New Course Request

Indiana University

Indianapolis Campus

Check Appropriate Boxes: Undergraduate credit [X] Graduate credit [ ] Professional credit [ ]

1. School/Division [Science]

2. Academic Subject Code [Math]

3. Course Number [32100] (must be cleared with University Enrollment Services)

4. Instructor [TBA]

5. Course Title [Elementary Topology]

Recommended Abbreviation (Optional) ____________________________

6. First time this course is to be offered (Semester/Year): [Fall 2010]

7. Credit Hours: Fixed at ___ 3 ___ or Variable from ___________ to ___________

8. Is this course to be graded S-F (only)? Yes [X] No [ ]


10. Course description (not to exceed 50 words) for Bulletin publication: Introduction to topology, including metric spaces, abstract topological spaces, continuous functions, connectedness, compactness, curves, Cantor sets, continua and the Baire category Theorem. Also an introduction to surfaces including spheres, tori, the Mobius band, the Klein bottle and a description of their classification.

11. Lecture Contact Hours: Fixed at ___ 3 ___ or Variable from ___________ to ___________

12. Non-Lecture Contact Hours: Fixed at ___ 0 ___ or Variable from ___________ to ___________

13. Estimated enrollment: ___ 20 ___ of which ___ percent are expected to be graduate students.


15. Justification for new course: To enhance undergraduate math curriculum

16. Are the necessary reading materials currently available in the appropriate library? [Yes]

17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.

18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.

19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by:

[Signature] Date 10-13-2009

Department Chairman/Division Director

Dean of Graduate School (when required) Date ________________________

Approved by:

[Signature] Date 11-17-09

Dean

Chancellor/Vice-President Date ________________________

University Enrollment Services Date ________________________

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White.
**Department:** Mathematics

**Effective Session:** Fall 2010

**Instructions:** Please check the items below which describe the purpose of this request.

- 1. New course with supporting documents
- 2. Add existing course offered at another campus
- 3. Expiration of a course
- 4. Change in course number
- 5. Change in course title
- 6. Change in course credit/type
- 7. Change in course attributes (department head signature only)
- 8. Change in instructional hours
- 9. Change in course description
- 10. Change in course requisites
- 11. Change in semesters offered (department head signature only)
- 12. Transfer from one department to another

**Proposed:**

- Subject Abbreviation: Math
- Course Number: 32100
- Long Title: Elementary Topology
- Short Title: Topology

**Existing:**

- Subject Abbreviation:
- Course Number:
- Abbreviated title will be entered by the Office of the Registrar if omitted. (30 characters only)

**Credit Type:**

- Fixed Credit: Cr. Hrs: [ ]
- Variable Credit Range: Minimum Cr. Hrs: [Check One] To [ ] Or [ ] Maximum Cr. Hrs: [ ]
- Equivalent Credit: Yes [X] No

**Course Type:**

- Minutes Per Mgr: 75
- Meetings Per Week: 2
- Weeks Offered: 15
- % of Credit Allocated: 100

**Course Attributes:**

- Pass/No Pass Only
- Satisfactory/Unsatisfactory Only
- Repeatability
- Maximum Repeatable Credit:
- Credit by Examination
- Special Fees

**Course Description (Include Requisites/Restrictions):**

P: MATH 26100.

Introduction to topology, including metric spaces, abstract topological spaces, continuous functions, connectedness, compactness, curves, Cantor sets, continua, and the Baire Category Theorem. Also, an introduction to surfaces, including spheres, tori, the Mobius band, the Klein bottle and a description of their classification.
MATH 32100
Elementary Topology

Syllabus

1. Metric spaces
   (a) abstract metrics
   (b) open and closed sets
   (c) continuous functions

2. topologies
   (a) open and closed sets
   (b) topological spaces
   (c) bases and subbases for a topology
   (d) continuous functions

3. topological spaces
   (a) metric topologies and equivalence of metrics
   (b) the trivial and discrete topologies
   (c) ordered spaces and the order topology
   (d) subspaces and the subspace topology topology
   (e) product spaces and the product topology
   (f) quotient spaces and the quotient topology

4. properties of topological spaces
   (a) Hausdorff spaces
   (b) connected spaces
   (c) path connected spaces
   (d) connected and path connected components
   (e) locally connected spaces
   (f) compactness
   (g) sequential compactness
   (h) compactness in metric spaces and complete metric spaces
5. special spaces and examples
   (a) maps of the interval and space filling curves
   (b) Cantor sets and embedding Cantor sets in $\mathbb{R}^n$
   (c) continua and decomposability
   (d) Baire spaces and the Baire category theorem

6. surfaces
   (a) the sphere and the Jordan curve theorem
   (b) the torus
   (c) the Möbius band
   (d) the Klein bottle
   (e) classification of surfaces