FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL

DEPARTMENT NAME: MATHEMATICAL SCIENCES	**COLLEGE OF:** CHARLES E. SCHMIDT COLLEGE OF SCIENCE

RECOMMENDED COURSE IDENTIFICATION:

PREFIX _____MTG___ **COURSE NUMBER** ___6396____ **LAB CODE** (L or C) _____

(*TO OBTAIN A COURSE NUMBER, CONTACT ERUDOLPH@FAU.EDU*)

COMPLETE COURSE TITLE

ALGEBRAIC TOPOLOGY

EFFECTIVE DATE

(first term course will be offered)

_____

CREDITS: 3	**TEXTBOOK INFORMATION:** J.P. MAY, A, CONCISE COURSE IN ALGEBRAIC TOPOLOGY, CHICAGO LECTURES IN MATHEMATICS, 1999

GRADING (*SELECT ONLY ONE GRADING OPTION*): **REGULAR** ___X__ **PASS/FAIL** _____ **SATISFACTORY/UNSATISFACTORY** _____

COURSE DESCRIPTION, NO MORE THAN 3 LINES:

THIS COURSE IS AN INTRODUCTION TO THE FUNDAMENTAL CONCEPTS AND BASIC METHODS OF ALGEBRAIC TOPOLOGY: HOMOTOPY, HOMOLOGY AND COHOMOLOGY OF CELL COMPLEXES AND THEIR APPLICATIONS TO GEOMETRY AND ALGEBRA.

PREREQUISITES W/MINIMUM GRADE:* **MAA 5228 AND 5229 INTRODUCTORY ANALYSIS (MINIMUM GRADE C) AND MAS 5311 AND 5312 INTRODUCTORY ABSTRACT ALGEBRA (MINIMUM GRADE C)**	**COREQUISITES:** **NONE**	**OTHER REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL):**

PREREQUISITES, COREQUISITES & REGISTRATION CONTROLS SHOWN ABOVE WILL BE ENFORCED FOR ALL COURSE SECTIONS.

*DEFAULT MINIMUM GRADE IS D-.

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE:

PH. D IN MATHEMATICS

Other departments, colleges that might be affected by the new course must be consulted. List entities that have been consulted and attach written comments from each.

Paul Yiu, yiu@fau.edu, (561) 297-2436 _____

Faculty Contact, Email, Complete Phone Number

SIGNATURES

SUPPORTING MATERIALS

Approved by:	*Date:*
Department Chair: _____	_____
College Curriculum Chair: _____	_____
College Dean: _____	_____
UGPC Chair: _____	_____
Dean of the Graduate College: _____	_____

Syllabus—must include all details as shown in the UGPC Guidelines.

Written Consent—required from all departments affected.

Go to: *http://graduate.fau.edu/gpc/* to download this form and guidelines to fill out the form.

1. **Course title/number, number of credit hours**
    Algebraic Topology, MTG 6396, 3 credit hours

2. **Course prerequisites**
    a. MAA 5228 and 5229 Introductory Analysis (Minimum Grade C)
    b. MAS 5311 and 5312 Introductory Abstract Algebra (Minimum Grade C)

3. **Course logistics**
    c. Term –Spring 2011
    d. Notation if online course – N/A
    e. Class location and time (if classroom-based course) – To be determined

4. **Instructor contact information**
    a. Instructor's name – Paul Yiu
    b. Office address – Science & Engineering Bld, SE43, Room 200
    c. Office hours – To be determined
    d. Contact telephone number – office (561) 297-2436, fax (561) 297-2436
    e. E-mail address – yui@fau.edu

5. **TA contact information (if applicable)**
    N/A

6. **Course description**
    This course is an introduction to the fundamental concepts and basic methods of algebraic topology: homotopy, homology and cohomology of cell complexes and their applications to geometry and algebra.

7. **Course objectives/student learning outcomes**
    *   Understand the basic concepts of algebraic topology: homotopy, homology and cohomology**.**
    *   Calculate fundamental groups and other homotopy and homology groups by the use of exact sequences**.**
    *   Learn some interplay between topology and algebra**.**

8. **Course evaluation method**
    There will be graded homework assignments accounting for 30% of the student's cumulative performance, a midterm exam, accounting for 30% of the student's cumulative performance, and a final exam (or project) that accounts for 40% of the cumulative performance. The overall grade in the course is derived from the cumulative performance according to the following table.

9. **Course grading scale (optional)**

Cumulative Performance	Grade
90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
0% -59%	F

10. **Policy on makeup tests, late work, and incompletes**

If a student cannot attend an exam or hand in a homework project on time due to circumstances beyond their control then the instructor may assign appropriate make-up work. Students will not be penalized for absences due to participation in University-approved activities, including athletic or scholastics teams, musical and theatrical performances, and debate activities. These students will be allowed to make up missed work without any reduction in the student's final course grade. Reasonable accommodation will also be made for students participating in a religious observance. Also, note that grades of Incomplete ("I") are reserved for students who are passing a course but have not completed all the required work because of exceptional circumstances. A grade of "I" will only be given under certain conditions and in accordance with the academic policies and regulations put forward in FAU's University Catalog. The student must show exceptional circumstances why requirements cannot be met. A request for an incomplete grade has to be made in writing with supporting documentation, where appropriate.

11. Special course requirements (if applicable)
N/A

12. Classroom etiquette policy (if applicable)
University policy on the use of electronic devices states: "In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions."

13. Disability policy statement
In compliance with the Americans with Disabilities Act (ADA), students who require special accommodation due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) -- in Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter, SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305) – and follow all OSD procedures.

14. Honor Code policy statement
Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 at http://www.fau.edu/regulations/chapter4/4.001 Honor_Code.pdf. If your college has particular policies relating to cheating and plagiarism, state so here or provide a link to the full policy.

15. Required texts/readings

J.P. May, A, *Concise Course in Algebraic Topology*, Chicgo Lectures in Mathematics, 1999.

16. Supplementary/recommended readings
   a. M. Agulier et al, *Algebraic Topology* from a Homotopical Viewpoint, Springer 2002.
   b. B. Gray, *Homotopy Theory*, Academic Press, 1975.
   c. D. Husemoller, *Fiber Bundles*, Graduate Text in Mathematics, 20, 1993.
   d. C. R. F. Maunder, *Algebraic Topology*, Dover reprint 1996.
   e. Moser and M.C. Tangora, *Chomology Operations and Applications in Homotopy Theory*, Dover reprint, 2008.
   f. N. Steenrod, *Topology of Fibre Bundles*, Princeton reprint, 1999.

g. J.W. Vick, *Homology Theory*, Graduate Text in Mathematics, 145, 1994.

17. Course topical outline

Lecture Schedule
  o Review of general topology (ca. 1 week)
  o Introduction to categories and functions (ca. 1 week)
  o Homotopy (ca. 1 week)
  o Natural group structure on sets of homotopy classes (ca. 1 week)
  o Fundamental group and covering spaces (ca. 2 weeks)
  o Construction of maps between spheres (ca. 3 weeks)
  o Homotopy exact sequences (ca. 2 weeks)
  o Basic homological algebra (ca. 1 week)
  o Cellular complexes (ca. 1 week)
  o Homology and cohomology of cell complexes (ca. 1 week)
  o Applications to selected algebra and geometry problems (ca. 2 weeks)