# MATH 111 Applied Precalculus

Updated: 6/3/2025
Compiled by Course Coordinator: Mark Korlie

## Program

Teaching Innovations Program (TIP): a year-long program that supports faculty teams in developing or redesigning a course or academic program

## Intervention

- The course is fully coordinated: all instructors use the same text, course contents, similar pacing schedules, common assessments, and grading scale.
- The course is designed for active learning. There are recitation sessions for all sections of the course, where students engage in group-work activities and apply inquiry-based learning strategies to solve assignment problems. Supplemental instructions through CAST (the Center for Academic Success and Tutoring) and review sessions for end-of-module exams are available to students.
- All sections of the course use a common syllabus (Montclair Syllabus) on Canvas, and all instructors use the course guide and are required to participate in Montclair's "Strong Student Campaign" coordinated and run by the Office for Faculty Excellence (OFE).

## Participating faculty

**Fall 2024 (17 Sections; 11 Instructors):**
Mirna Halawani (Adjunct)
Scott Theodore (Adjunct)
Brenda Donald (Adjunct)
James Panza (Adjunct)
Diyunugalage Jayarathne
Adam Leaman (Adjunct)
Jessica Dividson
Brad Ottino (Adjunct)
Stephen Taras (Adjunct)
Kobra Rahimi (Adjunct)
Kevin Kline (Adjunct)

**Spring 2025 (15 Sections; 10 Instructors):**

Mirna Halawani (Adjunct)
Scott Theodore (Adjunct)
Brenda Donald (Adjunct)
Jessica Dividson
Brad Ottino (Adjunct)
Stephen Taras (Adjunct)
Kobra Rahimi (Adjunct)
Kevin Kline (Adjunct)
Eliza Leszczynski
Karmen Yu

### Implementation

- The plan was implemented fully in all sections of MATH 111 in Fall 2024 and Spring 2025 with the participation of all instructors. They all use the same text, course contents, similar pacing schedules, common assessments, and grading scale.
- There were ongoing professional development activities for adjuncts and TA's.
- For Spring 2025, we made changes to foster students' success and sense of belonging in the course, including
    1. decreasing the number of problems on some module exams so that the time needed to complete each exam was nearly the same, and
    2. requiring all instructors to use the Montclair Syllabus (Montclair Simple Syllabus) on Canvas and use the "Be A Strong Student Slides" for Montclair's "Strong Student Campaign" in their classes.

## Course Redesign Goals and Analysis

### Summary

**Goal 1:** Create, disseminate and fully utilize Common Syllabus
**Status:** *Completed*
**Discussion:** The Common Syllabus is very useful; instructors like it and appreciate that it is prepopulated with relevant course information. It will be updated regularly if necessary, and we will continue to monitor instructors of all sections of the course to ensure that they are using it on Canvas.

**Goal 2:** Create, disseminate and fully adopt course guide
**Status:** *Completed*
**Discussion:** The course guide is posted on the Mathematics Department's Google drive, and a link to it is posted on Canvas Community for MATH 111 instructors. A copy/link to the course

guide is sent to all instructors prior to the beginning of the semester. It is updated as needed to include new information or delete information that is no longer needed.

**Goal 3:** Develop buy-in and implementation plan for new & continuing instructors
**Status:** *Completed*
**Discussion:** MATH 111 is a coordinated course. All instructors use the same text, course contents, pacing schedules, assessments, and grading scale.

**Goal 4:** Decrease section variance
**Status:** *In progress, but headed in the right direction*
**Discussion:** The coordination is working. Using the same text, course contents, pacing schedules, assessments, and grading scale is helping to decrease section variance. Also, it seems that our expectation that placing students who were not ready to take MATH 111 in a new course, MATH 108 (Transition to College Mathematics), would help is true. Section variance decreased substantially from 17.2% in Spring 24 to 9.2% in Fall 2024 and 7.3% in Spring 2025. MATH 108 was introduced for the first time in Fall 2024.

