

MATHEMATICS AND COMPUTER SCIENCE DEPARTMENT

The mission of the Mathematics and Computer Science Department is:

- To relate mathematics to the world the Lord has made and to the technology developed to deal with this world
- To train students to think logically and analytically about mathematical or computer-related questions
- To give students the tools they need to solve mathematical or computer-related problems
- To treat students with dignity and model godly living
- To advise students as they prepare for service in mathematical or computer-related fields
- To demonstrate how mathematics or computer science gives us insight into the Christian faith and vice versa

Majors

- Computer Science (<http://catalog.tiu.edu/trinity-college/academic-life/majors-minors-department/mathematics-computer-information-systems/computer-science-major>)e Major (<http://catalog.tiu.edu/trinity-college/academic-life/majors-minors-department/mathematics-computer-information-systems/computer-science-major>)
- Mathematics Major (<http://catalog.tiu.edu/trinity-college/academic-life/majors-minors-department/mathematics-computer-information-systems/mathematics-major>)
- Mathematics Major with Secondary Education Licensure (<http://catalog.tiu.edu/trinity-college/academic-life/majors-minors-department/mathematics-computer-information-systems/mathematics-major-secondary-education-licensure>)
- Middle Grades Mathematics Education (<http://catalog.tiu.edu/trinity-college/academic-life/majors-minors-department/education/middle-education-mathematics-major>)

Minors

- Information Technology Minor (<http://catalog.tiu.edu/trinity-college/academic-life/majors-minors-department/mathematics-computer-information-systems/computer-information-systems-minor>)

Courses

Subjects in this department include: Mathematics (MA) (p. 1) and Computer Science(CS) (<http://catalog.tiu.edu/trinity-college/academic-life/majors-minors-department/mathematics-computer-information-systems/computer-science-major>).

Mathematics (MA)

MA 116 Intermediate Algebra - 3 Hours

The real number system, linear and quadratic equations, exponents, radicals, complex numbers, graphing, functions, determinants, and inequalities. May not be applied toward general education requirement. Offered fall semester for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 117 Mathematics in the Modern World - 3 Hours

This is a general-education course designed especially for non-science majors. The course will further develop the quantitative skills and reasoning ability of such students. It will serve as an introduction to some of the great ideas and relevant applications found within the discipline of mathematics. Includes problem-solving strategies, functions and their graphs, probability, statistics and the mathematics of finance. Additional topics may include Fibonacci numbers, cryptography, infinity, fractals, chaos, tiling, knots, voting theory, game theory, and fairness. This course cannot be taken as a prerequisite for MA 121. Prerequisites: high school Algebra II course and minimum ACT Math score of 17 (or minimum SAT Math score of 400); or MA 116. Offered each semester for Deerfield traditional undergraduate; other modes as scheduled. Delivery mode: Deerfield traditional undergraduate, online.

MA 118 Finite Mathematics - 4 Hours

Includes functions and their graphs, systems of linear equations, linear programming, the mathematics of finance, combinatorics, basic probability, and statistics. This course cannot be taken as a prerequisite for MA 121. Prerequisites: high school Algebra II course and minimum ACT Math score of 17 (or minimum SAT Math score of 400), or MA 116. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 119 College Algebra - 3 Hours

This course deals with concepts related to algebra, equations and inequalities, functions and graphs, systems of equations, and exponential and logarithmic functions as applied to practical life problems. Offered on demand for REACH/Excel adult undergraduate. Offered in the REACH/Excel adult undergraduate.

MA 120 College Algebra and Trigonometry - 4 Hours

Inequalities, linear and quadratic functions; polynomials; complex numbers; trigonometric, exponential, and logarithmic functions. Prerequisites: MA 116; or high school Algebra II course and minimum ACT Math score of 17 (or minimum SAT Math score of 400). Offered fall semester for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 121 Calculus and Analytic Geometry I - 4 Hours

Includes functions and graphs, derivatives and their applications, derivatives of trigonometric functions, integration. Prerequisite: MA 120, or high school Precalculus and minimum ACT Mathematics score of 22 (or minimum SAT Math score of 520). Computer fee. Offered spring semester for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 122 Calculus and Analytic Geometry II - 4 Hours

Includes applications of integration, derivatives and integrals of exponential and logarithmic functions, techniques of integration, parametric equations, polar coordinates, infinite series. Computer fee. Prerequisite: MA 121. Offered fall semester for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 200 Mathematical Concepts - 4 Hours

This course is designed especially for elementary education majors. Content includes all concepts normally emphasized in the contemporary elementary school. Special concern is given to the introduction and development of the operations on the set of whole numbers by using appropriate teaching methods. Prerequisite: Admission to the Division of Education (Gate 1). Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate, Florida non-traditional undergraduate.

MA 204 Mathematics for Elementary Educators - 3 Hours

This course is designed especially for elementary education majors. Content includes All concepts normally emphasized in the contemporary elementary school. Special attention is given to the introduction and development of the operations on the set of whole numbers by using appropriate teaching methods. Credit obtained in this course is not applicable toward meeting the general education Math requirement of the college. Delivery mode: Florida non-traditional undergraduate.

