course is added, or no later than the end of the schedule adjustment period the first week of classes. If the additional amount due is not paid on this date, a late payment fee applies.

Students who are using the semester payment plan and who drop a course or courses may reduce their payment schedules. Students should contact Student Accounts directly to take this action. Students may not increase their payment plans for courses added during the schedule change period. Additional amounts due for courses added are payable to the University in full on the date the course is added.

For students who plan to or are receiving financial aid, course-load reductions and additions can affect the amount of financial aid awarded to them. This is particularly true if a course reduction results in a full-time student becoming a part-time student. Students will be responsible for any charges remaining after a course-load change, and any amount due as a refund under the University's policy may be refunded directly to the financial aid grantor, rather than to the student, if the rules of the grantor so require. If a student receives a financial aid award and must decrease his or her academic workload to less than full time, he or she should contact the Office of Financial Aid, telephone (757) 594-7170.

PAYING YOUR BILLS AT THE UNIVERSITY
You can view your student account charges and make eCheck (electronic check transfer) or credit card payments to pay your tuition and fees, and room and board charges online, through your CNULive account, there is a convenience charge for all credit card payments. **No Paper bills will be mailed.**

- No more waiting for your bill to arrive in the mail.
- No more guessing if payment is received. You will receive an immediate confirmation of payment online.
- No more writing paper checks and paying postage.

Please visit our website at businessoffice.cnu.edu for more details and instructions.

Billing
Christopher Newport University bills tuition and fees and room and board charges by term. Fall bills are posted online in July and payment is due in August. Spring bills are posted in December and are due in January. It is the student's responsibility to contact the Office of Student Accounts if they are having a problem accessing their bill. Failure to receive a bill does not waive the student from any financial penalties.

For registrations, schedule adjustments, housing and meal plan assignments taking place after early registration

and the initial billing, payment is due by the payment due date or no later than the first day of class for that term. It is the student's responsibility to insure all charges are paid prior to the first day of class each term.

Please visit our website: businessoffice.cnu.edu for additional information and due dates.

Payments

1. You may view and pay your bill online through your CNU Live account.
2. Payment may also be made at the Cashier's Office with cash, money order, or check, payable to Christopher Newport University (CNU). The Cashier's Office is located in room 219 on the second floor of Gosnold Hall.
3. Money order or check, payable to Christopher Newport University can be mailed to Christopher Newport University, Attn: Cashier's Office, 1 Avenue of the Arts, Newport News, VA 23606-3072.

Students may also pay their tuition bills to the University through a monthly payment program, discussed later in this publication.

Please take careful note of the following:

1. Students who owe the University any charges accrued from previous terms (i.e., tuition, room-and-board, parking fines, library fines, etc.) are required to pay these charges before being permitted to register or access grades.
2. Students who are receiving any form of tuition assistance must provide the Office of Student Accounts with properly approved tuition assistance forms and pay any balance by the payment due date or a late payment fee will be assessed.
3. Students who are receiving any form of financial aid must have awarded and accepted aid, prior to the payment due date. Deferments will be for only the amount of the award, excluding work-study, and students are required to pay any balance by the payment due date. (Deferments do not apply to private alternative loan programs.) If a financial aid recipient chooses to withdraw from classes, they must complete the appropriate forms with the University Registrar or they will be held liable for all classes for which they are registered. Students may also be liable to repay any financial aid disbursed if the semester is not successfully completed. Late financial aid applicants must be prepared to meet the tuition obligation through means other than financial aid by the payment due date.
4. The University may, at its sole discretion, cancel a student's registration for failure to meet financial obligations at any time. Questions concerning financial policy and payment of tuition and fees should be directed to the Office of Student Accounts, Gosnold Hall 218, telephone (757)594-7195.

Payment Policy

Tuition and fees are considered fully earned and are due at the time of registration or no later than the payment due date established for each term. Tuition payment may be mailed if **received** in the University Business Office **by the payment due date.** Postmark date does not apply. You may also pay online with an eCheck (no fee) or credit card: VISA, American Express, Discover and Mastercard (convenience fee applies with credit card use).

In the Fall Term, at 5:00 p.m. on the **payment due date, the University may cancel the registration for all students who have not made financial arrangements.** These students may register again during scheduled registration periods. The University does not guarantee that students will be able to obtain their original schedules. Classes are available on a first-come-first-served basis. Reinstatement does not apply if a student's registration is cancelled on the payment due date. In the Spring Term classes are cancelled at the end of the schedule adjustment period.

Reinstatement

Beginning on the Monday following schedule adjustment week of each term, students whose registration was cancelled on Friday of schedule adjustment week may be reinstated provided they have the full amount of their financial obligation. Students may be reinstated during the first week following schedule adjustment. A reinstatement fee may apply. Please visit our CNU Business Office website for current rates.

Reinstatement will not be processed unless the student has paid the full financial obligation. If the student presents the University with a check that is returned from the bank for insufficient funds, the student's registration will automatically be cancelled.

During the reinstatement period, students may not make any schedule changes. They will be reinstated for the original schedule only. Reinstatements will only be permitted for two weeks following schedule adjustment week. Reinstatements will not be permitted after this date. Reinstatement does not apply to students whose registration was cancelled prior to schedule adjustment week.

Monthly Payment Plan

This payment option allows payment of tuition and fees in monthly installments. When determining the amount to budget, please consider tuition and fees, applied music fees, and room and board (if applicable). This plan may be used by full-time or part-time students, but is not available for summer terms.

Information concerning this plan may be obtained on our website at businessoffice.cnu.edu, or by calling (757) 594-7582. Students are encouraged to apply for the plan as soon as possible, since late application for the plan requires a larger down payment. Students who have applied for and receive financial aid may participate in the monthly tuition payment plan. The University assesses a late payment fee for each payment that is made late. This fee is payable directly to the University.

Tuition Refund Policy

If the University cancels a course for which a student has registered, the student is entitled to a full refund for that cancelled course. Please note that refunds will not be issued for any fee which is listed in the University Catalog as a non-refundable fee, unless the course is cancelled by the University. Tuition and comprehensive fees will be refunded for Fall and Spring terms in accordance with the following policy:

- 100 percent for all courses dropped through the end of the first week of the academic term or for any course which is cancelled by the University.
- 75 percent for all courses dropped during the second week of the academic term.
- 50 percent for all courses dropped during the third and fourth week of the academic term, after which time there shall be no refund.

For refund policies concerning other terms, please refer to the Business Office website at businessoffice.cnu.edu. Federal financial aid recipients who totally withdraw from the University will have their refund processed in accordance with federal regulations. These laws provide for a prorated refund if a student totally withdraws before the academic term is complete. These funds may be refunded to the financial aid grantor, if the rules of the grantor so require. All refund checks are processed through the State Treasurer and are mailed directly from Richmond to the student. Students should receive refunds within 45 days from the date the student officially makes the schedule change. Applied music fees are not refundable after the first day of scheduled lessons with the instructor.

For students receiving financial aid or tuition assistance, funds received from these programs are applied to the student's account, as received, until the entire financial obligation to the University is satisfied. Refunds are made to the student from the last funds received, if the student's account is overpaid.

Students must drop courses on or before the deadlines listed above in order to be eligible for a refund. Students who are participating in the semester tuition payment budgeting plan and whose payments received by the University exceed the amount owed in accordance with the policy listed above will receive a direct refund from the University.

All refunds will be processed in accordance with the above policy. If there are extenuating circumstances (such as mandatory job transfer or active duty military mobilization from the Hampton Roads area documented by a letter from the employer and/or a copy of military orders or extended period of hospitalization documented by a physician's statement), students should contact the Office of Student Accounts, Gosnold Hall 218, telephone (757) 594-7195, to obtain a tuition refund appeal form. Notification of the final decision will be made within two weeks of the date the appeal is filed.

Please be aware that students are held individually responsible for the information contained in the Christopher Newport University Catalog. Failure to read and comply with University regulations will not exempt students from financial penalties. All appeals must be filed by the end of the academic term to be considered. **Any appeal filed after the term will be denied regardless of the circumstances.**

Returned Checks

A returned check fee will be assessed for all checks returned from the bank to the University for any reason. An individual has seven (7) calendar days to repay the amount of the check and the returned check fee. If a check for tuition and fees is returned to the University from the bank for any reason a late payment fee will be assessed in addition to the returned check fee. If the student does not repay the total amount due within seven (7) calendar days, his or her registration will be cancelled. If a student who is being reinstated presents a check to the University that is returned by the bank for any reason, his or her registration will be cancelled. If the University receives two non-sufficient fund checks or eChecks from a student, the University will no longer accept checks or eChecks from the student or on the student's behalf.

Cashing of Student Checks

The Business Office will cash checks up to $25.00. Checks should be made payable to "Cash." Two-party checks will be cashed only when payable to the student by his or her parent. Under regulations governing state-supported agencies, the University is not permitted to cash checks made payable to Christopher Newport University. A **returned check fee** is charged for each check returned for insufficient funds. If an individual has a check returned a second time, the University will revoke all check-cashing privileges. The University will not cash a check for an individual who owes a debt to the University.

Delinquent Financial Obligations

Students who have outstanding financial obligations to the University (to include tuition and fees, room and board, parking fees and fines, library fees and fines, checks

returned for non-sufficient funds, etc.) will be refused all services to the University until these financial obligations have been paid in full. Students will not be permitted to register for subsequent terms, grades will be held, and the University will not issue official transcripts, etc. This also will apply to students who retain property that belongs to the University.

If a student's financial account becomes delinquent, the University charges a late payment penalty and administrative fee. The University may turn the account over to a third-party collection agency/credit bureau, the Department of Taxation, and the Attorney General's Office. The University is permitted under Virginia Law to attach Virginia State income tax refunds or lottery winnings in repayment of any debt which is owed to the University. In the event an account becomes delinquent, the student is responsible for all reasonable administrative costs, collection fees, and attorney's fees incurred in the collection of funds owed to the University.

Incidental Expenses

It is impossible to estimate the exact costs of clothing, travel, and other incidental expenses which the student incurs, for these are governed largely by the habits of the individual. The cost of books depends on the courses taken. Money for textbooks cannot be included in checks covering tuition and fees.

Veterans' Benefits

Students who are using Veterans Administration education benefits for the first time should anticipate a delay of approximately eight weeks before the first education allowance check is mailed. Students who plan to use V. A. Benefits should contact the University's Office of the Registrar, located on the first floor of Gosnold Hall, telephone (757) 594-7155. The University defers payment of tuition for Veteran's Chapter 31 and 33 benefits only when all paperwork has been completed and approved.

Senior Citizens

The 1989 session of the Virginia General Assembly amended and reenacted the Senior Citizen's Higher Education Act of 1974. Senior citizens are permitted to register and enroll in courses as full-time or part-time students for academic credit, without charge, providing taxable income for federal income tax purposes did not exceed $15,000 for the year preceding the enrollment year. Senior citizens may also, without charge, enroll in academic credit courses for audit purposes and in non-credit courses offered by the University without regard to income. They will, however, be required to pay applied music fees for any course for which such a fee is applicable. Senior citizens must meet the applicable University admissions requirements to participate in this waiver program, and the determination of the University's ability to offer a selected course is at the discretion of the University.

The law passed by the General Assembly in the 1988 session requires the State Council of Higher Education to establish procedures to ensure that tuition-paying students are accommodated in courses before senior citizens participating in this program are enrolled. In the case of eligible senior citizens who have completed 75 percent of the requirements towards a degree, the University is authorized to make individual exceptions to such procedures as may be established by the Council of Higher Education.

Under this program, the categorization of senior citizen applies to those whose 60th birthday falls before the registration term and who have been a legal domiciliary of Virginia for one year. No limit is placed on the number of terms a senior citizen who is not enrolled for academic credit may register for courses, but the individual can take no more than three non-credit courses in any one term. The law places no restriction on the number of courses that may be taken for credit in any term or on the number of terms in which an eligible senior citizen may take courses for credit. The continuing education program welcomes the participation of senior citizens with the understanding that their registration is contingent on a minimum number of paying students to allow the course's formation.

Forms to request the senior citizen tuition waiver are available in the Office of Student Accounts, Gosnold Hall 218, and must be completed for each academic term.

Classification as an In-State Student

Students and applicants for admission who claim entitlement to in-state educational privileges, including in-state tuition rates, must demonstrate eligibility in accordance with the provisions of Section 23-7.4 of the Code of Virginia. **Applicants for admission who believe they qualify for in-state educational privileges must complete the *Application for In-State Tuition Rates* and return it with their application for admission.** Students who are already enrolled at the University may apply for a reclassification of status through the Office of the Registrar. Such requests must be made on the *Application for Virginia In-State Tuition Rates* form. Inquiries should be addressed to the Office of Admission, CNU, 1 Avenue of the Arts, Newport News, Virginia 23606-3072.

Procedure

Upon receipt in the Office of Admission, the *Application for Virginia In-State Tuition Rates* form will be reviewed by a staff member for an initial determination. If the staff member disagrees with the student's own determination for in-state privileges, the student will be contacted immediately and given an explanation of the determination.

Appeals

Students who disagree with the original residency decision may request an immediate appeal, orally or in writing; but it must be done within 10 working days of being notified of the initial determination. A panel of three University officials will then review the appeal. Students are welcome to forward any supporting documentation (e.g., income tax returns). The panel will respond to appeals within five working days. Students who still disagree may request a final appeal. This appeal must be made in writing, addressed to the Dean of Admission within five working days of the first appeal decision. Another panel of University officials will then convene to consider the appeal. A written notification of the panel's decision will be sent to the student by U.S. Registered Mail within five days of the hearing. Should the student disagree with the final determination, he or she then has 30 days to take this matter to Circuit Court.

SHORT-TERM EMERGENCY LOANS

The John Stephen Rasmussen Memorial Fund

This fund was established by the community in 1972, in memory of John Stephen Rasmussen, a 21-year-old student who lost his life in a fire while in the act of saving others. He was posthumously awarded a Carnegie Medal. Students may borrow, twice each Term, interest free, sums (funds permitting) for a period not to exceed 45 days. Applicants should present a valid Christopher Newport University student ID card when they apply to the Office of Student Accounts.

Emergency Loan Fund

An emergency loan fund was established in 1967 by the sophomore class, in honor of former CNU President James C. Windsor. Students may borrow interest free, sums for a period not to exceed 45 days. Students may receive no more than two emergency loans per academic term and each loan is limited to $200, funds permitting. For emergency loan purposes, all summer terms equal one academic term. Applicants should present a valid Christopher Newport University student ID when they apply to the Office of Student Accounts.

OFFICE OF FINANCIAL AID

Tina Russell, Director
Gosnold Hall, First Floor
(757) 594-7170
finaid@cnu.edu

Christopher Newport University offers financial assistance to qualified graduate students to help pay for all or part of their college expenses. All students are encouraged to complete the *Free Application for Federal Student Aid* (FAFSA) by March 1 to ensure aid is in place for the following academic year. The FAFSA can be completed online at www.fafsa.gov. Results are sent to the CNU Office of Financial Aid electronically, and students can expect to receive their offer of financial aid no later than June 30. Students who file their FAFSA late should be prepared to pay their tuition and expenses up front. Students who wish to be considered for financial aid must file a FAFSA each year, beginning January 1.

STUDENT ELIGIBILITY

To be eligible for financial aid, graduate students must:

Be admitted as a degree-seeking student in an eligible graduate program;
Be enrolled at least half-time;
Be in good academic standing;
Be making satisfactory academic progress;
Be a U.S. citizen or eligible non-citizen;
Not owe a refund of a federal grant;
Not be in default on a federal student loan.

Half-time students must be enrolled in at least five credits in the fall semester or in the spring semester, and a total of at least three credits for all summer sessions combined to receive aid. Total aid for the year cannot exceed federal annual loan limits established by the federal government and is limited by the cost of attendance (tuition, fees, room, board and miscellaneous expenses as defined by the Office of Financial Aid).

FEDERAL DIRECT STUDENT LOAN

Graduate students may borrow up to $20,500 per academic year, not to exceed the cost of attendance. Loans made under the Federal Unsubsidized Direct Student Loan program are at a fixed interest rate and are long-term, deferrable loans. With an Unsubsidized Direct Loan, the interest that accrues while the loan is in deferment is the responsibility of the student. Students may borrow a total of $20,500 per year, not to exceed the cost of attendance. These loans are deferred until six months after the student graduates or stops attending half- time.

Loan proceeds are sent directly to CNU and are applied to charges before any refunds are made to the student.

SCHOLARSHIPS

Graduate students are encouraged to seek outside scholarships as an additional source of funding to pay for college. The following is a list of suggested websites:

fastweb.com
scholarships.fatomei.com
findtuition.com
FreeCollegeScholarships.net
studentaid.gov

When the Office of Financial Aid is notified of specific outside scholarship sources, they will be made available via email to all students, on the Financial Aid website, and at the Office of Financial Aid.

Satisfactory Academic Progress

Per federal regulations, students receiving financial aid must be making progress toward a degree. Students must remain in good academic in order to qualify for financial aid. Please review CNU's Satisfactory Academic Progress policy online at cnu.edu/financialaid/policies/.

Budget Planning

Budget planning for attending CNU should consider both direct and indirect costs. Direct charges are tuition and fees (cnu.edu/businessoffice/studentsparents/tuition.asp). Indirect costs include but are not limited to room, board, books, transportation and miscellaneous expenses. Students should be prepared to pay out-of-pocket for books and initial living expenses, as student loans are not disbursed until the first week of classes.

Additional Information

Students interested in receiving financial aid should view the Christopher Newport University website at cnu.edu/financialaid. Financial aid applications should be submitted online at fafsa.gov. Individual guidance is available on a walk-in basis at the Office of Financial Aid, Gosnold Hall, 1st Floor. You may also call the office at (757) 594-7170 or email your questions to finaid@cnu.edu.

SHORT-TERM EMERGENCY LOANS

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student ID card when they apply to the Office of Student Accounts.

Emergency Loan Fund

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GRADUATE ASSISTANTSHIPS

Terms

The length of time a graduate student may receive an assistantship is a combination of four semesters and two summers in a two-year period and may include a tuition and fee waiver. Types of assistantship activities are research and/or related activities, administration (e.g., of tutorial programs), or teaching and/or related activities. Employment outside of the assistantship requires the approval of the Director of Graduate Studies. Students must indicate their compliance with university privacy regulations by signing the *Confidentiality/Privacy Statement of Agreement.*

Criteria

The degree-seeking graduate student must be enrolled as a full-time student, taking a minimum of six and a maximum of nine credit hours in the semester of the award. He/she must submit a *Graduate Assistantship Application* and the following: scores from the standardized test required for graduate program admission, graduate grade point average, undergraduate grade point average, two letters of reference, and an essay explaining how the award will further his/her career goals.

Application Procedures

Contact the Office of Graduate Studies at (757) 594-7544 or gradstdy@cnu.edu for a *Graduate Assistantship Application* and submit the application directly to the Graduate Program Coordinator of the program in which you are enrolled along with a copy to the Office of Graduate Studies.

BACHELOR'S TO MASTER'S FIVE-YEAR DEGREE PROGRAMS

Christopher Newport University offers master's degree programs that CNU students can complete with one additional year beyond the senior year. At the end of four years of study a student earns a bachelor's degree, and the student enrolls the next semester/term in graduate courses leading to a master's degree. Please note that the use of the term 'five-year' is not meant to insure the completion of the master's in precisely five years. While in most cases this should be possible, the number of graduate hours completed while an undergraduate, the number of hours required for the master's, and the vagaries of thesis research may require a specific student to take longer than five years.

Students may elect to participate in a five-year program to earn their master's degree in one of the following areas:

Applied Physics and Computer Science (MS - APCS)
Environmental Science (MS - ENVS)
Teaching (MAT)

Admission Requirements

- Current Grade Point Average (GPA) of 3.00 or higher.
- **Examination scores: (must be less than five years old) See each degree program for specific requirements**;
- Two completed recommendation forms (one must be from a CNU faculty member in the major). There is a specific recommendation form for **MS applicants** and a specific recommendation form for **MAT applicants**.
- Additional, specific requirements (such as an essay or documents) are listed on the *Checklist for Applicants to the Bachelor's to Master's 5 Year Degree Program* at: cnu.edu/gradstudies/pdf/5yearchecklistmat.pdf

Application Process

- The student completes and electronically submits the *Application for Admission to the Five-Year Graduate Study Program at: cnu.edu/gradstudies/fiveyear/ Select the Application Information tab.*
- The student submits all items listed on the *Checklist* required for admission to the program of their choice.
- The **application deadline for the Five-year Graduate Study Program is February 1 of the junior year**. Sixty-five undergraduate credits must have been earned prior to submitting the application. Transfer students may apply at this time, but a decision will not be made until applicants have demonstrated at least 12 hours of earned credit at Christopher Newport University with a GPA of 3.0 or higher. **The application and all supporting documents must be received by Graduate Admission by February 1.**
- No application fee is required.

To check the status of the application email **gradques@cnu.edu**.

After the complete admission package has been received by Graduate Admission at gradques@cnu.edu, it will be sent to the appropriate Graduate Program Coordinator for review and:

- if you applied to the **APCS** or **ENVS** program, please allow **three weeks for the committee's decision and processing**. A decision letter will be sent to you by mail;
- if you applied to the **MAT** program, the MAT Admission Committee will begin reviewing application packages March 15. A decision letter will be sent to you by mail on April 1.

Once accepted into the five-year program, students meet with their academic advisor and Graduate Program Coordinator to determine a specific course Plan of Study. Students begin taking graduate classes in their senior year at CNU.

Academic Performance as an Undergraduate Student in Five-year Program

a) To continue in the five-year program, a student must maintain a 3.0 GPA, and remain in good standing by earning a grade of *B-* or better in any graduate course taken while in the undergraduate status.
b) If an undergraduate student in a five-year program earns a single grade of *F* or two grades of *C+* or lower in a graduate-level course(s), that student will not be allowed to continue in the five-year program, and the offer of admission to the graduate program will be rescinded.
c) Upon completion of the normal requirements in his or her respective undergraduate program, a bachelor's degree will be awarded to the student.

Graduate Grading System
If an undergraduate student in a five-year program enrolls in a graduate course, the following graduate grading system will apply:

Letter Grade	Meaning	Numerical Value
A	Excellent	4.00
A-		3.70
B+		3.30
B	Good	3.00
B-		2.70
C+		2.30
C	Passing (Poor)	2.00
C-		1.70
F	Failing	0.00
I	Incomplete	
W	Withdrew	

Graduate courses may not be taken on a pass/fail basis.

Graduate Courses taken while a Senior may be transferred to a CNU Graduate Transcript
During the senior year, the five-year student will enroll in graduate credit hours that may be transferred to the graduate transcript. The student is responsible for completing 120 credits for the undergraduate degree plus any graduate credits. Only the courses and the credits are posted to the graduate transcript. No grades are posted for the transferred courses.

