New Course Request  Indiana University  Indianapolis Campus

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

1. School/Division  Science / Mathematical Sciences  2. Academic Subject Code  MATH

3. Course Number  266  (must be cleared with University Enrollment Services)  4. Instructor

5. Course Title  Ordinary Differential Equations

Recommended Abbreviation (Optional) (Limited to 32 Characters including spaces)

6. First time this course is to be offered (Semester/Year):  Fall 2008

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

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

9. Is variable title approval being requested? Yes [ ] No [X]

10. Course description (not to exceed 50 words) for Bulletin publication:  P: 166 and 171 (minimum grade of C in each). Fall, Spring, Summer. First order equations, second and n'th order linear equations, series solutions, solution by Laplace transform, systems of linear equations.

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: 100 of which 0 percent are expected to be graduate students.

14. Frequency of scheduling: Every Sem  Will this course be required for majors? Yes [ ]

15. Justification for new course: New course partially replaces MATH 262; change in credit hours 4 to 3.

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:  

Department Chairman/Division Director  Date 3/12/08

Approved by:  

Dean  Date 3/12/08

Dean of Graduate School (when required)  Date

Chancellor/Vice-President  Date

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.

University Enrollment Services Final—White: Chancellor/Vice-President—Blue: School/Division—Yellow: Department/Division—Pink: University Enrollment Services Advance—White
MATH 266
ORDINARY DIFFERENTIAL EQUATIONS
*Elementary Differential Equations, Eighth edition*
by William E. Boyce and Richard C. DiPrima
John Wiley & Sons, Inc., 2005

Course Syllabus

*Prerequisites:* Math 166 and 171 with a minimum grade of C in each.

*Course Description:* We will cover topics selected from Chapters 1 through 7 of the text. However, we will cover the topics in a different order than the book. Topics include first- and second-order differential equations, applications, first-order systems, power series solutions, the method of Laplace transform. The topics covered have important applications in science and engineering.

1. **FIRST-ORDER EQUATIONS**
   - Integrating Factor and First-Order Linear Equations
   - Separable Equations, Homogeneous Equations
   - Exact Equations
   - Some Basic Theory, Integral Curves, Orthogonal Trajectories
   - Applications to Mixture and Population Growth Problems

2. **HIGHER-ORDER LINEAR EQUATIONS**
   - Reduction of Order, Complementary Solutions
   - Particular Solutions, Method of Undetermined Coefficients
   - Forms of Particular Solutions & Annihilator Operator
   - -Particular Solutions, Method of Variation of Parameters
   - Application to Oscillating Systems

3. **FIRST-ORDER LINEAR SYSTEMS**
   - Eigenvalues & Eigenvectors, Homogeneous Solutions
   - Solutions of Nonhomogeneous Systems

4. **SERIES SOLUTIONS**
   - Series Solutions near Ordinary Points
   - Regular Singular Points; the Cauchy-Euler Equation
   - Frobenius Solutions near Regular Singular Points (Case I)
   - Frobenius Solutions (Case II & III)
5. THE LAPLACE TRANSFORM

- Transforms of Step and Periodic Functions, Derivatives, etc.
- Transform of Convolution Integrals, Initial-Value Problems
- Initial-Value Problems, Transform of the Dirac Delta Function
**DEPARTMENT:** Mathematical Sciences  
**EFFECTIVE SESSION:** Fall 2006

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

- [ ] 1. New course with supporting documents
- [x] 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:** 286
- **Long Title:** Ordinary Differential Equations
- **Short Title:**

  Abbreviated title will be entered by the Office of the Registrar if omitted. (22 CHARACTERS ONLY)

**EXISTING:**

- **Subject Abbreviation:** MATH
- **Course Number:** 286
- **Long Title:** Ordinary Differential Equations
- **Short Title:**

**TERMS OFFERED:** Check all that apply:

- [x] Summer
- [ ] Fall
- [x] Spring

**CAMPUS(ES) INVOLVED:**

- [x] Calumet
- [ ] Cont Ed
- [ ] Ft. Wayne
- [ ] North Central
- [ ] Tech Statewide
- [ ] W. Lafayette

**CREDIT TYPE:**

1. Fixed Credit: Cr. Hrs.

   3

2. Variable Credit Range:

   Minimum Cr. Hrs:  
   (Check One) To  
   Or  
   Maximum Cr. Hrs:  

3. Equivalent Credit:  
   Yes  
   No  

4. Thesis Credit:  
   Yes  
   No  

**INSTRUCTIONAL TYPE:**

- [ ] Lecture
- [ ] Recitation
- [ ] Presentation
- [ ] Laboratory
- [ ] Lab Prep
- [ ] Studio
- [ ] Distance
- [ ] Clinic
- [ ] Experiential
- [ ] Research
- [ ] Ind. Study
- [ ] Pract/Observer

**Minutes Per Mth Meetings Per Week Weeks Offered % of Credit Allocated Delivery Method (Asym. Or Syn.) Delivery Medium (Audio, Internet, Live, Text-Based, Video)**

**COURSE ATTRIBUTES:** Check all that apply

- [ ] 1. Pass/Not Pass Only
- [ ] 2. Satisfactory/Unsatisfactory Only
- [ ] 3. Repeatable
- [ ] 4. Credit by Examination
- [ ] 5. Designator Required
- [ ] 6. Special Fees
- [ ] 7. Registration Approval Type
- [ ] Department
- [ ] Instructor
- [ ] 8. Variable Title
- [ ] 9. Remedial
- [ ] 10. Honors
- [ ] 11. Full Time Privilege
- [ ] 12. Off Campus Experience

**COURSE DESCRIPTION (INCLUDE REQUIREMENTS):**

P: 166 and 171 (minimum grade of C in each). First order equations, second and n-th order linear equations, series solutions, solution by Laplace transform, systems of linear equations.

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**Calumet Department Head:** Date  
**Calumet School Dean:** Date

**Fort Wayne Department Head:** Date  
**Fort 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

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**OFFICE OF THE REGISTRAR**