

B.S. IN MATHEMATICAL SCIENCES
2007-08
GENERAL EDUCATION REQUIREMENTS

NAME _____

Writing	Credits	Grade
UNIV 111 Focused Inquiry I		
UNIV 112 Focused Inquiry II (C grade or better required)		
ENGL 200 Writing & Rhetoric II (C grade or better required, must complete 24 credits before enrolling)		

Writing Intensive: 2 WI courses required, at least one must be in the major. See Approved List A.		
MATH 490 Mathematical Expositions (also fulfills a major requirement)		

Math & Statistics:	Credits	Grade
MATH 151 Pre-calculus (MATH 141 or Placement)		

Natural Sciences: Complete one of the following sequences of courses with lab: BIOL 151-152 OR PHYS 207-208 OR PHYS 201-202 OR CHEM 101-102.	Credits	Grade

Complete another course with lab in the natural sciences from Approved List D. This course must be in the biological sciences if the above sequence was in PHYS or CHEM OR must be in the physical sciences if the BIOL sequence was selected.	Credits	Grade

Complete one other course in the natural sciences OR complete a minor or second major offered outside the Department of Mathematical Sciences. Students in the Extended Teacher Preparation program are considered to have a second major outside the Department of Mathematical Sciences.	Credits	Grade

Visual & Performing Arts: Take 2-3 credits from Approved List E.	Credits	Grade

Literature: Take a literature course from Approved List F.	Credits	Grade

Civilization: Take 1 course from each area listed (9 credits total) but no more than 6 credits in any one discipline OR take two 4-credit interdisciplinary courses (8 credits total) that combine elements of each area.	Credits	Grade

Historical and Cultural Origins: 1 course from Approved List G.	Credits	Grade

American (U.S.) Studies: 1 course from Approved List H.	Credits	Grade

Global Studies: 1 course from Approved List I.	Credits	Grade

Foreign Language: Must demonstrate competency through 102 level by course or placement test.	Credits	Grade
101 level		
102 level		

Human Behavior: Take 2 courses in different disciplines from Approved List J.	Credits	Grade

Urban-Environment: Take 1 course from Approved List K.	Credits	Grade

Ethical Principles: Select a course from Approved List C.	Credits	Grade

 Has VCCS Associate Degree _____

MATHEMATICAL SCIENCES MAJOR

The Bachelor of Science degree awarded by the Department of Mathematics and Applied Mathematics requires a minimum of 42 credits above the 100 level in courses labeled MATH, OPER, or STAT. Students choose the concentration in mathematics, applied mathematic, biomathematics or secondary mathematics teacher preparation. At least 24 of these credits must be at the 300-500 levels.

Applied Mathematics

MATH 301 Differential Equations; MATH 512 Complex Analysis for Applications; MATH 517-518 Methods of Applied Mathematics; and six additional upper-level credits in mathematical sciences. (MATH 302 Numerical Calculus, MATH 437 Applied Partial Differential Equations, and MATH 511 Applied Linear Algebra are recommended.)

Mathematics

MATH 501 Intro to Abstract Algebra; MATH 507-508 Analysis I-II; MATH 509 General Topology; and six additional upper-level credits in mathematical sciences.

Secondary Teacher Preparation

MATH 327 Mathematical Modeling; MATH 504 Algebraic Structures and Functions; MATH 505 Modern Geometry; MATH 507 Analysis I; MATH 530 History of Mathematics; MATH 554 Using Technology in the Teaching of Mathematics

Biomathematics

MATH 301 Differential Equations; MATH 380 Introduction to Mathematical Biology; MATH 527-528 Methods of Applied Mathematics for Life Sciences; MATH 529 Computational Modeling in Mathematical Biology; and three additional upper level credits in mathematical sciences.

