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| **ISHIK UNIVERSITY FACULTY OF SCIENCE Department of INFORMATION TECHNOLOGY,2017-2018 Spring Course Information for IT 416 WIRELESS NETWORKING** |

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| --- | --- |
| **Course Name:** | WIRELESS NETWORKING |
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| --- | --- | --- | --- | --- | --- | --- |
| **Code** | **Course type** | **Regular Semester** | **Theoretical** | **Practical** | **Credits** | **ECTS** |
| IT 416 | 2 | 8 | 2 | 2 | 3 |  |

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| **Name of Lecturer(s)-Academic Title:** | Alaa Ghazi - |
| **Teaching Assistant:** | - |
| **Course Language:** | English |
| **Course Type:** | Non-area Elective |
| **Office Hours** | 9 AM to 5 PM  |
| **Contact:** | Email:alaa.ghazi@ishik.edu.iq Tel:Tel  |
| **Teacher's academic profile:** | M. Sc. in Computer Engineering B. Sc. in Electronic and Communications Engineering  |
| **Course Objectives:** | The objective of this course is to provide an understanding of various wireless networking technologies ranging from cellular networks to wireless personal area networks and how they differ from wired networks (e.g., signal transmission, interference, mobility, etc.). The course will cover the architecture and protocols of cellular networks (1G, 2G, 3G and LTE), IEEE 802.11 networks, and IEEE 802.15 networks. Deployment issues will be discussed. Physical layer details are provided as necessary, but will not be the primary focus. There will be a brief treatment of satellite systems and positioning technologies. |
| **Course Description (Course overview):** | This course will cover the fundamental aspects of wireless networks, with emphasis on current and next-generation wireless networks. Various aspects of wireless networking will be covered including: fundamentals of cellular communication, mobile radio propagation, multiple access techniques, and mobility support, channel allocation, Wireless PAN/LAN/MAN standards, mobile ad-hoc networks, wireless sensor networks, and routing in wireless and mobile networks. |
| **COURSE CONTENT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Hour** |               **Date**               | **Topic** |
| **1** | 2 | 8-12/10/2017 | Introduction and Overview, Wireless Systems |
| **2** | 2 | 15-19/10/2017 | Radio Propagation |
|  |  |  |  |
| **3** | 2 | 22-26/10/2017 | Antenna and Transmission |
| **4** | 2 | 29/10-2/11/2017 | Multiple Access Techniques: FDMA, TDMA, CDMA, OFDM, SDMA |
|  |  |  |  |
| **5** | 2 | 5-9/11/2017 | Architecture and Operational Details of Mobile Networks |
| **6** | 2 | 12-16/11/2017 | Wireless Local Area Networks |
|  |  |  |  |
| **7** | 2 | 19-23/11/2017 | Midterm Exam |
| **8** | 2 | 26-30/11/2017 | Mobility Management in Wireless Networks |
|  |  |  |  |
| **9** | 2 | 3-7/12/2017 | WiMAX |
| **10** | 2 | 10-14/12/2017 | Satellite Communications |
|  |  |  |  |
| **11** | 2 | 17-21/12/2017 | Wireless Sensor Networks |
| **12** | 2 | 24-28/12/2017 | ? |
|  |  |  |  |
| **13** | 2 | 31/12/2017-4/1/2018 | Student Presentations |
| **14** | 2 | 7-11/1/2018 | Review |
|  |  |  |  |
| **15** | 2 | 14-18/1/2018 | Final Exam |
| **16** | 2 | 21-25/1/2018 | Final Exam |
|  |  |  |  |

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| **COURSE/STUDENT LEARNING OUTCOMES**

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| --- | --- |
|  |  |
| **1** | Students will be able to understand the technical details of wireless and mobile communication |
| **2** | Students will be able to explain different communication networks; and have a solid understanding on antennas, signal propagations, signal coding/decoding process; |
| **3** | Students will be able to have a solid understanding on antennas, signal propagations, signal coding/decoding process |
| **4** | Students will be able to differentiate cellular networks and cordless networks from other wireless networks; |
| **5** | Students will able to determine and apply appropriate communication techniques in mobile networks and wireless LAN; |

