Menoufiya University
Faculty of Electronic Eng.
Department of Physics and
Engineering Mathematics

جامعة المنوفية
كلية الهندسة الإلكترونية
قسم الفيزيقا والرياضيات الهندسية

Annual Course Report

(ENGINEERING MATHEMATICS ٥, ٦)

A-   Basic Information

١ **Title and Code**

Engineering Mathematics
PM ٢٠١ and PM ٢٠٢

٢ **Programme(s) on which this course is given**   Physics and engineering math. Dept.

٣ **Academic year / Level of programme**   Second year ٢٠١١-٢٠١٢

٤ **Units/Weekly hours**

Lecture | ٨ | Tutorial/Practical | ٤ | Total | ١٢ |

٥- **Names of lecturers contributing to the delivery of the course**

i- Prof. Dr Saied El-Serafi
ii- Prof. Emil Shoukralla
iii- Dr. Ramadan El-Shanawany
iv- Assoc. Prof. Wedad Ali

Course coordinator: Prof. Dr Saied El-Serafi

External evaluators: Prof. Dr. Sayed M. Farag

B- Statistical Information

No. of students attending the course: No. | ٨٦٠ | % | ١٠٠ |

No. of students completing the course: No. | ٨٣٤ | % | ٩٦.٩٨ |

Results:

Passed: No. | ٧٩٠ | % | ٩٤.٧٢ | Failed: No. | ٤٤ | % | ٥.٢٨ |

Grading of successful students:

Excellent: No. | ١٥٦ | % | ١٨.٧١ | Very Good: No. | ٢١٢ | % | ٢٥.٤٢ |

Good: No. | ١٦٩ | % | ٢٠.٢٦ | Pass: No. | ٢٥٣ | % | ٣٠.٣٣ |

C- Professional Information

1. **Course Teaching**

Topic	No of hours	Lecture/ hours	Tutorial/ Practical
١. Periodic Functions – Trigonometric Series – Convergence of Fourier series.	٥	٣	٢
٢. Euler Formulas – Fourier coefficients Fourier series with different period.	٥	٣	٢
٣. Fourier series for discontinuous functions – Even and Odd functions.	٥	٣	٢
٤. Even and Odd harmonics – Even and Odd cosine or sine functions.	٥	٣	٢
٥. Practical harmonic analysis.	٥	٣	٢
٦. Fourier series in complex form.	٥	٣	٢
٧. Fourier Integrals – Fourier Transform.	٥	٣	٢
٨. Error Estimation: Sources and Classifications of Errors, Absolute Error and Relative Error	٥	٣	٢
٩. Approximation Theory, Approximation of Functions by Polynomials	٥	٣	٢
١٠. Taylor Polynomials, Orthogonal Plynomials of Functions Uniformly	٥	٣	٢
١١. Approximation: Pade Approximant. Least Squares Methods.	٥	٣	٢
١٢. Interpolation: Lagrange, Newton Interpolating Polynomials	٥	٣	٢
١٣. Numerical Differentiation.	٥	٣	٢
١٤. Numerical integration١	٥	٣	٢
Total sum	٧٠	٤٢	٢٨

Topic	No of hours	Lecture	Tutorial/ Practical
Differentiation of vector functions – Curvature and Torsion of a vector curve.	٥	٣	٢
Scalar and vector fields – Gradient of scalar functions – Divergence of vector functions.	٥	٣	٢
Curl of vector functions – Orthogonal curvilinear coordinates – Line integral of vector functions.	٥	٣	٢
Surface and volume integral of vector functions – Green's theorem, Stock's theorem.	٥	٣	٢
Gauss's theorem – Complex numbers – complex functions.	٥	٣	٢
Limits, continuity and differentiation of complex functions – Analytic functions – Cauchy-Riemann equations.	٥	٣	٢
Harmonic functions – Elementary complex functions – Line integral of complex functions.	٥	٣	٢
Contour integral – Cauchy's integral theorems.	٥	٣	٢
Power series of complex functions (Taylor series, Maclaurin series and Laurent series).	٥	٣	٢
Singularities and Zeros – Residues at poles – Residue theorem of integration.	٥	٣	٢
Basic concepts, types and classification	٥	٣	٢

of partial differential equations – Initial value problems.			
Method of separation variables – One dimensional equations.	٥	٣	٢
Two dimensional equations.	٥	٣	٢
Total sum	٦٥	٣٩	٢٦

Topics taught as a percentage of the content specified:

>٩٠ % ☐   ٧٠-٩٠ % √   <٧٠٪ ☐

٢. **Teaching and Learning Methods:**

Lectures: √

Practical Training/ Laboratory: ☐

Seminar/Workshop: ☐

Class Activity: √

Case Study: ☐

Other Assignments/Homework: √

Case Study
 Other assignments/homework:
  A real world project assigned.

٣. **Student Assessment:**

Method of Assessment	Percentage of total
Written examination	٦٨
Midterm exams	٢٠
Oral Examination	٦
Practical/laboratory work	٠
Other Assignments/class work	٦
Total	١٠٠ %

Members of Examination Committee:
١. Prof.Dr. Emil Shokralla
٢. Prof. Dr. Magdi Kamel
٣. Assoc. Prof. Wedad Ali

Role of external evaluator:
- Review examination to cover all objectives of the syllabus
- Confirming reliability and feasibility of the examination
- Determining repetition of the questions

٤. Facilities and Teaching Materials:

Totally adequate ☐

Adequate to some extent ☑

Inadequate ☐

٥. Administrative Constraints

- Students need extra hours to practice their exercises.
- Insufficient class rooms and facilities.

٦. Student Evaluation of the course: Response of
                                   Course Team

-Insufficient background in computer software programming.	- An extra exercises and solved problems are added to the course.

٧. Comments from external evaluator(s):

There is a gap between up-to-date information and reference text books.

٨. Course Enhancement:

Action Plan for Academic Year ٢٠١١ – ٢٠١٢:

Improvement Field	Weak points	Action required	Person Responsible	Completion Date
Assessment Methods	Midterm only & Reports	- add quizzes - Research, survey	Lectures	٢٠١٢
Quality of Teaching and Learning	- lack of facilities - Huge number of students	- Increasing data show numbers -Dividing the students into subgroups	Faculty	٢٠١١
Learning resources	Lack of availability of teaching & learning resources	Increasing number of computers and Labs workshop facilities	- Faculty - Department	٢٠١٣
Course content	١- To be renewed and developed. ٢- Shortage in computer software programming	١- ٢٠٪ of courses to be reviewed and replaced by new topics ٢- Adding special mathematical software programming.	- Lectures - Department, Faculty	٢٠١١

Head of Department:

Prof. Dr. Magdi Kamel