Credits
To receive the master's degree, all graduate students, including those enrolled in the five-year bachelor's to master's programs, **must present on the graduate transcript successful completion of a minimum of 30 hours of graduate credits.** However individual programs may require additional hours.

The **Five-year Program Requirements**, **Graduate Course Hours** and **Course of Study** for each program are listed on the following pages.

MASTER OF ARTS IN TEACHING
FIVE-YEAR PROGRAM

This five-year program leads to both a baccalaureate degree and a Master of Arts in Teaching (MAT). At the end of four years of study a student earns a bachelor's degree. Based on the endorsement area chosen, the student enrolls in courses to teach at the elementary or secondary level. In the fall and spring semesters of the fifth year, the student is involved in a 13-14 week full-time teaching internship in the public schools, and receives supervision from knowledgeable teaching professionals. Upon completion of the program, a student earns a Master of Arts in Teaching degree and a license to teach in the Commonwealth of Virginia. This master's degree program is for those students who seek to become successful first-year teachers.

MAT five-year students select an endorsement area from one of the following:

Endorsement	Grades
Art (Visual Arts)	PK - 12
Biology	6 - 12
Chemistry	6 - 12
Computer Science	6 - 12
Elementary	PK - 6
English	6 - 12
English as a Second Language	PK - 12
History and Social Science	6 - 12
Mathematics	6 - 12
Music-Choral or Instrumental	PK - 12
Physics	6 - 12
Spanish	PK - 12

Admission Requirements

Criteria for student admission into a five-year program:

1. Undergraduate cumulative GPA of 3.0 or higher.
2. MAT Examination score requirements: (must be less than five years old);
   a) **VCLA (Virginia Communications and Literacy Assessment)** Reading and Writing subtest scores of 235 or higher on each subtest, AND
   b) **Praxis Core Mathematics** exam with a minimum score of 150 or higher. Exemption: Applicants with an SAT score of 1100 with a minimum 530 on the verbal and quantitative portions of the test OR an ACT composite score of 24, with a mathematics score of no less than 22 and the English plus Reading score of no less than 46, are exempt from having to take the Praxis Core Mathematics exam.
3. A successful background check by Newport News Public Schools.
4. Two completed recommendation forms. Three recommendations forms are recommended. One must be from a faculty member in the major who has taught the student in a major course.
5. Two essays, demonstrating competence in written communication and dispositions for teaching. The responses should be typed and double spaced. The suggested length for each essay is 250 words. The essays are a critical component of the application. An inadequate essay may result in denial of admission, request for an interview, or remediation.
6. Completion of all prerequisites, or written plan for completion of all prerequisites, with no more than two outstanding, prior to beginning graduate study at CNU.
7. Resume showing experience in working with children and/or in schools.
8. MAT-Choral and Instrumental Music five-year applicants must be accepted for continuance in the Bachelor of Music in music education program**.**

Students apply for admission to a five-year program by February 1 of the junior year. Transfer students may also apply at this time, but a decision will not be made until applicants have demonstrated at least 12 hours of earned credit at CNU with a GPA of 3.0 or higher.

Five-Year Undergraduate Program Requirements

a) To continue in the five-year program, a student must maintain a 3.0 GPA, and remain in good standing by earning a grade of *B-* or better in any graduate course taken while in the undergraduate status.
b) If an undergraduate student in a five-year program earns a single grade of *F* or two grades of *C+* or lower in a graduate-level course(s), that student will not be allowed to continue in the five-year program, and the offer of

admission to the graduate program will be rescinded.

c) Upon completion of the normal requirements in his or her respective undergraduate program, a baccalaureate degree will be awarded to the student.

Graduate Course Hours

Graduate credit hours taken as a five-year MAT undergraduate are subject to the following requirements:

a) A maximum of nine hours of credit will be allowed while classified as an undergraduate.
b) All courses must be approved by the student's advisor.
c) The student will be held to the same standards in these classes as any other graduate student.
d) To continue to take graduate courses as an undergraduate, a student must complete each graduate course with a grade of *B-* or better.
e) Six graduate credit hours will count toward the 120 hours required for an undergraduate degree and will not directly count toward the MAT degree.
f) Should the five-year student take nine graduate credit hours during the senior year, one three-credit graduate course will be transferred to the graduate transcript once the baccalaureate degree is earned. Only the course and credits are posted to the graduate transcript. No grade is posted for the transferred course
g) **The number of credit hours on the graduate transcript must total at least 30 overall.**

Course of Study

a) The five-year student who takes six graduate credit hours while in undergraduate status will enroll in nine graduate credits during the summer terms, 12 graduate credits fall semester, and nine graduate credits spring semester (see Example A below).
b) The five-year student who takes nine graduate credit hours (by permission) while in undergraduate status will have three graduate credit hours moved to the graduate transcript. The student will enroll in graduate credits during fall and spring semesters of the senior year (see Example B below).
c) A student accepted into the five-year program is required to follow the course of study as shown below in order to complete the curriculum within five years.

Examples of Five-year Program Course of Study

Example A: Five-year student takes 6 graduate credit hours while in undergraduate status

Undergraduate Status		
Graduate Courses taken in senior year	6	credits
Undergraduate Courses	114	credits
Total	120	credits
Graduate Status		
Summer	8	credits
Fall	13	credits
Spring	9	credits
Total for MAT	30	credits

Example B: Five-year student takes 9 graduate credit hours while in undergraduate status

Undergraduate Status		
Graduate credits taken in senior year with permission	9	credits
Undergraduate Courses	114	credits
Total	123	credits
(3 credits to be moved to Graduate Transcript)		
Graduate Status		
Credits moved from Undergraduate Transcript	3	credits
Summer	8	credits
Fall	10	credits
Spring	9	credits
Total for MAT	30	credits

Further information about this program maybe found at MAT website: gradstudies.cnu.edu/mat

Goals of the Program

Students who complete the Teacher Preparation Program at Christopher Newport University will demonstrate competence in these areas:

1. Planning and preparing for instruction based on knowledge of content, resources and students;
2. Creating a safe, orderly and nurturing environment that creates high expectations for all while recognizing and respecting diversity;
3. Delivering and assessing instruction to meet state-mandated and district objectives, adjusting methods as needed to engage and teach every child;
4. Professional responsibilities of dress, collegial behaviors, engagement with families, administrative duties, and self-directed growth.

Requirements for beginning the Teaching Internship (TCHG 510 or 511/512)

- GPA of 3.00 or higher
- Praxis II passed (except ESL candidates)
- VCLA passed and score report submitted
- 120 hour field log submitted
- TB test results submitted
- Evidence of three conferences/workshops submitted (at least two hours each, at different venues)
- Proof of AED/First Aid/CPR submitted
- Child Abuse and Neglect Module certificate submitted
- Civics Module certificate submitted (elementary only)

Program Completion Requirements

The student completing the Teacher Preparation Program with recommendation for state licensure must accomplish all of the following:

- Successful completion of all required program coursework;
- 3.0 GPA in graduate coursework with no more than two grades of C on the graduate transcript;
- Passing scores on the appropriate PRAXIS II exam and other state-mandated examinations;
- An acceptable impact study evaluated by a university supervisor;
- Provide evidence of meeting program goals (above) through evaluations submitted during the teaching internship.

NOTE: Program completion will result in a recommendation for Virginia state licensure for teaching. The license is conferred by the Virginia Department of Education, and the commission of a felony, or a misdemeanor involving children and/or drugs, may result in the denial of issuance of the license. Questions concerning this should be directed to the Director of Teacher Preparation, Dr. Marsha Sprague at msprague@cnu.edu or (757) 594-7388.

Graduate Assistantships

Graduate assistantships are available. Contact the Graduate Program Coordinator for details. Additional information is available in this catalog on page 30.

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM
WITH LICENSURE
ART (VISUAL ARTS) PK - 12

GRADUATE COURSE REQUIREMENTS
SENIOR YEAR

(Select two of the three; the third course will be taken in fall of the professional year or by permission of the Graduate Program Coordinator during the senior year.)		Credits
FNAR 534	Theory and Practice of Art Education **F**	3
FNAR 589	Teaching Functional Arts	3
PSYC 544	Assessment of Learning	3

PROFESSIONAL YEAR - SUMMER

TCHG 516-517	Curriculum and Instruction I, II	3
FNAR 535	Integrating the Visual Arts	3
TCHG 543	Classroom Management and Discipline	2

PROFESSIONAL YEAR - FALL

ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures (3)	3
TCHG 518L	Secondary Field Practicum **F**	1
3 Credit Course	Selected from Senior Year courses if not taken	(3)
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING

TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements

ENGL 123, 223	First-year and Second-year Writing Seminars	6
MATH 125	Elementary Statistics	3
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3
FNAR 201-202	World Art in Context I, II	6
FNAR 118	2-D Design	3
FNAR 128	Introduction to Digital Media	3
FNAR 224	Painting I	3
FNAR 226	Mixed Media and Functional Art I	3
FNAR 241 or FNAR 251	Ceramics I or Sculpture I	3
FNAR 322	Advanced Figure Drawing	3
9 CREDITS	Upper-level Art History Electives	9

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM
WITH LICENSURE
BIOLOGY 6 - 12

GRADUATE COURSE REQUIREMENTS
SENIOR YEAR
FROM THE FOLLOWING ELECTIVES:

Select six credits; two credits of ENVS electives will be taken in fall of the professional year or by permission of the Graduate Program Coordinator during the senior year.		Credits
ENVS Electives:		6
ENVS 518	Biological Conservation: Theory & Practice (4)	
ENVS 522	Summer Field Studies (2)	
ENVS 530	Biogeography (3)	
ENVS 532/532L	Wetlands Ecology and Lab (4)	
ENVS 536/536L	Terrestrial Ecology and Lab (4)	
ENVS 540/540L	Environmental Microbiology and Lab (4)	
ENVS 550	Global Change (3)	
ENVS 590	Topical Seminars in Environmental Science (1 - 4)	
ENVS 595	Advanced Topics in Environmental Science (1 - 4)	

PROFESSIONAL YEAR - SUMMER

TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management & Discipline	2
NSCI 570	Teaching STEM	4

PROFESSIONAL YEAR - FALL

ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures (3)	3
TCHG 518L	Secondary Field Practicum **F**	1
2 Credits	ENVS Elective selected from Senior Year if not taken	(2)
120 HOURS	*Field Experience*	

PROFESSIONAL - SPRING

TCHG 580	Technology for Teacher	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements

COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3

(continued on the next page)

Major Courses Required:		Credit
BIOL 211/211L	Principles of Biology I & Lab	4
BIOL 212/212L	Principles of Biology II & Lab	4
BIOL 213/213L	Principles of Biology III & Lab	4
BIOL 313	Genetics	3
BIOL 391	Junior Seminar	3
BIOL 491	Senior Seminar	1
BIOL 407/407L	General Ecology & Lab	4
BIOL ___	Fifteen additional credits above the 100-level (12 of these credits must be at 300-/400-level and have laboratory components) Recommended for all secondary biology teachers: BIOL 215 Biological Evolution BIOL 314/314L Human Anatomy & Physiology & Lab OR BIOL 420/420L Animal Physiology & Lab	15

Support Courses required:		
MATH 125 & 130	Mathematics Electives or higher	6
CHEM 121/121L	General Chemistry I & Lab	4
CHEM 122/122L	General Chemistry II & Lab	4
CHEM 321/ 321L	Organic Chemistry I, II & Lab	4
CHEM 322/ 322L	Organic Chemistry II & Lab	4
PHYS 151/151L	Intermediate Physics & Lab	4
PHYS 152/152L	Intermediate Physics & Lab	4

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM
WITH LICENSURE
CHEMISTRY 6 - 12

GRADUATE COURSE REQUIREMENTS

SENIOR YEAR -		Credits
CHEM Electives:		6

Six Hours of Graduate CHEM electives (except CHEM 545) must include ONE course from the following unless taken at the undergraduate level: CHEM 543 Atmospheric Chemistry; CHEM 540 Soils and Water Chemistry; or CHEM 565 Environmental Chemistry; two credits will be taken in the fall of the professional year or by permission of the Graduate Program Coordinator during the senior year.

PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
NSCI 570	Teaching STEM	4

PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or	Multiculturalism, Diversity and Education or	3
TCHG 550	Teaching Across Cultures	
TCHG 518L	Secondary Field Practicum **F**	1
CHEM xxx	Graduate CHEM elective if not taken in senior year	(2)
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements		
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics	3
MATH 140	Calculus & Analytic Geometry	4
MATH 240	Intermediate Calculus	4
BIOL 107 or 108 (or higher)	General Biology I or II & Laboratory	8
CHEM 121/121L-122/122L	General Chemistry I & II & Laboratory	8
PHYS 151/151L-152/152L	Intermediate Physics & Laboratory	8
Major Courses in Chemistry:		
CHEM 321/321L-322/322L	Organic Chemistry I, II & Laboratory	8
CHEM 341-342/342L	Physical Chemistry I, II & Laboratory	7
CHEM 361/361L	Analytical Chemistry & Laboratory	4
CHEM 391	WI: Investigating Chemical Literature	3
CHEM 401/401L	Inorganic Chemistry & Laboratory	4
CHEM 445/445L	Instrumental Analysis & Laboratory	4
CHEM 492	WI: POGIA-Comprehensive Review	3
6 Credits	300/400 Chemistry Electives	6

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM WITH LICENSURE COMPUTER SCIENCE 6-12

GRADUATE COURSE REQUIREMENTS

Select two of the three; the third course will be taken in fall of the professional year or by permission of the Graduate Program Coordinator during the senior year.

SENIOR YEAR		Credits
CPSC 501	Software System Design and Implementation	3
CPSC ____	Graduate Elective	3
CPSC ____	Graduate Elective	2
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
NSCI 570	Teaching STEM	4
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
TCHG 518L	Secondary Field Practicum **F**	1
2 or 3 Credit Course	Selected from Senior Year courses if not taken	(2-3)
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements

COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics	3
Core Courses:		
CPEN 371	WI: Computer Ethics	2
CPSC 125, 150/150L-250/250L	Computer Science Courses	11
MATH 140	Calculus and Analytic Geometry	4
PHYS 151/151L-152/152L or PHYS 201/201L-202/202L	Intermediate Physics & Lab or General Physics & Lab	8 8
PHYS 340 or MATH 235 or MATH 260 or PHYS 340	Methods of Theoretical Physics or Applied Matrix Techniques or Linear Algebra or Methods of Theoretical Physics	3

(continued on the next page)

Support Courses in Computer Science:		Credits
MATH 240	Intermediate Calculus	4
ENGR 213	Discrete Structures for Computer Applications	3
CPEN 214	Digital Logic Design	3
PHYS 341	Design and Analysis of Experiments	3
Major Courses in Computer Science:		
CPSC 360	Programming Language Concepts	3
CPSC 270	Data and File Structures	3
CPSC 410	Operating Systems	3
CPSC 420	Algorithms	3
CPSC 330 or CPEN 414	Computer Organization or Computer Architecture	3
Select three:		9
CPSC 425, 427, 440, 450, 460, 470, 471, 480, 485, 495;MATH 380; PHYS 421, 441; with courses number 495 and above used no more than twice		
PCSE 498	WI: Capstone Course	3

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM WITH LICENSURE ELEMENTARY PK- 6

GRADUATE COURSE REQUIREMENTS

SENIOR YEAR

Select two of the three; the third course will be taken in fall of the professional year or by permission of the Graduate Program Coordinator during the senior year.		Credits
ENGL 530 or	Grammar to Enhance and Enrich Writing or	3
ENGL 532 or	Language Varieties in American Schools (3) or	
MLAN 511	Advanced Strategies in TESOL (3) **F**	
MATH 570	The Study of Mathematics **F**	3
ENGL 521	Developing Elementary Writers and Readers **F**	3

PROFESSIONAL YEAR - SUMMER

PSYC 544	Assessment of Learning	3
TCHG 516, 517	Curriculum and Instruction I, II **F (elementary)**	3
TCHG 543	Classroom Management and Discipline	2

PROFESSIONAL YEAR - FALL

PSYC 521	Reading Acquisition and Development	3
PSYC 521L	Reading Acquisition and Development Lab	1
PSYC 535	Exceptional Learner	3
SOCL 501 or	Multiculturalism, Diversity and Education or	3
TCHG 550	Teaching Across Cultures	
3 Credit Course	Selected from Senior Year courses if not taken	(3)
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING

TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements

ENGL 123, 223	First-Year & Second-Year Writing Seminars	6
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics	3
GEOG 201	Introduction to Geography	3
GOVT 101	Power and Politics in America	3
HIST 111	The Ancient & Medieval World	3
HIST 121	Early America to the Civil War	3
ENGL 316	Children's Literature	3
ENGL 310 or	Introduction to Linguistics or	3
ENGL 430	The Structure of English	
MATH 109	Theoretical Foundations of Elem. School Mathematics	3
NSCI 310	Exploring Science Concepts	3
7 Credits	Two Science Courses with one Lab	7

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM
WITH LICENSURE
ENGLISH 6 - 12

GRADUATE COURSE REQUIREMENTS

SENIOR YEAR		Credits
Select two of the three; the third course will be taken in fall of the professional year or by permission of the Graduate Program Coordinator during the senior year.		
PSYC 544	Assessment of Learning	3
ENGL 526	Teaching Writing in Secondary English Classes	3
ENGL 530 or ENGL 532 or MLAN 511	Grammar to Enhance and Enrich Writing or Language Varieties in American Schools or Advanced Strategies in TESOL **F**	3
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
ENGL 501	Teaching Literature	3
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
TCHG 518L	Secondary Field Practicum **F**	1
3 Credit Course	Selected from Senior Year courses if not taken	(3)
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements		
ENGL 123, 223	First-Year & Second-Year Writing Seminars	6
ENGL 200, 201, 202	Literary Foundations I, II, III	9
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics	3
ENGL 308	WI: Literature, Theory, and Culture WI	3
ENGL 309	WI: Creative Nonfiction	3
ENGL 315	Adolescent Literature	3
MLAN 311	Teaching English to Speakers of Other Languages	3

(continued on the next page)

		Credits
Choose one of the following:		3
ENGL 341	The Invasion of America: Concepts of Americanness, 1492-1800 (3)	
ENGL 342	Financial Fictions and the Rise of Realism (3)	
ENGL 343	Postmodern America (3)	
ENGL 345	African-American Literature and Culture	
ENGL 410	Southern American Literature (3)	
ENGL 412	Multicultural American Literature (3)	
Choose one of the following:		3
ENGL 428	The Literary Booms	
ENGL 429	East-West Literary Relations	
Choose one of the following::		
ENGL 256	Introduction to Film Studies (3)	
ENGL 356	Film, Theory, and Culture (3)	
ENGL 380	Film and Literature (3)	
ENGL 381	The Roaring Twenties (3)	
ENGL 385	American Film (3)	
Other required content courses:		
ENGL 421	Shakespeare	3
ENGL 430	The Structure of English	3
ENGL 490	WI: Senior Seminar	3

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM WITH LICENSURE ENGLISH AS A SECOND LANGUAGE (ESL) PK - 12

GRADUATE COURSE REQUIREMENTS

SENIOR YEAR		Credits
(Select two of the three; the third course will be taken in fall of the professional year)		
ENGL 521	Developing Elementary Writers and Readers	3
MLAN 511	Advanced Strategies in TESOL **F**	3
ENGL 530 or	Grammar to Enhance and Enrich Writing	3
ENGL 532	Language Varieties in American Schools	
PROFESSIONAL YEAR - SUMMER		
PSYC 535	Exceptional Learner	3
TCHG 516-517 m/s	Curriculum and Instruction I, II (mid/sec)	3
TCHG 543	Classroom Management and Discipline	2
PROFESSIONAL YEAR - FALL		
PSYC 521	Reading Acquisition and Development	3
PSYC 521L	Reading Acquisition and Development Lab **F**	1
ENGL 522	Content Area Literacy **F**	3
SOCL 501 or	Multiculturalism, Diversity and Education or	3
TCHG 550	Teaching Across Cultures	
3 Credit Course	Selected from Senior Year courses if not taken	(3)
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements

ENGL 123, 223	First-Year & Second-Year Writing Seminars	6
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics	3
ENGL 310	Introduction to Linguistics	3
ENGL 430	The Structure of English	3
SOCL 330 or	Language and Culture or	3
MLAN 308	Cross-cultural Understanding	
MLAN 311	Teaching English to Speakers of Other Languages (TESOL)	3
Foreign Language through 202	(Spanish recommended)	

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM
WITH LICENSURE
HISTORY AND SOCIAL SCIENCE 6 - 12

GRADUATE COURSE REQUIREMENTS
SENIOR YEAR

Select two of the three; the third course will be taken in fall of the professional year or by permission of the Graduate Program Coordinator during the senior year.		Credits
HIST ____	510/520/530 History	3
HIST ____	510/520/530 History	3

PROFESSIONAL YEAR - SUMMER

TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management & Discipline	2
HIST/GOVT 570	Methods for Teaching Social Studies	3
HIST ____ or GEOG 570	510, 520, 530 History or World Geography for Teachers	3

PROFESSIONAL YEAR - FALL

ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
TCHG 518L	Secondary Field Practicum **F**	1
3 Credit Course	Selected from Senior Year courses if not taken	(3)
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING

TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements
Student must earn a B.A./B.S. in History or Government or B.A. in American Studies

COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics	3
HIST 111-112G	The Ancient and Medieval World-The Modern World	6
HIST 121-122	Early America to the Civil War-Modern America	6
HIST 390	WI: Historical Methods and Historiography	3
HIST __ __	Two 300/400-level History courses	6
ECON 201 or ECON 202	Macroeconomics or Microeconomics (201 preferred)	3
GEOG 201-202	Introduction to Geography I and II	6
GOVT 100 or GOVT 101	Political Thought & Society or Power and Politics in America	3
GOVT 202	State and Local Government	3
GOVT 215	International and Comparative Politics	3
GOVT ___, ___	Two 300/400-level Government courses	6

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM WITH LICENSURE MATHEMATICS 6 - 12

GRADUATE COURSE REQUIREMENTS

SENIOR YEAR		Credits
Select two of the three; the third course will be taken in fall of the professional year or by permission of the Graduate Program Coordinator during the senior year.		
MATH 578	Elementary Geometry from an Advanced Viewpoint	3
MATH 538	Apprenticeship in Teaching Mathematics	2
PSYC 544	Assessment of Learning	3
PROFESSIONAL YEAR: SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
NSCI 570	Teaching STEM	4
PROFESSIONAL YEAR: FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
TCHG 518L	Secondary Field Practicum **F**	1
2-3 Credit Course	Selected from Senior Year courses if not taken	(2-3)
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR: SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements		
ENGL 123, 223	First-Year & Second-Year Writing Seminars	6
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics (May be replaced by MATH 435)	3
MATH 140	Calculus and Analytic Geometry	4
MATH 245	Proofs and Discrete Math	3
MATH 250	Multivariable Calculus	3
MATH 260	Linear Algebra	3

(continued on the next page)

MATH 360	Real Analysis I	3
MATH 370	Modern Algebra I	3
MATH 451 OR MATH 499	Independent Learning Experiences OR Independent Research	1-3
MATH 128 or CPSC 125 or higher		3
MATH __ __ __ __ __ __	Six* 300/400-level Mathematics (excluding 499) (*may include up to nine credits of BIOL, PHYS, CPSC or other upper level sciences)	18
MATH __	One 400-level Mathematics course (excluding 499)	3

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM
WITH LICENSURE
MUSIC - CHORAL PK - 12

GRADUATE COURSE REQUIREMENTS

SENIOR YEAR		
MUSC 520	Choral Literature and Conducting	3
MUSC 510	Foundations of Music Education	3
MUSC 580	Jazz Ensemble Techniques	1
PROFESSIONAL YEAR - SUMMER		
PSYC 535	Exceptional Learner	3
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
MUSC 537	Music in Elementary Schools	3
APP COND 531 or APP MUSC 531	Applied Choral Conducting or Applied Lessons	1
MUSC 598	Choral Apprenticeship	1
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements
Accepted for continuance in the Bachelor of Music in music education program is required.

