Course Specification:Mathematics 4 MTH102

1. Basic Information

Program Title	Biomedical Engineering
Department offering the Program	Biomedical Engineering
Department Responsible for the Course	Mathematics and Engineering Physics
Course Code	MTH102
Year/ Level	100
Specialization	Major
Requirements	MTH101
Authorization date of course specification	

Teaching Hours	Credit	Lectures	Tutorial	Practical
	2	1	2	0

2. Course aims:

No.	Aim
1	Apply knowledge of mathematics to solve fundamental engineering problems.
3	Encourage the in-self and life-long learning to acquire the appropriate mathematical tools.

3. Intended Learning Outcomes (ILOs):

a. Knowledge and Understanding:

No.	Knowledge and Understanding
A1	Acquire Scientific principles and methodology necessary to understand theories of mathematics (3D and 2D fields) as required by engineering.

b. Intellectual Skills

No.	Intellectual Skills
B1	Select appropriate solutions for mathematical problems based on analytical thinking.

c. Professional Skills

No.	Professional Skills
C1	Apply knowledge of mathematics, to solve engineering problems.

d. General Skills

No.	General Skills
D1	Work as a team and/or independently, as appropriate.
D3	Communicate effectively through oral presentations and written reports.

4. Course Contents:

No.	Topics	Weeks
1	Gamma, Beta.	1
2	Bessel and Legendre functions.	2
3	Fourier series and Fourier Integral	3-4
4	Boundary value problem (heat, wave and Laplace equations).	5-6
5	Complex numbers	7,9
6	Functions of a complex variable	10
7	Elementary functions	11
8	Conformal mapping	12
9	Complex integration	13
10	Power series	14
11	Residue theorem	14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Lectures
2	Discussion Sessions

6. Teaching and Learning Methods for Disabled students

No.	Teaching Method	Reason
1	Extra Discussion sessions	To answer any questions

7. Student Evaluation:

7.1 Student Evaluation Methods:

No.	Evaluation Method	ILOs

1	Mid Term Examination	A1, B1, C1
2	Semester work	B1, C1, D1, D3
3	Final Term Examination	A1, B1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Mid Term Examination	8
2	Semester work	Weekly
3	Final Term Examination	15

7.3 Weighting of Evaluations:

No.	Evaluation Method	Weights
1	Mid Term Examination	30%
2	Semester work	20%
3	Final Term Examination	50%
Total		100%

8. List of References

No.	Reference List
1	Larry Andrews, Special functions of Mathematics for Engineers, Second Edition, SPIE PRESS, (1998).
2	J. W. Brown and R. V. Churchill, Complex variables and applications, McGraw-Hill, New York,2009.
3	Stroud, K. A., and Dexter J. Booth. Engineering mathematics. New York: Industrial Press, 2013.
4	Stroud, K. A., and Dexter J. Booth. Advanced engineering mathematics. New York: Industrial Press, 2011.
5	Lecture notes

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Sound System
5	Wireless Internet

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	Aims	Knowledge &Understanding	Intellectual Skills	Professional Skills	General Skills
1	Gamma, Beta.	1	A1			
2	Bessel and legendre functions.	1,3	A1	B1	C1	D1, D3
3	Fourier series and Fourier Intergral	1,3	A1	B1	C1	D1
4	Boundary value problem (heat, wave and laplace equations).	1,3	A1			D1
5	Complex numbers	1,3	A1	B1	C1	D3
6	Functions of a complex variable	1,3	A1		C1	D3
7	Elementary functions	1,3	A1	B1		D3
8	Conformal mapping	1,3	A1		C1	D1
9	Complex integration	1,3	A1		C1	D1
10	Power series	1,3	A1	B1	C1	D3
11	Residue theorem	1,3	A1	B1	C1	D3

Course Coordinator: Prof. Dr.

Head of Department: Assoc. Prof. HossamEldeen Moustafa

Date of Approval: