

## Zarqa University Faculty of Engineering Technology Mechanical Engineering Department

|                     | 0905301 Applied Mathematics   |                            |             |  |  |  |
|---------------------|---|----------------------------|-------------|--|--|--|
|                     | 2 Credits Compulsory Fall 2014  |                            |             |  |  |  |
|                     | Prerequisites by Course: 0905201 Advanced Engineering Mathematics   |                            |             |  |  |  |
| Course Information  | Co-requisites by Course: -  |                            |             |  |  |  |
|                     | Prerequisites for: Heat Transfer (1) Fluid Mechanics (2)  |                            |             |  |  |  |
|                     | Schedule: Lecture, 11:00-12:00, ST, L123  |                            |             |  |  |  |
| Instructor          | Prof. DrIng. Mohammed Abu-Hilal   |                            |             |  |  |  |
| Contact Information | mabuhilal@zu.edu.jo, Office L321, Phone: 05-3821100-2098  |                            |             |  |  |  |
| Office hours        | 10:00-11:00+12:00-13:00, STTh; or by appointment  |                            |             |  |  |  |
| Textbook            | E. Kreyszig, Advanced Engineering Mathematics, 9 <sup>th</sup> Edition. J. Wiley 2006.  |                            |             |  |  |  |
| References and      | A. Jeffrey, Advanced Engineering Mathematics, Harcourt/Academic   |                            |             |  |  |  |
| Resources           | Press, 2002.  |                            |             |  |  |  |
| Evaluation Criteria | Activity  | Percent (%)                | Percent (%) |  |  |  |
|                     | Quizzes and Homework  | -                          |             |  |  |  |
|                     | First Exam  | 25                         | 25          |  |  |  |
|                     | Second Exam   | 25                         |             |  |  |  |
|                     | Final Exam  | 50                         |             |  |  |  |
| Course Description  | Fourier Series, Integrals, and Transforms. Partial Differential   |                            |             |  |  |  |
|                     | Equations. Complex Numbers and Functions. Applications for the solution of boundary value and initial value problems will be given The problems treated and solved in this course are typical of those solutions. |                            |             |  |  |  |
|                     |   |                            |             |  |  |  |
|                     |   |                            |             |  |  |  |
|                     | seen in applications such as problems of heat conduction,   |                            |             |  |  |  |
|                     | mechanical vibrations and wave propagation.   |                            |             |  |  |  |
| Intended Learning   | Course Outcome  |                            | [%]         |  |  |  |
| Outcomes            | 1. Ability in analyzing periodic and transient functions  |                            |             |  |  |  |
|                     | 2 Ability in modeling and a   | lying partial differential | 500/        |  |  |  |
|                     | 2. Addity in modeling and solving partial differential  |                            |             |  |  |  |
|                     | vibrations, heat transfer, fluid mechanics, electric<br>fields, and magnetic fields   |                            |             |  |  |  |
|                     |   |                            |             |  |  |  |
|                     | <ul> <li>3. Ability in applying complex number and simple</li> <li>20%</li> </ul>   |                            |             |  |  |  |
|                     |   |                            |             |  |  |  |
| Relationships to    | a Ability to apply knowledge of mathematics science and   |                            |             |  |  |  |
| Program Outcomes    | a Admity to apply knowledge of mathematics, science, and<br>engineering (H)   |                            |             |  |  |  |
|                     | e Ability to identify, formulate, and solve engineering problems (H)  |                            |             |  |  |  |
|                     | k Ability to use the techniques, skills, and modern engineering tools   |                            |             |  |  |  |
|                     | necessary for engineering practice (L)  |                            |             |  |  |  |
|                     |   |                            |             |  |  |  |
| Contribution to the | Mathematics and Basic Sciences  |                            | 100%        |  |  |  |
| Professional        | Engineering Topics  | Engineering Sciences       | -           |  |  |  |
| Components          |   | Engineering Design         | -           |  |  |  |
|                     | General Education   |                            | -           |  |  |  |

| Course Outline | Subject   |         |  |
|----------------|---|---------|--|
|                | Fourier Series, Integrals, and Transforms                                     |         |  |
|                | Exam I (up to end of week 5)  |         |  |
|                | Partial Differential Equations  |         |  |
|                | Exam II (up to end of week 11)  |         |  |
|                | Complex Analysis  |         |  |
|                | Review, Final Exam  | 2       |  |
| Policies:      | Attendance  |         |  |
|                | Attendance will be checked each class. Students are expected to               |         |  |
|                | attend each lecture. University regulations will be strictly followed         |         |  |
|                | for students exceeding the maximum number of absences.                        |         |  |
|                |   |         |  |
|                | Homework  |         |  |
|                | - Homework assignment are due at the beginning of class the day they are due. |         |  |
|                | - No late homework will be accepted unless prior arrangement                  |         |  |
|                | have been made with the instructor  |         |  |
|                | - No make-up allowed on homework.   |         |  |
|                | - You can consult each other regarding homework solution s                    |         |  |
|                | however each assignment must be your own solution. Verbatim                   |         |  |
|                | or duplicates assignments will be regarded as cheating.                       |         |  |
|                | Class participation and behavior  |         |  |
|                | - Classroom participation is a part of learning: it is only by                | asking  |  |
|                | auestions and talking through ideas that you can come to fully                |         |  |
|                | understand the material   |         |  |
|                | - Please do not engage in behavior which detracts from the                    | ability |  |
|                | of other students to learn. Such behaviors include arriving                   | e at    |  |
|                | class late, speaking or whispering while the instructor and                   | 1       |  |
|                | students are discussing ideas or asking questions, reading                    |         |  |
|                | messages newspapers in class, cell-phones ringing, etc.                       |         |  |

| Week | Date       | Sec | Торіс                          | Homework | Due date |
|------|------------|-----|--------------------------------|----------|----------|
| 1    | 22/02/2015 |     |                                |          |          |
| 2    | 01/03/2015 |     |                                |          |          |
| 3    | 08/03/2015 |     |                                |          |          |
| 4    | 15/03/2015 |     |                                |          |          |
| 5    | 22/03/2015 |     |                                |          |          |
| 6    | 29/03/2015 |     |                                |          |          |
| 7    | 05/04/2015 |     | Exam I (up to end of week 5)   |          |          |
| 8    | 12/04/2015 |     |                                |          |          |
| 9    | 19/04/2015 |     |                                |          |          |
| 10   | 26/04/2015 |     |                                |          |          |
| 11   | 03/05/2015 |     |                                |          |          |
| 12   | 10/05/2015 |     | Exam II (up to end of week 11) |          |          |
| 13   | 17/05/2015 |     |                                |          |          |
| 14   | 24/05/2015 |     |                                |          |          |
| 15   | 31/05/2015 |     |                                |          |          |
| 16   | 07/06/2015 |     | Reviw, Final Exam              |          |          |
|      |            |     |                                |          |          |