CONCENTRATION

Mathematics Core: Required for all Mathematical Science majors.			Credits	Grade
MATH 200 Calculus with Analytic Geometry I				
STAT 212 Concepts of Statistics				
MATH 201 Calculus with Analytic Geometry II				
MATH 255 Introduction to Computational Mathematics				
MATH 300 Introduction to Mathematical Reasoning				
MATH 307 Multivariate Calculus				
MATH 310 Linear Algebra				
MATH 490 Mathematical Expositions				

Concentration: Other required courses in mathematics			Credits	Grade

Electives: Select additional courses to satisfy the 120 credits needed to graduate.			Credits	Grade

Additional degree requirements

- Cumulative 2.00 GPA
- 2.00 GPA in the major
- 45 credits in upper level courses or the equivalent
- 120 Total Earned Hours
- 30 At least 30 of the last 45 credits taken at VCU
- Computer literacy requirement (must either pass Computer Proficiency Assessment at www.vcu.edu/cte/knowledgehelp or pass INFO 160, 161, & 162 courses or equivalent transfer course)

College of Humanities & Sciences – Approved Lists

Approved List A – Written Communications

(See course descriptions in the bulletin for any prerequisites.)

Writing

UNIV 111 Focused Inquiry I
UNIV 112 Focused Inquiry II
ENGL 200 Writing and Rhetoric Workshop II
(Taken in sophomore year.)

Writing intensive courses

African American Studies
AFAM 408 Seminar in African-American Studies

Anthropology

ANTH 301/BIOL 341 Human Evolution
ANTH 302 Archeological Theory
ANTH 303 Archeological Methods and Research Design
ANTH 315 Anthropological Field Methods & Research Design
ANTH/INTL 348 South American Ethnography
ANTH/INTL 349 Rethinking a Continent: Latin America
ANTH/INTL 350 Rethinking a Continent: Europe
ANTH/RELS/INTL 425 Religion, Magic and Witchcraft

Biology

BIOL 300 Biotechniques Laboratory (.5 WI credit)
BIOL 309 Entomology (.5 WI credit)
BIOZ 310L Laboratory in Genetics (.5 WI credit)
BIOZ 312L Invertebrate Zoology Laboratory (.5 WI credit)
BIOL 317L Ecology Laboratory
BIOL 320 Biology of the Seed Plant (.5 WI credit)
BIOZ 321L Plant Development Laboratory
BIOL 341/ANTH 301 Human Evolution
BIOL 392 Introduction to Research
BIOL 445 Neurobiology and Behavior (.5 WI credit)
BIOL 514 Stream Ecology (.5 WI credit)
BIOL 519 Plant Ecology (.5 WI credit)
BIOL 522 Evolution and Speciation
BIOL 541/ENFO 541 Laboratory in Molecular Genetics (.5 WI credit)

Chemistry

CHEZ 303L Physical Chemistry Laboratory I
CHEZ 409L Instrumental Analysis Laboratory

Criminal justice

CRJ/ENGL 302 Legal Writing
CRJ/HSEP 330 Legal and Constitutional Issues in Homeland Security and Emergency Preparedness
CRJS 358 Lawyer's Role in the Justice System
CRJS 460 Senior Seminar

Economics

ECON 302 Macroeconomic Theory

English

ENGL 301 English Studies: Reading Literature
ENGL/CRJS 302 Legal Writing
ENGL 303 Writing in the Workplace
ENGL 304 Advanced Writing
ENGL/MGMT 327 Business and Technical Report Writing
ENGL/RELS 361 The Bible as Literature
ENGL/ENVS 385 Nature Writing
ENGL 490 Senior Seminar in English (any topic)

Environmental studies

ENVS/ENGL 385 Nature Writing
ENVS 490 Research Seminar in Environmental Studies

French

FREN 300, 301 Advanced Grammar and Writing

Forensic science

FRSC 365 Forensic Microscopy
FRSC 375 Forensic Evidence, Law and Criminal Procedures

German

GRMN 301 Advanced Grammar and Writing

Geography

GEOG/INTL 303 World Regions
GEOG JURSP 306 Urban Economic Geography

History

HIST 300 Introduction to Historical Study
HIST 369 American Constitutional and Legal Development
HIST 490 Seminar in History (any topic)

Homeland Security and Emergency Preparedness

HSEP/CRJS 330 Legal and Constitutional Issues in Homeland Security and Emergency Preparedness
HSEP 490 Senior Seminar

