Program on which the course is given: All programs
Major or minor elements of program: N.A.
Departments offering the program: All departments
Department offering the course: Department of Basic Science
Academic year/level: Second year - Second semester
Date of specification approval: / / 2009

A - Basic Information

Title: Mathematics
Credit Hours: N.A.
Tutorial: 2

B - Professional Information

1. Overall aims of the course
   By the end of this course the student will be able to:
   ➢ Obtain a series solution of a second order differential equation at ordinary and regular points.
   ➢ Work with Bessel functions and Legendre polynomials.
   ➢ Use Laplace transforms in solving differential equations.
   ➢ Obtain Fourier series expansions of piecewise continuous functions.
   ➢ Evaluate double, triple integrals and surface integrals of scalar functions and apply them to compute areas, volumes, masses, centers of mass and moments of inertia.
   ➢ Deal with vector fields and evaluate line and surface integrals.

2. Intended Learning outcomes of the course
   (a) Knowledge and understanding
      (i) Acquire knowledge for subsequent courses in mathematics.
      (ii) Acquire tools for introductory and advanced engineering courses.
   (b) Intellectual skills
      (i) Develop prerequisite analytical skills for subsequent courses in mathematics.
      (ii) Acquire familiarity with modeling physical and engineering problems.
   (c) Professional and practical skills
      N.A.
   (d) General and transferable skills
      N.A.
3. Contents

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<th>No of hours</th>
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<td>Special functions of mathematical physics</td>
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<td>Laplace transforms with applications</td>
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<td>Fourier series expansions</td>
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<td>Vector analysis</td>
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</table>

4. Teaching and learning methods
   (a) Lectures (power point presentation recommended)
   (b) Class tutorials

5. Students’ assessment methods
   (a) Midterm examination
   (b) Assignments and quizzes
   (c) Final examination

5.1 Assessment schedule
   Weekly

5.2 Weighting of assessments
   Class participation and attendance           10%
   Assignments and quizzes                       10%
   Midterm examination                           20%
   Final examination                             60%

6. List of references
   (i) Lecture Notes
       Differential equations II Staff members
       Multivariable calculus II Staff members
   (ii) Reference Books
       Thomas and Finney Latest edition

7. Facilities required for teaching and learning
   Data show – projector

   Course Coordinator
   Head of Department