Number of units 6	T 3	Pr -	Th 3	Number of weekly hours	Annual System 30 weeks	**Al-Esra'a University College Department: Engineering of Refrigeration and Air Conditioning Technologies**
				Engineering and Numerical Analysis		Third stage

Course Objective

The subject aims to teaching the student, the applications of advanced engineering mathematic and numerical analysis to solve the engineering problems in the field.

Week	Topic	Lab. Experiment Assignments	Notes
1	First order differential equations		
2	Applications on first order D.E		
3	Special cases of first order D.E		
4	Second order linear equation with constant coefficients		
5	Applications on S.O.D.E		
6	High order linear differential equations		
7	Applications on high order linear differential equations. Integral operators.		
8	Fourier series		
9	Even and odd functions. Applications of Fourier series		
10	Gamma Function		
11	Laplace transformation. Inverse Laplace transformation.		
12	Laplace transformation to solve differential equations. applications		
13-14	Partial differential equations, solution by separation method		
15	Applications of partial differential equations.		
16	Nonlinear equations solution, Simple Iteration		

Half-year Break			
17	Newton-Raphson method		
18	finite difference method		
19	Interpolation		
20	Lagrangian method		
21	Solution of simultaneous linear equations.		
22	Direct methods. Indirect methods		
23	Numerical integration. Complex numerical integration, applications		
24	Curves fitting analysis		
25	Newton method		
26	Numerical method to solve differential equations		
27	Rang-Kotta method		
28	Power seriesmethod		
29	Exponential equations		
30	Frobinous method		