THEA 230	Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics	3

Applied Music and Ensembles

APP MUSC 131-132, 231-232, 331-332, 431-432 (Senior Recital)	8
8 Credits of MUSC 105, 106, or 117	8
Non-credits of MUSC 012	8
MUSC 115-116 and 215-216 or four semesters of APP PIAN 130; successful completion of the piano proficiency for choral music education majors	4

(continued on next page)

Music Theory and History

MUSC 200	Music Technology	1
MUSC 209-210	Elementary Ear Training	2
MUSC 309-310	Advanced Ear Training	2
MUSC 211-212	The Tonal System-Tonal Harmony & Voice-Leading	6
MUSC 311-312	Chromatic Harmony-Extended Tonal Techniques & Atonality	6
MUSC 303-304-305W	History of Western Music	9
MUSC 401W	WI:Seminar in Music Bibliography	3
MUSC 415	Orchestration	1

Music Techniques

MUSC 220	Brass Instrument Techniques **F**	1
MUSC 230	Woodwind Instrument Techniques **F**	1
MUSC 240	Percussion Techniques **F**	1
MUSC 250	String Instrument Techniques **F**	1
MUSC 265-266	Foreign Language Diction I & II	2
MUSC 496	Vocal Pedagogy	3

Conducting and Literature

MUSC 314	Principles of Choral Conducting	3

Completion of exit examination in music theory and music history with a score of 70% or higher.

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM
WITH LICENSURE
MUSIC - INSTRUMENTAL PK - 12

GRADUATE COURSE REQUIREMENTS

SENIOR YEAR

MUSC 510	Foundations of Music Education	3
MUSC 530 or 540	Wind or Orchestral Literature & Conducting	3
MUSC 580	Jazz Ensemble Techniques	1

PROFESSIONAL YEAR - SUMMER

PSYC 535	Exceptional Learner	3
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2

PROFESSIONAL YEAR - FALL

ENGL 522	Content Area Literacy **F**	3
MUSC 537	Music in Elementary Schools	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
APP COND 531 or APP MUSC 531	Applied Wind/Orchestral Conducting or Applied Music	1
MUSC 570	Marching Band Techniques	1
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING

TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements
Accepted for continuance in the Bachelor of Music in music education program is required.

MATH 125	Elementary Statistics	3
THEA 230	Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
SOCL 314	Education, Culture and Society	3

Applied Music and Ensembles

APP MUSC 131-132, 231-232, 331-332 and 431-432 (Senior Recital)	8
MUSC 101, 102, 111, 112 or 114	8
Non-credits of MUSC 012	8
Four semesters of APP PIAN 130; MUSC 115-116, 215-216; successful completion of the piano proficiency for instrumental music education majors	4
MUSC 125	1

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Music Theory and History

MUSC 200	Music Technology	1
MUSC 209-210	Elementary Ear Training	2
MUSC 309-310	Advanced Ear Training	2
MUSC 211-212	The Tonal System-Tonal Harmony & Voice-Leading	6
MUSC 311-312	Chromatic Harmony-Extended Tonal Techniques & Atonality	6
MUSC 303-304-305W	History of Western Music	9
MUSC 401W	WI: Seminar in Music Bibliography	3
MUSC 415	Orchestration	1

Music Techniques

MUSC 220	Brass Instrument Techniques **F**	1
MUSC 230	Woodwind Instrument Techniques **F**	1
MUSC 240	Percussion Techniques **F**	1
MUSC 250	String Instrument Techniques **F**	1
MUSC 260	Voice Techniques	1

Conducting and Literature

MUSC 316	Principles of Instrumental Conducting	3

Completion of exit examination in music theory and music history with a score of 70% or higher.

Chamber Music	4

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM
WITH LICENSURE
PHYSICS 6 - 12

GRADUATE COURSE REQUIREMENTS

SENIOR YEAR

(Select two of the three; the third course will be taken in fall of the professional year or by permission of the Graduate Program Coordinator during the senior year.)		6
PHYS 501	Models of Dynamical Systems	
PHYS 502	Quantum Physics	
PHYS 504	Electromagnetic Theory	

PROFESSIONAL YEAR - SUMMER

TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
NSCI 570	Teaching STEM	4

PROFESSIONAL YEAR - FALL

PHYS 5xx	Physics Elective	2
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
TCHG 518L	Secondary Field Practicum **F**	1
3 Credit Course	Selected from Senior Year courses if not taken	(3)
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING

TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8

TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements

COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics	3

Core Courses:

CPEN 371	WI: Computer Ethics	2
CPSC 125	Foundations of Computer Science	3
CPSC 150/150L-250/250L	Computers & Programming I & II and Labs	8
MATH 140	Calculus and Analytic Geometry	4
PHYS 201/201L-202/202L	General Physics and Lab	8
PHYS 340	Methods of Theoretical Physics	3

(continued on the next page)

Support Courses in Applied Physics:

ENGR 121	Engineering Design	3
MATH 240	Intermediate Calculus	4
MATH 250	Multivariable Calculus	3
MATH 320	Ordinary Differential Equations	3

Major Courses in Applied Physics:

ENGR 211/211L	Intro. to Electric Circuits & Electronics, & Lab	4
CPEN 214	Digital Logic Design	3
PHYS 303	General Physics	3
PHYS 341	Design and Analysis of Experiments	3
PHYS 351	Modern Physics	3
PHYS 401	Models of Dynamical Systems	3
PHYS 404	Electromagnetism	3

Select two from the following:

ENGR 212/212L	Electronics and Laboratory	4
PHYS 352	Device Physics	3
PHYS 402	Quantum Physics	3
PHYS 406	Thermodynamics	3
PHYS 421	System Design Lab (Data Acquisition)	3
PHYS 431	Optical Physics	3
MATH 440	Mathematical Modeling	3

PCSE 498	WI: Capstone Project	3

COURSE PLAN FOR MAT FIVE-YEAR PROGRAM
WITH LICENSURE
SPANISH PK - 12

GRADUATE COURSE REQUIREMENTS
SENIOR YEAR
(Select two of the three; the third course will be taken in fall of the professional year or by permission of the Graduate Program Coordinator during the senior year.)

MLAN 511	Advanced Strategies in TESOL **F**	3
MLAN 570	Teaching Modern Language	3
PSYC 544	Assessment of Learning	3

PROFESSIONAL YEAR - SUMMER

PSYC 535	Exceptional Learner	3
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2

PROFESSIONAL YEAR - FALL

SPAN 538	Apprenticeship in Teaching Spanish	3
ENGL 522	Content Area Literacy **F**	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
TCHG 518L	Secondary Field Practicum **F**	1
3 Credit Course	Selected from Senior Year courses if not taken	(3)
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING

TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

Undergraduate Content and Support Course Requirements

COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society	3
SOCL 314L	Education, Culture and Society Lab **F**	1
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics	3

Modern Language Core:
Choose one of the following:

MLAN 203	Into the Woods: The European Folktale Tradition	3
MLAN 205	The Novel in English Translation	3
MLAN 206	The Drama in English Translation	3
MLAN 207	International Cinema	3

Required:

MLAN 308	Cross-Cultural Awareness	3
MLAN 310	Texts in Context	3
MLAN 490	Capstone Course in Modern Languages	3

Major and Elective Studies

Choose two of the following:		
SPAN 301	Grammar and Composition	3
SPAN 303	WI: Advanced Grammar and Composition	3
SPAN 314	Conducting Business in Spain and Latin America: Cross-Cultural Negotiations I	3
SPAN 321	Techniques of Translation and Interpretation	3
Choose one of the following:		
SPAN 302	Advanced Spanish Conversation	3
SPAN 308	Conversation via Cinema	3
Choose two of the following:		
SPAN 351	Introduction to Latin-American Literature I	3
SPAN 352	Introduction to Latin-American Literature II	3
SPAN 353	Introduction to Spanish Literature I	3
SPAN 354	Introduction to Spanish Literature II	3
Choose one of the following:		
SPAN 471	Hispanic Visual Culture and the Arts	3
SPAN 472	Hispanic Popular Culture	3
SPAN 473	Hispanic Literature and Social Issues	3
Select:		
6 CREDITS	Select two Spanish courses at the 300 level or higher that have not been used to satisfy one the above categories	

MASTER OF SCIENCE IN APPLIED PHYSICS AND COMPUTER SCIENCE FIVE-YEAR PROGRAM

This five-year program leads to both a Bachelor of Science degree and a Master of Science in Applied Physics and Computer Science degree. By continuing an extra year to obtain the M.S., undergraduate students' lifetime earnings and the potential for increased opportunities and job satisfaction can increase significantly. These programs are very flexible and students will still receive the B.S. in their degree program once they complete the requirements, even if they don't complete the M.S. program. Interested students should talk to their advisor early in their program since course sequencing is critical to success.

Concentration Areas

M.S. - APCS Five-year students select a concentration from one of the following:

Computer Science
Computer Systems Engineering and Instrumentation
Applied Physics

Admission Requirements

Criteria for student admission into a five-year program:

a) Undergraduate cumulative GPA of 3.0 or higher. Transfer students must demonstrate at least 12 hours of earned credit at CNU with a GPA of 3.0 or higher.
b) GPA in the student's major of at least 3.0.
c) Submit one of the following exam scores (must be less than five years old):
   i) A minimum SAT Score of 1100 with a minimum of 530 in the verbal and quantitative sections; OR
   ii) ACT Score of a composite score of 24, with the ACT math score no less than 22, and an English plus Reading score no less than 46; OR
   iii) A Graduate Record Examination (GRE) score of at least 295 for Verbal and Quantitative sections combined is required. It is highly desirable to have a reasonably balanced score between the Verbal and Quantitative sections. Those with a combined score of 300 or above should experience success in the graduate program. For GRE scores reported prior to November 2011, a GRE score of at least 950 for Verbal and Quantitative sections combined is required and a score at or above 1000 is highly desirable. GRE scores are used as one of several indicators of the applicant's ability to succeed in graduate studies.
d) Two completed recommendation forms. One must be from a faculty member in the major who has taught or mentored the student in a major course or research project.
e) Students apply for admission to a five-year program by February 1 of the junior year.
f) A Program of Study or plan of the five-year program reviewed by the advisor is highly recommended.

A student admitted to the Five Year program remains an undergraduate student until undergraduate graduation. Admittance to this program does not confer graduate status. However, Five Year students do not need to request to take graduate courses as an undergraduate. In addition, they are automatically admitted to the graduate program upon graduation as long as they meet the program's requirements.

Undergraduate Program Requirements

a) To continue in the five-year program a student must maintain a 3.0 GPA, and remain in good standing by earning a grade of *B*- or better in any graduate course taken while in the undergraduate status.
b) If an undergraduate student in a five-year program earns a single grade of *F* or two grades of *C*+ or lower in a graduate level course(s), that student will not be allowed to continue in the five-year program and the offer of admission to the graduate program will be rescinded.

c) During the senior year, the MS-APCS five-year student will enroll in nine (9) to twelve (12) graduate credit hours that will be transferred to the graduate transcript. Only the courses and the credits are posted to the graduate transcript. No grades are posted for the transferred courses. The student will be responsible for completing 120 credits for the undergraduate degree plus nine to twelve graduate credits.

d) Upon completion of the normal requirements in his/her respective undergraduate programs, a bachelor's degree will be awarded to the student.

Graduate Course Hours

Graduate credit hours taken as a five-year B.S./M.S. undergraduate are subject to the following requirements:

a) A maximum of twelve hours of graduate credit will be allowed while classified as an undergraduate.

b) All courses must be approved by the student's advisor.

c) The student will be held to the same standards in these classes as any other graduate student.

d) Upon completion of their undergraduate degree, students in the five-year program will be required to take additional graduate hours so that the number of credit hours on the graduate transcript is a minimum of 30 hours of graduate credits. A minimum of 18 hours must be earned while in graduate status.

Five-year programs are generally thesis-track programs. Five-year non-thesis students are required to take 36 credits. The non-thesis track may be an option in certain circumstances. Contact the PCSE Graduate Program Coordinator for more information.

Example of Five-Year Program Course of Study

Undergraduate Status

Graduate courses taken in senior year (to be moved to graduate transcript)	9 credits
Undergraduate course hours	120 credits
Total	129 credits

Graduate Status

Graduate course hours transferred from undergraduate transcript	9 credits
Summer, Fall, Spring	21 credits
Total for MS in APCS	30 credits

M.S. APCS FIVE-YEAR PROGRAM OF STUDY WITH A CONCENTRATION IN COMPUTER SCIENCE

Academic Prerequisites

All applicants should have completed a three-semester sequence in mathematics, including at least two semesters of calculus; and programming, including data structures. It is assumed that these courses are at least at the level of the following texts: Anton, *Calculus*; Liang, *Java Programming*; Aho, Hopcroft and Ullman, *Data Structures*; Mano, *Computer Engineering*. Students who do not have all prerequisites may, in some cases, be allowed to take a graduate independent study course to develop the necessary background for further graduate work.

Plan of Study

To ensure a depth and focus appropriate to the master's level and student's interests, the student's Plan of Study must be approved by the Graduate Program Coordinator.

Core Courses		**9 credits**
CPSC 501	Software System Design and Implementation (3)	
CPSC 502	Communications I (Computer Networks) (3)	
CPSC 510	Artificial Intelligence I (3)	
Concentration Courses		**12 credits**
Select any four CPSC courses from the M.S. in Applied Physics and Computer Science program (at least one must be 600 level). The courses chosen must be approved by the Graduate Program Coordinator.		
Thesis		**9 credits**
PCSE 699	Thesis Research (1-9)	
Total for MS in APCS Five-year Program of Study		**30 credits**

M.S. APCS FIVE-YEAR PROGRAM OF STUDY WITH A CONCENTRATION IN COMPUTER SYSTEMS ENGINEERING AND INSTRUMENTATION

Academic Prerequisites

All applicants should have completed a two-semester sequence in physics, including mechanics and at least two labs; a five-semester sequence in mathematics, including calculus, matrix methods and differential equations; programming, including data structures; a course in computer organization and architecture; and a course with a lab in circuit analysis. It is assumed that these courses are at least at the level of the following texts: Serway, *Classical and Modern Physics*; Anton, *Calculus*; Williams, *Linear Algebra with Applications*; Boyce and DiPrima, *Ordinary Differential Equations*; Liang, *Java Programming*; Aho, Hopcroft and Ullman, *Data Structures*; Mano, *Computer Engineering*; Hayt and Kemmerly, *Circuit Theory*.

Plan of Study

To ensure a depth and focus appropriate to the master's level and student's interests, the student's Plan of Study must be approved by the Graduate Program Coordinator.

Core Courses		**9 credits**
PHYS 521	Computer Architecture (3)	
CPSC 501	Software System Design and Implementation (3)	
CPSC 502	Communications I (Computer Networks) (3)	

Concentration Courses		**12 credits**
Select five courses from the M.S. in Applied Physics and Computer Science program (at least one must be 600-level). The courses must reflect the hardware and software nature of this concentration. The courses chosen must be approved by the Graduate Program Coordinator.		
Listed below are some examples:		
PHYS 503	Data Acquisition and Instrumentation (3)	
PHYS 522	Microprocessor-based Systems (3)	
PHYS 621	Digital Signal Processing (3)	
CPSC 525	Object Oriented Programming and Design (3)	
CPSC 550	Distributed Operating Systems (3)	
CPSC 611	Communications II (3)	
CPSC 621	Parallel Processing (3)	

Thesis		**9 credits**
PCSE 699	Thesis Research (1-9)	

Total for MS in APCS Five-year Program of Study	**30 credits**

M.S. APCS FIVE-YEAR PROGRAM OF STUDY WITH A CONCENTRATION IN APPLIED PHYSICS

Special Features of the Concentration

The Applied Physics curriculum presents the foundation theories of the physical world: mechanics, electromagnetism, thermodynamics, quantum mechanics, optics and solid state. Students use these models in two computational courses and in their theses where they construct simulations of physical systems, analyze physical systems or design smart sensors, and then display the results of these efforts by using state-of-the-art techniques in computer graphics. This emphasis on fundamental concepts and on computational techniques of modeling and simulation is complemented by the experimental procedures that undergird current practice in data acquisition. As a result, students experience the entire range of effective problem-solving practices: data acquisition and data storage, and data analysis based on the fundamental physical models and graphical display of the results of the analysis. For students with special interests and with established backgrounds in physics or engineering, the curriculum offers a versatility that allows students, in concert with their faculty advisers, to tailor graduate programs to suit their own professional goals by combining CNU courses with the offerings at the Virginia Consortium of Engineering and Science Universities (VCES).

Academic Prerequisites

All applicants should have completed a three-semester sequence in physics, including modern physics and at least two labs; a five-semester sequence in mathematics, including calculus, matrix methods and differential equations; programming, including data structures; and a course with a lab in circuit analysis. It is assumed that these courses are at least at the level of the following texts: Serway, *Classical and Modern Physics*; Anton, *Calculus*; Williams, *Linear Algebra with Applications*; Boyce and DiPrima, *Ordinary Differential Equations;* Liang*, Java Programming;* Aho, Hopcroft and Ullman*, Data Structures*; Hayt and Kemmerly, *Circuit Theory*.

Plan of Study

To ensure a depth and focus appropriate to the master's level and student's interests, the student's Plan of Study must be approved by the Graduate Program Coordinator.

Core Courses		**9 credits**
PHYS 501	Models of Dynamical Systems (3)	
PHYS 504	Electromagnetic Theory (3) and	
Either		
PHYS 502 or	Quantum Physics (3) or	
PHYS 506	Thermodynamics & Statistical Physics (3)	

Concentration Courses	**12 credits**
Select any four PHYS courses from the M.S. in Applied Physics and Computer Science program, not including any course taken to fulfill the core courses requirement. CPSC 501 is also an acceptable choice. The courses chosen must be approved by the Graduate Program Coordinator.	

Thesis		**9 credits**
PCSE 699	Thesis Research (1-9)	

Total for MS in APCS Five-year Program of Study	**30 credits**

M.S. IN ENVIRONMENTAL SCIENCE
FIVE-YEAR PROGRAM

The Master of Science in Environmental Science is designed for current and prospective students in the rapidly growing field of environmental monitoring and conservation. This five-year program leads to both a Bachelor of Science and a Master of Science in Environmental Science, and provides a solid background in ecological and environmental conservation theory.

This degree program is flexible enough to fit the interests and needs of a wide variety of students and is designed for students planning to pursue a Ph.D. or students interested in careers involving environmental assessment, monitoring or conservation.

How and When to Apply

After completion of 30 credit hours of undergraduate study, the student completes the *Statement of Intent* to participate in the five-year program. In this statement, the student and his/her undergraduate advisor design a tentative five-year course schedule and discuss the objectives and requirements of the program. This form is distributed by the faculty advisor and the Graduate Program Coordinator.

After completion of 65 credit hours of undergraduate study, the student submits the application to the Five-Year BS/MS Program no later than February 1 of the junior year. The *Application for Admission to the Five-Year Program* is available at gradstudies.cnu.edu/fiveyear. The application and all supporting documents/materials are reviewed by a Graduate Admission Committee and the Office of Graduate Studies.

Admission Requirements

Criteria for student admission into a five-year program:

a) Undergraduate cumulative GPA of 3.0 or higher. Transfer students must demonstrate at least 12 hours of earned credit at CNU with a GPA of 3.0 or higher.
b) GPA in the student's major of at least 3.0.
c) Submission of one of the following (must be less than five years old):
   i) A minimum SAT Score of 1100 with at least 530 in the verbal and quantitative sections;
   ii) ACT Score of a composite score of 24, with the ACT math score no less than 22, and an English plus Reading score no less than 46;
   iii) Graduate Record Examination (GRE) score of at least 295 for Verbal and Quantitative sections combined is required. It is highly desirable to have a reasonably balanced score between the Verbal and Quantitative sections. Those with a combined score of 300 or above should experience success in the graduate program. For GRE scores reported prior to November 2011, a GRE score of at least 950 for Verbal and Quantitative sections combined is required and a score at or above 1000 is highly desirable. GRE scores are used as one of several indicators of the applicant's ability to succeed in graduate studies.
d) Two completed recommendation forms are required. One must be from a faculty member in the major who has taught or mentored the student in a major course or research project.
e) Procurement of a thesis advisor. Prospective students should contact faculty members with similar research interests to determine if they are accepting new graduate students and are encouraged to speak with the Graduate Program Coordinator if they need assistance selecting a faculty member to contact. Students will only be admitted into the program if a faculty member has formally agreed to serve as the thesis advisor and has expressed that agreement to the Graduate Program Coordinator.

Five-Year Undergraduate Program Requirements

a) Upon acceptance into the five-year program, students work with their academic advisors and the Graduate Program Coordinator to determine a specific Plan of Study. The Plan of Study must be filed with the Office of Graduate Studies. Students begin taking graduate courses in their senior year at CNU.

b) To continue in the five-year program a student must maintain a 3.0 GPA, and remain in good standing by earning a grade of *B-* or better in any graduate course taken while in the undergraduate status.
c) If an undergraduate student in a five-year program earns a single grade of *F* or two grades of *C+* or lower in a graduate level course(s), that student will not be allowed to continue in the five-year program and the offer of admission to the graduate program will be rescinded.
d) Upon completion of the normal requirements in the student's undergraduate program, a bachelor's degree will be awarded to the student.