MA 221 Calculus and Analytic Geometry III - 4 Hours

Includes three dimensional analytic geometry, vectors, partial derivatives, functions of several variables, multiple integrals, vector calculus. Computer fee. Prerequisite: MA 122. Offered spring semester in even-numbered years for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 280X Introductory Statistics - 3 Hours

An examination of both descriptive and inferential statistics. Specific topics include the scientific method, data analysis and production, measures of central tendency and variability, correlation and regression, random sampling and probability, nonparametric inferential tests, and parametric inferential tests including one-way analysis of variance. Credit obtained in this course does not fulfill the major requirements in psychology (for Deerfield traditional and REACH/Excel undergraduates) or business (for Deerfield traditional undergraduates) or the minor requirement in sociology. (REACH/Excel business majors take PSY 280X as part of the major.) Offered each semester for Deerfield traditional undergraduate; other modes as scheduled. Computer fee. Delivery mode: Deerfield traditional undergraduate and REACH/Excel adult undergraduate.

MA 285X Statistics - 4 Hours

An examination of both descriptive and inferential statistics. Specific topics include the scientific method, data analysis and production, measures of central tendency and variability, correlation and regression, random sampling and probability, nonparametric inferential tests, and parametric inferential tests including one-way analysis of variance. Specific instruction and computer experience in the use of SPSS is provided. Offered each semester for Deerfield traditional undergraduate; other modes as scheduled. Computer fee. Cross-listed with BIO 285X, PSY 285X, SOC 285X. Delivery mode: Deerfield traditional undergraduate, REACH/Excel adult undergraduate, online.

MA 321 Mathematical Statistics I - 4 Hours

Probability theory, random variables, discrete distributions, continuous distributions, sampling theory, correlation and regression, and hypothesis testing. Prerequisite: MA 121. Offered fall semester in even-numbered years for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 324 Mathematical Statistics II - 1 Hour

Hypergeometric distribution, negative binomial distribution, gamma and chi-square distributions, multivariable distributions, marginal and conditional distributions, order statistics. Prerequisite: MA 321 or concurrent registration in MA 321. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 331 Linear Algebra - 3 Hours

Systems of linear equations, matrices, determinants, vector spaces, linear transformations, change of basis, eigenvalues, eigenvectors, and discrete dynamical systems. Prerequisite: MA 120. Offered spring semester in even-numbered years for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 335 Differential Equations - 3 Hours

Linear differential systems, nonlinear first-order equations, series methods, and numerical algorithms. Prerequisite: MA 221 and MA 331. Offered fall semester in even-numbered years for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 340 History of Mathematics - 4 Hours

Includes Greek mathematics, non-Western mathematics, the development of calculus, mathematics of the 18th and 19th centuries, non-Euclidean geometry, and set theory. Prerequisite: MA 121 or consent of instructor. Offered spring semester in odd-numbered years for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 350 Topics In Mathematics - 3-4 Hours

Selected topics in Mathematics announced. May be repeated for credit with different topic. Prerequisites: MA 121, MA 122. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 360 Theory of Interest - 3 Hours

This course covers the material on the Society of Actuaries/Casualty Actuarial Society Exam FM (Financial Mathematics Exam). Topics include time value of money, nominal and effective rates of interest, discount rates, force of interest, annuities, amortization of loans, sinking funds, bonds, duration, immunization, interest rate swaps, and determinants of interest rates. Prerequisite: MA 122. Offered fall semester in odd-numbered years. Delivery mode: Deerfield traditional undergraduate.

MA 390 Actuarial Examination Preparation - 1 Hour

Prepares students to take a particular actuarial exam. Students do problems from practice actuarial exams and study guides. Prerequisite: consent of instructor. May be repeated for credit. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 411 Modern Algebra - 3 Hours

Groups, rings, fields, and Galois theory. Prerequisite: MA 121. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 412 Geometry - 3 Hours

Topics selected from advanced Euclidean Geometry, differential geometry, and topology. Prerequisite: MA 122. Offered fall semester in odd-numbered years for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 413 Real Analysis - 3 Hours

The real number system, limits continuity and differentiability of real functions, the Riemann integral. Prerequisite: MA 122. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 420 Number Theory - 3 Hours

Divisibility, primes, congruences, elementary group theory, diophantine equations, applications to cryptography, continued fractions, and algebraic numbers. Prerequisite: MA 120 or MA 121. This course fulfills the IDS 499X Integrative Thought Capstone requirement for students in the Mathematics and Mathematics with Secondary Education Licensure majors for Deerfield traditional undergraduate. Offered fall semester in odd-numbered years. Delivery mode: Deerfield traditional undergraduate.

MA 445 Internship - 1-6 Hours

The opportunity to work in a business or professional organization to analyze and interpret data, to develop concepts, and to engage in problem solving. Prerequisites: Instructor approval and permission of the Dean of the College. Delivery mode: Deerfield traditional undergraduate.

