Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: MATH 138 **Year: 2025-2026**

Course Title: Precalculus **Credit Hours: 4**

I. Course Description: This course provides the algebraic foundation from a function standpoint for a standard calculus course. Topics include: theory of functions and radicals, right triangle trigonometry, analytic trigonometry, law of sines, law of cosines, trigonometry with applications, vectors, polar coordinates, binomial theorem and conic sections. MATH 138 fulfills the SUNY General Education Mathematics (and Quantitative Reasoning) Knowledge and Skills area. Prerequisites: C or better grade in MATH 122 or MATH 120 or as determined by initial placement 4 Cr, (4 Lec.) Fall and spring semesters.

II. Additional Course Information:

1. This course is a college-level course which prepares students for the advanced math required in many programs.
2. This course uses free Open Educational Resource (OER) textbooks accessible online.
3. Fully asynchronous sections require students to earn a 50% or higher on the final exam.

III. Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Interpret and draw inferences from appropriate mathematical models such as formulas, graphs, or tables.
2. Represent mathematical information symbolically, visually, numerically, or verbally as appropriate.
3. Apply formulas to simplify trigonometric expressions and equations.
4. Identify and perform operations of functions.

IV. Tompkins Cortland Institutional Learning Outcomes; Program Learning Outcomes; SUNY General Education Competencies and Knowledge and Skills Areas

Tompkins Cortland ILOs

Complete this section for “service” courses only (e.g., courses that are required of all students; courses that are not program specific but satisfy liberal arts requirements; or commonly used in multiple academic programs to meet non-program-specific requirements). Check only Institutional Learning Outcomes (ILOs) that are meaningfully developed and assessed in this course. For each ILO chosen, include the SLO to which it aligns.

Students will:

☐ Communicate effectively, in oral and written forms, taking into consideration audience and purpose.

☒ Apply principles and methods of scientific inquiry and quantitative reasoning appropriate to their discipline.

Students will be able to

SLO #1 –interpret and draw inferences from appropriate mathematical models such as formulas, graphs, or tables.

SLO #3 –apply formulas to simplify trigonometric expressions and equations.

☒ Use information, critical thinking, and the creative process to solve problems and reach conclusions.

Students will be able to

SLO #2 –represent mathematical information symbolically, visually, numerically, or verbally as appropriate.

SLO #3 –apply formulas to simplify trigonometric expressions and equations.

☐ Use technology appropriate to their discipline.

☐ Describe the ways in which social, economic, or environmental sustainability depends on their own and the collective contributions of a diversity of ideas and people.

Program Learning Outcomes N/A

Complete this section for program-specific courses (e.g., those that share the same discipline code as the academic program or satisfy requirements in related programs). List the academic program(s) here and note which Student Learning Outcomes align to specific Programmatic Learning Outcomes. Please see the MCS Instructions for more details.

SUNY General Education Competencies

If this course assesses a SUNY GEN ED Competency, check all that apply and indicate which course outcome(s) address each checked item:

☒ CRITICAL THINKING & REASONING- Students will:

a. clearly articulate an issue or problem;
b. identify, analyze, and evaluate ideas, data, and arguments as they occur in their own or others' work; acknowledge limitations such as perspective and bias; and
c. develop well-reasoned (logical) arguments to form judgments and/or draw conclusions.

Course SLO(s):

Students will be able to

SLO #1 –Interpret and draw inferences from appropriate mathematical models such as formulas, graphs, or tables.

SLO #2 –Represent mathematical information symbolically, visually, numerically, or verbally as appropriate.

SLO #3 –Apply formulas to simplify trigonometric expressions and equations.

SLO #4 –Identify and perform operations of functions.

☐ INFORMATION LITERACY - Students will:

a. locate information effectively using tools appropriate to their need and discipline; evaluate information with an awareness of authority, validity, and bias; and demonstrate an understanding of the ethical dimensions of information use, creation, and dissemination.

☒ SUNY GENERAL EDUCATION KNOWLEDGE AND SKILLS AREA(s): **Mathematics (and Quantitative Reasoning)**
For courses that are approved to meet one (or more) of the ten SUNY General Education Knowledge and Skills Areas, indicate which area the course fulfills, and which outcome(s) are aligned with the SUNY outcomes for that area:

SUNY SLO: Students will demonstrate the ability to interpret and draw inferences from mathematical models such as formulas, graphs, tables, or schematics.