Graduate Course Hours

Graduate credit hours taken as a five-year B.S./M.S. undergraduate are subject to the following requirements:

a) A maximum of twelve (12) hours of credit will be allowed while classified as an undergraduate.
b) All courses must be approved by the student's advisor and be part of the student's Plan of Study.
c) The student will be held to the same standards in these classes as a graduate student.
d) To continue to take graduate courses as an undergraduate, a student must complete each course with a grade of *B-* or better.
e) Graduate cross-listed courses will count toward the student's major requirements in exactly the same way that the corresponding undergraduate cross-listed courses would count. If a graduate course, which is not cross-listed, is used to satisfy a requirement of the undergraduate major then the student must get the course substitution approved by the department chair to substitute the graduate course for a required course in the major. Any graduate-level course used to satisfy undergraduate major requirements will not be eligible to be transferred to the graduate transcript.
f) Five-year students are required to do the thesis option in order to complete the curriculum within the five years.
g) Students in the five-year program who have taken graduate courses as undergraduates will have up to 12 graduate credits moved to their graduate transcripts.
h) **The minimum number of credit hours on the graduate transcript must total at least 30 overall. A minimum of 18 hours must be earned while in graduate status.**

Example of Five-year Course of Study

Five-year student takes 12 graduate credit hours while in undergraduate status

Undergraduate Status

Graduate courses taken in senior year (12 credits to be moved to graduate transcript)	12 credits
Undergraduate course hours	120 credits
Total	132 credits

Graduate Status

Graduate course hours transferred from undergraduate transcript	12 credits
Summer	2 credits
Fall	10 credits
Spring	6 credits
Total for MS in ENVS	30 credits

MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE
FIVE-YEAR PROGRAM OF STUDY

Core Courses (6 credits)

ENVS 505	Technical and Scientific Writing (3)
ENVS 510	Biometry (3)

Concentration Courses (18 credits)

ENVS 518	Biological Conservation: Theory & Practice (3)
ENVS 519	Restoration Ecology (3)
ENVS 522	Summer Field Studies (2)
ENVS 525	Environmental Regulations (3)
ENVS 530	Biogeography (3)
ENVS 532/532L	Wetlands Ecology & Lab (4)
ENVS 534/534L	Marine Ecology & Lab (4)
ENVS 535/535L	Ornithology & Lab (4)
ENVS 536/536L	Terrestrial Ecology & Lab (4)
ENVS 538/538L	Limnology and Aquatic Biology & Lab (4)
ENVS 540/540L	Environmental Microbiology & Lab (4)
ENVS 545/545L	Mammalogy & Lab (4)
ENVS 550	Global Change (3)
ENVS 555/555L	GIS & Spatial Analysis Techniques & Lab (4)
ENVS 575	Seminar in Scientific Communication (3)
ENVS 590	Topical Seminars in Environmental Science (1-4 cr.)
CHEM 535	Nanochemistry and Nanotechnology (3)
CHEM 543	Atmospheric Chemistry (3)
CHEM 545/545L	Instrumental Methods in Environmental & Lab (4)
CHEM 560	Polymer Chemistry (3)
CHEM 565	Environmental Chemistry (3)
CHEM 570	Advanced Organic Chemistry (3)
CHEM 580	Chemical Spectroscopy (3)

Thesis (6 credits)

ENVS 699	Thesis Research

Total for MS in ENVS
Five-Year Program of Study 30 credits

MASTER'S DEGREE PROGRAMS

CNU offers three master's programs for the educational advancement and professional enhancement of traditional applicants, those with a bachelor's degree earned prior to beginning of graduate study.

Master of Arts in Teaching
Master of Science in Applied Physics and Computer Science
Master of Science in Environmental Science

Master of Arts in Teaching

The Master of Arts in Teaching (MAT) degree is designed for students who wish to become licensed teachers. This program offers students the latest advancements in content area teaching through hands-on activities, discussion and field experiences to prepare them with competencies necessary to enter the teaching profession. All students study instructional practices which are based on evidence provided by educational research. In addition, an emphasis is placed on the study of diversity in the United States and implications of that diversity for educational practice. MAT students select from one of the following endorsement areas**: Art (Visual Arts), Biology, Computer Science, Chemistry, Elementary, English, English as a Second Language (ESL), History & Social Science, Mathematics, Physics, or Spanish**. Faculty are utilized from 12 academic departments and supplemented by practicing educational professionals to provide students with a strong background in their selected teaching area.

Master of Science in Applied Physics and Computer Science

The degree is designed to produce graduates ready to make contributions to their professions and/or to continue toward a Ph.D. degree in applied physics, computer engineering or computer science. Students may select from three concentrations: Applied Physics, Computer Systems Engineering and Instrumentation, or Computer Science. Computer Science has specialization and research opportunities available in artificial intelligence, software engineering, networking and communications, as well as computer systems engineering and instrumentation. Specialization and research opportunities in Applied Physics include nuclear physics, laser and photonics, solid-state physics, modeling and simulation, sensors and instrumentation systems design.

Master of Science in Environmental Science

The degree is designed to provide the knowledge and technical skills in ecological and environmental conservation theory to prepare students desiring to work in the rapidly growing field of environmental monitoring and conservation, or to continue toward a Ph.D. degree. Students also develop the skills required for employment with environmental assessment/monitoring businesses and state government agencies. The department is actively engaged in research projects and has access to a variety of excellent field research sites. Research currently is being conducted at local (e.g. Hoffler Creek Nature Preserve), regional (e.g. Great Dismal Swamp National Wildlife Refuge) and national (e.g. Death Valley National Park) sites as well as international locations. All courses are taught in the new 160,000 square foot Forbes Hall, which contains 70 teaching labs and student research spaces as well as state of the art classrooms.

The **Office of Graduate Studies** is located in McMurran Hall 159F and welcomes inquiries from those interested in the master's programs. From the Office of Graduate Studies website **gradstudies.cnu.edu**, students may view the Graduate Catalog, apply for admission, or contact the Graduate Program Coordinator of their choice. Contact the Office of Graduate Studies at **gradstdy@cnu.edu** or by calling **757-594-7544** for additional information.

MASTER OF ARTS IN TEACHING

Dr. Marsha Sprague, Graduate Program Coordinator
McMurran Hall 253
msprague@cnu.edu
(757) 594-7388

The Master of Arts in Teaching (MAT) is a practitioner-oriented degree designed to translate theory into effective instructional practice. The curriculum is based on recognized needs for teacher education as identified by bodies such as the National Board of Professional Teaching Standards and The Interstate Teacher Assessment and Support Consortium (InTASC). The mission of the CNU MAT Teacher Preparation Program is to prepare highly qualified teachers who are licensed to teach in the Commonwealth of Virginia and in reciprocal states throughout the United States.

Endorsement Areas

MAT students select an endorsement area from one of the following:

Art (Visual Arts)	PK	-	12
Biology	6	-	12
Chemistry	6	-	12
Computer Science	6	-	12
Elementary	PK	-	6
English	6	-	12
English as a Second Language	PK	-	12
History and Social Science	6	-	12
Mathematics	6	-	12
Physics	6	-	12
Spanish	PK	-	12

The Teacher Preparation Program Curriculum

The Teacher Preparation Program curriculum includes education and content courses that provide opportunities for students to learn subject knowledge and teaching methods appropriate to the endorsement area. A student teaching experience, with a work sample project, serves as the culminating event.The Teacher Preparation Program offers two curriculum options for those already holding a degree: Master of Arts in Teaching with Licensure and Initial Licensure.

Master of Arts in Teaching with Licensure

Those who have obtained a baccalaureate degree and desire to enroll in the Master of Arts in Teaching with Licensure program enter in a degree-seeking status. The curricula for the endorsement areas are shown on pages titled *Course Plan for MAT with Licensure, Already Degreed*.

Initial Licensure

Those who have obtained a baccalaureate degree and desire to seek a Commonwealth of Virginia license enter in a non-degree status. The curricula for the endorsement areas are shown on pages titled *Course Plan for Initial Licensure, Already Degreed*.

Prerequisite Requirements

Prerequisite courses are designed to meet the requirements of the Virginia Department of Education. Completion (or written plan for completion) of all prerequisite content and support courses is required prior to beginning either Teacher Preparation Programs. No more than two prerequisite courses may be outstanding prior to beginning the graduate program. The prerequisite content and support courses are listed on the Course Plan pages.

Admission Requirements

The Master of Arts in Teaching with Licensure

1. A baccalaureate degree from a regionally accredited college or university with a minimum grade point average (GPA) of 3.00 on a 4.00 scale;
2. An official transcript from the baccalaureate institution with the degree posted, and official transcripts for all graduate work taken at other institutions;

3. Three recommendation forms. These must be from professional educators who have observed the applicant's teaching or from professors who can attest that the applicant is likely to be able to be successful in graduate level academic work;
4. VCLA Reading and Writing subtests with a score of at least 235 in each; and PRAXIS Core Mathematics subtest with a scores of 150 or higher.
5. PRAXIS II test results that show a passing Virginia score, as required.
6. A successful background check by Newport News Public Schools.
7. Two essays, demonstrating competence in written communication and dispositions for teaching. The responses should be typed and double spaced. The suggested length for each essay is 250 words. The essays are a critical component of the application. An inadequate essay may result in denial of admission, request for an interview, or remediation.
8. Resume showing experience with children and/or schools.
9. Certificate of Release or Discharge from Active Duty (DD 214), if applicable
10. Background check clearance through Newport News Public Schools.

Admission Requirements for Initial Licensure

1. A baccalaureate degree from a regionally accredited college or university with a minimum grade point average of 2.80 on a 4.00 scale;
2. An official transcript from the baccalaureate institution with the degree posted, and official transcripts for all graduate work taken at other institutions;
3. Three recommendation forms. These must be from professional educators who have observed the applicant's teaching or from professors who can attest that the applicant is likely to be able to be successful in graduate-level academic work;
   VCLA Reading and Writing subtests with a score of at least 235 in each; and PRAXIS Core Mathematics subtest with a scores of 150 or higher.
5. PRAXIS II test results that show a passing Virginia score, as required.
6. A successful background check by Newport News Public Schools.
7. Two essays, demonstrating competence in written communication and dispositions for teaching. The responses should be typed and double spaced. The suggested length for each essay is 250 words. The essays are a critical component of the application. An inadequate essay may result in denial of admission, request for an interview, or remediation.
8. Resume showing experience in working with children and/or in schools.
9. Certificate of Release or Discharge from Active Duty (DD 214), if applicable
10. Background check clearance through Newport News Public Schools.

Admission Requirements for Non-degree/Non-program Status are stated on page 14 of this catalog

1. Hold a baccalaureate degree from a regionally accredited college or university with a minimum grade point average of 3.00 on a 4.00 scale;
2. Provide an official transcript from the baccalaureate institution with the degree posted.
3. Apply and submit documents by the published application deadline.
4. A limit of 12 graduate hours may be taken in this status.

Teachers Taking Courses for Re-licensure or Professional Development

Any regular or provisionally licensed Virginia teacher who desires to enroll in a graduate course for re-licensure or continued professional development may do so in a graduate non-degree status if they:

1. Hold a baccalaureate degree from a regionally accredited college or university with a minimum grade point average of 3.00 on a 4.00 scale;
2. Provide a copy of the official transcript from the baccalaureate institution with the degree posted.;
3. Apply and submit documents by the published application deadline;
4. A limit of 12 graduate hours may be taken in this status.

NOTE: Registration for graduate courses is on a space-available basis and is limited to 12 hours.

Changing from Non-degree Status to Degree-seeking Status (only for students enrolled in a program)
A non-degree student in the Initial Licensure program may apply to change to degree-seeking status in the MAT program if the student has completed 12 or more hours of MAT graduate courses with a cumulative 3.5 GPA or higher and has submitted a passing score for the Praxis II exam, if required. To apply, the student submits the *Request for Change to Degree-seeking Status* form to Graduate Admission along with his or her CNU graduate transcript.

Goals of the Program
Students who complete the Teacher Preparation Program at Christopher Newport University will demonstrate competence in these areas:

1. Planning and preparing for instruction based on knowledge of content, resources and students;
2. Creating a safe, orderly and nurturing environment that creates high expectations for all while recognizing and respecting diversity;
3. Delivering and assessing instruction to meet state-mandated and district objectives, adjusting methods as needed to engage and teach every child;
4. Professional responsibilities of dress, collegial behaviors, engagement with families, administrative duties, and self-directed growth.

Requirements for beginning the Teaching Internship (TCHG 510 or 511/512)

- GPA of 3.00 or higher
- Praxis II passed (except ESL candidates)
- VCLA passed and score report submitted
- 120 hour field log submitted
- TB test results submitted
- Evidence of three conferences/workshops submitted (at least two hours each, at different values)
- Proof of AED/First Aid/CPR submitted
- Child Abuse and Neglect Module certificate submitted
- Civics Module certificate submitted (elementary only)

Program Completion Requirements
The student completing the Teacher Preparation Program with recommendation for state licensure must accomplish all of the following:

- Successful completion of all required program coursework;
- 3.0 GPA in graduate coursework with no more than two grades of C on the graduate transcript;
- Passing scores on the appropriate PRAXIS II exam and other state-mandated examinations;
- An acceptable impact study evaluated by a university supervisor;
- Completion of all courses required for state licensure.
- Provide evidence of meeting program goals (above) through evaluations submitted during the teaching internship

NOTE: Program completion will result in a recommendation for Virginia state licensure for teaching. The license is conferred by the Virginia Department of Education, and the commission of a felony, or a misdemeanor involving children and/or drugs, may result in the denial of issuance of the license. Questions concerning this should be directed to the Director of Teacher Preparation, Dr. Marsha Sprague at msprague@cnu.edu or (757) 594-7388.

Graduate Assistantships
Graduate assistantships are available. Contact the Graduate Program Coordinator for details. Additional information is available in this catalog on page 30.

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
ART (VISUAL ARTS) PK - 12

GRADUATE COURSE REQUIREMENTS		Credits
FNAR 534	Theory and Practice of Art Education **F**	3
FNAR 589	Teaching Functional Arts	3
PSYC 544	Assessment of Learning and Education	3
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
FNAR 535	Integrating the Visual Arts	3
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or	Multiculturalism, Diversity and Education or	3
TCHG 550	Teaching Across Cultures	
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
Support Courses:		
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
FNAR 201, 202	World Art in Context I, II	6
FNAR 118	2-D Design	3
FNAR 128	Introduction to Digital Media	3
FNAR 224	Painting I	3
FNAR 226	Mixed Media and Functional Art I	3
FNAR 241 or	Ceramics I or	3
FNAR 251	Sculpture I	3
FNAR 322	Advanced Figure Drawing	3
FNAR 252	Advanced Printmaking *(recommended)*	3
9 CREDITS	Upper-level Art History Electives	9

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
ART (VISUAL ARTS) PK - 12

GRADUATE COURSE REQUIREMENTS

		Credits
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
PROFESSIONAL YEAR - FALL		
FNAR 534	Theory and Practice of Art Education **F**	3
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	24

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
Support Courses:		
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
FNAR 201, 202	World Art in Context I, II	6
FNAR 118	2-D Design	3
FNAR 128	Introduction to Digital Media	3
FNAR 224	Painting I	3
FNAR 226	Mixed Media and Functional Art I	3
FNAR 241 or	Ceramics I or	3
FNAR 251	Sculpture I	3
FNAR 322	Advanced Figure Drawing	3
9 CREDITS	Upper-level Art History Electives	9

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
BIOLOGY 6 - 12

GRADUATE COURSE REQUIREMENTS

8 HOURS FROM THE FOLLOWING ELECTIVES:		Credits
ENVS Electives:		8
ENVS 518	Biological Conversation: Theory & Practice (4)	
ENVS 522	Summer Field Studies (2)	
ENVS 530	Biogeography (3)	
ENVS 532/532L	Wetlands Ecology and Lab (4)	
ENVS 536/536L	Terrestrial Ecology and Lab (4)	
ENVS 540/540L	Environmental Microbiology and Lab (4)	
ENVS 550	Global Change (3)	
ENVS 590	Topical Seminars in Environmental Science (1 - 4)	
ENVS 595	Advanced Topics in Environmental Science (1 - 4)	
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
NSCI 570	Teaching STEM	4
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or	Multiculturalism, Diversity and Education or	3
TCHG 550	Teaching Across Cultures (3)	
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		21
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
Major Courses in Biology:		
BIOL 211/211L-212/212L-213/213L	Principles of Biology I, II, III & Lab	12
BIOL 313	Genetics	3

(continued on the next page)

Major Courses in Biology con't:		Credits
BIOL 391	Junior Seminar	3
BIOL 491	Senior Seminar	1
BIOL 407/407L	General Ecology & Lab	4
BIOL ___	Fifteen additional credits above the 100-level (12 of these credits must be at the 300-/400-level and have laboratory components)	15
	Recommended for all secondary biology teachers: BIOL 215 Biological Evolution BIOL 314/314L Human Anatomy & Physiology & Lab or BIOL 420/420L Animal Physiology & Lab	
Support Courses required:		
MATH 125 & 130 or higher	Mathematics Electives	6
CHEM 121/121L-122/122L	General Chemistry I, II & Lab	8
CHEM 321/ 321L-322/322L	Organic Chemistry I, II & Lab	8
PHYS 151/151L-152/152L	Intermediate Physics & Lab	8

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
BIOLOGY 6 - 12

GRADUATE COURSE REQUIREMENTS

PROFESSIONAL YEAR: SUMMER		Credits
TCHG 516, 517	Curriculum and Instruction	3
TCHG 543	Classroom Management and Discipline	2
NSCI 570	Teaching STEM	4
PROFESSIONAL YEAR: FALL		
PSYC 535	Exceptional Learner	3
ENGL 522	Content Area Literacy **F**	3
TCHG 518L	Secondary Field Practicum **F**	1
120 hours	*Field Experience*	
PROFESSIONAL YEAR: SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	25

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		21
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
Major Courses in Biology:		
BIOL 211/211L-212/212L-213/213L	Principles of Biology I, II, III & Lab	12
BIOL 313	Genetics	3
BIOL 391	Junior Seminar	3
BIOL 491	Senior Seminar	1
BIOL 407/407L	General Ecology & Lab	4
BIOL _____	Biology Electives (12 of these credits must be at the 300-/400-level and have laboratory components)	15
Support Courses:		
MATH 125 & 130 or higher	Mathematics Electives	6
CHEM 121/121L-122/122L	General Chemistry I, II & Lab	8
CHEM 321/321L-322/322L	Organic Chemistry I, II & Lab	8
PHYS 151/151L-152/152L	Intermediate Physics & Lab	8

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
CHEMISTRY 6-12

GRADUATE COURSE REQUIREMENTS		Credits
8 Hours of Graduate CHEM electives (except CHEM 545) and must include ONE course from the following unless taken at the undergraduate level: CHEM 543 Atmospheric Chemistry; CHEM 540 Soils and Water Chemistry; or CHEM 565 Environmental Chemistry		8
PROFESSIONAL YEAR - SUMMER		
NSCI 570	Teaching STEM	4
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501	Multiculturalism, Diversity and Education or	3
TCHG 550 or	Teaching Across Cultures	
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS		
Appropriate substituted courses should be documented		
General Education/Liberal Learning Coursework		21
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
PSYC 312	Educational Psychology	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
MATH 125	Elementary Statistics	3
MATH 140	Calculus & Analytic Geometry	4
MATH 240	Intermediate Calculus	4
CPSC 110	Introduction to Computing	3
BIOL 107 or 108 (or higher)	General Biology I or II	3
PHYS 201/201L-202/202L	General Physics & Lab	8
Required Chemistry Courses:		
CHEM 121/121L-122/122L	General Chemistry I, II & Lab	8
CHEM 321/321L-322/322L	Organic Chemistry I, II & Lab	8
CHEM 341/342/342L	Physical Chemistry I, II & Lab	7
CHEM 361/361L	Analytical Chemistry & Lab	4
CHEM 391	WI: Investigating Chemical Literature	3
CHEM 401/401L	Inorganic Chemistry & Lab	4
CHEM 445/445L	Instrumental Analysis & Lab	4
CHEM 492	WI: POGIA - Comprehensive Review	3
6 CREDITS	300/400 Chemistry Electives	6

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
CHEMISTRY 6 - 12

GRADUATE COURSE REQUIREMENTS		Credits
PROFESSIONAL YEAR - SUMMER		
NSCI 570	Teaching STEM	4
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	25

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		21
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
MATH 125	Elementary Statistics	3
MATH 140	Calculus & Analytic Geometry	4
MATH 240	Intermediate Calculus	4
CPSC 110	Introduction to Computing	3
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
BIOL 107 or 108 (or higher)	General Biology I or II	3
PHYS 151/151L, 152/152L	Intermediate Physics & Lab	8
Major Courses in Chemistry:		
CHEM 121/121L, 122/122L	General Chemistry I, II & Lab	8
CHEM 321/321L, 322/322L	Organic Chemistry I, II & Lab	8
CHEM 341, 342/342L	Physical Chemistry I, II & Lab	7
CHEM 361/361L	Analytical Chemistry & Lab	5
CHEM 391	WI: Investigating Chemical Literature	5
CHEM 401/401L	Inorganic Chemistry & Lab	5
CHEM 445/445L	Instrumental Analysis & Lab	4
Choose two from of the following:		6
CHEM 443	Atmospheric Chemistry (3)	
CHEM 440	Soils and Water Chemistry(3)	
CHEM 465	Environmental Chemistry (3)	

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
COMPUTER SCIENCE 6-12

GRADUATE COURSE REQUIREMENTS		Credits
CPSC 501	Software System Design and Implementation	3
5 CREDITS	CPSC Graduate Electives	5
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
NSCI 570	Teaching STEM	4
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		21
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
Core Courses:		
CPSC 125, 150/150L-250/250L	Computer Science Courses	
CPSC 270, 360, 410, 420	Computer Science Courses	
CPSC 330 or CPEN 414	Computer Organization or Computer Architecture	3
CPEN 214	Digital Logic Design	3
CPEN 371	WI: Computer Ethics	3
ENGR 213	Discrete Structures for Computer Applications	3
MATH 125	Elementary Statistics	3
MATH 140	Calculus and Analytic Geometry	4
MATH 240	Intermediate Calculus	3
MATH 235 or MATH 260 or PHYS 340	Applied Matrix Techniques or Linear Algebra or Methods of Theoretical Physics	3
ENGR 213	Discrete Structures for Computer Applications	3
PHYS 151/151L-152/152L or PHYS 201/201L-202/202L	Intermediate Physics & Lab or General Physics & Lab (8)	8
PHYS 341	Design and Analysis of Experiments	3
Electives		9

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
COMPUTER SCIENCE 6 - 12

GRADUATE COURSE REQUIREMENTS

PROFESSIONAL YEAR - SUMMER		Credits
TCHG 516, 517	Curriculum and Instruction I	3
TCHG 543	Classroom Management and Discipline	2
NSCI 570	Teaching STEM	4
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	25