Humanities and sciences

HUMS 591 Special Topics: Arts in Contemporary Britain (summer course only)

Interdisciplinary science

INSC 301 Investigatory Mathematics and Science

International studies

INTL/GEOG 303 World Regions
INTL/ANTH 348 South American Ethnography
INTL/ANTH 349 Rethinking a Continent: Latin America
INTL/ANTH 350 Rethinking a Continent: Europe
INTL/POLI 365 International Political Economy
INTL/RELS/WMNS 372 Global Women's Spirituality

INTL/RELS 409 Modern Islamic Thought and Global Trends
INTL/RELS/PHIL 412 Zen Buddhism
INTL/ANTH/RELS 425 Religion, Magic and Witchcraft
INTL/RELS 441 Islamic Mysticism: the Sufis
INTL/POLI 468 Seminar in Comparative Foreign Policy
INTL 490 Seminar in International Issues

Life sciences

LFSC/PSYC 307 Community Solutions: Multiple Perspectives

Mass communications

MASC 203 Writing for Mass Media
MASC 333 Public Relations Writing
MASC 363 Introduction to Broadcast Writing
MASC 392 Advertising Copywriting
MASC 403 Advanced Reporting
MASC 404 Specialized Project Reporting
MASC 475 Capital News Service

Mathematics

MATH 490 Mathematical Expositions
MATH 530 The History of Mathematics
MATH 531 Expositions in Modern Mathematics

Management/Business

MGMT/ENGL 327 Business and Technical Report Writing

Operations Research

OPER/STAT 490 Communications in Statistics and Operations Research

Philosophy

PHIL 301 Mind and Reality
PHIL 302 Reason and Knowledge
PHIL 303 Philosophy of Language
PHIL 320 Philosophy of Law
PHIL 335 Social and Political Philosophy
PHIL/INTL/RELS 412 Zen Buddhism
PHIL 490 Seminar in Philosophy

Physics

PHYS 450 Senior Physics Laboratory

Political science

POLI/WMNS 316 Women and the Law
POLI 341, 342 History of Political Thought
POLI/INTL 365 International Political Economy
POLI/INTL 468 Seminar in Comparative Foreign Policy
POLI 490 Senior Seminar

Psychology

PSYC/LFSC 307 Community Solutions: Multiple Perspectives
PSYC 317 Experimental Methods

Religious studies

RELS/ENGL 381 The Bible as Literature
RELS/WMNS 371 Islam and Women
RELS/WMNS/INTL 372 Global Women's Spirituality
RELS/INTL 409 Modern Islamic Thought and Global Trends
RELS/PHIL/ANTL 412 Zen Buddhism
RELS/INTL/ANTH 425 Religion, Magic and Witchcraft
RELS/INTL 441 Islamic Mysticism: the Sufis
RELS 490 Seminar in Religious Studies

Sociology

SOCY 402 Sociological Theory
SOCY 436 Work and Management in Modern Society

Spanish

SPAN 300, 301 Advanced Grammar and Writing

Statistics and Operations Research

STAT/OPER 490 Communications in Statistics and Operations Research

Urban studies

URSP/GEOG 306 Urban Economic Geography

Women's studies

WMNS/POLI 316 Women and the Law
WMNS/RELS 371 Islam and Women
WMNS/INTL/RELS 372 Global Women's Spirituality
WMNS 401 Topical Senior Seminar

Approved List B – Math & Statistics

(See course descriptions in the bulletin for any prerequisites.)

MATH 131 Introduction to Contemporary Mathematics
MATH 151 Pre-calculus Mathematics
MATH 200 Calculus with Analytic Geometry
STAT 208 Statistical Thinking
STAT 210 Basic Practice of Statistics
STAT 212 Concepts of Statistics (for science majors only)

Approved List C – Ethical Principles

(See course descriptions in the bulletin for any prerequisites.)