MA 450 Independent Study - 1-4 Hours

Research and specialization studies designed to meet the needs of individual students. Prerequisite: consent of instructor. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

MA 498 Professional Experience - 0-1 Hours

A supervised experience in one or more professional environment(s) which demonstrates the student's ability to relate knowledge and skills developed in the major to practical tasks in the workplace, graduate school, or professional school. Requires at least 45 clock hours of prepared, supervised, and evaluated experience which demonstrates practical application of major-related knowledge and skills. The professional experience must have prior approval by the department. Offered each semester for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

Computer Science

CS 112 Intermediate Spreadsheets, Databases, and Word Processing - 2 Hours

Advanced features of word-processing and spreadsheet software, and an introduction to database software and web page design. Offered fall semester for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 120 Computer Programming I - 3 Hours

Development of problem-solving skills, emphasizing algorithm development and top-down design. Students will do extensive programming in a specified language. Computer laboratory fee. Offered spring semester in even-numbered years for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 160 Computer Hardware - 4 Hours

The exploration and troubleshooting of different aspects of a personal computer such as microprocessors, motherboards, the BIOS, sound and video cards, printers, network connectivity and memory. Will be taught in a lab environment that allows each student to disassemble and assemble the above components in a working computer. Will also have a component where the student assists in the troubleshooting of computer-related problems. This course, in conjunction with CS 170 Computer Operating Systems and CS 260 Computer Networking, prepares students to obtain A+ certification. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 170 Computer Operating Systems - 4 Hours

The fundamental functions and concepts of operating systems, including their organization, architecture, and security. This course, in conjunction with CS 160 Computer Hardware and CS 260 Computer Networking, prepares students to obtain A+ certification. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 220 Computer Programming II - 3 Hours

Continued study of problem-solving skills and algorithmic development. More advanced programming techniques in a specified language. Prerequisite: CS 120. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 230 Applied Computer Technology - 3 Hours

Concerns the logic and reasoning necessary to make effective use of digital technology. Students will learn many of the issues and questions that must be addressed to make the best use of common computer applications such as communications, spreadsheets, word processing, databases, multimedia, and Internet design and research. Lab fee will be charged. Delivery mode: REACH/Excel adult undergraduate.

CS 240 Discrete Mathematics - 3 Hours

A survey of discrete mathematical concepts including sets, logic, combinatorics, graph theory, trees, and the Boolean Algebra. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 251 Topics in Computer Languages - 1 Hour

A short, specific introduction to the structure and syntax of given computer languages. Assumes a strong background in programming. Prerequisite: CS 120. May be repeated with a different topic. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 260 Computer Networking - 3 Hours

An exploration of the concepts of computer networks, equipment, protocols, and network security. Network design, transmission media, and functions of a network will be examined. This course, in conjunction with CS 160 Computer Hardware and CS 170 Computer Operating Systems, prepares students to obtain A+ certification. Prerequisite: CS 170. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 310 Database Management Systems - 3 Hours

The application, logical structure, and physical implementation of database systems. An examination of how data resources can be managed to support information systems in organizations. Includes an overview of big data. Prerequisite: CS 112 or consent of instructor. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 312 Data Communications Networks - 3 Hours

Familiarizes the student with the concepts and terminology of data communications, network design, and distributed information systems. Equipment, protocols, architectures, and transmission alternatives. Prerequisite: CS 310. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 320 Data Structures - 3 Hours

Continued study of algorithmic development and analysis, along with the introduction of common data structures (arrays, linked lists, stacks, queues, and trees) and file structure (sequential, random, and indexed). Prerequisite: CS 220. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 330 Web Programming - 3 Hours

An introduction to programming for the World Wide Web, including instruction in HTML, CSS, JavaScript, or related languages. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 340 Programming Languages - 3 Hours

A study of the fundamental concepts underlying programming languages. Students will demonstrate the ability to master a new programming language on their own. Prerequisite: CS 220. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 350 Topics in Computer Science - 1-4 Hours

Selected topics in computer science. May be repeated for credit with different topics. Computer laboratory fee may be required depending on topic. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 410 Systems Analysis and Design - 3 Hours

Information analysis and logical system specification. Emphasis on the iterative nature of the analysis and design process. Prerequisite: CS 310 or consent of instructor. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 420 Software Engineering - 3 Hours

Study of the software development process. Analysis, design, implementation, and testing of a semester-long, team software project. Prerequisite: CS 320. Computer laboratory fee. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 445 Internship - 1-6 Hours

The opportunity to use computing technologies in an approved on-campus or off-campus site. Satisfies the professional experience requirement for Computer Science majors. Prerequisites: Instructor approval and permission of the Dean of the College. Delivery mode: Deerfield traditional undergraduate.

CS 450 Independent Study - 1-4 Hours

Specialized study designed to meet the needs of individual students. Prerequisite: consent of the instructor. Offered on demand for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.

CS 490 Computer Ethics - 3 Hours

The capstone course of the Computer Science. An examination of ethical and societal implications of various information and communication technologies from a Christian perspective. Includes topics such as technology and interpersonal relationships, and artificial intelligence. Prerequisite: PH 180 or PH 182. Offered spring semester in odd-numbered years for Deerfield traditional undergraduate. Delivery mode: Deerfield traditional undergraduate.