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| المملكة العربية السعودية  وزارة التعليم العالي  **جامعة أم القرى**  الكلية الجامعية بالجموم – قسم الحاسب الآلي |  | Kingdom of Saudi Arabia  Ministry of Higher Education  **Umm Al-Qura University**  University College in Al-Jamoum  Computer Dept. |

Course Specification

1. **Course number and name:** (2316517-3) Computer Networks
2. **Credits and contact hours:** 3 Credits

(Lecture: 3/week – Practical Session: Non)

1. **Instructor’s or course coordinator’s name:** Dr. Kheir Eddine Bouazza
2. **Text books**
3. **Main Text book:** Andrew S. Tanenbaum and David J. Wetheral. Computer Networks, Pearson, 5th Edition, 2010.
4. **Reference:** [William Stallings](http://www.amazon.com/William-Stallings/e/B000APXR9Q/ref=dp_byline_cont_book_1). Data and Computer Communications, Pearson, 10th Edition, 2013.
5. **Specific course information**
6. **brief description of the content of the course (Catalog Description):**

This course focuses on fundamental network terminology and concepts, e.g. protocols, Open System Interconnection (OSI) and TCP/IP models, Ethernet, Internet Protocol (IP) addressing, routing protocols and network devices, such as routers and switches.  The course provides an opportunity for students to understand the interconnections of various networks and to be able to design and configure small-scaled networks given some typical (customers) requirements.

1. **prerequisites or co-requisites:** Operating Systems (2316411-3)
2. **indicate whether a required, elective, or selected elective course in the program:** required
3. **Specific goals for the course**

The student will be able to:

1. Understand and analyze the hardware, software, components of a network and the real implementations of these concepts.
2. Understand networking protocols and their hierarchical relationship hardware and software. Compare protocol models and select appropriate protocols for a particular design.
3. List seven layers of the OSI Model and compare them to the layering used in the Internet model (TCP/IP).
4. Explain the differences between a hub, switch (bridge), and a router and the relationship between (802.1D) bridge and a modern switch.
5. Explain routing operations and how DNS works in the global internet.

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| *Course*  *Goals* | *Program Outcomes* | | | | | | | | | | |
| SOa | SOb | SOc | SOd | SOe | SOf | SOg | SOh | SOi | SOj | SOk |
| 1 | ✓ |  | ✓ | ✓ |  |  |  |  | ✓ | ✓ | ✓ |
| 2 | ✓ |  |  |  |  |  |  |  | ✓ | ✓ | ✓ |
| 3 | ✓ |  |  |  |  |  |  |  |  |  | ✓ |
| 4 | ✓ |  |  | ✓ |  |  |  |  | ✓ | ✓ | ✓ |
| 5 | ✓ |  | ✓ | ✓ |  |  |  |  | ✓ | ✓ | ✓ |

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| **Relationship of Course Goals to the Program Student Outcomes** | |
| **SOa** | An ability to apply knowledge of computing and mathematics appropriate to the discipline   * *Students are required to have a good understanding and knowledge of principles of networking to successfully pass all the evaluation components.* |
| **SOc** | An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.   * *Students are required to design, implement, evaluate and analyze different protocols and network related aspects using simulations.* |
| **SOd** | An ability to function effectively on teams to accomplish a common goal.   * *Some course work will be done as team projects.* |
| **SOi** | An ability to use current techniques, skills, and tools necessary for computing practices.   * *Students are required to use sophisticated network analyzer in labs to visualize working of different protocols on different network layers. Network Simulator is used to visualize network related tasks.* |
| **SOj** | An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.   * *Students are required to apply their knowledge of computing to design a solution to a problem and to document the solution including the tradeoffs involved in their design choices.* |
| **SOk** | An ability to apply design and development principles in the construction of software systems of varying complexity.   * *The students are required to use standard design principles on computer networks.* |

1. **Brief list of topics to be covered**

* Introduction
* The Physical Layer
* The Data Link Layer
* The Medium Access Control Sublayer
* The Network Layer
* The Transport Layer
* The Application Layer