

APPENDIX A-7

**Basic and Applied Science Courses (BA)**

Basic and Applied Science Courses Group

**BA 223 – Mathematics 3**

COURSE INFORMATION

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Course Title: Construction Engineering Drawings

Code: BA 223

Hours: Lecture – 2 Hrs.                      Tutorial – 2 Hrs.                      Credit –3.

Prerequisite: BA 124

GRADING

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Class Performance/Attendance: 10%

Midterm # 1/Assignments – (7<sup>th</sup> Week): 30%

Midterm # 2/Assignments – (12<sup>th</sup> Week): 20%

Final Exam: 40%

COURSE DESCRIPTION

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First order D.E. (i) Separation of variables (ii) Homogenous equation. First order D.E. (iii) Exact equation (iv) Linear Equations. First order D.E. (v) Bernoulli's equation – First order D.E. Second order D.E with constant coeff. (Homogenous equations) - Method of undetermined coefficients. Second order D.E. with constant coeff. (Non - homogenous equations)- Method of variation of parameters. Euler homogenous equation. Laplace Transform: Basic definition- First shift theorem. Laplace Transform: Transform differentiation & Transform integration. Unit step function – Second shifting theorem – Convolution theorem. Inverse Laplace Transform. Solution of D.E. and integral equations using Laplace transform- Application: Solve R-L circuit using Laplace transform. Fourier Series: Fourier series for functions of period  $2P$  . Fourier Series: Fourier series for even and odd functions. Fourier Series: Fourier series for harmonic functions.

TEXT BOOK & REFERENCES

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Advanced Engineering Mathematics by Dennis G. Zill / Micheal R. Cullen.

COURSE AIM

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To study methods of solving the differential equations which arise as mathematical modeling in many topics of engineering.

## APPENDIX A-8

### SPECIFIC OUTCOMES OF INSTRUCTION

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- The students will be able to perform and solve differential equations, Laplace transform and Fourier analysis, that is of fundamental importance in modern

### COURSE OUTLINE

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- Week Number 1:* First order D.E. (i) Separation of variables (ii) Homogenous equation
- Week Number 2:* First order D.E. (iii) Exact equation (iv) Linear Equations
- Week Number 3:* First order D.E. (v) Bernoulli's equation – Revision on First order D.E
- Week Number 4:* Method of undetermined coefficients.
- Week Number 5:* Homogenous equations - Method of undetermined coefficients. Second order D.E. with constant coeff.(Non - homogenous equations)- Method of variation of parameters
- Week Number 6:* Continue method of variation of parameters- Euler homogenous equation
- Week Number 7:* Laplace Transform: Basic definition- First shift theorem + 7th week Exam
- Week Number 8:* Laplace Transform: Transform differentiation & Transform integration
- Week Number 9:* Unit step function – Second shifting theorem – Convolution theorem
- Week Number 10:* Inverse Laplace Transform
- Week Number 11:* Solution of D.E. and integral equations using Laplace transform-
- Week Number 12:* Application: Solve R-L circuit using Laplace transform
- Week Number 13:* Fourier Series: Fourier series for functions of period 2P
- Week Number 14:* Fourier Series: Fourier series for even and odd functions
- Week Number 15:* Fourier Series: Fourier series for harmonic functions
- Week Number 16:* Final Exam.

### COURSE COORDINATOR AND DEMAND

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*Course Coordinator:* Dr.Nehad Nashaat.

*Course Demand:* *Required*