MTHS101 Calculus I Course Syllabus

Course Name	Calculus I
Course Code	MTHS 101
Type of Course	COMPULSORY
Course Level	UNDERGRADUATE
ECTS Credits	6
Weekly Theory Hour	2
Weekly Practice Hour	2
Year	2012-2013
Term	FALL
Instructor (s)	Assist. Prof. Seren Başaran
Teaching System	LECTURING
Education Language	ENGLISH
Prerequisite course	-
Other recommended matters	-
Training status	Lecturing; This course utilizes the Moodle course management system to share information and resources. To access the course site, log on to this link: http://elearning.gau.edu.tr and select the course from list of courses. All course materials will be posted here.
Course Objectives	The main goal of this course is to gain a deep understanding of the fundamental concepts and relationships of functions and introducing limit and continuity. Students will expand their knowledge of quadratic, exponential, and logarithmic functions to include power, polynomial, rational, piece-wise, and trigonometric functions. Students will investigate and explore mathematical ideas, develop multiple strategies for analyzing complex situations, and use graphical methods to build understanding, make connections between representations, and provide support in solving problems. Students will analyze various representations of functions. Students will apply mathematical skills and make meaningful connections to life's experiences.
Learning Outcomes	Students will; 1. develop mathematical proficiency that will enable them to efficiently use mathematics to make sense of and improve the world around them. 2. Develop positive attitudes toward mathematics, including the confidence, creativity, enjoyment, and perseverance that come from achievement. 3. Become proficient problem-solvers by posing appropriate questions, selecting appropriate methods, employing a variety of strategies, and exploring alternative approaches. 4. Think logically, using inductive reasoning to formulate reasonable conjectures and using deductive reasoning for justification, formally or informally.

	5. Cooperatively and independently explore mathematics, using inquiry and technological skills. 6. Make connections between mathematical ideas, between mathematics and other disciplines, and to life. 7. Communicate mathematics through writing, modeling, and visualizing, using precise mathematical language and symbolic notation.	
Course content	Sets, numbers, concepts of functions, types of functions and graphs; increasing and decreasing functions; close defined functions, one-to-one functions and one function of the reverse, trigonometric functions, extreme function values, techniques of graphing and curve drawing. limit and continuity;	

Weekly detailed plan	**WEEK**	**TOPICS**	
		Theoretical	**Practical**
	1	Introducing Syllabus Fundamentals Sets of Real Numbers Absolute Value Solving Equations Equalities and Inequalities Rectangular Coordinates. Visualizing Graphs and Graphing Utilities Equations of Lines Symmetry and Graphs. Circles	Students will use the language and operations of algebra to evaluate, analyze and solve problems.
	2	Functions Analyze and solve problems using functions. Model and graph functions and transformations of functions. Analyze the behavior of functions.	Students will understand and represent functions and analyze function behavior.
	3	Graphing The Definition of a Function The Graph of a Function Shapes of Graphs. Average Rate of Change Techniques in Graphing Methods of Combining Functions. Inverse Functions	Identify the domain, range, and other attributes of families of functions and their inverses. Approximate instantaneous rates of change and find average rates of change using graphs and numerical data. Identify and analyze continuity, end behavior, asymptotes, symmetry (odd and even functions), and limits, and connect these concepts to graphs of functions. Determine intervals over which a function is increasing

			or decreasing, and describe the intervals using interval notation.
	4	Polynomial and Rational Functions	
	5	Exponential and logarithmic functions	Quiz1
	6	Trigonometric functions	Solve problems using trigonometry.
	7	Students will use algebraic, spatial, and logical reasoning to solve problems.	
	8	**MIDTERM**	
	9	Extreme Function Values	
	10	techniques of graphing	
	11	Curve drawing	
	12	Limit Introduction The definition of limit One-Sided Limits Limit Properties Computing Limits Infinite Limits Limits At Infinity, Part I Limits At Infinity, Part II	Relate the graphical representation of discontinuities and end behavior to the concept of limit.
	13	Continuity	Quiz2
	14	REVISION	
	15	**FINAL**	

Textbook/ Recommended Reading Materials	Cohen D, Lee, T., B., Sklar,D.(2011) Precalculus. 7th Edition. Brooks/Cole. Cengage Learning. Belmont, CA Stewart,J.,Redlin,L.,Watson.S.(2009) Precalculus.Mathematics for Calculus.5th Edition:Brooks-Cole.Cengage-Learning Beecher, J., A., Penna, J., A., Bittinger, M., L.(2003) Precalculus: A Right Triangle Approach. Addison Wesley. ISBN-13: 978-0-321-69397-6 Thomas, G., B., Weir, M., D. ,Hass, J. (2009)Thomas' Calculus.12th Edition. Pearson. ISBN 9780321587992

Assessment Methods

Term Activities	Number	Percentage
Quiz1	1	10
Quiz2	1	10
Attendance	1	10
Midterm exam	1	30
Final exam	1	40
TOTAL		100
Percentage of Term activities		60
Percentage of Final Exam		40
TOTAL		100

Calculation work load within the framework of learning, teaching and evaluation activities			
Activities	Number	Time (hour)	Total work load (hour)
Weekly theory hour	14	2	28
Weekly practice hour	14	2	28
Quiz1	1	18	30
Quiz2	1	29	30
MidTerm	1	29	30
Final	1	30	34
TOTAL WORK LOAD(hour)= 180			
COURSE ECTS CREDIT= Total work load(hour)/(30 hours/ECTS)= 180/ 30 = 6			

Program and Learning Outcomes

Learning Outcomes	Program Outcomes																
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13	PO 14	PO 15	PO 16	PO 17
LO 1	2					5											
LO 2		2				5											
LO 3	2					5				5	5						
LO 4				5		5				5	5						
LO 5		2		5		5	5				5						
LO 6						5					5						
LO7						5											

*Contribution Level: **1** Very low **2** Low **3** Medium **4** High **5** Very High

CITT Department Programme Outcomes

1. Having adequate level of knowledge and skills in current/new computing and educational technologies.

2. Having sufficient communication and teaching skills in teaching profession.

3. Being able to teach updated computing technologies efficiently in English.

4. Being able to identify information technology problems through using various analysis and synthesis.

5. Being pragmatic to develop and apply persistent information technology solutions to educational and business problems.

6. Being able to use critical and computational thinking skills to produce alternative solutions at every level of project development life-cycle.

7. Being capable to work in disciplinary and interdisciplinary teamwork.

8. Being sensitive, reactive and responsive to professional, social and ethical issues. Having social and ethical awareness in teaching and in providing solutions to problems.

9. Having adequate level of knowledge and skills in current/new computer hardware, operating systems and computer networks.

10. Adequate level of knowledge and skills in current/new programming languages, programming paradigms (procedural and object-oriented) and programming environments (visual, console-based programming).

11. Being able to analyse, plan and manage educational software design and project development.

12. Having the capability of evaluating and criticising educational software design and development.

13. Adequate level of knowledge in using and integrating current/new e-learning and distance education systems such as learning management systems (LMS).

14. Having sufficient skills and knowledge in using instructional technology and material design.

15. Having skills to apply and use special teaching approaches, theories, teaching strategies, methods and techniques (such as to those people with disabilities).

16. Using appropriate measurement and evaluation techniques to assess students' learning and development in addition to supporting them with good level of feedback.

17. Having sufficient knowledge in the process of establishment of Republic of Turkey. Identifying social, cultural, political and economic problems through understanding Ataturk's principles and revolution.