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		21
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
Core Courses:		
CPSC 125, 150/150L-250/250L	Computer Science Courses	
CPSC 270, 360, 410, 420	Computer Science Courses	
CPSC 330 or CPEN 414	Computer Organization or Computer Architecture	3
CPEN 214	Digital Logic Design	3
CPEN 371	WI: Computer Ethics	3
ENGR 213	Discrete Structures for Computer Applications	3
MATH 125	Elementary Statistics	3
MATH 140	Calculus and Analytic Geometry	4
MATH 240	Intermediate Calculus	3
MATH 235 or	Applied Matrix Techniques or	3
MATH 235 or	Applied Matrix Techniques or	3
MATH 260 or PHYS 340	Linear Algebra or Methods of Theoretical Physics	
ENGR 213	Discrete Structures for Computer Applications	3
PHYS 151/151L-152/152L or	Intermediate Physics & Lab or	8
PHYS 201/201L-202/202L	General Physics & Lab	
PHYS 341	Design and Analysis of Experiments	3
Electives		9

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
ELEMENTARY PK - 6

GRADUATE COURSE REQUIREMENTS		Credits
ENGL 530 or ENGL 532 or MLAN 511	Grammar to Enhance and Enrich Writing or Language Varieties in American Schools (3) or Advanced Strategies in TESOL (3) **F**	3
PSYC 521	Reading Acquisition and Development	3
PSYC 521L	Reading Acquisition and Development Lab **F**	1
PSYC 544	Assessment of Learning	3
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II **F**	3
TCHG 543	Classroom Management and Discipline	2
PSYC 535	Exceptional Learner	3
PROFESSIONAL YEAR - FALL		
ENGL 521	Developing Elementary Writers and Readers **F**	3
MATH 570	The Study of Mathematics	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures (3)	3
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Appropriate substituted courses should be documented
Degree in Liberal Arts or Science required

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
NSCI 310	Natural Science	3
ENGL 310 ENGL 430	Introduction to Linguistics or The Structure of English	3
GEOG 201	Introduction to Geography	3

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
ELEMENTARY PK - 6

GRADUATE COURSE REQUIREMENTS

PROFESSIONAL YEAR - SUMMER		Credits
TCHG 516, 517	Curriculum and Instruction I, II **F**	3
TCHG 543	Classroom Management and Discipline	2
PSYC 535	Exceptional Learner	3
PROFESSIONAL YEAR - FALL		
ENGL 521	Developing Elementary Writers and Readers **F**	3
MATH 570	The Study of Mathematics **F**	3
PSYC 521	Reading Acquisition and Development	3
PSYC 521L	Reading Acquisition and Development Lab **F**	1
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	27

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS

Appropriate substituted courses should be documented
Degree in Liberal Arts or Science or equivalent

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
NSCI 310	Natural Science	3
ENGL 316	Children's Literature	3
ENGL 310 or ENGL 430	Introduction to Linguistics or The Structure of English	3
GEOG 201	Introduction to Geography	3

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
ENGLISH 6 - 12

GRADUATE COURSE REQUIREMENTS		Credits
ENGL 530 or	Grammar to Enhance and Enrich Writing or	3
ENGL 532 or	Language Varieties in American Schools or	
MLAN 511	Advanced Strategies in TESOL **F**	
ENGL 526	Teaching Writing in Secondary English Classes **F**	3
PSYC 544	Assessment of Learning	3
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II **F**	3
TCHG 543	Classroom Management and Discipline	2
ENGL 501	Teaching Literature	3
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or	Multiculturalism, Diversity and Education or	3
TCHG 550	Teaching Across Cultures	
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
ENGL 308	WI: Literature, Theory and Culture	3
ENGL 309	Creative Nonfiction	3
ENGL 315	Adolescent Literature	3
ENGL 421	Shakespeare	3
ENGL 430	The Structure of English	3
MLAN 311	Teaching English to Speakers of Other Languages	3
6 CREDITS	Two (2) Courses in American Literature	6
6 CREDITS	Two (2) Courses in British Literature	6
3 CREDITS	One (1) Course in World Literature	3
3 CREDITS	One (1) Course in Film/Media Studies	3

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
ENGLISH 6 - 12

GRADUATE COURSE REQUIREMENTS

Elective (select one)		Credits
ENGL 501 or	Teaching Literature (summer) or	3
ENGL 526	Teaching Writing in Secondary English Classes (fall)	

PROFESSIONAL YEAR - SUMMER

TCHG 516, 517	Curriculum and Instruction I, II **F**	3
TCHG 543	Classroom Management and Discipline	2

PROFESSIONAL YEAR - FALL

ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING

TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8

TOTAL GRADUATE COURSE HOURS 24

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
ENGL 308	WI: Literature, Theory, and Culture	3
ENGL 309	WI: Creative Nonfiction	3
ENGL 315	Adolescent Literature	3
ENGL 421	Shakespeare	3
ENGL 430	The Structure of English	3
MLAN 311	Teaching English to Speakers of Other Languages	3
6 CREDITS	Two (2) Courses in American Literature	6
6 CREDITS	Two (2) Courses in British Literature	6
3 CREDITS	One (1) Course in World Literature	3
3 CREDITS	One (1) Course in Film/Media Studies	3

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
ENGLISH AS A SECOND LANGUAGE (ESL) PK-12

GRADUATE COURSE REQUIREMENTS		Credits
PSYC 521	Reading Acquisition & Development	3
PSYC 521L	Reading Acquisition & Development Lab **F**	1
ENGL 521	Teaching Writing	3
MLAN 511	Advanced Strategies in TESOL **F**	3
PROFESSIONAL YEAR - SUMMER		
PSYC 535	Exceptional Learner	3
TCHG 516, 517	Curriculum and Instruction I, II **F**	3
TCHG 543	Classroom Management and Discipline	2
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
ENGL 530 or ENGL 532	Grammar to Enhance and Enrich Writing or Language Varieties in American Schools	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS

Major: Any liberal arts major (English or Psychology recommended) with general education courses in English, Mathematics, Social Studies, Science

Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
ENGL 310	Introduction to Linguistics	3
ENGL 430	The Structure of English	3
SOCL 330 or MLAN 308	Language and Culture or Cross-cultural Understanding	3
MLAN 311	Teaching English to Speakers of Other Languages (TESOL)	3
Foreign Language through 202	(Spanish recommended)	

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
ENGLISH AS A SECOND LANGUAGE (ESL) PK-12

GRADUATE COURSE REQUIREMENTS

PROFESSIONAL YEAR - SUMMER		Credits
MLAN 511	Advanced Strategies in TESOL **F**	3
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 521	Reading Acquisition and Development	3
PSYC 521L	Reading Acquisition and Development Lab **F**	1
PSYC 535	Exceptional Learner	3
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	27

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS

Major: Any liberal arts major (English or Psychology recommended) with general education courses in English, Mathematics, Social Studies, Science

Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
ENGL 310	Introduction to Linguistics	3
SOCL 330 or MLAN 308	Language and Culture or Cross-cultural Understanding	3
ENGL 430	The Structure of English	3
MLAN 311	Teaching English to Speakers of Other Languages (TESOL)	3
LANG through 202	(Spanish recommended)	6-12

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
HISTORY & SOCIAL SCIENCE 6 - 12

GRADUATE COURSE REQUIREMENTS		Credits
HIST ____	510/520/530 History	3
HIST ____	510/520/530 History	3
HIST/GOVT 570	Methods for Teaching Social Studies	3
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
HIST ___ or	510/520/530 History or	3
GEOG 570	World Geography for Teachers	
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or	Multiculturalism, Diversity and Education or	3
TCHG 550	Teaching Across Cultures	
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F** or	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Student must have B.A./B.S. in History or Government or B.A. in American Studies
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
HIST 111-112G	The Ancient and Medieval World-The Modern World	6
HIST 121-122	Early America to the Civil War-Modern America	6
HIST 390	WI: Historical Methods and Historiography	3
HIST __ __	Two 300/400-level History courses	6
ECON 201 or ECON 202	Macroeconomics Microeconomics (201 preferred)	3
GEOG 201-202	Introduction to Geography I - II	6
GOVT 100 or GOVT 101	Political Thought & Society or Power and Politics in America	3
GOVT 202	State and Local Government	3
GOVT 215	International and Comparative Politics	3
GOVT __ __	Two 300/400-level Government courses	6

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
HISTORY & SOCIAL SCIENCE 6 - 12

GRADUATE COURSE REQUIREMENTS

PROFESSIONAL YEAR - SUMMER		Credits
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
HIST/GOVT 570	Methods for Teaching Social Studies	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	24

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Student must have B.A./B.S. in History or Government or B.A. in American Studies
Appropriate substituted courses should be documented

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
HIST 111-112G	The Ancient and Medieval World-The Modern World	6
HIST 121-122	Early America to the Civil War-Modern America	6
HIST 390	WI: Historical Methods and Historiography	3
HIST __ __	Two 300/400-level History courses	6
ECON 201 or ECON 202	Macroeconomics or Microeconomics (201 preferred)	3
GEOG 201, 202	Introduction to Geography I, II	6
GOVT 100 or GOVT 101	Political Thought & Society or Power and Politics in America	3
GOVT 202	State and Local Government	3
GOVT 215	International and Comparative Politics	3
GOVT __ __	Two 300/400-level Government courses	6

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
MATHEMATICS 6 - 12

GRADUATE COURSE REQUIREMENTS		Credits
MATH 578	Elementary Geometry from an Advanced Viewpoint	3
MATH 538	Apprenticeship in Teaching Mathematics	2
PSYC 544	Assessment of Learning	3
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
NSCI 570	Teaching STEM	4
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Student must have B.A./B.S. in mathematics Appropriate substituted courses should be documented.

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics (May be replaced by MATH 435)	3
MATH 140	Calculus and Analytic Geometry	4
MATH 240-250	Intermediate Calculus-Multivariable Calculus	6
MATH 260	Linear Algebra	3
MATH 335	Applied Probability	3
MATH 360	Real Analysis I	3
MATH 370	Modern Algebra I	3
MATH 128 or CPSC 125 or higher		3
MATH __ __ __ __ __ __	Six* 300/400-level Mathematics courses	18
	(*may include up to nine credits of BIOL, PHYS, CPSC or other upper level sciences)	
MATH __	One 400-level Mathematics course	3

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
MATHEMATICS 6 - 12

GRADUATE COURSE REQUIREMENTS

		Credits
PROFESSIONAL YEAR - SUMMER		
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
NSCI 570	Teaching STEM	4
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	25

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS

Student must have B.A./B.S. in mathematics Appropriate substituted courses should be documented.

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
MATH 125	Elementary Statistics (May be replaced by MATH 435)	3
MATH 140	Calculus and Analytic Geometry	4
MATH 240-250	Intermediate Calculus-Multivariable Calculus	6
MATH 245	Proofs and Descrete Mathematics	3
MATH 260	Linear Algebra	3
MATH 360	Real Analysis I	3
MATH 370	Modern Algebra I	3
MATH 128 or CPSC 125 or higher		3
MATH __ __ __ __ __ __	Six* 300/400-level Mathematics courses	18
	(*may include up to nine credits of BIOL, PHYS, CPSC or other upper level sciences)	
MATH __	One 400-level Mathematics course	3

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
PHYSICS 6 - 12

GRADUATE COURSE REQUIREMENTS		
Choose two of the following:		6
PHYS 501	Models of Dynamical Systems (3)	
PHYS 502	Quantum Physics (3)	
PHYS 504	Electromagnetic Theory (3)	
PROFESSIONAL YEAR - SUMMER		
NSCI 570	Teaching STEM	4
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2
PROFESSIONAL YEAR - FALL		
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
TCHG 518L	Secondary Field Practicum **F**	1
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
PHYS ___	Graduate Physics Course Electives	2
120 HOURS	*Field Experience*	
PROFESSIONAL YEAR - SPRING		
TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
TOTAL GRADUATE COURSE HOURS		36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS

Student must have B.A./B.S. in physics Appropriate substituted courses should be documented.

General Education/ Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
Core Courses:		
CPEN 371	WI: Computer Ethics	2
CPSC 125	Foundations of Computer Science	3
CPSC 150/150L, 250/250L	Computer Programming I, II & Lab	4
MATH 140	Calculus and Analytic Geometry	4
PHYS 201/201L-202/202L	General Physics & Lab	8
PHYS 340	Methods of Theoretical Physics	3
Support Courses in Applied Physics:		
ENGR 121	Engineering Design	3
MATH 240-250	Intermediate Calculus-Multivariable Calculus	6
MATH 320	Ordinary Differential Equations	3
Major Courses in Applied Physics:		
ENGR 211/211L	Intro. to Electric Circuits & Electronics, & Lab	4
CPEN 214	Digital Logic Design	3
PHYS 303, 341, 351, 401, 404	Physics Courses	15
Two electives from: ENGR 212, 212L; PHYS 352, 402, 406, 421, 431, 441, or MATH 440		6-7
PCSE 498	WI: Capstone Course	3

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
PHYSICS 6 - 12

GRADUATE COURSE REQUIREMENTS

PROFESSIONAL YEAR - SUMMER

NSCI 570	Teaching STEM	4
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2

PROFESSIONAL YEAR - FALL

ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING

TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	25

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS

Student must have B.A./B.S. in physics Appropriate substituted courses should be documented.

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
COMM 201 or THEA 230	Public Speaking or Practical Acting	3
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
Core Courses:		
CPEN 371	WI: Computer Ethics	2
CPSC 125	Foundations of Computer Science	3
CPSC 150/150L, 250/250L	Computer Programming I, II & Lab	4
MATH 140	Calculus and Analytic Geometry	4
PHYS 201/201L-202/202L	General Physics & Lab	8
PHYS 340	Methods of Theoretical Physics	3
Support Courses in Applied Physics:		
ENGR 121	Engineering Design	3
MATH 240-250	Intermediate Calculus-Multivariable Calculus	6
MATH 320	Ordinary Differential Equations	3
Major Courses in Applied Physics:		
ENGR 211/211L	Intro. to Electric Circuits & Electronics, & Lab	4
CPEN 214	Digital Logic Design	3
PHYS 303	General Physics	3
PHYS 341	Design and Analysis of Experiments	3
PHYS 351	Modern Physics	3
PHYS 401	Models of Dynamical Systems	3
PHYS 404	Electromagnetism	3
Two electives from:		
ENGR 212, 212L ; PHYS 352, 402, 406, 421, 431, 441, or MATH 440		6-7

COURSE PLAN FOR MAT WITH LICENSURE
ALREADY DEGREED
SPANISH PK - 12

GRADUATE COURSE REQUIREMENTS

MLAN 511	Advanced Strategies in TESOL **F**	3
MLAN 570	Teaching Modern Language	3
PSYC 544	Assessment of Learning and Education	3

PROFESSIONAL YEAR - SUMMER

PSYC 535	Exceptional Learner	3
TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2

PROFESSIONAL YEAR - FALL

ENGL 522	Content Area Literacy **F**	3
SOCL 501 or TCHG 550	Multiculturalism, Diversity and Education or Teaching Across Cultures	3
SPAN 538	Apprenticeship in Teaching Spanish	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING

TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	36

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Student must have B.A. in Spanish Appropriate substituted courses should be documented.

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3
Modern Languages Core:		
Choose one of the following:		**3**
MLAN 203	Into the Woods: The European Folktale Tradition	
MLAN 205	The Novel in English Translation	
MLAN 206	The Drama in English Translation	
MLAN 207	International Cinema	
Required:		
MLAN 308	Cross-Cultural Awareness	3
MLAN 310	Texts in Context	3
MLAN 490	Capstone Course in Modern Languages	3

(continued on the next page)

Major and Elective Studies:

Two of the following:		6
SPAN 301	Grammar and Composition	
SPAN 303	WI: Advanced Grammar and Composition	
SPAN 314	Conducting Business in Spain and Latin America: Cross-Cultural Negotiations I	
SPAN 315	Conducting Business in Spain and Latin America: Cross-Cultural Negotiations II	
SPAN 321	Techniques of Translation and Interpretation	
One of the following:		3
SPAN 302	Advanced Spanish Conversation	
SPAN 304	Advanced Communication in Spanish	
SPAN 308	Conversation via Cinema	
Two of the following:		6
SPAN 351	Introduction to Latin-American Literature I	
SPAN 352	Introduction to Latin-American Literature II	
SPAN 353	Introduction to Spanish Literature I	
SPAN 354	Introduction to Spanish Literature II	
One of the following:		3
SPAN 361	Hispanic Visual Culture and the Arts	
SPAN 362	Hispanic Popular Culture	
SPAN 363	Hispanic Literature and Social Issues	
SPAN 463	WI: Studies in Cervantes	
Two SPAN Electives	Select two Spanish courses at the 300 level or higher that have not been used to satisfy one the above categories	6

COURSE PLAN FOR INITIAL LICENSURE
ALREADY DEGREED
SPANISH PK - 12

GRADUATE COURSE REQUIREMENTS

PROFESSIONAL YEAR - SUMMER

TCHG 516, 517	Curriculum and Instruction I, II	3
TCHG 543	Classroom Management and Discipline	2

PROFESSIONAL YEAR - FALL

MLAN 570	Teaching Modern Languages	3
ENGL 522	Content Area Literacy **F**	3
PSYC 535	Exceptional Learner	3
TCHG 518L	Secondary Field Practicum **F**	1
120 HOURS	*Field Experience*	

PROFESSIONAL YEAR - SPRING

TCHG 580	Technology for Teachers	1
TCHG 510 OR 511 and 512	Teaching Internship **F**	8
	TOTAL GRADUATE COURSE HOURS	24

***F** denotes that a class has a required field experience component in public schools.

PREREQUISITE CONTENT AND SUPPORT COURSE REQUIREMENTS
Student must have B.A. in Spanish Appropriate substituted courses should be documented.

General Education/Liberal Learning Coursework		28
6 Credits each	Written Communication Literacy and Mathematics Literacy	
3 Credits each	Western Tradition, Global/Multicultural and Creative Expressions	
7 Credits	Natural World	
PSYC 207 or PSYC 208	Life-span Development or Child Development	3
SOCL 314	Education, Culture and Society and Lab	3
SOCL 314L	Education, Culture and Society Lab **F**	1
PSYC 312	Educational Psychology	3
CPSC 110	Introduction to Computing	3

One of the following:		3
MLAN 203	Into the Woods: The European Folktale Tradition	
MLAN 205	The Novel in English Translation	
MLAN 206	The Drama in English Translation	
MLAN 207	International Cinema	

Required:		
MLAN 308	Cross-Cultural Awareness	3
MLAN 310	Texts in Context	3
MLAN 490	Capstone Course in Modern Languages	3

(continued on the next page)

Major and Elective Studies:

Two of the following:		6
SPAN 301	Grammar and Composition	
SPAN 303	WI: Advanced Grammar and Composition	
SPAN 314	Conducting Business in Spain and Latin America: Cross-Cultural Negotiations I	
SPAN 321	Techniques of Translation and Interpretation	
One of the following:		3
SPAN 302	Advanced Spanish Conversation	
SPAN 308	Conversation via Cinema	
Two of the following:		6
SPAN 351	Introduction to Latin-American Literature I	
SPAN 352	Introduction to Latin-American Literature II	
SPAN 353	Introduction to Spanish Literature I	
SPAN 354	Introduction to Spanish Literature II	
One of the following:		3
SPAN 471	Hispanic Visual Culture and the Arts	
SPAN 472	Hispanic Popular Culture	
SPAN 473	Hispanic Literature and Social Issues	
Two SPAN Electives	Select two Spanish courses at the 300 level or higher that have not been used to satisfy one the above categories	6

MASTER OF SCIENCE
IN APPLIED PHYSICS AND COMPUTER SCIENCE

Dr. Antonio Siochi, Graduate Program Coordinator
Luter Hall 330
siochi@cnu.edu (757) 594-7569

The Master of Science in Applied Physics and Computer Science is built around a core of physics and computer science courses that are the foundation of the three areas of concentration: computer science, computer systems engineering and instrumentation, and applied physics. The CNU master's program offers students with a bachelor's degree a significant step in their maturing as scientists. The department offers many opportunities to its graduate students because of its location in the heart of high-tech Hampton Roads and its ties with area national labs and newly developing companies. Graduate students will be able to:

- participate in funded research at both the Thomas Jefferson National Accelerator Facility and the NASA Langley Research Center, - each within a 15-minute drive of the campus;
- conduct research in solid state materials, digital signal processing, high-speed data acquisition, artificial intelligence, smart sensor design, application-specific integrated circuits, modeling and simulation, nuclear physics and pattern recognition;
- solve business and industry problems at the Applied Research Center (ARC) - a state-of-the-art research consortium for several universities;
- learn in an interdisciplinary and collegial environment;
- work in well-equipped laboratories on campus, NASA Langley, Thomas Jefferson National Accelerator Facility and the ARC;
- publish their research in papers and conference presentations nationally and internationally.

Concentration Areas

M.S. - APCS applicants select a concentration from one of the following:

Applied Physics

Computer Systems Engineering and Instrumentation

Computer Science

Each concentration offers a thesis or non-thesis program.

Admission Requirements for Degree-Seeking Students

1. A baccalaureate degree from a regionally accredited college or university with a minimum grade point average of 3.00 on a 4.00 scale.
2. An official transcript from the baccalaureate institution with the degree posted, and official transcripts for all graduate work taken at other institutions.
3. Three letters of recommendation from people who can attest that the applicant is likely to be able to be successful in graduate-level academic work.
4. Scores from the Graduate Record Examination (GRE) General Test taken within five years prior to the date of admission. A GRE score of at least 295 for Verbal and Quantitative sections combined is required. It is highly desirable to have a reasonably balanced score between the Verbal and Quantitative sections. Those with a combined score of 300 or above should experience success in the graduate program. For GRE scores reported prior to November 2011, a GRE score of at least 950 for Verbal and Quantitative sections combined is required and a score at or above 1000 is highly desirable. GRE scores are used as one of several indicators of the applicant's ability to succeed in graduate studies. For those applicants already holding a master's degree, the GRE may be waived by permission of the Director of Graduate Studies. A letter to the Director of Graduate Studies requesting a waiver is required.

The Master of Science in Applied Physics and Computer Science is designed to serve students with a baccalaureate degree in applied physics, computer science, electrical and/or computer engineering or mathematics. Students with degrees in other areas are encouraged to apply. Departmental graduate advisors will establish the background courses needed for such students. This program is also designed to serve students who want advanced study in the electronic or optical properties of materials, computer science, computer systems engineering or computer-controlled instrumentation. Applicants who have completed interesting research or design projects as undergraduates or as a part of their work are invited to submit descriptions of such projects in support of their applications.

Academic Policy for Non-Degree Students
Non-degree students are limited to 12 hours of graduate study. Up to 12 credits of graduate study may be applied to the graduate degree should a non-degree student apply and be accepted to degree-seeking status. Should a non-degree student desire additional courses beyond the 12-credit limit, he or she may petition the Graduate Program Coordinator for a waiver of this limit. Before enrolling in any graduate course a non-degree student must obtain consent of the instructor. The instructor will determine whether the student has the academic background prerequisites for the specific course. Admission requirements for non-degree students are found on page 14 of this catalog.