Course SLOs
SLO #1 – Students will be able to interpret and draw inferences from appropriate mathematical models such as formulas, graphs, or tables.

SUNY SLO: Students will be able to represent mathematical information symbolically, visually, numerically, or verbally as appropriate

Course SLOs
SLO #2 – Students will be able to represent mathematical information symbolically, visually, numerically, or verbally as appropriate.

SUNY SLO: Students will demonstrate the ability to employ quantitative methods such as arithmetic, algebra, geometry, or statistics to solve problems.

Course SLOs
SLO #3 – Students will be able to apply formulas to simplify trigonometric equations and expressions.

SLO #4 – Students will be able to identify and perform operations of functions.

☐ This course does not address any of the above Tompkins Cortland ILOs, PLOs, or SUNY General Education Competencies or Knowledge and Skills Areas.

V. Essential Topics/Themes

1. Review of graphing and solving for unknowns in various types of functions, theory of function, radicals and exponents, and exponential and logarithmic functions
2. Angles, right triangle trigonometry, unit circle, graphs of all trigonometric functions with transformations, and inverse trigonometry
3. Trigonometric identities, sum and difference identities, double, half-angle, reduction formulas, product to sum, sum to product, and solving trigonometric equations
4. Law of sines and cosines, graphing conic sections, vectors, polar coordinates, systems of equations, partial fractions, and the binomial theorem

VI. Methods of Assessment/Evaluation

Method	% Course Grade
1. Tests	50 – 80%
2. Final Exam	15 – 25%
3. Homework Assignments	15 – 30%

4. Projects/Written Assignments	0-10%
5. Attendance, class participation, classroom conduct	0 – 10%

VII. Texts – ☒ Required ☐ Recommended ☐ Used for more than one course (list courses)

High school instructors may consult with staff in the CollegeNow office for additional information and guidance.

	OER
1. Lumen OHM	☒
2. Abramson, Jay. Precalculus. Oct 23, 2014. OpenStax, Houston, Texas URL: https://openstax.org/books/precalculus/pages/1-introduction-to-functions	☒

Editions listed are current as of date of syllabus. More recent editions may be used.

VIII. Bibliography of Supplemental Materials – None specified

IX. Other Learning Resources

Audiovisual: None specified

Electronic:

YouTube - https://www.youtube.com [+] **(search for topics you need help with if you do not understand a concept).**

- **MathAntics** - https://www.youtube.com/user/mathantics [+]
- **MathMan1024** - https://www.youtube.com/user/mathman1024 [+]
- **MrB4Math** - https://www.youtube.com/user/MrB4math [+]
- **ProfRobBob** - https://www.youtube.com/c/profrobbob [+]
- **TecMath** - https://www.youtube.com/c/tecmath [+]

- **KahnAcademy -** https://www.khanacademy.org/signup **- is a great a great source of videos on all of the topics covered in this course.**
- **PurpleMath.com** - https://www.purplemath.com/modules/index.html

Other: None specified

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for academic adjustments. All course materials are available in alternate formats upon request.*

Academic Integrity: *Every student at Tompkins Cortland Community College is expected to act in an academically honest fashion in all aspects of his or her academic work: in writing papers and reports, in taking examinations, in performing laboratory experiments and reporting the results, in clinical and cooperative learning experiences, and in attending to paperwork such as registration forms.*

Any written work submitted by a student must be his or her own. If the student uses the words or ideas of someone else, he or she must cite the source by such means as a footnote. Our guiding principle is that any honest evaluation of a student's performance must be based on that student's work. Any action taken by a student that would result in misrepresentation of someone else's work or actions as the student's own — such as cheating on a test, submitting for credit a paper written by another person, or forging an advisor's signature — is intellectually dishonest and deserving of censure.

Several degree programs offer student learning opportunities (such as internships, field work, and clinical experiences) outside the standard classroom setting. As part of the learning process, students must understand and engage in conduct that adheres to principles guiding employment within the professional workplace. These behaviors include, but are not limited to, academic integrity, accountability, reliability, respect, use of appropriate language and dress, civility, professional ethics, honesty, and trustworthiness. Disciplinary action may be initiated for inappropriate conduct occurring while participating in any course-related project or event.