New Course Request

Indiana University Indianapolis Campus

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

1. School/Division: Science
2. Academic Subject Code: Math
3. Course Number: 42500 (must be cleared with University Enrollment Services)
4. Instructor
5. Course Title: Elements of Complex Analysis
   Recommended Abbreviation (Optional) (Limited to 32 Characters including spaces)

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 [ ]
9. Is variable title approval being requested? Yes [ ] No [X]
   P: MATH 26100 and MATH 35100.
10. Course description (not to exceed 50 words) for Bulletin publication: Complex numbers and complex-valued functions; differentiation of complex functions; power series, uniform convergence; integration; contour integrals; elementary conformal mapping.

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: 15 of which ________ percent are expected to be graduate students.
14. Frequency of scheduling: 1/year Will this course be required for majors? Possible
15. Justification for new course: Needed for pure math and engineering

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: ___________________________ Date: 10-19-2009

Department Chairman/Division Director

Dean of Graduate School (when required) Date: ___________________________ Date: 11-17-09

Approved by: ___________________________ Date: 11-17-09

Dean ___________________________ Date: ___________________________

Chancellor/Vice-President ___________________________

University Enrollment Services ___________________________

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.
PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

DEPARTMENT Mathematical Sciences
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: ____________
Long Title: Elements of Complex Analysis
Short Title: ___________________________

EXISTING:

Subject Abbreviation Math: ___________________________
Course Number: ____________

TERMS OFFERED

Check All That Apply:
☐ Summer
☒ Fall
☐ Spring

CAMPUS(ES) INVOLVED
☐ Calumet
☐ Cort. Ed
☐ N. Central
☐ Ft. Wayne
☒ Tech Statewide
☐ Indianapolis
☐ W. Lafayette

CREDIT TYPE

1. Fixed Credit: Cr. Hrs.: ___________________________
2. Variable Credit: Range: ___________________________
   Minimum Cr. Hrs. ___________________________
   (Check One) To ___________________________
   Or ___________________________
   Maximum Cr. Hrs.: ___________________________
3. Equivalent Credit: Yes ☐ No ☒

COURSE ATTRIBUTES: Check All That Apply

☐ 1. Pass/Not Pass Only
☐ 2. Satisfactory/Unsatisfactory Only
☐ 3. Repeatable
☐ 4. Credit by Examination
☐ 5. Special Fees

☐ 6. Registration Approval Type
   Department ☐ Instructor ☒

☐ 7. Variable Title
☐ 8. Honors
☐ 9. Full Time Privilege
☐ 10. Off Campus Experience

Schedule Type

Lecture
Recitation
Presentation
Lab Prep
Studio
Distance
Clinic
Experiential
Research
Ind. Study
Prac/Observ

Minutes Per Mtg
75
2
10

Schedule Type

Meetings Per Week
Weeks Offered
% of Credit Allocated
15
100

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

P: MATH 26100 and MATH 35100.
Complex numbers and complex-valued functions; differentiation of complex functions; power series, uniform convergence; integration, contour integrals; elementary conformal mapping.

Calumet Department Head: Date
Calumet: School Dean: Date

Ft. Wayne Department Head: Date
Ft. Wayne School Dean: Date

Indianapolis Department Head: Date
Indianapolis School Dean: Date

North Central Department Head: Date
North Central Chancellor: Date

West Lafayette Department Head: Date
West Lafayette College/School Dean: Date
West Lafayette Registrar: Date

OFFICE OF THE REGISTRAR
MATH 42500
Elements of Complex Analysis
Description

Complex numbers and complex-valued functions; differentiation of complex functions; power series, uniform convergence; integration, contour integrals; elementary conformal mapping.
MATH 42500
Elements of Complex Analysis
Fundamentals of Complex Analysis, 3rd Edition,

Syllabus

1. Complex Numbers
   (a) cartesian and polar representation of complex numbers
   (b) arithmetic of complex numbers
   (c) powers and roots of complex numbers

2. Analytic Functions
   (a) functions of a complex variable
   (b) analytic functions
   (c) the Cauchy-Riemann equations

3. Elementary Functions
   (a) the exponential function
   (b) the trigonometric functions
   (c) the logarithmic function
   (d) complex powers

4. Complex integration
   (a) contour integrals
   (b) path independence
   (c) Cauchy’s integral theorem and consequences

5. Series
   (a) power series for analytic functions
   (b) convergence
   (c) Laurent series
   (d) zeros and singularities
   (e) analytic continuation

6. Residue theory
   (a) the residue theorem
   (b) improper integrals

7. Conformal Mappings