



## Course specification

University/Academy: Damanhour University

Faculty/Institute: Science

Department: Mathematics

### 1. course Data:

Course code: Math424	Course title: Partial Differential Equations and Transforms	Academic year/level: 2010-2011 Fourth year - Second term
Specialization: Mathematics and Physics	No. of instructional units: lecture <input type="text" value="2"/> tutorial <input type="text" value="2"/> practical <input type="text" value="-"/>	

### 2. course Aim

Demonstrate theoretical knowledge and have practical skills in the subject of advanced Partial Differential Equations and Transforms. Demonstrate an ability to initiate and sustain in-depth research relevant to Partial Differential Equations and Transforms. Have an opportunity to put theory into practice via work-based learning.

### 3. Intended learning outcome

#### a) Knowledge and understanding

a1. State the theories and concepts used in Partial Differential Equations and Transforms.

a2. Identify the steps required to carry out a piece of research on a topic within Partial Differential Equations and Transforms.

a3. Recognize the contribution and impacts of real analysis in different areas of science.

#### b) Intellectual skills

b1. Apply appropriate theories, principles and concepts relevant to the Partial Differential Equations and Transforms.

b2. Assess and evaluate the literature within Partial Differential Equations and Transforms.



	<p>b3. Demonstrate an appropriate judgment in selecting and presenting information using various methods relevant to Partial Differential Equations and Transforms.</p>
<p><b>c) Professional skills</b></p>	<p>c1. Plan and design practical activities using techniques and procedures appropriate to Partial Differential Equations and Transforms.</p> <p>c2. Plan and design a piece of independent research using Partial Differential Equations and Transforms.</p>
<p><b>d) General skills</b></p>	<p>d1. Use appropriate effective written and oral communication learning relevant to the topics in the course of Partial Differential Equations and Transforms.</p> <p>d2. Work effectively as part of a group, involving leadership, group dynamics and interpersonal skills such as listening, negotiation and persuasion relevant to these topics.</p> <p>d3. Deal with problems relevant to Partial Differential Equations and Transforms topics using ideas and techniques some of which are at the forefront of the discipline.</p> <p>d4. Think independently and develop the ability to self appraise and reflect on scientific data Arabic and in English relevant to real analysis.</p>
<p><b>4. course content</b></p>	<p>The Cauchy problem.</p> <p>Cauchy - Kowalewsky theorem.</p> <p>Wave equation.</p> <p>Hyperbolic equations.</p> <p>The mixed problem.</p> <p>Elliptic equations.</p> <p>Harmonic functions.</p> <p>Parabolic equations.</p> <p>Heat conduction equation.</p> <p>Extremum principle.</p> <p>Laplace, Fourier and integral transforms.</p>



	Applications.
<b>5. Teaching and learning methods</b>	5.1 Lectures. 5.2 Tutorials 5.3 Homework 5.4 Oral discussion
<b>6. teaching and learning methods for students with special needs</b>	Non
<b>7. Student Assessment</b>	
<b>a. Procedures used:</b>	Final exam
<b>b. Schedule:</b>	Assessment 1    Final exam    Week 15
<b>c. Weighing of Assessment:</b>	Final exam 200 Marks
<b>8. List of Textbooks and References:</b>	
<b>a. Course Notes</b>	Course notes provided by the staff member of Math department, to be handed at the beginning of the semester.
<b>b. Required Books (Textbooks)</b>	Courant and Hilbert, Mathematical Physics, Springer Verlage, 1988
<b>1- Recommended Books</b>	None
<b>2- Periodicals, web sites,...,etc</b>	None

**Course Instructor:** Dr. Ragab Omar Abd El-Rahman

**Head of Department:** Dr. Ragab Omar Abd El-Rahman

**Date:**    /    /