Changing from Non-degree Status to Degree-seeking Status
A non-degree student may apply to change to degree-seeking status if he or she:

- has completed 12 hours of CNU graduate courses with a cumulative 3.0 GPA or higher,
- has a status of Good Academic Standing, and
- has submitted passing scores from the Graduate Record Exam.

To apply, submit the *Request for Change to Degree-seeking Status* form to Graduate Admission along with the documentation listed in 'Admission Requirements for Degree-seeking Students' shown on page 14.

Academic Prerequisites
See each concentration for the specific academic prerequisites. An accelerated schedule of undergraduate prerequisites can be arranged for applicants whose qualifications do not entirely satisfy the prerequisites for graduate study. Good computer programming skills are critical to a student's success in many of the courses, especially those courses with the CPSC prefix.

Goals of the Program
The program's overall goal is to provide its graduates with the scientific background and technical tools to:

1. Advance an experimental technique, extend the application of a theory or produce new data or observations.
2. Design, build and evaluate a system of measurement, instrumentation, computers and/or software.
3. Present logically and clearly the results of their own scientific investigation.
4. Understand and critically evaluate other scientists' work.

Curriculum
The student chooses either the 30-hour program, which requires three core courses, four concentration courses and a thesis, or the 36-hour program, which requires three core courses, five concentration courses and four elective courses.

The special feature of the coursework in the master's degree program is its emphasis on applications, laboratory experience and extensive use of computer software and hardware. All of the courses make extensive use of computers or require significant laboratory experimentation.

A formal plan of graduate study is prepared with the student's advisor. The general requirements listed are guides and serve as a model for students' planning for each of the concentrations.

Thesis Proposal and Defense (Thesis Option)
Thesis students write and orally defend a thesis proposal. The written proposal and its oral defense are designed to evaluate the student's readiness to conduct research. The scope of this evaluation is the significance, soundness and viability of the proposed research, as well as the student's proficiency in his or her field. A student failing the proposal defense may request a re-examination within six months of the failure. Only one additional defense is permitted.

Comprehensive Examination (Non-Thesis Option)
A comprehensive examination is required, covering the concentration courses. This comprehensive examination may be written or oral. At the time of the comprehensive exam at a specifically designated time, each student will be asked questions that specifically assess the student's mastery of course-related objectives. A student not passing the comprehensive examination may request a re-examination within six months of the failure. Only one additional examination is permitted after the failure of the original comprehensive examination.

Thesis
Students whose research results in a thesis are required to **enroll in at least one thesis credit hour during any semester in which they are working on the thesis and must enroll in <u>at least</u> one thesis credit hour during the semester of degree completion.**

All theses presented must meet the requirements as listed in the ***Policy and Style Manual for Thesis Proposals and Master's Theses*** and the **Thesis Format Review** and **Final Copy Due Date**s. The website cnu.edu/gradstudies/ lists the regulations in this regard. Finally, theses may be placed in the CNU library as research sources available to the academic community.

Graduation Requirements

Thesis Option

- Successful completion of 30 hours of the M.S. in Applied Physics and Computer Science degree program, consisting of 21 hours coursework and 9 hours of thesis.
- An overall graduate grade point average of 3.00 in all CNU courses submitted for graduate credit with no more than two grades of *C;*
- Successful completion of the thesis proposal and oral defense;
- Successful defense of the completed thesis and presentation of the appropriate number of approved copies to the Office of Graduate Studies by the published deadline;
- Presentation of an electronic copy of the thesis in a suitable format to the department for archive purposes only.

Non-Thesis Option

- Successful completion of 36 hours of the M.S. in Applied Physics and Computer Science degree program coursework;
- An overall graduate grade point average of 3.00 in all CNU courses submitted for graduate credit with no more than two grades of *C*;
- Successful completion of the comprehensive examination.

Graduate Assistantships

Screening of applicants wishing to be considered for graduate assistantships will begin on May 1 for the following fall semester. See page 30 of the catalog for special terms, criteria and procedures. Applications are available on the department's website.

For further information:

Contact the APCS Graduate Program Coordinator, Dr. Antonio Siochi, by email at siochi@cnu.edu or (757) 594-7569.

MASTER OF SCIENCE
IN APPLIED PHYSICS AND COMPUTER SCIENCE

COMPUTER SCIENCE CONCENTRATION

Academic Prerequisites
All applicants should have completed a three-semester sequence in mathematics, including at least two semesters of calculus; and programming, including data structures. It is assumed that these courses are at least at the level of the following texts: Anton, *Calculus*; Liang, *Java Programming*; Aho, Hopcroft and Ullman, *Data Structures*; Mano, *Computer Engineering*. Students who do not have all prerequisites may, in some cases, be allowed to take a graduate independent study course to develop the necessary background for further graduate work.

Program of Study 30-36 Credits
To ensure a depth and focus appropriate to the master's level and student's interests, the student's Plan of Study must be approved by the Graduate Program Coordinator.

		Thesis	Non-Thesis
Core Courses		**9 credits**	**9 credits**
CPSC 501	Software System Design and Implementation		
CPSC 502	Communications I (Computer Networks)		
CPSC 510	Artificial Intelligence I		
Concentration Courses		**12 credits**	**15 credits**
Select any four CPSC courses from the M.S. in Applied Physics and Computer Science program (at least one must be 600 level). Courses chosen must be approved by the Graduate Program Coordinator.			
Thesis		**9 credits**	
PCSE 699	Thesis Research (1-9)		
OR			
Non-Thesis			**12 credits**
12 additional credit hours of CPSC courses from the M.S. in Applied Physics and Computer Science program			
Total for M.S. in APCS		**30 credits**	**36 credits**

MASTER OF SCIENCE
IN APPLIED PHYSICS AND COMPUTER SCIENCE

COMPUTER SYSTEMS ENGINEERING AND INSTRUMENTATION CONCENTRATION

Academic Prerequisites
All applicants should have completed a two-semester sequence in physics, including mechanics and at least two labs; a five-semester sequence in mathematics, including calculus, matrix methods and differential equations; programming, including data structures; a course in computer organization and architecture; and a course with a lab in circuit analysis. It is assumed that these courses are at least at the level of the following texts: Serway, *Classical and Modern Physics*; Anton, *Calculus*; Williams, *Linear Algebra with Applications*; Boyce and DiPrima, *Ordinary Differential Equations*; Liang, *Java Programming*; Aho, Hopcroft and Ullman, *Data Structures*; Mano, *Computer Engineering*; Hayt and Kemmerly, *Circuit Theory*.

Program of Study 30-36 Credits
To ensure a depth and focus appropriate to the master's level and student's interests, the student's Plan of Study must be approved by the Graduate Program Coordinator.

		Thesis	Non-Thesis
Core Courses		**9 credits**	**9 credits**
PHYS 521	Computer Architecture		
CPSC 501	Software System Design and Implementation		
CPSC 502	Communications I (Computer Networks)		
Concentration Courses		**12 credits**	**15 credits**
Select any 4 CPSC courses from the M.S. in Applied Physics and Computer Science program (at least one must be 600 level). Courses chosen must be approved by the Graduate Program Coordinator.			
Listed below are some examples.			
PHYS 503	Data Acquisition and Instrumentation		
PHYS 522	Microprocessor-based Systems		
PHYS 621	Digital Signal Processing		
CPSC 525	Object Oriented Programming and Design		
CPSC 550	Distributed Operating Systems		
CPSC 611	Communications II		
CPSC 621	Parallel Processing		
Thesis			
PCSE 699	Thesis Research (1-6)	**9 credits**	
OR			
Non-Thesis			
12 additional credit hours of courses from the M.S. in Applied Physics and Computer Science program			**12 credits**
Total for M.S. in APCS		**30 credits**	**36 credits**

MASTER OF SCIENCE
IN APPLIED PHYSICS AND COMPUTER SCIENCE

APPLIED PHYSICS CONCENTRATION

Special Features of the Concentration

The Applied Physics curriculum presents the foundation theories of the physical world: mechanics, electromagnetism, thermodynamics, quantum mechanics, optics and solid state. Students use these models in two computational courses and in their theses where they construct simulations of physical systems, analyze physical systems or design smart sensors, and then display the results of these efforts by using state-of-the-art techniques in computer graphics. This emphasis on fundamental concepts and on computational techniques of modeling and simulation is complemented by the experimental procedures that undergird current practice in data acquisition. As a result, students experience the entire range of effective problem-solving practices: data acquisition and data storage, and data analysis based on the fundamental physical models and graphical display of the results of the analysis. For students with special interests and with established backgrounds in physics or engineering, the curriculum offers a versatility that allows students, in concert with their faculty advisers, to tailor graduate programs to suit their own professional goals by combining CNU courses with the offerings at the Virginia Consortium of Engineering and Science Universities (VCES).

Academic Prerequisites

All applicants should have completed a three-semester sequence in physics, including modern physics and at least two labs; a five-semester sequence in mathematics, including calculus, matrix methods and differential equations; programming, including data structures; and a course with a lab in circuit analysis. It is assumed that these courses are at least at the level of the following texts: Serway, *Classical and Modern Physics*; Anton, *Calculus*; Williams, *Linear Algebra with Applications*; Boyce and DiPrima, *Ordinary Differential Equations*; Liang, *Java Programming*; Aho, Hopcroft and Ullman, *Data Structures*; Hayt and Kemmerly, *Circuit Theory*.

Program of Study 30-36 Credits

To ensure a depth and focus appropriate to the master's level and student's interests, the student's Plan of Study must be approved by the Graduate Program Coordinator.

		Thesis	Non-Thesis
Core Courses		**9 credits**	**9 credits**
PHYS 501	Models of Dynamical Systems (3)		
PHYS 504	Electromagnetic Theory (3)		
PHYS 502	Quantum Physics (3)		
OR			
PHYS 506	Thermodynamics & Statistical Physics (3)		
Concentration Courses		**12 credits**	**15 credits**
Select any four PHYS courses from the M.S. in Applied Physics and Computer Science program, not including any course taken to fulfill the core courses requirement. CPSC 501 is also an acceptable choice. Courses chosen must be approved by the Graduate Program Coordinator.			
Thesis			
PCSE 699	Thesis Research (1-6)	**9 credits**	
OR			
Non-Thesis			
12 additional credit hours of courses from the M.S. in Applied Physics and Computer Science program			**12 credits**
Total for M.S. in APCS		**30 credits**	**36 credits**

MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE

Dr. Robert Atkinson, Graduate Program Coordinator
Forbes Hall 2040D
atkinson@cnu.edu
(757) 594-7619

The Master of Science in Environmental Science is designed for current and prospective students in the rapidly growing field of environmental monitoring and conservation. This degree program is flexible enough to fit the interests and needs of a wide variety of students and is designed for students planning to pursue a Ph.D., teachers desiring a M.S. in a biological science, or students interested in careers involving environmental assessment, monitoring and conservation.

The core courses are those mentioned most frequently by employers, consultants and educators as those needed for successful employment. The remainder of the curriculum is designed to enhance the understanding of ecosystem ecology, the conservation of organisms and their environment, and environmental chemistry. Many of these courses involve or consist entirely of fieldwork, since the majority of the employers surveyed are seeking graduates with first-hand knowledge of analyzing the environment.

Admission Requirements for Degree-seeking Students

1. A baccalaureate degree from a regionally accredited college or university with a minimum grade point average of 3.00 on a 4.00 scale.
2. An official transcript from the baccalaureate institution with the degree posted, and official transcripts for all graduate work taken at other institutions.
3. Three recommendation forms from people who can attest that the applicant is likely to be successful in graduate-level academic work.
4. Scores from the Graduate Record Examination (GRE) General Test taken within five years prior to the date of admission. A GRE score of at least 295 for Verbal and Quantitative sections combined is required. It is highly desirable to have a reasonably balanced score between the Verbal and Quantitative sections. Those with a combined score of 300 or above should experience success in the graduate program. For GRE scores reported prior to November 2011, a GRE score of at least 950 for Verbal and Quantitative sections combined is required and a score at or above 1000 is highly desirable. GRE scores are used as one of several indicators of the applicant's ability to succeed in graduate studies. For those applicants already holding a master's degree, the GRE may be waived by permission of the Director of Graduate Studies. A letter to the Director of Graduate Studies requesting a waiver is required.
5. Procurement of a thesis or project advisor. Prospective students should contact faculty members with similar research interests to determine if they are accepting new graduate students and are encouraged to speak with the Graduate Program Coordinator if they need assistance selecting faculty members to contact. Students will only be admitted into the program if a faculty member has formally agreed to serve as the thesis (or project) advisor and has expressed that agreement to the Graduate Program Coordinator.

Academic Policy for Non-degree Students

Students seeking non-degree admission status must have a grade point average of at least 3.0 on a 4.0 scale. Non-degree students are limited to 12 hours of graduate study. Up to 12 credits of graduate study may be applied to the graduate degree should a non-degree student apply and be accepted to degree-seeking status. Should a non-degree student desire additional courses beyond the 12-credit limit, he or she may petition the Graduate Program Coordinator for a waiver of this limit. Non-degree seeking students must meet the prerequisites before enrolling in a graduate course or obtain the consent of the instructor. Admission requirements for non-degree students are found on page 14 of this catalog.

Changing from Non-degree Status to Degree-seeking Status

A non-degree student may apply to change to degree-seeking status if he or she:

- has completed 12 hours of CNU graduate courses with a cumulative 3.0 GPA or higher,
- has a status of Good Academic Standing, and
- has submitted passing scores from the Graduate Record Exam.

To apply, submit the *Request for Change to Degree-seeking Status* form to Graduate Admission along with the documentation listed in 'Admission Requirements for Degree-seeking Students' shown on this page.

Academic Prerequisites

Students will provide evidence of satisfactory completion of a broad background of undergraduate courses including, yet not limited to: cellular biology, molecular biology, organismal biology, ecology, genetics, and statistics, as well as complete sequences of general and organic chemistry.

Goals of the Program

The curriculum of this program will contribute to the achievement of instructional goals in the following areas:

1. Solid background in ecological and environmental conservation theory;
2. Skills required for employment with environmental assessment/monitoring businesses, and state and federal governmental agencies;
3. Research and technical writing skills;
4. Preparation for further graduate work.

Curriculum

The Master of Science in Environmental Science degree program consists of thesis or non-thesis options. Many courses feature a prominent laboratory or field component in order to teach analytical and practical skills, while other courses are designed to build research and technical writing skills. The remainder of the course offerings is designed to enhance the understanding of ecology and the natural history of organisms. Many of the courses involve, or consist entirely of, field-work since employers are seeking graduates with first-hand knowledge of the environment and environmental assessment methods. Late afternoon and evening courses are available. Most courses beyond the core courses may be taken in any sequence.

Thesis Option

The thesis option is a 33-hour program that requires 6 hours of core courses, 21 hours of concentration courses (chosen with the guidance of the student's advisor and thesis committee), and 6 hours of thesis research. An oral presentation and defense of the written thesis are required.

Non-Thesis/Project Option

The non-thesis option is a 36-hour program that consists of 6 hours of core courses, 27 hours of concentration courses designed with the guidance of the student's advisor and committee, and 3 hours of project research. Non-thesis project research, typically limited in scope and with a reduced time demand than the thesis, will be designed under the supervision of the advisor and committee. An oral presentation and final project are required.

Comprehensive Examinations

A written and oral comprehensive examination is required to evaluate each student's proficiency in their field. Each student will either be asked questions that specifically assess the mastery of course-related material or material pertaining directly to the student's thesis expertise as deemed appropriate by their committee. A student failing either the written or oral comprehensive exam may request re-examination within six months of the failure, with only one additional examination being permitted.

Thesis

Students whose research results in a thesis are required to enroll in one thesis credit hour during any semester in which they are working on the thesis and must enroll in at least one thesis credit hour during the semester of degree completion. The defense of the thesis may be considered as part of the comprehensive examination. All theses presented must meet the requirements as listed in the ***Policy and Style Manual for Thesis Proposals and Master's Theses***. Access the manual at the Graduate Studies/Current Students/Forms and Thesis Manual website: gradstudies.cnu.edu. For the **Thesis Format Review** and **Final Copy Due Dates** access the Graduate Studies Dates and Deadlines website at cnu.edu/gradstudies/current/index.asp. Theses may be placed in the CNU library as research sources available to the academic community.

Graduation Requirements

Thesis Option (33 credits)

- Successful completion of 27 hours (minimum) of the M.S. in Environmental Science degree program coursework plus 6 hours of thesis (ENVS 699);
- Cumulative graduate grade point average of 3.00 in all CNU courses submitted for graduate credit with no more that two grades of *C;*
- Successful completion of the comprehensive examinations;
- Successful presentation and defense of thesis and appropriate number of approved thesis copies to the Office of Graduate Studies by the published deadline;
- Presentation of an electronic copy of the thesis to the chair of the committee in an acrobat.pdf format on CD suitable for archive purposes only.**Non-Thesis/Project Option (36 credits)**
- Successful completion of 33 hours (minimum) of the M.S. in Environmental Science degree program coursework plus 3 hours of non-thesis project (ENVS 689);
- Cumulative graduate grade point average of 3.00 in all CNU courses submitted for graduate credit with no more that

two grades of *C;*
- Successful completion of the comprehensive examinations;
- Oral presentation and written copy of project to advisor and committee;
- Presentation of an electronic copy of project to the chair of the committee in an acrobat.pdf format on CD suitable for archive purposes only.

Internships and Graduate Assistantships

Graduate assistants are employed to conduct research, perform administrative activities, and/or teach as directed by the graduate faculty within the department. The position requires a weekly time commitment and is awarded on a competitive basis. To qualify, a student must be a degree-seeking student with no limits or provisions, be enrolled in 6-9 graduate credit hours in the semester of the award. Contact the Graduate Program Coordinator for details. Additional information is on page 30 of this catalog.

Internships with environmental departments of municipalities, resource agencies, laboratories and engineering firms are available. The student gains practical experience in a workplace environment learning detailed methods of site evaluation, environmental assessment and technical report preparation. Many of the internships offer financial support to the student.

For further information:

Contact the ENVS Graduate Program Coordinator, Dr. Robert Atkinson, by email at atkinson@cnu.edu or (757) 594-7619.

MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE
PROGRAM OF STUDY
33-36 CREDITS

Core Courses (6 credits)

ENVS 505	Technical and Scientific Writing (3)
ENVS 510	Biometry (3)

Concentration Courses (21 credits for Thesis Option or 27 credits for Non-Thesis Option)

ENVS 518	Biological Conservation: Theory & Practice (3)
ENVS 519	Restoration Ecology (3)
ENVS 522	Summer Field Studies (2)
ENVS 525	Environmental Regulations (3)
ENVS 530	Biogeography (3)
ENVS 532/532L	Wetlands Ecology & Lab (4)
ENVS 534/534L	Marine Ecology & Lab (4)
ENVS 535/535L	Ornithology & Lab (4)
ENVS 536/536L	Terrestrial Ecology & Lab (4)
ENVS 538/538L	Limnology and Aquatic Biology & Lab (4)
ENVS 540/540L	Environmental Microbiology & Lab (4)
ENVS 545/545L	Mammalogy & Lab (4)
ENVS 550	Global Change (3)
ENVS 555/555L	GIS & Spatial Analysis Techniques & Lab (4)
ENVS 575	Seminar in Scientific Communication (3)
ENVS 590	Topical Seminars in Environmental Science (1-4 cr.)
CHEM 535	Nanochemistry and Nanotechnology (3)
CHEM 543	Atmospheric Chemistry (3)
CHEM 545/545L	Instrumental Methods in Environmental & Lab (4)
CHEM 560	Polymer Chemistry (3)
CHEM 565	Environmental Chemistry (3)
CHEM 570	Advanced Organic Chemistry (3)
CHEM 580	Chemical Spectroscopy (3)

Thesis or Project (6 credits for Thesis Option or 3 credits for Non-Thesis Option)

ENVS 699	Thesis Research (6)
ENVS 689	Project Research for Non-thesis (3)

Total for M.S. in ENVS **33 credits (Thesis) or**
36 credits (Non-Thesis)

BIOLOGY, and COURSES

BIOL 538. Teaching Secondary Science (4-0-4)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
A course in which prospective teachers are introduced to methods and materials of teaching biology. Emphasis on laboratory exercises and demonstration. Students are expected to design and instruct a variety of laboratory exercises. Students also maintain a journal of practical and methodology experiences.

CHEMISTRY

CHEM 535. Nanochemistry & Nanotechnology
[Meets with CHEM 435] (3-3-0)
This course will cover the fundamentals of nanochemistry and nanotechnology in terms of synthesis, characterization and applications of nanomaterials.

CHEM 538. Teaching Secondary Science (4-0-4)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
A course in which prospective teachers are introduced to methods and materials of teaching chemistry. Emphasis on laboratory exercise and demonstration. Students are expected to design and instruct a variety of laboratory exercises. Students maintain a journal of practical and methodology experiences.

CHEM 543. Atmospheric Chemistry
[Meets with CHEM 443] (3-3-0)
This course presents an introduction to the chemistry of the troposphere and stratosphere. Emphasis is placed on the structure of the atmosphere, photochemical smog, global climate change and greenhouse gases, stratospheric ozone depletion, and particulate matter in the troposphere.

CHEM 545. Instrumental Methods in Chemistry
[Meets with CHEM 445] (4-2-0)
Corequisite: CHEM 545L
Application of chemical principles to instrumentation. Instruction in operation of a variety of modern instruments.

CHEM 545L. Instrumental Methods in Chemistry Laboratory [Meets with CHEM 445L] (0-0-5)
Corequisite: CHEM 545
Laboratory exercises include instruction in operation of a variety of modern instruments. Lab fees apply each term.

CHEM 560. Polymer Chemistry
[Meets with CHEM 460] (3-3-0)
This course investigates the synthesis, characterization, processing, testing and application of a wide variety of polymer materials. Structure-property relationships will be emphasized.

CHEM 565. Environmental Chemistry
[Meets with CHEM 465] (3-3-0)
The study of the reactions, transport, effects, sources and fates of chemical species in the atmospheric, aquatic and terrestrial environments. Students prepare a comprehensive paper and presentation.

CHEM 570. Advanced Organic Chemistry
[Meets with CHEM 470] (3-3-0)
Synthesis is a central part of organic chemistry. Students in this course study the recent developments in organized chemistry and learn how to keep abreast of this ever-changing subject.

CHEM 580. Chemical Spectroscopy
[Meets with CHEM 480] (3-3-0)
Prerequisite: CHEM 342 or Approval of Instructor
The course focuses on the application of quantum mechanics and group theory to determining molecular structure and to developing concepts central to the theory behind and design of modern analytical instrumentation.

