MATHEMATICS - BLOOMFIELD COLLEGE (MTH)

MTH 130 Transition to Collegiate Mathematics (3 credits)
A course designed to develop a transition from high school expectations to the study of mathematics at the collegiate level made easier through the use of the TI-84+ graphing calculator as an aid to understanding of mathematical concepts. Critical thinking will be a central theme woven through the concepts of number sense; using percents to show change and comparison; solving simple equations through the application of interest, discount, and sales price; and introductory algebra including applications of linear and quadratic functions. This course will be waived if the student's mathematical preparation is sufficient. Students who have received credit for a higher level mathematics may not take this course.

MTH 131 Understanding Data in Social, Health, and Creative Contexts (3 credits)
This course explores statistical principles and data analysis within human and technological contexts, emphasizing applications in the humanities, social sciences, health, and creative fields. Students will develop arithmetic and quantitative reasoning skills, apply statistical methods, and utilize spreadsheet and statistical software (SPSS/JASP) to analyze and interpret data. The course fosters critical thinking and problem-solving through real-world applications, enhancing students' ability to assess, produce, and communicate knowledge as informed and responsible citizens. Aligned with the SEEDS Foundation's Quantitative Reasoning (QR) value, this course challenges students to analyze and develop arguments using mathematical and statistical reasoning, demonstrating their broader application to society. Additionally, in support of SEEDS Value: Educated Citizenry (EC), students will critically evaluate the sociopolitical structures that influence data interpretation and decision-making. Through hands-on practice, students will gain the skills needed to effectively use data in professional and academic settings.

MTH 141 College Algebra (3 credits)
Prerequisite(s): MTH130, Waived from MTH130, or an SAT Mathematics score of 550 or higher. The concept of functions and their properties form a central theme. Multiple representations of function properties are made possible through the use of T1-84+ graphing calculator. Polynomial, quadratic, exponential, and logarithmic functions are considered. The course also includes an introduction to matrices as a method of solving systems of equations. Students may, not receive credit for both MTH 140/141.

MTH 161 Precalculus (4 credits)
Prerequisite(s):MTH 130; or waived from MTH130 by coordinator. Restriction(s): Informatics, Computer Science, Game Programming, Biology, and Chemistry majors only; or permission of instructor. The concept of functions and their properties form a central theme. Multiple representations of function properties are made possible through the use of T1-84+ graphing calculator. Polynomial, quadratic, rational, exponential, logarithmic and trigonometric functions are considered. Students may not receive credit for both MTH 160 and MTH 161.

MTH 200 Applied Statistics I (4 credits)
Prerequisite(s): MTH 140, MTH 141, MTH 160, or MTH 161. This course covers the methodology of organizing, summarizing, and presenting statistical data. Students calculate and interpret the measures of central tendency and dispersion and are introduced to probability and distribution theory (Normal, Binomial, Poisson). They use distribution and sampling theory to make statistical inferences.

MTH 221C Calculus I (4 credits)
Prerequisite(s): MTH 160 or MTH 161 with a grade of C or higher or an appropriate score on the mathematics placement test. Restriction(s): Computer Science majors, Biology majors, and Informatics majors only; or permission of instructor. Basic theory of differential calculus through the concepts of limits and continuity are the goals of this course. Algebraic and trigonometric functions, curve sketching and applications to real-world problems (including maximum/minimum problems). The Mean Value Theorem and its consequences are covered. Satisfies SEEDS Quantitative Reasoning student learning outcome in alignment with Educated Citizenry value.

MTH 222C Calculus II (4 credits)
Prerequisite(s): MTH 221C. This is an introduction to integral calculus and its application to the solution of real world problems. Integration of exponential, logarithmic and trigonometric functions, techniques of integration, and an introduction to differential equations are covered.

MTH 223A Calculus and Analytic Geometry III (4 credits)
Prerequisite(s): MTH 222C. The study of calculus is continued through sequences and series, multivariable functions and their derivatives, multiple integrals and vector valued functions, Green's Theorem, and Stokes' Theorem. Applications using the graphing calculator are included.

MTH 320A Differential Equations (4 credits)
Prerequisite(s): MTH 222C. The focus of this course is the solution of differential equations. Topics include separation of variables, homogeneous equations, integrating factors, linear and higher order equations and applications via classical and computer-based methods.

MTH 332A Discrete Mathematics (3 credits)
Prerequisite(s): MTH 131, MTH 160, or MTH 161 with a grade of C or better. Restriction(s): Computer Science majors, Biology majors, Game Programming majors, and Informatics majors only; or permission of instructor. Topics in this course could include elementary set theory, permutations and combinations, discrete functions, relations and graphs, trees, counting procedures and Boolean Algebra. Application of these topics in programming and systems theory will be covered.

MTH 337 Linear Algebra (4 credits)
Prerequisite(s): MTH 222C may be taken before or concurrently. This is a course in the abstract mathematics sequence. Topics include systems of linear equations, matrices, vectors, linear transformations, bases, linear independence, orthogonality, eigenvectors and eigenvalues.