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| **COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES**(Blank : no contribution, I: Introduction, P: Profecient, A: Advanced )

|  |  |  |
| --- | --- | --- |
|  | **Program Learning Outcomes** | **Cont.** |
| **1** | An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution | P |
| **2** | An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs | P |
| **3** | An ability to function effectively on teams to accomplish a common goal | A |
| **4** | An understanding of professional, ethical, legal, security, social, and economic issues and responsibilities | P |
| **5** | An ability to analyze the local and global impact of computing on individuals, organizations, and society | I |
| **6** | An ability to use current techniques, skills, and tools necessary for computing practice | I |
| **7** | An ability to use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking, web systems and technologies | I |
| **8** | An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems | P |
| **9** | An ability to effectively integrate IT-based solutions into the user environment | I |
| **10** | An ability apply problem solving skills, core IT concepts, best practices and standards to information technologies | I |
| **11** | An ability to identify and evaluate organizational requirements and current and emerging technologies | A |
| **12** | An ability to select, design, integrate and administer IT-based solutions into the organizational environment | I |

 |
| **Prerequisites (Course Reading List and References):** | Introduction to data Communication and computer networks , Calculus, and Probability. |
| **Student's obligation (Special Requirements):** | Submission of reports is expected in electronic format (PDF, Word files) via email or Digital DropBox at Blackboard. No late homework will be accepted. No make ups will be given for missed exams with out a verified medical excuse. A grade of 0 will be assigned to missed exams. Class attendance is expected. Please be on time. University policies regarding academic dishonesty will be implemented |
| **Weekly Laboratory/Practice Plan:** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Hour** |               **Date**               | **Topics** |
| 1 | 2 | 8-12/10/2017 |  |
| 2 | 2 | 15-19/10/2017 |  |
|  |  |  |  |
| 3 | 2 | 22-26/10/2017 |  |
| 4 | 2 | 29/10-2/11/2017 |  |
|  |  |  |  |
| 5 | 2 | 5-9/11/2017 |  |
| 6 | 2 | 12-16/11/2017 |  |
|  |  |  |  |
| 7 | 2 | 19-23/11/2017 |  |
| 8 | 2 | 26-30/11/2017 |  |
|  |  |  |  |
| 9 | 2 | 3-7/12/2017 |  |
| 10 | 2 | 10-14/12/2017 |  |
|  |  |  |  |
| 11 | 2 | 17-21/12/2017 |  |
| 12 | 2 | 24-28/12/2017 |  |
|  |  |  |  |
| 13 | 2 | 31/12/2017-4/1/2018 |  |
| 14 | 2 | 7-11/1/2018 |  |
|  |  |  |  |
| 15 | 2 | 14-18/1/2018 |  |
| 16 | 2 | 21-25/1/2018 |  |
|  |  |  |  |

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| **Course Book/Textbook:** | WIRELESS COMMUNICATIONS Second Edition Andreas F. Molisch, 2011 Wireless Communication and Networking , Vijay K. Garg. |
| **Other Course Materials/References:** | Wireless Communications, Andrea Goldsmith, Cambridge University Press. Wireless Communications and Networking, Jon Mark, WeihuaZhuang, Prentice Hall. |
| **Teaching Methods (Forms of Teaching):** | Lectures, Excersises, Presentation, Project, Assignments, Demonstration |
| **COURSE EVALUATION CRITERIA**

|  |  |  |
| --- | --- | --- |
| **Method** | **Quantity** | **Percentage (%)** |
| Participation | 1 | 15 |
| Quiz | 1 | 10 |
| Homework | 1 | 5 |
| Midterm Exam(s) | 1 | 30 |
| Final Exam | 1 | 40 |
| **Total** | **100** |
| **Examinations:**Fill in the Blanks, Multiple Choices, Short Answers |  |  |

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| **Extra Notes:** |
| **ECTS (ALLOCATED BASED ON STUDENT) WORKLOAD**

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| --- | --- | --- | --- |
| **Activities** | **Quantity** | **Duration (Hour)** | **Total Work Load** |
| Course Duration (Including the exam week: 16x Total course hours) |  |  | 0 |
| Hours for off-the-classroom study (Pre-study, practice) |  |  | 0 |
| Assignments Mid-terms |  |  | 0 |
| Final examination |  |  | 0 |
| Other |  |  | 0 |
| **Total Workload** | **0** |
| **ECTS Credit (Total workload/25)** | **0** |

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**Peer review**

|  |  |  |
| --- | --- | --- |
| Signature: | Signature: | Signature: |
| Name: | Name: | Name: |
| Lecturer                                                                       | Head of Department                                                         | Dean |

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