College of Science
Bachelor of Science in Computational Modeling and Data Analytics
Major in Computational Modeling and Data Analytics (CMDA)
Option: Economics
For students graduating in calendar year **2020**

CORE REQUIREMENTS (39 credits)
Complete all following courses in CMDA, Computer Science, and Mathematics. Courses marked with * will be used for computing the "in major" GPA. In accordance with State Council guidelines, courses used to fulfill the SCHEV approved degree core may not also be used to meet Curriculum for Liberal Education or major requirements.

CMDA 2005*#	Integrated Quantitative Sciences	(6)( )
CMDA 2006*#	Integrated Quantitative Sciences	(6)( )
CMDA 3605*	Mathematical Modeling: Methods and Tools	(3)( )
CMDA 3606*	Mathematical Modeling: Methods and Tools	(3)( )
CMDA/CS 3634*	Computer Science Foundations for Computational Modeling & Data Analytics	(3)( )
CMDA/CS/STAT 3654*	Introductory Data Analytics & Visualization	(3)( )
CMDA/CS/STAT 4654*	Intermediate Data Analytics and Machine Learning	(3)( )
CMDA 4864*	CMDA Capstone	(3)( )
CS 1114	Introduction to Software Design	(3)( )
CS 2114	Software Design and Data Structures	(3)( )
MATH 2114	Intro to Linear Algebra	(3)( )

MATH 2204, MATH 2214, STAT 3005, STAT 3006 & STAT 3104 will substitute for CMDA 2005 and 2006.

ECONOMICS OPTION REQUIREMENTS (12 credits)
Complete all following Economics courses.
These courses, all marked with * will be used for computing the "in major" GPA.

ECON 3104*	Microeconomic Theory	(3)( )
ECON 3204*	Macroeconomic Theory	(3)( )
ECON 4304*	Introduction to Econometric Methods	(3)( )
ECON 4424*	Theory of Games and Economic Behavior	(3)( )

ECONOMICS ELECTIVES FOR THE ECONOMICS OPTION (3 credits)
Complete one course from the list below.
This course, marked with *, will also be used for computing the "in major" GPA.

ECON 4044*	Public Economics	(3)( )
ECON 4054*	Public Finance	(3)( )
ECON 4074*	Labor Economics	(3)( )
ECON 4084*	Industry Structure	(3)( )
ECON 4124*	Growth and Development	(3)( )
ECON/AAEC 4135*	International Economics	(3)( )
ECON/AAEC 4136*	International Economics	(3)( )
ECON 4404*	Economics of Organization	(3)( )
ECON 4434*	Experimental Economics	(3)( )
NEUR/ECON/PSYC 4454*	Neuroeconomics	(3)( )

RESTRICTED ELECTIVES FOR ECONOMICS OPTION (3 credits)
Complete one course from the list below.
This course, marked with *, will also be used for computing the "in major" GPA.

CMDA 4604*	Intermediate Topics in Mathematical Modeling	(3)( )
CMDA/STAT 4664*	Computational Intensive Stochastic Modeling	(3)( )
CMDA 4964*	Field Study	(3)( )
CMDA 4994*	Undergraduate Research	(3)( )
ECON 4994*	Undergraduate Research	(3)( )
MATH 4445*	Introduction to Numerical Analysis	(3)( )
STAT 4204*	Experimental Designs	(3)( )
STAT 4444*	Applied Bayesian Statistics	(3)( )

REQUIREMENTS FOR THE COLLEGE AND UNIVERSITY
CURRICULUM FOR LIBERAL EDUCATION (40 credits)
Consult the University Undergraduate Course Catalogue or the CLE Guide at http://www.cle.prov.vt.edu for approved courses.

Area 1: Writing and Discourse

_____ (3) ( )   _____ (3) ( )

Area 2: Ideas, Cultural Traditions and Values

_____ (3) ( )   _____ (3) ( )

Area 3: Society and Human Behavior

ECON 2005 Principles of Economics   (3) ( )   ECON 2006 Principles of Economics   (3) ( )

Area 4: Scientific Reasoning and Discovery

_____ (4) ( )   _____ (4) ( )

Area 5: Quantitative and Symbolic Reasoning

MATH 1225 Calculus of a Single Variable   (4) ( )   MATH 1226 Calculus of a Single Variable   (4) ( )

Area 6: Creativity and Aesthetic Experience

_____ (3) ( )

Area 7: Critical Issues in a Global Context

_____ (3) ( )

FREE ELECTIVES (23 credits)

_____ (3) ( )   _____ (3) ( )

_____ (3) ( )   _____ (3) ( )

_____ (3) ( )   _____ (3) ( )

_____ (3) ( )   _____ (2) ( )

Prerequisites

Some courses in the major requirements and electives above have prerequisites. Students are required to double check course prerequisites and equivalents. Please see your advisor or consult the Undergraduate Course Catalog for more information.

Progress Toward Degree

Three conditions are required for continuation in the major:
  (1) Upon having attempted 72 semester credits (including transfer, AP, advanced standing, credit by examination, course withdrawal) majors must have completed the following courses with grades of **C⁻** or better in two or fewer attempts (including attempts that were withdrawn): MATH 1225; MATH 1226; MATH 2114; (CMDA 2005 and CMDA 2006) or (STAT 3005, 3006, 3104; MATH 2204, 2214); ECON 2005; ECON 2006; ECON 3104; ECON 3204.
  (2) Upon having attempted 72 semester credits (including transfer, AP, advanced standing, credit by examination, course withdrawal) majors must have completed the following courses with grades of **C** or better in two or fewer attempts (including attempts that were withdrawn): CS 1114; CS 2114.
  (3) Upon having attempted 90 semester credits, students must have an in-major GPA of 2.0 or better.

Graduation Requirements

120 credit hours are required for graduation. These credits must include the courses required for the major (see above sections). To graduate, a student must have at least a 2.0 in-major GPA and overall GPA. If 120 credit hours are reached and a student does not meet the GPA requirement, the student must take additional in-major courses to raise the in-major GPA to a 2.0.