CHEM 595. Advanced Topics in Chemistry
(Credit varies)
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

CHEM 599. Independent Study (1-3 Credits)
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures

COMPUTER SCIENCE COURSES

CPSC 501. Software System Design & Implementation
[Meets with CPSC 480] (3-3-0)
Prerequisites: Graduate standing or permission of the instructor. (Fall)
The management, specification, design, implementation and documentation of complex software systems. A paper or class presentation based on independent reading of research papers concerning new developments in software engineering are required. Students are expected to learn to use software systems such as CASE tools.

CPSC 502. Communications I (3-3-0)
Prerequisites: Graduate standing and ability to program in C or C++, or permission of the instructor. (Spring)
A comprehensive view of data communications with an emphasis on computer networks. Baseband and broadband local area networks, OSI model, logical link protocols, media with an emphasis on fiber-based interfaces, topology and routing/flow control. TCP/IP protocols and socket-based application development are emphasized.

CPSC 510. Artificial Intelligence I
[Meets with CPSC 471] (3-3-0)
Prerequisites: Graduate standing within the department. (Fall)
The purpose of this course is to introduce students to the basic elements of artificial intelligence with an emphasis on applications such as neural nets and heuristic search.

CPSC 521. Computer Architecture
[Same as PHYS 521; meets with CPEN 414] (3-3-0)
Prerequisites: Graduate standing within the department or permission of instructor. (Spring)
Advanced issues and techniques in computer architecture and design. Instruction set design and performance impact. Architectural simulation using VERILOG. Pipelining. Computer arithmetic and vector processors. Advanced memory and cache design. I/O interfaces for high performance.

CPSC 525. Object Oriented Programming & Design
[Meets with CPSC 425] (3-3-0)
Prerequisites: Graduate standing or permission of the instructor. (Spring)
Basic object-oriented design and applications. This course introduces object-oriented design methods and provides guidance in the effective implementation of object oriented programs. Substantive, additional work in the form of more advanced assignments and projects are required to distinguish this class from the cross-listed course.

CPSC 550. Distributed Operating Systems
[Meets with CPSC 450] (3-3-0)
*Prerequisites: Graduate standing within the department. (Spring)*A study of operating systems with emphasis on distributed systems and intra-system communications. Substantive, additional work in the form of more advanced assignments and projects are required to distinguish this class from the cross-listed course.

CPSC 560. Introduction to Compilers
[Meets with CPSC 460] (3-3-0)
(Even Year Spring)
A study of the problems of translating procedure oriented languages; lexicographic analysis, syntax checking, code generation and optimization, error detection and diagnostics. Substantive, additional work in the form of more advanced assignments and projects are required to distinguish this class from the cross-listed course.

CPSC 570. Theoretical Computer Science
[Meets with CPSC 470] (3-3-0)
Prerequisites: Graduate standing within the department. (Fall)
Presentation of basic results relating to formal models of computation. Emphasis is placed on developing skills in understanding rigorous definitions in computing and in determining their logical consequences. Substantive, additional work in the form of more advanced assignments and projects are required to distinguish this class from the cross-listed course.

CPSC 585. Principles & Applications of Multimedia
[Meets with CPSC 485] (3-3-0)
Prerequisites: Graduate standing with the department. (Fall)
The purpose of this course is to learn the principles and techniques of multimedia, focusing on digital images and audio in print and online form. Technical topics include the nature of sound and images and their digital representation and multimedia relevant Web protocols. The course also addresses copyright issues, graphic design and human interface principles. A semester project is required.

CPSC 595. Advanced Topics in Computer Science (Credit varies)
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

CPSC 599. Independent Study (1-3 Credits)
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages, and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for more information.

CPSC 611. Communications II (3-3-0)
Prerequisite: CPSC 502. (Even Year Fall)
Analysis of communication systems through the application of queuing theory results and the modeling and simulation of these systems by state-of-the-art network simulation tools. Client/server network software strategies with an emphasis on RPC.

CPSC 621. Parallel Processing (3-3-0)
Prerequisite: CPSC 521 or PHYS 521. (Odd Year Fall)
Advanced topics in concurrent processor design. Memory

and I/O structures for high performance and parallel architectures. Comparison of vector processing machines. SIMD architectures and algorithms. MIMD architectural options. Centralized vs. distributed memory. Shared memory vs. message passing. Algorithms for different MIMD machines. Parallel programming.

CPSC 642. Artificial Intelligence II (3-3-0)
Prerequisites: CPSC 510, or permission of the instructor. (Odd Year Spring)
Topics in artificial intelligence. Content will vary. Possible topics include advanced neural nets, qualitative reasoning and natural language processing.

ENGLISH COURSES

ENGL 501. Teaching Literature (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Summer)
In this seminar, students explore methods for teaching literature. The participants read and analyze various literary works. In addition the seminar introduces students to literary and pedagogical theories, but the emphasis is on the application of these theories to the English classroom.

ENGL 521. Developing Elementary Writers and Readers (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of the instructor. (Fall)
This course offers an introduction to the theory and practice of writing. Participants identify writing stages, explore approaches to teaching writing (such as writers workshop), and present writing lessons that exemplify various theoretical approaches. In addition, each student develops a practical theory of composition that can be used in a classroom. The course includes a field requirement to work with elementary students to improve their writing skills.

ENGL 526. Teaching Writing in Secondary English Classes (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall)
This course is for secondary English teaching candidates, threading together theoretical and practical approaches to the various forms of written discourse that teachers are expected to teach and assess. The class covers forms of written expression, from the personal narrative to the extended research project, and methods of expression, from private journaling, traditional print, and visual discourse, to help the novice teacher begin to define personal and professional pedagogical ideologies. The course includes a field requirement to work with secondary students to improve their writing skills.

ENGL 530. Grammar to Enrich and Enhance Writing (3-3-0) *Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall)*
The course presents an interactive approach to grammar instruction in which students learn not only the basic elements of English grammar, but also pertinent and engaging classroom activities for teaching grammar in the schools. This course is designed especially for students who are preparing to teach English in the public schools.

ENGL 532. Language Varieties in American Schools (3-3-0) *Prerequisite: Enrollment in the MAT Program or consent of instructor.*
This course surveys topics relevant to the language arts classroom. Illustrative topics include grammar and writing, language acquisition, techniques to facilitate the learning of Standard English by speakers of other languages and dialects, language variation, spoken versus written English, etc.

ENGL 595. Advanced Topics in English (Credit varies)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

ENGL 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

ENVIRONMENTAL SCIENCE

ENVS 505. Technical and Scientific Writing (3-3-0)
This course discusses the fundamentals of technical writing with consideration of other types of scientific writing. The stylistic and mechanical problems characteristic of technical writing are considered and worked on individually and in groups. Students write and edit journal articles.

ENVS 510. Biometry (3-3-0)
The application of statistical methods to biological problems. Experimental design, data acquisition, single and multiple analysis of variance, regression and correlation are covered. Test selection and modeling are also included.

ENVS 518. Biological Conservation: Theory and Practice (3-3-0)
Biological conservation is a relatively new, applied discipline having more ethical and sociopolitical ramifications than is typical of non-medical scientific disciplines. This course covers the development of conservation theory, biodiversity and problems of determining and evaluating biodiversity, relevant ecological principles, and ethical and economic issues. The course considers current conservation problems and the methods and strategies. The first part of the course is in lecture format and the second part is in seminar format.

ENVS 519. Restoration Ecology (3-3-0)
This course familiarizes the student with the newly emerging science of restoration ecology, including its theoretical foundation and its application in today's world. The first part of the course concerns case studies and the second part of the course, in seminar format, concerns recently published studies found in the peer-reviewed literature.

ENVS 522. Summer Field Studies (2-0-2)
A one-week field camp in selected habitats emphasizing application of field data gathering and processing techniques to the solving of multifaceted environmental problems. Travel, camping and boat work required. An additional day on campus is required for student presentations.

ENVS 525. Environmental Regulations (3-3-0)
A seminar designed to explore current environmental regulations and their impact on various constituents.

ENVS 530. Biogeography [Meets with BIOL 430] (3-3-0)
The study of the patterns of distributions of organisms, both past and present, and the abiotic and biotic factors that produced those distributions.

ENVS 532. Wetlands Ecology (4-3-0)
Corequisite: ENVS 532L
A study of the structure and function of wetland systems from salt to fresh and tropical to the arctic. Concepts will cover hydrology, biogeochemistry, wetland development and succession. Wetland delineation, management, creation and restoration apply these concepts.

ENVS 532L. Wetlands Ecology Laboratory (0-0-4)
Corequisite: ENVS 532
Field exercises in local wetlands applying principles from lecture. Lab fees apply each term.

ENVS 534. Marine Ecology (4-3-0)
Corequisite: ENVS 534L
Ecology of the disturbed and non-disturbed marine environment. Topics covered include: global distribution of marine organism and the factors influencing their distribution, plankton ecology, the benthos, salt marsh and sea grass ecology, rocky shore and coral reef ecology, human exploitation and interference in marine habitats, and sampling techniques in marine systems.

ENVS 534L. Marine Ecology Laboratory (0-0-4)
Corequisite: ENVS 534
Extensive field and local bay exercises applying principles from lecture. Lab fees apply each term.

ENVS 535. Ornithology [Meets with BIOL 425] (4-3-0)
Corequisite: ENVS 535L
An introduction to the biology of birds. Topics covered include anatomy, physiology, behavior, ecology, evolution, identification and conservation. Students are expected to present an in-class lecture and lead one lab session.

ENVS 535L. Ornithology Laboratory [Meets with BIOL 425L] (0-0-4)
Corequisite: ENVS 535
Lab is field-oriented and includes several Friday afternoon field trips and two weekend trips lasting one or two days. Students are required to attend two Friday afternoon trips and at least one weekend trip. Lab focuses on the identification of birds using both ocular and acoustic characters. Lab fees apply each term.

ENVS 536. Terrestrial Ecology (4-3-0)
Corerequisite: ENVS 536L
A study of the structure and function of terrestrial systems focusing on the distinctive landscapes of the mid-Atlantic coastal region. Concepts will cover population, community and ecosystem ecology of plants and animals within these systems with attention given to the processes and functions that are distinct within and common among these systems.

ENVS 536L. Terrestrial Ecology Laboratory (0-0-4)
Corerequisite: ENVS 536
Field exercises in local terrestrial ecosystems applying principles from lecture. Lab fees apply each term.

ENVS 538. Limnology and Aquatic Biology (4-3-0)
Corequisite: ENVS 538L
Interactions of physical, chemical and biological properties in natural and degraded freshwater ecosystems. Emphasis on application of field data gathering, processing and functional classification of organisms in aquatic communities.

ENVS 538L. Limnology & Aquatic Biology Laboratory (0-0-4) *Corequisite: ENVS 538*
Extensive field and laboratory exercises in local lakes and streams applying principles from lecture. Lab fees apply each term.

ENVS 540. Environmental Microbiology (4-3-0)
Corerequisite: ENVS 540L
The course investigates the role microorganisms play in terrestrial, aquatic and marine ecosystems. The course explores: the dynamics of microbial populations and communities; normal microbiota and their interactions with other organisms; and environmental pathologies in which microorganisms are the primary agent (e.g., coliforms and other fecal contaminants in water, and adicophiles in mine tailings).

ENVS 540L. Environmental Microbiology Laboratory (0-0-4) *Corerequisite: ENVS 540*
Laboratory exercises include classic environmental testing procedures and novel new assessment procedures that have their roots in biochemistry and molecular biology. Lab fees apply each term.

ENVS 545. Mammalogy [Meets with BIOL 445] (4-3-0)
Corequisite: ENVS 545L
A study of the basic principles of mammalian biology. Students learn to recognize Virginia's mammals and gain an understanding of global mammalian diversity and systematics. The course provides a broad understanding of the natural history of mammalian groups and species, and investigates the roll of mammals in natural and urban systems. Conservation of this important taxonomic group is also discussed. Students are expected to present an in-class lecture and lead one lab session.

ENVS 545L. Mammalogy Laboratory [Meets with BIOL 445L] (0-0-4)
Corequisite: ENVS 545
The lab is field oriented, and includes regular field trips to explore field biology and field identification. Lab fees apply each term.

ENVS 550. Global Change (3-3-0)
An examination of the evidence for and causes of global change. The impact of changes in the global cycles of C, N, P and H2O on ecosystem structure and function are examined. Atmosphere, terrestrial and aquatic biosphere changes are discussed along with their effect on plant and animal communities. Students present current scientific papers on various issues within this field.

ENVS 555. GIS & Spatial Analysis Techniques [Meets with BIOL 435] (4-3-0) *Corequisite: ENVS 555L*
In this course, computer information mapping, output design, spatial analyzes, GPS applications, and remote sensing techniques are discussed, explored (hands-on), and applied to local and regional problems.

ENVS 555L. GIS & Spatial Analysis Techniques Laboratory [Meets with BIOL 435L] (0-0-4)
Corequisite: ENVS 555
Lab includes the application of ArcGIS (ESRI Co.) software in combination with collecting field data with Trimble GPS to geospatially address environmental questions. Lab fees apply each term.

ENVS 575. Seminar in Scientific Communication (3-3-0)
This special topics course, offered for students wishing to improve their formal and informal communication skills, is designed to be a graduate level seminar in which the students and instructor utilize a variety of learning techniques to explore current and practical issues in science communication and science education.

ENVS 590. Topical Seminars in Environmental Science (1-4 credits)
Prerequisites: May vary depending on the topic offered.
A variety of environmental science-related topics not available in the regular curriculum are offered. These courses will be designed to fill a particular need not met by the regular courses or may be designed to use the talents of an environmental scientist who is not part of the CNU faculty.

ENVS 595. Advanced Topics in Environmental Science (Credit varies) *Prerequisite: Enrollment in the MAT Program or consent of instructor.*
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

ENVS 599. Independent Study (1-3 Credits)
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

ENVS 689. Project Research for Non-Thesis (1-3 Credits, taken in increments)
The student may not proceed beyond the first credit without Project Research Committee approval of the project.

ENVS 699. Thesis Research
(1-6 Credits, taken in increments)
The student may not proceed beyond the first credit without thesis committee approval of the proposal. Students are required to be enrolled in at least one credit hour of ENVS 699 during any semester in which they are working on the thesis and must be enrolled in one thesis credit hour during the semester of degree completion.

FINE ARTS COURSES

FNAR 534. Theory and Practice of Art Education (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall)
A study of the theories of art education related to child development, perceptual theory and general educational philosophy. Course focuses on the disciplines of art, art history, art production, art criticism and aesthetics. Field observation is required.

FNAR 535. Integrating the Visual Arts (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Summer)
This seminar invites students to consider and create the varied ways in which the visual arts can be integrated within the context of public school teaching. A number of integrative approaches are considered: integrating the arts into other content areas; integrating one's own personal talents and interest into the art classroom; integrating community resources into the curriculum; and integrating various aspects of the visual arts into teaching units.

FNAR 589. Teaching Functional Arts (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Spring)
Teaching Functional Arts is a course that continues the exploration of craft processes and materials appropriate for art teachers. Possible projects include weaving, copper enameling, fabric surface design, wood construction and jewelry making. Students develop competencies in presenting mini-workshops in craft skills.

FNAR 595. Advanced Topics in Art (Credit varies)
Prerequisite: Enrollment in the MAT Program or consent of the instructor.
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

FNAR 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

GEOGRAPHY and GOVERNMENT COURSES

GEOG 570. World Geography for Teachers (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
This course has two major purposes: 1) to enhance (future) teachers' abilities to find and assess learning resources for secondary-level world geography and 2) to enhance (future) teachers' content knowledge of world geography. The course begins with a survey of core geographic ideas, the key learning objectives in geographic education. The latter half of the course is devoted to finding and appraising resources for geographic learning and instruction. The capstone project is a learning resources portfolio covering a particular world region.

GOVT 570. Methods for Teaching Social Studies (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Social studies education is a powerful tool, not only in the development of democratic behavior, but also in the promotion of understanding multiculturalism and the complexities of global issues that are shaping the world today. This course exposes prospective social studies teachers to various methodologies that they can employ in their teaching to achieve the goals of preparing the youth in meeting the challenges of an ever-changing and complex world.

GOVT 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

HISTORY COURSES

HIST 510. The American Historian as Teacher (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
The primary focus of this graduate seminar is to prepare students who will pursue a career in teaching history and social studies. To that end, the seminar will examine themes in American history from many different perspectives (e.g. political, economic, social, and cultural), but the specific focus, form and content of each seminar will be determined by the instructor. Previous subjects have included the colonial period, slavery, women's rights, and the Vietnam War. All seminars will deal with selected problems in history and an examination of historiography, methodology and philosophy of history. Seminar discussions and research projects revolve around primary and secondary sources, monograph and academic articles, competing interpretation of historical events, and communicating lessons to future students. As areas of study vary on a regular basis, this course may be repeated for credit.

HIST 520. The European Historian as Teacher (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
The primary focus of this graduate seminar is to prepare students who will pursue a career in teaching history and social studies. To that end, the seminar will examine themes in European history from many different perspectives (e.g. political, economic, social, and cultural), but the specific focus, form and content of each seminar will be determined by the instructor. Previous subjects have included ancient Rome, Tudor Britain, and modern Germany. All seminars will deal with selected problems in history and an examination of historiography, methodology and philosophy of history. Seminar discussions and research projects revolve around primary and secondary sources, monograph and academic articles, competing interpretation of historical events, and communicating lessons to future students. As areas of study vary on a regular basis, this course may be repeated for credit.

HIST 530. The World Historian as Teacher (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
The primary focus of this graduate seminar is to prepare students who will pursue a career in teaching history and social studies. To that end, the seminar will examine themes in non-western world history from many different perspectives (e.g. political, economic, social, and cultural), but the specific focus, form and content of each seminar will be determined by the instructor. Regions covered may be Asia, Africa, Latin America, and Middle East. All seminars will deal with selected problems in history and an examination of historiography, methodology and philosophy of history. Seminar discussions and research projects revolve around primary and secondary sources, monograph and academic articles, competing interpretation of historical events, and communicating lessons to future students. As areas of study vary on a regular basis, this course may be repeated for credit.

HIST 570. Methods for Teaching Social Studies (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Social studies education is a powerful tool, not only in the development of democratic behavior, but also in the promotion of understanding multiculturalism and the complexities of global issues that are shaping the world today. This course exposes prospective social studies teachers to various methodologies that they can employ in their teaching to achieve the goals of preparing the youth in meeting the challenges of any ever-changing and complex world.

HIST 595. Advanced Topics in History (Credit varies)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

HIST 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

MATHEMATICS COURSES

MATH 538. Apprenticeship in Teaching Mathematics (2-2-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall)
The purpose of the course is to have students work with lower-level college students in understanding and mastering basic mathematics concepts. Students are assigned tutorial activities such as observing, analyzing class responses and assisting in class work. This includes administering individual and group tutoring sessions, submitting a log of interactions and writing a research paper about how students learn mathematics.

MATH 578. Elementary Geometry from an Advanced Viewpoint (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of the instructor. (Spring)
This course compares and contrasts the origins, applications and basic structures of Euclidean and non-Euclidean geometry. Attention is given to ideas involved in teaching geometry.

MATH 595. Advanced Topics in Mathematics (Credit varies) *Prerequisite: Enrollment in the MAT Program or consent of the instructor.*
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

MATH 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

MODERN LANGUAGES COURSES

MLAN 511. Advanced Strategies in TESOL [Same as ENGL 511]
(3-3-0) *Prerequisite: Enrollment in the MAT Program or consent of instructor. (Spring, Summer)*
This course is a graduate seminar that examines methods of teaching English to speakers of other languages (TESOL). Students learn about the cognitive, affective, linguistic and sociocultural processes involved in second language development and acquire the ability to critically evaluate and develop teaching methods and materials.

MLAN 570. Teaching Modern Languages (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall)
Students use their foreign language and cultural knowledge to plan and delivery lessons; create classroom experiences appropriate to the needs of learners; develop effective strategies for teaching the foreign language in meaningful context; collaborate with peers in reflection on the teaching/learning process and in planning lessons; and develop an awareness of the responsibility of an educator.

MUSIC COURSES

APP COND 531. Applied Choral Conducting (1-0-.5)
Prerequisite: Music education major pursuing the MAT degree. (Fall)
The study of applied choral conducting at the graduate level is to develop further the synthesis of baton technique, rehearsal technique, expression and scholarship. Through weekly practice with the CNU Chamber Choir; conducting on concerts and recitals; attending master classes, recitals, and concerts; listening to recordings; and reading articles and books on conducting and pedagogy, a student will have the opportunity to improve technique and performance and achieve a greater musical and historical understanding of the repertoire.

APP COND 531. Applied Orchestral Conducting (1-0-.5) *Prerequisite: Music education major pursuing the MAT degree. (Fall)*
The study of applied orchestral conducting at the graduate level is to develop and further the synthesis of baton technique, rehearsal technique, expression, and scholarship. Through weekly practice with the CNU Orchestra; conducting of concerts and recitals; attending master classes, recitals, and concerts; listening to recordings; and reading articles and books on conducting and pedagogy, a student will have the opportunity to improve technique and performance and achieve a greater musical and historical understanding of the repertoire.

APP COND 531. Applied Wind Conducting (1-0-.5)
Prerequisite: Music education major pursuing the MAT degree. (Fall)
The study of applied wind conducting at the graduate level is to develop further the synthesis of baton technique, rehearsal technique, expression and scholarship. Through weekly practice with the CNU Wind Ensemble; conducting of concerts and recitals; attending master classes, recitals, and concerts; listening to recordings; and reading articles and books on conducting and pedagogy, a student will have the opportunity to improve technique and performance and achieve a greater musical and historical understanding of the repertoire.

APP MUSC 531. Applied Music (1-0-.5)
Prerequisite: Music education major pursuing the MAT degree. (Fall)
The study of applied music at the graduate level is to develop further the synthesis of technique, expression, repertoire and performance. Through weekly, 30-minute lessons, intense study of selected repertoire, and performance, the student will continue to develop the knowledge

and skills expected of a professional musician. The course is of particular value to music pedagogues desiring to become more distinguished performers.

MUSC 510. Foundations of Music Education (3-3-0)
Prerequisite: Music education major pursuing the MAT degree. (Fall)
This is a comprehensive course focusing on the instruction and management of instrumental music program from middle school through high school. Methods and materials for beginning through secondary instrumental music students are discussed and experienced through reading, writing and practicum. The course also includes techniques and methods of measuring and evaluating musical behaviors in cognitive, affective and psychomotor domains.

MUSC 520. Choral Literature and Conducting (3-3-0)
Prerequisite: MUSC 310, 312 and 314; choral music education major pursuing the MAT degree or consent of the instructor. (Spring)
A survey course that requires historical and structural analysis and conducting of major choral literature from the Renaissance to the present. Students conduct live ensembles both in the classroom and in the rehearsal hall. Special emphasis is placed on major works, composers, compositional styles, analysis, programming, error detection, and conducting. Students read and discuss a variety of material to develop the knowledge and pedagogical skills necessary to become effective teachers, scholars and musicians. A major research paper and presentation are required.