International studies

INTL 341/RELS 340 Global Ethics and the World's Religions

Mass communications

MASC 290 Ethical Problems in Mass Media

Philosophy

PHIL 211 History of Ethics
PHIL 212 Ethics and Applications
PHIL 213 Ethics and Health Care

PHIL 214 Ethics and Business
Political science
POLI 107 Political Theory
Religious studies
RELS 340/INTL 341 Global Ethics and the World's Religions
Sociology
SOCY 445 Medical Sociology

Approved List D – Natural Sciences

(See course descriptions in the bulletin for any prerequisites.)

Biological sciences

BIOL 101 Biological Concepts
BIOZ 101L Biological Concepts Laboratory
BIOZ/ENVS 103 Environmental Science
BIOZ/ENVS 103L Environmental Science Laboratory
BIOL 151 Introduction to Biological Science I (for biology and other science majors)
BIOZ 151L Introduction to Biological Science Laboratory I (for biology and other science majors)
BIOL 152 Introduction to Biological Science II (for biology and other science majors)
BIOZ 152L Introduction to Biological Science Laboratory II (for biology and other science majors)

Physical sciences

Chemistry

CHEM 101 General Chemistry (for science majors)
CHEZ/FRSZ 101L General Chemistry Laboratory (for science majors)
CHEM 110 Chemistry and Society
CHEZ 110L Chemistry and Society Laboratory
CHEM 112 Chemistry in the News

Forensic Science

FRSZ/CHEZ 101L General Chemistry Laboratory (for science majors)

Physics

PHYS 101 Foundations of Physics
PHYZ 101L Foundations of Physics Laboratory
PHYS 103 Elementary Astronomy
PHYZ 103L Elementary Astronomy Laboratory
PHYS 107 Wonders of Technology
PHYS 202 General Physics (for science majors)
PHYS 208 University Physics II (for science majors)

Approved List E – Visual & Performing Arts

A. Basic-level courses designed specifically for non-arts majors.

Art education

ARTE 301-302 Art for Elementary Teachers
ARTE 498 Two-dimensional Art Experiences
ARTE 499 Three-dimensional Art Experiences

Art foundation

ARTE 121-122 Introduction to Drawing

Dance and choreography

DANC 171, 172 Tai Chi
DANC 183, 184 Introduction to Modern Dance Technique
DANC 313 Dance in World Cultures

Interior design

IDES 103-104 Introductory Studio Course

Music

MHIS 105 Introduction to Writing Music
MHIS 243 Music Appreciation

Sculpture

SCPT 209 Introduction to Sculpture

Theatre

THEA 107, 108 Introduction to Stage Performance

B. Basic-level courses open to both art and non-art majors.

African American studies

AFAMDANC 121, 122 Tap Technique I
AFAMDANC 126, 127 African-Caribbean Dance
AFAM/MS 250 Introduction to African-American Music
AFAM/HEA 303 Black Theatre
AFAM 350/MHIS 350/INTL 370 Studies in the Music of the African Continent and Diaspora

Art history

ARTH 103, 104 Survey of Western Art
ARTH 207 Introduction to Non-Western Art
ARTH 270, 271 History of the Motion Picture

Crafts

CRAF 201-202 Metalsmithing
CRAF 211-212 Jewelry
CRAF 221 Woodworking Techniques
CRAF 241 Ceramics: Handbuilding
CRAF 242 Ceramics: Wheelthrowing
CRAF 251, 252 Introduction to Glassworking
CRAF 261, 262 Beginning Textiles

College of Humanities & Sciences – Approved Lists

Dance and choreography

DANC 103-104 Survey of Dance History
 DANC 105-106 Improvisation
 DANC 114, 214, 314, 414 Summer Dance Workshop
 DANC/AFAM 121, 122 Tap Technique I
 DANC/AFAM 126, 127 African-Caribbean Dance I
 DANC 133-134 Introduction to Ballet Technique I and II
 DANC 141, 142 Ballroom Dancing
 DANC 243 Dynamic Alignment
 DANC 291 Topics in Dance
 DANC 313 Dance in World Cultures

Fashion design and merchandising

FASH 240 Survey of the Fashion Industry I

Interior design

IDES 103-104 Introductory Studio Course,

International studies

INTL 370/AFAM 350/MHS 350 Studies in the Music of the African Continent and Diaspora

