WCORE

WCORE QUANTITATIVE EMPHASIS COURSES

CMPT	**150**	**Math and Technology of Entertainment Arts**	**4 Credits**
Explore the math and technology behind compute animation and video game design. Ever wonder while watching a movie: "How did they do that?" Students will learn the mathematical and computational theory behind image processing, 2D and 3D computer graphics and special effects. This seminar will discuss the progress of computer graphics research over the last fifty years. (WCore: WCSAM, QE)			
DATA	**110**	**Explorations in Data Science**	**4 Credits**
Data Science is on the forefront of the Big Data Revolution. Governments, companies, nonprofits, and health care providers are collecting, storing, and analyzing vast amounts of data to extract information about us and make predictions about our lives. The mathematical and technological aspects of data science have been central to its success, yet they cannot exist in isolation. The context in which data is collected and used, and potentially misused, shape the impact on individuals and society as a whole. Therefore, the study of issues involving data collection, analysis, and its communication from multiple contexts involving different disciplines-including but not limited to economics, psychology, sociology, biology, medicine and chemistry-will be a central theme of this class. (WCore: WCSAM, QE)			
DATA	**150**	**Data and Society**	**4 Credits**
Quantitative literacy is increasingly important in our world of information. The primary goal of this course is to learn about data and how it's used. Along the way, we will learn how to develop basic tools to analyze and visualize data, read and evaluate research claims, and report research findings in honest and ethical ways. (This course may not be taken for credit if a student already has credit for DATA 220.) (WCore: QE)			
DATA	**220**	**Modern Statistics**	**4 Credits**
Statistics is the study of data. This course will develop tools for analyzing data from a variety of fields. We follow the process from data gathering (sampling methods and experimental design) to exploratory data analysis (graphs, tables, charts, and summary statistics) to inferential statistics (hypothesis tests and confidence intervals) using simulation and sampling distributions. A key component of the course is the introduction of the statistical language R for analysis and R Markdown for the presentation of statistical analysis. (WCore: QE).			
EDUC	**221**	**Math for K–6 Teachers II**	**3 Credits**
This course is a concept-oriented exploration of geometry, measurement, probability, and data analysis topics in relation to children's learning. The emphasis is on developing conceptual and relational understandings of these topics from an informal and hands-on perspective. Students will examine how many of the concepts related to these topics develop from the early and elementary children's natural explorations. (WCore: QE)			
ENVI	**102**	**Ecology of Food Systems**	**4 Credits**
We eat many times a day, but very few of us think about our meals as part of a complex system of interactions between plants, animals, people, machines, and institutions. In this course we will explore the current state of the US food system, from production to consumption as well as issues such as food waste and food insecurity. Through hands-on experiments, guest experts and field visits, we'll also learn about the many ways that folks are working to create new food systems that are more just, fair and ecological. This course will also introduce students to the hands-on skills essential for sustainable agriculture on a variety of scales. On some days, participants should come to class dressed to do garden work and expect to get their hands dirty, as well as spend time visiting several area farms and gardens. Students will have the opportunity to implement what they learn while working in Westminster's campus garden and in cooperation with community partners. (WCore: WCSAM, QE)			
ENVI	**115**	**Science of the Environment**	**4 Credits**
In this course, you will get hands-on opportunities to learn about many critical aspects of our environment the soil that produces the food we eat, the air we breathe and the water we drink, as well as the climate of the planet we call home. You will have the opportunity to learn how these important environmental systems work, as well several techniques and tools to collect, analyze, and interpret environmental data. A major goal of the course is to help you understand the science behind many environmental issues so that you can make informed decisions about important environmental and global challenges. (WCore: WCSAM, QE)			
GEOL	**107**	**Geology of the American West**	**4 Credits**
This class uses case studies in Western North America to introduce students to the field of geology. Through investigations of the Pacific Northwest, the Colorado Plateau, the Wyoming Craton, and the Wasatch Mountains, students will learn the theories and concepts that geologists use to understand our entire planet. Be warned: this class will change the way you see the world. (WCore: WCSAM, QE)			
GEOL	**111**	**National Parks Geology**	**4 Credits**
Many of America's National Parks were designated because of their geologic beauty and history. This course will examine geologic principles and concepts through the lens of National Park Service units, as they often represent the most exquisite examples of geologic phenomena. Geology within national parks tells a story of the evolution of North America, from mountain building, to volcanism, to historic inland seas and giant beasts of an earlier geologic age. (WCore: WCSAM, QE)			
NEURO	**120**	**Genetics of Human Behavior**	**4 Credits**
Have you ever wondered how much your genes affect who you are? This course is an exploration of the role of genetic inheritance on human behavior. We will focus on modern genetic analysis and the molecular techniques used to study both complex normal human behaviors and diseases. Lab exercises, data analysis, and case studies will be integrated throughout to familiarize students with the process and methods of science. (WCore: WCSAM, QE)			
NURS	**450**	**Older Adults in the Community**	**4 Credits**

