Mat 100 Precalculus (Fall 2014)

http://math.ncc.metu.edu.tr/math100

Frequency: Fall/Spring Terms

Credit: (1-2)2

Catalog description: Mat 100 is a preparatory course for calculus courses. Topics include: Functions and their inverses, operations with functions and graphing techniques, polynomial functions, rational functions, exponential and logarithmic functions, trigonometric functions, trigonometric identities and trigonometric equations, systems of equations, inequalities and solving techniques.

Justification for the Course Proposal: This course is meant to prepare students for success in the calculus series (MAT 119-120).

Course Objectives: A successful student will: become comfortable with the language of functions; gain an understanding of polynomial, rational, exponential, logarithmic and trigonometric functions and ability to describe their graphs; be able to solve linear and quadratic equations and equations with exponential and logarithmic functions; and gain problem solving skills analyzing the quantitative aspects of real- world problems and creating mathematical models.

Course Coordinator: Erhan Gürel (office: SZ-32, phone: x2942, email: *egurel_at_metu.edu.tr*)

Exams and Grading: Course grades are determined by (online) homework completed in recitations, a midterm exam, and a final exam, as well as a small number of bonus points awarded on the basis of attendance, class participation, and/or project completion.

- **Short Exams:** 2x10 =%20 (WeBWork)
- **Midterm:** 30 %
- **Final Exam:** 50 %
- **Bonus:** 5 % (policy varies between sections)

Homework: Course homework will be assigned and graded using the online WeBWork system. This homework will be completed during recitation hours in a computer lab with the aid of the assistants.

Textbook: Barnett, Ziegler, Syleen and Sobecki. *Precalculus* 7th ed. Mc Graw Hill, 2010.

Make-up Policy: In order to be eligible to enter the make-up examination for a missed examination, a student must have a documented or verifiable and officially acceptable excuse. **It is not possible to make up multiple missed exams.** The make-up examination for all exams will be after the final exam, **and will include all topics.**

Math Help Room: The mathematics help room in T-103 is a room staffed by mathematics faculty and teaching assistants where students may gather to ask questions, work on homework, and view exams. *Students are also invited to seek out instructors in their offices.*

S1 - G. Benli	Tue 13:40-14:30 Thu 13:40-15:30	TZ-19
S2 - G. Benli	Tue 11:40-12:30 Thu 9:40-11:30	TAZ-08
S3 - E. Gurel	Tue 15:40-17:30 Thu 12:40-13:30	TZ-19
S4 - E. Gurel	Tue 12:40-13:30 Thu 10:40-12:30	TZ-20
S5 - E. Bilgin	Mon 13:40-14:30 Tue 8:40-10:30	TZ-19
S6 - E. Bilgin	Mon 9:40-10:30 Wed 8:40-10:30	TZ-19

INSTRUCTOR	SECTION	OFFICE	PHONE	E-MAIL
Gökhan Benli	Sections 1, 2	TZ-29	3422	*benli_at_metu.edu.tr*
Emel Bilgin	Sections 5, 6	TAZ-30	3410	*bemel_at_metu.edu.tr*
Erhan Gürel	Sections 3, 4	TZ-32	3425	*egurel_at_metu.edu.tr*

ASSISTANT	OFFICE	PHONE	E-MAIL
Münevver Çelik	SZ-43	2953	*mucelik*
Yakut Dosiev	RZ-31	3445	*dyagut*
Arda Buğra Özer	SZ-36	2946	*abozer*

LECTURES

There will be 14 lectures given by the instructors, each lasting 1 class hour. Besides these lectures there will be 2 hours of recitation per week. The table below is a rough guideline for the content of course lectures. Professors may reorder content as necessary/desired. The section numbers below are from the textbook, *Precalculus*, (7^{th} ed.) by Barnett, Ziegler, Syleen and Sobecki.

Week 1: Sept.22-26	1	**Chapter R. Basic Algebraic Operations** **§R.1:** Algebra and Real Numbers. **§R.2:** Exponents and Radicals. **§R.3:** Polynomials: Basic Operations and Factoring. **§R.4:** Rational Expressions.
Week 2: Sept.29-Oct.3	2	**Chapter 1. Equations and Inequalities** **§1.1:** Linear Equations and Applications. **§1.2:** Linear Inequalities. **§1.3:** Absolute Value in Equations and Inequalities.
Week 3: Oct.6-10	3	**§1.4:** Complex Numbers. **§1.5:** Quadratic Equations and Applications. **§1.6:** Additional Equation-Solving Techniques.
Week 4: Oct.13-17	4	**Chapter 2. Graphs** **§2.1:** Cartesian Coordinate System. **§2.2:** Distance in the Plane. **§2.3:** Equation of a Line. **§2.4:** Linear Equations and Models.
Week 5: Oct.20-24	5	**Chapter 3. Functions** **§3.1:** Functions. **§3.2:** Graphing Functions. **§3.3:** Transformations of Functions.

Week 6: Oct.27-31	6	**§3.3:** Transformations of Functions. **§3.4:** Quadratic Functions. **§3.5:** Operations on Functions; compositon.
	Holiday: Wed., Oct. 29	
Week 7: Nov.3-7	7	**§3.6:** Inverse Functions. **Chapter 4. Polynomials and Rational Functions** **§4.1:** Polynomial Functions, Division and Models.
Week 8: Nov.10-14	8	**§4.1:** Polynomial Functions, Division and Models. **§4.2:** Real Zeros and Polynomial Inequalities.
Week 9: Nov.17-21	9	**§4.4:** Rational Functions and Inequalities. **Chapter 5. Exponential and Logarithmic Functions** **§5.1:** Exponential Functions.
Week 10: Nov.24-28	10	**§5.3:** Logarithmic Functions. **§5.5:** Exponential and Logarithmic Functions.
Week 11: Dec.1-5	11	**Chapter 6. Trigonometric Functions** **§6.1:** Angles and Their Measure. **§6.2:** Trigonometric Functions: A Unit Circle Approach. **§6.3:** Solving Right Triangles. **§6.4:** Properties of Trigonometric Functions.
Week 12:	12	**§6.5:** More General Trigonometric Functions and Models.

Dec.8-12		**§6.6:** Inverse Trigonometric Funtions. **Chapter 7. Trigonometric Identities and Conditional Equations** **§7.1:** Basic Identities and Their Use.
Week 13: Dec.15-19	13	**§7.2:** Sum, Difference and Cofunction Identities. **§7.3:** Double Angle and Half Angle Identities. **§7.4:** Product-Sum, Sum-Product Identities.
Week 14: Dec.20-26	14	**§7.5:** Trigonometric Equations. **Chapter 8. Additional Topics in Trigonometry** **§8.1:** Law of Sines. **§8.2:** Law of Cosines.
Week 15: Dec.29-30	15	**§:** Review.
FINAL EXAM		

Important Dates

- **September 22**: Classes Start
- **September 29-October 3**: Add-Drop
- **October 29**: HOLIDAY (Wednesday)
- **Noveber 28**: Withdrawal deadline
- **December 31**: Classes End
- **Janury 1**: HOLIDAY (Thursday)
- **January 5-17**: Finals Period
- **January 24**: Grades Announced
- **January 28-30**: Resit Exams