Music

APPM 300-level Private Instruction: Principal and Secondary Performing Mediums
 APPM 370 Large Ensembles (auditions required for all sections)
 APPM 390 Small Ensembles (auditions required for all sections)
 MHS 120 Introduction to World Musical Styles
 MHS/AFAM 250 Introduction to African-American Music
 MHS 350/INTL 370/AFAM 350 Studies in the Music of the African Continent and Diaspora

Theatre

THEA 103 Stagecraft
 THEA 211-212 Introduction to Drama
 THEA 229 Introduction to Lighting Design
 THEA/AFAM 303 Black Theatre

C. Advanced-level courses open to both arts and non-arts majors. Some require special permission/audition.

Dance and choreography

DANC 221, 222 Tap Technique II
 DANC 319, 320 Video/Choreography Workshop

Approved List F – Literature

English

ENGL 201 Western World Literature I
 ENGL 202 Western World Literature II
 ENGL 203 British Literature I
 ENGL 204 British Literature II
 ENGL 205 American Literature I
 ENGL 206 American Literature II
 ENGL 211 Contemporary World Literature
 ENGL 215 Readings in Literature
 ENGL 216 Readings in Narrative
 ENGL/WMNS 236 Women in Literature
 ENGL 241 Shakespeare's Plays
 ENGL 291 Topics in Literature

Women's studies

WMNS/ENGL 236 Women in Literature

Approved List G – Historical & Cultural Origins

African American studies

AFAM/HIST 105 Survey of African History I
 AFAM/HIST 106 Survey of African History II

Anthropology

ANTH 105/INTL 104 Introduction to Archaeology
 ANTH/GEOG 312 History of Human Settlement

Foreign language

FRLG/INTL 203 Language and Identity

Geography

GEOG/ANTH 312 History of Human Settlement

History

HIST 101 Survey of European History I
 HIST 102 Survey of European History II
 HIST/AFAM 105 Survey of African History I
 HIST/AFAM 106 Survey of African History II
 HIST 107 Survey of East Asian Civilizations I
 HIST 108 Survey of East Asian Civilizations II
 HIST 109 Survey of Latin American History I
 HIST 110 Survey of Latin American History II

International studies

INTL 104/ANTH 105 Introduction to Archaeology

INTL/FRLG 203 Language and Identity

INTL/RELS 311 Religions of the World I

INTL/RELS 312 Religions of the World II

Italian

ITAL 391/HUMS 491 Perugia Study Abroad

Philosophy

PHIL 103 Ancient Greek and Medieval Western Philosophy

PHIL 104 Modern Western Philosophy

Religious studies

RELS/INTL 311 Religions of the World I

RELS/INTL 312 Religions of the World II

Approved List H – American Studies

American studies

AMST 394 Perspectives in American Studies

Foreign language

FRLG/INTL 204 Language and Groups in the United States

History

HIST 103 Survey of American History I

HIST 104 Survey of American History II

International studies

INTL/FRLG 204 Language and Groups in the United States

Political science

POLI 103 U.S. Government

Religious studies

RELS 334 Religion in Contemporary America

Approved List I – Global Studies

Anthropology

ANTH/INTL 455 Anthropology of Development and Globalization (INTL 101 prerequisite)

Geography

GEOG/INTL 303, 304 World Regions

International studies

INTL 101 Human Societies and Globalization

INTL/POLI 103 International Relations

INTL/MASC 151 Communications Technology and Global Society

INTL/GEOG 303, 304 World Regions

Mass communications

MASC/INTL 151 Communications Technology and Global Society

Political science

POLI/INTL 105 International Relations

POLI 109 Comparative Politics

POLI/INTL 365 International Political Economy

Sociology

SOCY/INTL 330 Global Societies: Trends and Issues

SOCY 430 Politics, Power and Ideology

Approved List J – Human Behavior

Anthropology

ANTH/INTL 103 Introduction to Anthropology

ANTH/INTL 348 South American Ethnography (ANTH 103 prerequisite)

ANTH/INTL 349 Rethinking a Continent: Latin America (ANTH 103 prerequisite)

