|  |  |  |  |
| --- | --- | --- | --- |
| **logoUniversity of Management & Technology**  School of Engineering  Department of Electrical Engineering | | | |
| EE 455Industrial Electronics | | | |
| **Lecture Schedule** | As per timetable | **Semester** | Spring 2016 |
| **Pre-requisite** | EE 455- Power Electronics | **Credit Hours** | 3 |
| **Instructor(s)** | Faisal Fiaz (Sec A)  FahadUsman Khan (Sec B) | **Contact** | [faisal.fiaz@umt.edu.pk](mailto:faisal.fiaz@umt.edu.pk)  [Fahad.Khan@umt.edu.pk](mailto:Fahad.Khan@umt.edu.pk) |
| **Office** | 501/7 SEN Building | **Office Hours** | Posted on respective office doors |
| **Course Description** | Electric heating: Principles and applications; induction and dielectric heating; high-frequency welding. Spot welding control. Industrial control: Speed control of DC, AC, and servo motors. Process control. Measurement of non-electrical quantities: Temperature, displacement, pressure, time, frequency; digital industrial measuring systems. Ultrasonic generation and applications. X-ray applications in industry. Photo-electric devices. Industrial control using PLCs. Data acquisition. Distributed control system in process industries.The course directly contributes to **objectives**a, d, e and f of the HEC Electrical Engineering Curriculum. | | |
| **Expected Outcomes** | The course strongly supports expected **outcomes** a, b, d and i of the HEC Electrical Engineering Curriculum. Upon completion of this course, students will understandvarious industrial applications of electronics includingheating, welding, speed control of electrical machines, photo-electricdevices, x-ray, PLCs, and data acquisition. | | |
| **Textbook(s)** | **Recommended Text:**[1] V.R.Moorthi, ‘’Power Electronics,’’ Oxford University Press, 2005  [2] Dale R Patrick and Stephen W Fardo, ‘’Industrial Electronics, Devices and Systems’’, The Fairmont Press, Inc., 2000  **Reference:**Frank D. Petruzella, “Programmable Logic Controllers,”T Third  Edition, 2005, McGraw-Hill  Frank D. Petruzella, “Industrial Electronics,”T First Edition, 1995,  McGraw-Hill | | |
| **Grading Policy** | * Assignments: 10 marks * Quizzes: 15 marks (All quizzes will be mandatory and announced. Quizzes will be of 10-15 minutes duration. Quizzes could be open book or closed book. All are advised to bring their text books along) * Midterm: 25 marks (60-70 minute exam. All topics covered before the midterm exam will be included) * Final: 50 marks (120-150 minute exam. Will be comprehensive) | | |

**Course Schedule**

|  |  |  |
| --- | --- | --- |
| **Lecture** | **Topics** | **Textbook (TB) /**  **Reference (Ref) Readings** |
| 1-2 | Review of basics of Power Electronics |  |
| 3-6 | Speed control of DC motors | TB[1]: Chs. # 07,09 |
| 7-10 | Speed Control of AC motors | TB[1]: Chs. # 08,14 |
| 11-14 | Ultrasonic generation and applications. X-ray applications in industry | TB[2]: Ch. # 07 |
| 15-16 | **MID TERM EXAM 8TH WEEK** | **All Covered Course** |
| 17-20 | Process Control | TB[2]: Ch. 12 |
| 21-24 | Photoelectric Devices | TB[2]: Ch. # 14 |
| 25-28 | Electric Heating, Welding | TB[2]: Ch. # 15 |
| 29-30 | Industrial control using PLCs | Tb[2]: Ch # 11 |
|  | **Final Term Exam (Comprehensive)** |  |