



University: *Fayoum University*
 Faculty: *Computers and Information*
 Department: *Computer Science*

Course Specification

1- Basic Information			
Code: GEN 228	Course Title: Mathematics (4)	Year/Level: Second year – Second term	
Programme: B.Sc degree in Computer Science	Number of units:	Lecture:	4 hrs/ week
		Tutorial:	3 hrs/ week
		Practical:	0 hrs/ week

2- Aims of Course:	To introduce the students to the basic concepts methods of solving second and higher –order differential equations and affrication on it.
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3- Intended Learning Outcomes	
A- Knowledge and Understanding:	<p>A3. Demonstrate the essential mathematics and physics relevant to computer science.</p> <p>A7. Demonstrate essential facts, concepts, principles and theories relating to computing and information and computer applications as appropriate to the program of study</p> <p>A8. Express the main concepts of statistics, probability theory, algebra and numerical analysis and their role in the computing and information discipline.</p> <p>a1) Second and higher- order differential equations</p> <p>a2) System of linear diff eq.</p> <p>a3) Series solutions. Lap lace Trans forms</p> <p>a4) Special Functions partial diff eq.</p> <p>a5) System of linear first- order diff. esq.</p> <p>a6) Numerical methods for or diary diff. eq.</p>
B- Intellectual Skills:	<p>B1. Analyze real problems, and appropriate problem solving methods that satisfy commercial or industrial constraints and analyze results.</p> <p>B4. Apply solutions to a computer science problem, follow-up on solution to verify it, and if necessary restrict the solution methodologies upon the results.</p> <p>B7. Determine goals for problem solving and test the result of the solution of the problems.</p> <p>B11. Evaluate a range of innovative design patterns and solutions to solve a computer science problem containing a range of commercial and industrial constraints.</p>

	<p>b1) Evaluate mathematical problems b2) Compare between solutions b3) Apply methods of solutions</p>
C- Professional and Practical Skills:	<p>C1. Analyze and improve organizational processes from an ICT perspective. C8. Deploy appropriate tools for the construction and documentation of computer-based systems that are used to solve practical problems. C9. Deploy different modeling techniques to model and analyze real life computing problems. C11. Develop a range of fundamental research skills that enable the graduate to continuously increase his knowledge, advance his career and pursue graduate studies. c1) The graduate would be proficient in using methods to solve problems. c2) To prove and solve different problems</p>
D- General and transferable Skills	<p>D2. Use effective information-retrieval skills (including the use of browsers, search engines and catalogues) and general IT facilities. D4. Demonstrate independent critical thinking and problem solving skills. d1) Mark a report d2) To gain access to data and information from libraries and internet related to the course subject.</p>

4-Course Content:	<ol style="list-style-type: none"> 1. Second and higher-order differential equations. 2. Applications of second-order differential equations with constant coefficients. 3. Systems of linear differential equations. 4. Series solutions. 5. Laplace transforms. 6. Special functions. 7. Partial differential equations. 8. Boundary value problems. 9. Fourier series and integrals. 10. Diffusion, potential and wave equations in rectangular, 11. Cylindrical, and spherical co-ordinates.
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5- Teaching and Learning Methods:	<ol style="list-style-type: none"> 1. Lectures 2. Tutorials 3. Class discussions 4. Internet searches 5. Independent Work 6. Problem-based Learning
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6- Teaching and Learning Methods for handicapped students :	-
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7- Student Assessment	
A- Assessment Methods:	<ol style="list-style-type: none"> 1. Assignments and Quizzes 2. Midterm written exam 3. Oral exam 4. Final written exam
B- Assessment schedule:	Midterm Examination: Week 7 Oral Examination: Week 14 Final Examination: Week 15
C- Weighting of assessments:	Assignments and Quizzes: 0% Mid-Term Examination: 16% Oral Examination: 8% Final-term Examination: 76%

8- Books and References	
A- Notes:	-
B- Essential Books (Text Books):	<ul style="list-style-type: none"> ▪ A first course in differential equations with modeling applications by Dennis Ger. Zillah (2015)
C- Recommended Books:	-
D- Periodicals, Web sites, ... etc	-

Course Professor: Dr. Fathi Mohamed Department Head: Dr. Amira Edress

Course Content Intended Learning Outcomes Matrix

Course Title: Mathematics (4)

Course Code: GEN 228

Course Content	Week	Knowledge & Understanding						Intellectual Skills			Professional & Practical Skills		General & Transferable Skills	
		a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	c2	d1	d2
1. Second and higher-order differential equations.	1	x						x	x	x	x	x	x	x
2. Applications of second-order differential equations with constant coefficients.	2	x						x	x	x	x	x	x	x
3. Systems of linear differential equations.	3		x			x		x	x	x	x	x	x	x
4. Series solutions.	4			x				x	x	x	x	x	x	x
5. Laplace transforms.	5			x				x	x	x	x	x	x	x
6. Special functions.	6				x			x	x	x	x	x	x	x
7. Partial differential equations.	7				x			x	x	x	x	x	x	x
8. Boundary value problems.	8				x			x	x	x	x	x	x	x
9. Fourier series and integrals.	9				x			x	x	x	x	x	x	x
10. Diffusion, potential and wave equations in rectangular,	10						x	x	x	x	x	x	x	x
11. cylindrical, and spherical co-ordinates	11						x	x	x	x	x	x	x	x

Course coordinator: Dr. Fathi Mohamed

Head of Department: Dr. Amira Edress