Economics

ECON 101/INTL 102 Introduction to Political Economy

ECON 203 Introduction to Economics

Geography

GEOG 102 Introduction to Human Geography

Homeland Security and Emergency Preparedness

HSEP 101 Homeland Security and Emergency Preparedness

International studies

INTL 102/ECON 101 Introduction to Political Economy

INTL/ANTH 103 Introduction to Anthropology

INTL/ANTH 348 South American Ethnography (ANTH 103 prerequisite)

INTL/ANTH 349 Rethinking a Continent: Latin America (ANTH 103 prerequisite)

Mass communications

MASC 101 Mass Communications

Psychology

PSYC 101 Introduction to Psychology

Social Science

SOC 340 Human Sexuality

Sociology

SOCY 101 General Sociology

SOCY 340 Self and Society

Women's studies

WMNS 201 Introduction to Women's Studies

Approved List K – Urban Environment

All courses designated as "service learning" fulfill this requirement. (See course descriptions in the bulletin for any prerequisites.)

Anthropology

ANTH/GEOG 312 History of Human Settlement

ANTH 450/ENGL 454/INTL 454 Cross-cultural Communication

Criminal justice

CRJS 181 Justice System Survey

CRJS 305 Policing Theories and Practice

CRJS 352 Crime and Delinquency Prevention

CRJS 488 Economic and Organized Crime

CRJS 491 Topics in Criminal Justice: Youth in Corrections/Service Learning (only this topic)

Economics

ECON/URSP 321 Urban Economics

English

ENGL 454/INTL 454/ANTH 450 Cross-cultural Communication

Environmental science

ENVS 491 Topics in Environmental Studies: Ecology of Urban Environments (only this topic)

French

FREN 301 Advanced Grammar and Writing

Foreign language

FRLG 345/URSP 350/INTL 345 Great Cities of the World

FRLG 490 Foreign Languages Urban Internship

Geography

GEOG/URSP 302 Land Use Capability

GEOG/URSP 306 Urban Economic Geography

GEOG/ANTH 312 History of Human Settlement

GEOG/INTL/URSP 340 World Cities Outside of North America

Humanities and sciences

HUMS 391 Special Topics in the Humanities and Sciences: Science Education in the Urban Environment (only this topic)

International studies

INTL/URSP/GEOG 340 World Cities Outside of North America

INTL 345/FRLG 345/URSP 350 Great Cities of the World

INTL 454/ANTH 450/ENGL 454 Cross-cultural Communication

Mass communications

MASC 303 General Assignment Reporting

MASC 403 Advanced Reporting

MASC 404 Specialized Project Reporting

MASC 439 Public Relations Campaigns

MASC 464 Advance Television Newsgathering

Philosophy

PHIL 340 Philosophy for Children

Physics

PHYS 291 Topics in Physical Science: Physics Outreach - Richmond Elementary Schools (only this topic)

Political science

POLI 321 City Politics

Psychology

PSYC 491 Topics in Psychology: Youth in Corrections/Service Learning (only this topic)

PSYC 493 Fieldwork: Urban Environment (only this topic)

PSYC 493 Fieldwork: Mentoring Children at Risk (only this topic)

Social work

SLWK 422 Social Welfare Legislation and Services

Sociology

SOCY 302 Contemporary Social Problems

SOCY 327 Urban Sociology

SOCY 391 Topics in Sociology: Youth in Corrections/Service Learning (only this topic)

Spanish

SPAN 402 Language Issues in the Spanish-speaking World

Teacher Education

TEDU 101 Introduction to Teaching

Urban studies

URSP 116 Introduction to the City

URSP 245 Housing and Community Revitalization

URSP 281 Design of the City

URSP/GEOG 302 Land Use Capability

URSP 304 Urban Social Systems

URSP/GEOG 306 Urban Economic Geography

URSP 315 The Evolution of American Cities

URSP 316 Urban Life in Modern America

URSP/ECON 321 Urban Economics

URSP/GEOG/INTL 340 World Cities Outside of North America

URSP 350/INTL 345/FRLG 345 Great Cities of the World