In this course the RN student will focus on the physical, mental, emotional, social, and spiritual aspects of aging. Through the evidence based practice concepts learned in NURS 391 and the teaching mentoring concepts learned through NURS 385, students will assess the health patterns of an older adult in the community to identify the environmental factors impacting the community-dwelling older adult. The student will acquire knowledge about diverse community resources available for older adults in the community. To coincide with NURS 385, students will continue with a focus on health promotion relevant to their older adult in the community. (WCore: QE)			
WCSAM	**103**	**Counting Votes**	**4 Credits**
After eighteen years of waiting, you finally have the right to vote! But just what does voting mean? There are actually many methods of expressing voting preferences via ballots. Which is the best method? How is a state's number of representatives in the U.S. House of Representatives actually determined? What other methods are there, and what results would they produce? How might that change the political landscape of our country? Which states have real power within the Electoral College? We will take a mathematical look at all of these questions by studying Arrow's Impossibility Theorem, exploring various apportionment methods and their implications, and learning about power within weighted voting systems. (WCore: WCSAM, QE)			
WCSAM	**104**	**Explorations in Oceanography**	**4 Credits**
This course will take an interdisciplinary approach to exploring oceanography, marine ecology, and how anthropogenic activities influence the ocean. We will study key aspects of physical, biological, and chemical oceanography in order to gain an integrated and comprehensive understanding of the oceans. This course will include multiday experiments and labs in which students will explore concepts such as what physical factors control ocean circulation, what influences biological primary production, the chemistry behind ocean acidification, and how ocean acidification impacts different classes of phytoplankton. Group activities will often utilize real oceanographic, remote sensing, and time series data to explore relationships, long-term trends, and periodic events, such as El Niño. (WCore: WCSAM, QE)			
WCSAM	**109**	**Introduction to Circuits and Electronics**	**4 Credits**
This is a hands -on course where students build practical electronic devices and learn basic electronics and electric circuits. (WCore: WCSAM, QE)			
WCSAM	**112**	**Personal Wealth Foundations**	**3 Credits**
This course presents the student with practical solutions to the contemporary issue of a debt laden society whose populace lacks the financial skills to properly manage their finances. The course discusses the key components of financial planning - wealth protection, accumulation, and distribution. Practical application and experimentation of financial principles will be applied to money management, insurance, credit, investing, and the financial marketplace. Implementation of the principles taught and skills learned in this course will allow students to find success in their personal finances. (WCore: WCSAM and QE)			
WCSAM	**113**	**Probability, Risk, and Reward**	**4 Credits**
An engaging introduction to probabilistic thinking through the exploration of games of chance, cognitive biases, applications in business, health, and science, and fascinating episodes in the history of probability. (WCore: WCSAM, QE)			
WCSAM	**116**	**Introduction to the Universe**	**4 Credits**
This course will introduce students to the field of astronomy, starting with students reproducing the ancient insights into the motions of the sun, moon, planets, and stars, and continuing through new modern discoveries such as dark matter and extrasolar planets. Emphasis is placed on the physical properties of light and how it is used to observe the universe beyond our physical reach. Throughout the course, we will discuss the interaction of astronomy and culture, and what makes science different from other ways of knowing. (WCore: WCSAM, QE)			
WCSAM	**202**	**Isotope Biogeochemistry**	**3 Credits**
This course will use a case study approach to understand how the use of isotopic ratios and isotopic tracers have been employed to answer a wide range of questions about the earth and our universe. Students will read, present, and discuss seminal research articles from the primary literature that have used isotopes to answer important scientific questions. Topics covered will be drawn from across all environmental related fields, and will include the use of isotopes to: date the earth and our solar system, determine bird migration patterns and breeding grounds, determine the diet and trophic status of various organisms in an ecosystem, determine the source of toxic heavy metals, characterize the composition of the earth's atmosphere in the distant past, characterize ocean circulation and groundwater flow, etc. Students will learn how isotope measurements are made using mass spectrometers both at Westminster University and at multiple isotope labs at another institution on a class field trip. Students will analyze real data from these facilities in order to answer a current research question, and will later present their findings and conclusions. (WCore: WCSAM, QE)			
WCSAM	**206**	**Making and Breaking Secret Codes**	**4 Credits**
The purpose of this course is to introduce you to the complex and exciting world of secret communication. Starting with the ciphers used by Julius Caesar, we will trace the development of cryptography (the science of enciphering messages) and cryptanalysis (the science of breaking ciphers and decoding secret messages) through the medieval period, the Enigma machine and WWII, and the computer age. We will develop a hands-on understanding of the computer-based encryption that keeps our credit card numbers safe online and allows us to transmit information securely over great distances. (WCore: WCSAM, QE)			
WCSBS	**220**	**Social Justice By the Numbers**	**4 Credits**
How can we measure and analyze justice, fairness, and equity in our society? How can we use such analysis to determine how to better ourselves and the society in which we live? Jordan Ellenberg describes math as “an atomic-powered prosthesis that you attach to your common sense”; in this course, you will develop your prosthesis and use it to analyze and improve the world around you. (WCore: WCSBS, QE)			