MUSC 530. Wind Literature and Conducting (3-3-0)
Prerequisite: MUSC 310, 312 and 316; instrumental music education major with an emphasis in band pursuing the MAT degree or consent of the instructor. (Spring)
A comprehensive study of wind groups focusing on instrumentation and literature from the earliest beginnings to the present. Special emphasis on major works, composers, stylistic changes, programming and conducting. Students read and discuss a variety of material to develop the knowledge and pedagogical skills necessary to become effective teachers, scholars and musicians. A major research paper and presentation are required. Students conduct live ensembles both in the classroom and in the rehearsal hall. The course is required for the Master of Arts in Teaching degree with a concentration in instrumental music education with an emphasis in band.

MUSC 537. Music in the Elementary Schools (3-3-0)
Prerequisite: Music education major pursuing the MAT degree. (Fall)
Fundamental procedures of and experiences in teaching elementary school music, stressing music materials suitable for the first six grades. Methods discussed and practiced include those of Orff, Kodaly, Suzuki, Manhattanville and Dalcroze. An introduction to fretted instruments and recorders is also included. Students read and discuss a variety of material to develop the knowledge and pedagogical skills necessary to become effective teachers, scholars and musicians. A major research paper and presentation are required.

MUSC 540. Orchestral Literature and Conducting (3-3-0)
Prerequisite: MUSC 310, 312 and 316; instrumental music education major with an emphasis in orchestra pursuing the MAT degree or consent of the instructor. (Spring)
A comprehensive study of orchestral groups focusing on instrumentation and literature from the earliest beginnings to the present. Special emphasis on major works, composers, stylistic changes, programming and conducting. Students read and discuss a variety of material to develop the knowledge and pedagogical skills necessary to become effective teachers, scholars and musicians. A major research paper and presentation are required. Students conduct live ensembles both in the classroom and in the rehearsal hall.

MUSC 570. Marching Band Techniques (1-1-0)
Prerequisite: MUSC 310, 312 and 316; instrumental music education major pursuing the MAT degree or consent of the instructor. (Fall)
Techniques and methods for organizing, programming, rehearsing, teaching and arranging music for a marching band. Computer-assisted drill design is a major component of this course. A comprehensive notebook and extensive outside readings and viewings or videos are required.

MUSC 580. Jazz Ensemble Techniques (1-1-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall)
Techniques and methods for organizing, programming, rehearsing and teaching improvisation in a school jazz band and choral setting. A comprehensive notebook and extensive outside readings and listening examples are required in addition to 10 hours of field observation and participation in the public schools.

MUSC 595. Advanced Topics in Music (Credit varies)
Prerequisite: Enrollment in the MAT Program in Choral Music Education or consent of instructor.
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

MUSC 598. Choral Apprenticeship (1-0-20)
Prerequisite: Enrollment in the MAT Program in Choral Music Education or consent of instructor. (Fall)
This course is a closely monitored, one-semester apprenticeship with the CNU Director of Choral Studies with the Women's and Men's chorus, the student's cooperating teacher in the public schools at the elementary or second-

ary level, or with a local volunteer organization such as the YMCA, Boy's and Girl's Clubs of America, or other organizations as approved, in advance, by the faculty supervisor. Students must successfully complete a minimum of 20 hours of on-site training in a self-directed service project directly related to their upcoming student teaching experience for which they receive an evaluation by their training supervisor and the faculty supervisor. The student must also present a Project Book and a log of hours to the training supervisor and the faculty supervisor in addition to writing a research paper that synthesizes the student's work from the apprenticeship.

MUSC 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

NATURAL SCIENCE COURSES

NSCI 570. Teaching STEM (4-0-4)
Prerequisite: Enrollment in MAT program.
This course is a graduate level seminar in which the students and instructor utilize a variety of learning techniques to explore current and practical methods of STEM (Science, Technology, Engineering and Mathematics) education. The instructor will act as a facilitator and co-learner in this process, and an important component of the course is to identify and explore issues of particular interest to the students enrolled in the class.

PHYSICS COURSES

PHYS 501. Models of Dynamical Systems (3-3-0)
Prerequisites: Math through differential equations or permission of the instructor. (Fall)
The classical models of physical phenomena, the modern perspective on their analytic and qualitative solutions and the insights that numerical analysis of the models gives to expected behaviors of dynamical systems. Computer analysis and graphical representation of solutions for regular and chaotic dynamical systems.

PHYS 502. Quantum Physics (3-3-0)
Prerequisites: PHYS 501 or permission of instructor. (Odd Spring)
Study of the formulation of quantum physics and the use of computers to analyze quantum mechanical systems. Topics include the postulates of quantum physics, the Shroedinger equation, indeterminacy, the Heisenberg representation, angular momentum, internal degrees of freedom, the hydrogen atom, perturbation theory, quantization of the EM field and radiative transitions.

PHYS 503. Data Acquisition and Instrumentation
(3-3-0) *Prerequisites: Graduate standing within the department or permission of instructor. (Even Year Fall)*
Data reduction and error analysis. Computer-controlled data acquisition systems in the laboratory. The use of a case study to develop a measurement system. Noise in electronic systems. Introduction to signal processing. Students are required to complete a project that includes an implementation of a measurement system and data reduction of the results.

PHYS 504. Electromagnetic Theory (3-3-0)
Prerequisites: PHYS 304 or MATH 350 or permission of instructor. (Even year Spring)
Review of electrostatics and magnetostatics. Maxwell's equations and time varying fields: wave propagation and polarization, waveguides and cavities and radiating systems. Computer programs for the solution of problems will be emphasized.

PHYS 506. Thermodynamics and Statistical Physics [Meets with PHYS 406] (3-3-0)
Prerequisites: Graduate standing within the department or permission of instructor. (Odd Year Spring)
Review of thermodynamics followed by advanced topics in thermodynamics: first-order phase transitions, maximum work theorem, Legendre transformations, critical phenomena and irreversible thermodynamics. Statistical mechanics: entropy representation, microcanonical, canonical, grand canonical formalisms, quantum fluids and fluctuations. Use of the computer in the analysis and presentation of technical problems.

PHYS 521. Computer Architecture
[Same as CPSC 521; meets with CPEN 414] (3-3-0)
Prerequisites: Graduate standing within the department or permission of instructor. (Spring)
Advanced issues and techniques in computer architecture and design. Instruction set design and performance impact. Architectural simulation using VERILOG. Pipelining. Computer arithmetic and vector processors. Advanced memory and cache design. I/O interfaces for high performance.

PHYS 522. Microprocessor-based Systems
[Meets with CPEN 422] (3-3-0)
Prerequisites: Graduate standing in the department or permission of the instructor. (Fall)
Focus on microprocessor-based computer architectures. Hardware topics include studies of several microprocessor architectures, memory, peripheral interfaces and buses. Software issues include I/O and interrupt handling and microprocessor development systems.

PHYS 531. Optical Physics
[Meets with PHYS 431] (3-3-0)
Prerequisites: Graduate standing in the department or permission of the instructor.
This course lays the foundation of modern optical science. It presents an overview of the properties of light and its interaction with matter and describes basic principles for control and detection of light beams. Provides an introduction to optical spectroscopy. The use of computer software for optical analysis is emphasized.

PHYS 541. Modeling and Simulation
[Meets with PHYS 441] (3-3-0)
Prerequisites: PHYS 501, PHYS 502, MATH 580, CPSC 501, C or FORTRAN 90.
The modeling and simulation of physical systems. Applying software methodologies to the solution of physical problems. Lectures typically involve a short review of a physics topic such as Keplerian motion, followed by an extensive discussion on the modeling and/or simulation of the problem. A large component of the course is a project. Students are able to "design" their own project, drawing from any area in the complete spectrum of physics curriculum. The project might entail modeling physical systems (ex: mechanics, optics, fluids, waveguides, atmospheric propagation or nonlinear system). Or, the student may choose to write a stimulation (ex: interplanetary spaceflight, orbital adjustment and insertion or powered flight). Substantive, additional work in the form of more advanced assignments and projects are required to distinguish this class from the cross-listed class.

PHYS 595. Advanced Topics in Physics (Credit varies)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

PHYS 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

PHYS 621. Digital Signal Processing (3-3-0)
Prerequisites: PHYS 503, PHYS 522. (Odd Year Fall)
This course covers the principles of digital signal processing beginning with the sampling process on through digital filter design. Advanced topics include approximation effects, inverse filtering and hardware implementation structures. The course correlates theoretical aspects presented in the classroom with practical experimentation and design in a laboratory setting using commercial DSP hardware.

PHYS 631. Physics of Solids (3-3-0)
Prerequisites: PHYS 502 and PHYS 506 or permission of instructor.
Introduction to the physics of solids at the graduate level. Quantum ideas are emphasized to provide a better understanding of the properties of solids. Topics include crystal structure, electrons in a periodic potential, Fermi surface and band theory, lattice dynamics, phonons, semiconductors and magnetism.

PCSE 699. Thesis Research (6 Credits)
Thesis Research may be taken in one-credit increments. Students are required to enroll in one credit hour of PCSE 699 during any semester in which they are working on the thesis and must enroll in at least one thesis credit hour during the semester of degree completion.

PSYCHOLOGY COURSES

PSYC 521. Reading Acquisition and Development
(3-3-0) *Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall, Spring)*
Corequisite: PSYC 521L
This course examines theories, principles, strategies and research related to reading acquisition and development in children from preschool through elementary grades. The developmental nature of reading acquisition and the application of current reading research to instructional practice will be emphasized. Topics covered will include theories of reading development; skills-based, holistic and balanced approaches to reading instruction; the application of empirical research findings to reading instruction; language basics, including syllables, phonemes and morphemes; concepts of print; letter recognition; phonemic awareness; the alphabetic principle (sound-symbol knowledge); vocabulary, fluency, and comprehension strategies; the role of the family in reading acquisition; reading attitudes and motivation; and diverse learners.

PSYC 521L. Reading Acquisition and Development Laboratory (1-0-3)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall, Spring) Corequisite: PSYC 521
This course accompanies PSYC 521, Reading Acquisition and Development. PSYC 521 is designed to provide

pre-service teachers a strong theoretical and empirical (research) foundation for understanding the reading acquisition process and one on which to base sound reading instructional practice. The laboratory is designed to provide pre-service teachers the opportunity to apply reading theory and research to successful instructional practice in structured field experiences and reflective analyses of those experiences.

PSYC 535. Exceptional Learner (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall, Spring, Summer)
This course provides prospective teachers with a basic understanding of special education, its terminology, legal mandates, the etiology and characteristics of exceptionality, and various strategies for educating students with diverse learning needs. Specifically, students are introduced to appropriate educational interventions related to learning disabilities, mental retardation, emotional disturbance, attention-deficit/hyperactivity disorder, autism, developmental delays, speech or language impairment, hearing impairment, visual impairment, physical disabilities, chronic health conditions, traumatic brain injuries, and giftedness.

PSYC 544. Assessment of Learning
[Same as TCHG 544] (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall, Spring)
This course is designed to develop competence in constructing and employing valid and reliable assessments of student achievement in the K-12 classroom. Specifically, students are introduced to such topics as constructing well-designed assessments based on curricular goals, interpreting test results, effectively communicating results, and using assessment data to inform instruction.

PSYC 595. Advanced Topics in Psychology (Credit varies)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

PSYC 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

SOCIOLOGY COURSES

SOCL 501. Multiculturalism, Diversity & Education (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Summer, Fall)
This course addresses the sources and consequences of racial, ethnic, class and gender diversity in the United States with special attention to the implications for education and the public school system. Topics include bilingual education; the relationships between inequalities of race, ethnicity and class and education; immigration and the schools; affirmative action; racism; and sexism.

SOCL 595. Advanced Topics in Sociology (Credit varies)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

SOCL 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

SPANISH COURSES

SPAN 538. Apprenticeship in Teaching Spanish (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall)
This course introduces prospective teachers to the skills necessary to plan, implement and evaluate effective lessons in the area of Spanish instruction. In this course, students are assigned to a University professor and work with beginning foreign language students.

SPAN 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

TEACHING AND LEARNING COURSES

TCHG 510. Teaching Internship (8-0-24)
Prerequisite: Enrollment in the MAT program or consent of instructor. (Spring)
A full-time,13-14 week clinical teaching experience in the public schools.

TCHG 511. Teaching Internship I (4-0-12)
Prerequisite: Enrollment in the MAT program or consent of instructor. (Spring)
The student teaching internship I is a six to eight-week hands-on field experience that brings together both university preparation and the Virginia public school classroom. It is the final step in supporting teacher candidates' entry into the professional world of education.

TCHG 512. Teaching Internship Abroad (4-0-12)
(Spring)
Prerequisite: TCHG 511 or consent of the instructor.
The student teaching internship abroad is a four to six-week hands-on field experience in an overseas setting that brings together both university preparation and the K-12 school classroom. Together with TCHG 511, TCHG 512 is the final step in supporting teacher candidates' entry into the professional world of education.

TCHG 516. Curriculum and Instruction I (2-2-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Summer)
This course teaches prospective teachers those curriculum and instructional methodologies that are appropriate to the needs of today's students. Emphasis is placed on the acquisition of skills essential for teacher decision-making in the areas of instructional planning, lesson design, and delivery of instruction. Special attention is paid to the research on effective instructional strategies. A key requirement of the course is microteaching simulations that are evaluated by the instructor and student's peers. This course has separate sections for elementary and middle/secondary. The elementary section has a field component.

TCHG 517. Curriculum and Instruction II (1-1-0)
Prerequisite: TCHG 516. Enrollment in the MAT Program or consent of instructor. (Summer)
This course is designed to continue to teach prospective teachers those curriculum and instructional methodologies that are appropriate to the needs of today's students. Emphasis is placed on the acquisition of skills essential for teacher decision-making in the areas of instructional planning, lesson design, and delivery of instruction, motivation and assessment. A key requirement of the course is microteaching simulations that are evaluated by the instructor and student's peers. This course has separate sections for elementary and middle/secondary. The elementary section has a field component.

TCHG 518L. Secondary Field Practicum (1-0-3)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
This course is designed to give teacher candidates wishing to teach middle or high school hands-on experience in secondary classrooms. Emphasis is placed on acquisition of skills necessary for effective implementation of planning, instruction and assessment. Key requirements of the course are attending practicum meetings and completing teaching tasks within the assigned school placement.

TCHG 521L. Reading Acquisition and Development Laboratory (1-0-3)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Corequisite: PSYC 521
This course accompanies PSYC 521, Reading Acquisition and Development. PSYC 521 is designed to provide pre-service teachers a strong theoretical and empirical (research) foundation for understanding the reading acquisition process and one on which to base sound reading instructional practice. The laboratory is designed to provide pre-service teachers the opportunity to apply reading theory and research to successful instructional practice in structured field experiences and reflective analyses of those experiences.

TCHG 543. Classroom Management and Discipline (2-2-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Summer)
The course addresses components of successful classroom management, including managing the physical environment, student behavior, instruction and student productivity. A number of discipline models will be presented. Emphasis is on research proven to effect productive classroom behaviors.

TCHG 544. Assessment of Learning
[Same as PSYC 544] (3-3-0)
Prerequisite: Enrollment in the MAT Program or consent of instructor. (Fall, Spring)
This course is designed to develop competence in constructing and employing valid and reliable assessments of student achievement in the K-12 classroom. Specifically, students are introduced to such topics as constructing well-designed assessments based on curricular goals, interpreting test results, effectively communicating results, and using assessment data to inform instruction.

TCHG 550. Teaching Across Cultures (3-2-1)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
This course is a two-week study abroad experiential course, tied to a graduate seminar, that examines issues involved in educating students in a context other than the United States. Students learn about the culture of the country under study, and how it impacts the educational goals, pedagogy and materials used in the schools. Comparison and contrast between the country's education and that of the United States will be examined.

TCHG 580 Technology for Teachers (1-1-0)
(Spring) Prerequisite: CPSC 110 or equivalent
This course addresses instructional technology required for the K-12 classroom. Issues, skills and strategies associated with instructional technology are introduced. Experience involving practical application of instructional technology in the classroom is gained throughout the course. There are separate sections for elementary and secondary candidates.

TCHG 595. Advanced Topics in Teaching (Credit varies)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Course topics are selected on the basis of faculty and student interests. Students may take a maximum of 3 credit hours of a topics course in a given semester, and a maximum of 9 credit hours in their total academic program. If more than 9 credit hours are taken, only the last 9 count toward the degree.

TCHG 599. Independent Study (1-3 Credits)
Prerequisite: Enrollment in the MAT Program or consent of instructor.
Qualified students may enrich their program through directed reading or independent research under faculty supervision and for University credit. Goals, prerequisites, stages and grading are agreed upon in writing by the faculty member and the student and are submitted for approval prior to enrollment. See page 17 for specific instructions and procedures.

FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT (FERPA)

Listed below is the annual notification of the Family Educational Rights and Privacy Act of 1974 (FERPA). The University is required to inform enrolled students annually of their rights under the terms of FERPA. The act does not apply to students admitted to the University who have not officially enrolled.

Note: Students should access registrar.cnu.edu/ferpa/ for the latest changes to CNU directory information and updates regarding the Family Educational Rights and Privacy Act of 1974 (FERPA). The Vice Provost for Enrollment and Student Success serves as the University's FERPA official and implements policies and procedures to facilitate compliance with this Federal Requirement.

A. Policy Intent

1. The University student record policy is intended to conform with all state and federal statutes dealing with access to information held by an educational institution on present and former students.

2. The CNU student record policy is formulated to protect the privacy of student information that is maintained and yet provide access to student records for those having a legitimate educational interest in viewing such records. Regulations and procedures to ensure adequate protection of the student are provided in this policy.

B. Student Rights under FERPA:

1. Enrolled students have the right to inspect their education record within 45 days of the request for inspection and are entitled to an explanation of any information therein. "Record" refers to those files and their contents that are maintained by official units of the University. Generally, students have the right to review any official record that the University maintains on that student. When access is permitted, documents will be examined only under conditions that will prevent unauthorized removal, alteration, or mutilation. Students must submit to the Office of the Registrar written requests that identify the record(s) they wish to inspect. A University official will make arrangements for access and notify the student of the time and place where the record(s) may be inspected. If the University official to whom the request was submitted does not maintain the requested record(s), that official shall advise the student of the correct official to whom the request should be addressed.

2. Information to which the student does not have access is limited to the following:

   a. Confidential letters and recommendations placed in the student's files before January 1, 1975, and those letters for which student has signed a waiver of his or her right of access. Letters of recommendation are removed from the Admissions files before the files are forwarded to the Office of the Registrar.

   b. Parents' confidential financial statements.

   c. Personal files and records of members of faculty or administrative personnel, which are in sole possession of the maker thereof.

   d. Education records, which contain information about more than one student; in such cases, CNU will allow the inquiring student access to the part of the record, which pertains only to the inquiring student.

   e. Records of the Admissions Office concerning students admitted but not yet enrolled at the University.

   f. Medical/psychological records used in connection with treatment of the student. A physician or psychologist of the student's choice may view such records;

   g. University Police Department records, when utilized for internal purposes by this office in its official capacities.

3. Documents submitted to the University by or for the student will not be returned to the student. Normally, academic records received from other institutions will not be sent to third parties external to the University, nor will copies of such documents be given to the student. The student should request such records from the originating institution.

4. Students have the right to request an amendment of the education record that the student believes is inaccurate or misleading. Should a student believe his or her record is incorrect, he/she should write the University official responsible for the record, clearly identify the part of the record he/she wants changed, and specify the information he/she feels is inaccurate or misleading. The official will respond within a reasonable period concerning his or her action. Should the student not be satisfied, a hearing may be requested of the University Registrar or the Vice Provost for Enrollment and Student Success.

5. Students have the right to consent to disclosures of personally identifiable information contained in the student's education record, except to the extent that

FERPA authorizes disclosure without consent (see C.3. below).

6. Students have the right to file a complaint with the US Department of Education concerning alleged failures by CNU to comply with the requirements of FERPA. The name and address of the office that administers FERPA is:

Family Policy Compliance Office
US Department of Education
600 Independence Avenue, SW
Washington, DC 20202-4605

C. Access to Student Records by Others:

1. Disclosure of General Directory Information: Certain information may be released by the University without prior consent of the student if considered appropriate by designated school officials. Such information is defined as the following:
   a. Student's name, address, telephone number (permanent and local)
   b. CNU email address
   c. Date of birth
   d. Dates of attendance at the University, field of concentration, degrees, honors and awards
   e. Enrollment status – full-time or part-time
   f. Height and weight of members of athletic teams
   g. Participation in officially recognized activities

2. Directory information will not be released for commercial purposes by administrative offices of the University under any circumstances. Students may request that directory information not be released by written request to the Office of the Registrar. All other student information will be released only upon written request of the student, excepting those instances cited below. A student's written consent is not required in a health, safety or emergency situation.

3. Disclosure to members of the University community:
   a. "School Official" is defined as a person employed by the University in an administrative, supervisory, academic or research, or support staff position (including university law enforcement personnel and health staff); a person or company with whom the University has contracted (such as attorney, auditor, or collection agent); or a person serving on the Board of Visitors.

   b. A school official must have a legitimate educational interest in order to review an education record. A legitimate educational interest is the demonstrated 'need to know' and is further defined in the following manner: the information requested must be within the context of the responsibilities assigned to the School Official; the information sought must be used within the context of official University business and not for purposes extraneous to the officials area of responsibility or the University; information requested must be relevant and necessary to the accomplishment of some task or to making some determination within the scope of University employment. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.

   c. Information requested by student organizations of any kind will be provided only when authorized by the Dean of Students.

   d. Effective July 2008, the Commonwealth of Virginia required higher education institutions to release educational record information to parents of dependent children. This state legislation is allowable within the guidelines of FERPA. Students who are tax dependents of their parent(s) or legal guardian(s) may authorize the receipt of mid-term or final grades and/or academic transcripts by contacting the Office of the Registrar to complete the documentation necessary for this disclosure. Proof of tax dependency may be required.

4. Disclosure to parents and organizations providing financial support to a student: It is the University's policy to release the academic transcript to parents and/or organizations only upon the student's written request or authorization, a policy consistent with the University's interpretation of FERPA.

5. Disclosure to other educational agencies and organizations: Information may be released to another institution of learning, research organization, or accrediting body for legitimate educational reasons, provided that any data shall be protected in a manner that will not permit the personal identification of the student by a third party.

6. Disclosure to local, state, and federal governmental agencies: Government agencies are permitted access to student records only when auditing, enforcing, and/or evaluating sponsored programs. In such instances, such data may not be given to a third party and will be destroyed when no longer needed for audit, enforcement, and/or evaluative purposes.

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