University / Academy: Menoufiya University

College / Institute: Faculty of Electronic Engineering

Department: Physics and Engineering Mathematics

Course Specification

١- Course basic information :		
Course Code: PM ٢٠١	**Course Title:** **Engineering Mathematics (٥)**	**Academic year: ٢٠١٢-٢٠١٣** **Second Year** **Level (٢) – Semester : ١**
Department requirement **Faculty requirement** **University requirement**	**Teaching hours: Lecture [٤]** **Tutorial [٢]**	

٢- Aim of the course	**a. Understand the principles of Fourier series.** **b. Understand the calculus and convergence of Fourier series.** **c. Understand Fourier Integrals and Fourier Transform.**
٣- Intended Learning Outcomes:	
A- Knowledge and Understanding:	**The graduates of electronic engineering program should demonstrate knowledge and understanding of:** **a١. Concepts and theories of mathematics and sciences, appropriate to the discipline.** **a٥. Methodologies of solving engineering problems, data collection and interpretation.** **a١٢. Contemporary engineering topics.**
B- Intellectual Skills	**The graduates of electronic engineering program should be able to:** **b١. Select appropriate mathematical and computer-based methods for modeling and analyzing problems.** **b٢. Select appropriate solutions for engineering problems based on analytical thinking.**

	b٤. Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
C- Professional Skills	The graduates of electronic engineering program should be able to: c١. Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.
D- General Skills	The graduates of the engineering programs should be able to: d١. Collaborate effectively within multidisciplinary team. d٣. Communicate effectively. d٧. Search for information and engage in life-long self learning discipline.
٤- Course Contents	Fourier series – Fourier integral – Numerical analysis
٥- Teaching and Learning Methods	- Lectures - Exercises and tutorials - Research assignments
٦- Teaching and Learning Methods for disable students	N/A
٧- Student Assessment	
a- Assessment Methods	- Quizzes - Mid-term and final exams
b- Assessment Schedule	Assessment ١: ٥th week. Mid-term examination: ٨th week. Assessment ٢: ١٠th week. Final written examination: ١٦th - ١٧th weeks
c- Weighting of Assessment	Mid-term examination: ٢٠٪ Final-term examination: ٦٨٪ Semester work: ٦٪

	Other types of assessment	٦٪	
	Total	١٠٠٪	

٨- List of text books and references:	
a- Course notes	**There are lectures notes prepared in the form of a book authorized by the department.**
b- Text books	**[١] Emil Shokralla, applied numerical analysis, Publishing for universities – Cairo [Arabic Edition].** **[٢] Emil Shokralla, special function and Fourier analysis, Publishing for universities – Cairo [Arabic Edition].** **[٣] Introduction to Engineering Mathematics, H. K. Dass and R. Verma, ٢٠٠٢.**
c- Recommended books	**None**
d- Periodicals, Web sites ……etc	**Web Sites related to Mathematics and Mathematical engineering such as:** **www.sosmath.com,** **www.math.hmc.edu,** **www.tutorial.math.lamar.edu,** **www.web.mit.edu**

Course contents - ILOs Matrix

Content Topics	Week	A- Knowledge & Understanding	B- Intellectual skills	C- Professional and practical skills	D- General and transferable skills
Fourier Series: **Periodic Functions –** **Trigonometric Series –** **Convergence of Fourier series.**	١	a١,a٥	b٢,b٤	c١	d١,d٣,d٧

Fourier Series: **Euler Formulas – Fourier coefficients-Fourier series with different period.**	٢	a١,a٥	b٢,b٤	c١	d١ ,d٧
Fourier Series: **Fourier series for discontinuous functions – Even and Odd functions.**	٣	a١,a٥	b٢,b٤	c١	d٣,d٧
Fourier Series: **Even and Odd harmonics –** **Even and Odd cosine or sine functions.**	٤	a١,a٥	b٢,b٤	c١	d٣,d٧
Fourier Series: **Practical harmonic analysis.**	٥	a١,a٥,a١٢	b٢,b٤	c١	d١,d٣
Fourier Series: **Fourier series in complex form.**	٦	a١,a٥	b٢,b٤	c١	d٣
Fourier Integrals: **Fourier integrals –** **Fourier Transforms.**	٧	a١,a٥,a١٢	b٢,b٤	c١	d١,d٧
Numerical analysis: **Error Estimation - Sources and Classifications of Errors - Absolute Error and Relative Error**	٨	a١,a٥,a١٢	b٢,b٤	c١	d١,d٣,d٧
Numerical analysis: **Approximation Theory -**	٩	a١,a٥,a١٢	b٢,b٤	c١	d١,d٣

Approximation of Functions by Polynomials					
Numerical analysis: **Taylor Polynomials - orthogonal Polynomials of Functions Uniformly**	١٠	a١,a٥	b٢,b٤	c١	d١
Numerical analysis: **Pade Approximation - Least Squares Methods.**	١١	a١,a٥	b١,b٢,b٤	c١	d٧
Numerical analysis: **Interpolation – Lagrange and Newton Interpolating Polynomials**	١٢	a١,a٥,a١٢	b١,b٢,b٤	c١	d١ ,d٧
Numerical analysis: **Numerical Differentiation and Integration.**	١٣,١٤	a١,a٥,a١٢	b١,b٢,b٤	c١	d١,d٣,d٧

Course coordinator: **Head of Department:**

Prof. Dr. said Ali El-Serafi **Prof. Dr. Magdi Kamel**

Prof. Dr. Emil Shokralla

Assoc. Prof. wedad Ali

Date: / /