

COURSE LEARNING OUTCOMES

<p>DEPARTMENT: Mathematics COURSE #: 30800 COURSE TITLE: Bridge to Advanced Mathematics TERM OFFERED: Spring 2018 PRE/CO-REQUISITES: A grade of C or higher in MATH 20300 or placement by the Department HOURS/CREDITS: 3hrs/3credits DATE EFFECTIVE: 5/4/18 COURSE COORDINATOR: Hooper</p>	<p>CATALOG DESCRIPTION : This course explores the logical and foundational structures of mathematics, with an emphasis on understanding and writing proofs. Topics include set theory, logic, mathematical induction, relations and orders, functions, Cantor's theory of countability, and development of the real number system.</p> <p>Typical Textbooks Used: (Actual textbooks used is instructor dependent.)</p> <ul style="list-style-type: none"> • <i>Mathematical Proofs</i>, 3rd edition, by Chartrand, Polimeni, and Zhang; Addison-Wesley Publ. • <i>Elementary Analysis</i>, 2nd edition, by Ross, Springer Publ.
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COURSE LEARNING OUTCOMES:

<i>After taking this course, the student should be able to:</i>	Contributes to Departmental Learning Outcome(s):
1. Demonstrate an ability to understand and manipulate mathematical statements involving quantifiers and logical connectives. Examples of manipulations include finding the negation, converse, and contrapositive of a quantified implication.	a, g
2. Write clear and rigorous proofs (or disproofs) of mathematical statements utilizing basic proof techniques including direct proof, proof by contrapositive, proof by contradiction, proof by cases, mathematical induction, and by providing an example (or counterexample).	e1, e2, f, g
3. Demonstrate knowledge of fundamental concepts of mathematics including those relating to logic, sets, functions, relations, cardinality, integers, rationals and reals. Precisely state fundamental definitions, axioms and theorems and utilize them to prove related results.	a, e1, e2, f, g

COURSE ASSESSMENT TOOLS:

Left up to instructor. (Instructor: Please adjust and insert percentages.) Typical assessment tools:

1. Attendance
2. Homework and/or Quizzes
3. Midterms
4. Final Exam

DEPARTMENTAL LEARNING OUTCOMES:

The mathematics department, in its varied courses, aims to teach students to:

- a. perform numeric and symbolic computations
- b. construct and apply symbolic and graphical representations of functions
- c. model real-life problems mathematically
- d. use technology appropriately to analyze mathematical problems
- e. state (e1) and apply (e2) mathematical definitions and theorems
- f. prove fundamental theorems
- g. construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.