**Goal 5:** Improve student learning outcomes and experiences
**Status:** *In progress, but seems headed in the right direction*
**Discussion:** The overall DFW rate decreased substantially in Fall 2024 (about 18.4%) and Spring 2025 (19.8%) for MATH 111 (from an average of over 40% for the 7 semesters preceding Fall 2024). Continuing to provide a recitation session, primarily run by a graduate assistant (GA) and assisted by a supplemental instructor (SI), for each section of the course is helping students to succeed. GA's and SI's are also available to tutor students at other times coordinated by CAST and the Mathematics Department. Placing students who were not ready to take MATH 111 in MATH 108 is helping to improve student success including student learning outcomes and experiences.

**Goal 6:** Improve student success for female, African-American, Hispanic, and Pell-eligible students
**Status:** *In progress, but seems headed in the right direction*
**Discussion:** The DFW rates decreased substantially for each of the demographic groups listed in this goal for Fall 2024 (approximately: female - 18%, African-American - 20%, Hispanic - 20%). Introducing the new course MATH 108 as a prerequisite for MATH 111 for some students who are not ready to take MATH 111 is helping to improve student success for each demographic group. We are looking forward to seeing similar corresponding results for Spring 2025 when the data is available.

## Grade Data Highlights

The following results are provided by Ashwin Vaidya, Mathematics Department Chair.

### Summary

Fall 2024

**Office for Faculty Excellence**
Email: faculty@montclair.edu
MONTCLAIR
STATE UNIVERSITY

| | | A | A- | B+ | B | B- | C+ | C | C- | D | F | D+ | D- | IN | WD | Total | %DFW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fall 2024 | MATH 111 | 83 | 35 | 91 | 80 | 69 | 47 | 26 | 23 | 17 | 55 | 1 | | 1 | 27 | 555 | 18.35 |

Variation Across Sections (Fall 2024)

| | Number of Sections | AV DFW ( %) | STD dev DFW (%) |
|---|---|---|---|
| MATH 111 (N=555) | 17 | 18.35 | 9.14 |

N = Number of students taking the course

Spring 2025

| | | A | A- | B+ | B | B- | C+ | C | C- | D | F | IN | WD | Total | Pass (%) | DFW (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 2025 | MATH 111 | 72 | 28 | 52 | 46 | 44 | 36 | 24 | 13 | 8 | 43 | 1 | 27 | 394 | 80 | 20 |

MATH 111

| Year/Semester | Average DFW (%) | STD Dev (%) |
|---|---|---|
| F 2020 | 18.7 | 9.4 |
| S 2021 | 34.7 | 7.5 |
| F 2021 | 33 | 12.5 |
| S 2022 | 61.9 | 6.8 |
| F 2022 | 43.1 | 13.5 |
| S 2023 | 51.9 | 17 |
| F 2023 | 36.2 | 16.4 |
| S 2024 | 34.7 | 17.2 |
| F 2024 | 18.4 | 9 |
| S 2025 | 19.8 | 7 |

# Next Steps

- Review the course contents for both MATH 111 and MATH 108 to better align the topics covered in both courses. Streamline the topics covered in coordination and alignment with MATH 108. It may help to improve students' success in MATH 111 and better prepare them for MATH 122 (Calculus I).
- Work with instructors to improve students' engagement and sense of belonging in class and use more active learning strategies that foster conceptual understanding of course contents, and help to improve students' learning outcomes.
- Introduce and promote activities that help to improve students' mathematical thinking, problem solving, and writing skills; and encourage them to use fundamental mathematical tools appropriately in problem solving and communicating mathematical ideas effectively.
- Beginning in Fall 2025, there will be in-class quizzes in all sections of the course. The quizzes will primarily be open-ended problems requiring students to show work and use appropriate mathematical notations to communicate their solutions to the problems. The goal is to improve students' mathematics writing skills that will help them to succeed in Calculus and other courses that require mathematics as a prerequisite.
- The ALEKS Placement, Preparation, and Learning (ALEKS PPL) Assessment will help. We believe that this new assessment (introduced in Spring 2025 and first implemented for Fall 2025) will help students to succeed and improve students' learning outcomes in MATH 111, Calculus, and other math related courses.