Course Outline

# CSNB213

# DATA COMMUNICATION & COMPUTER NETWORKS

Semester 1, 2018/2019

Credit Hours:3 (Three)

Lecturer: Rina Azlin Binti Razali

BW-3-C40

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03-89213311

Lectures:

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| --- | --- | --- | --- |
| Section | Day | Time | Room |
| Section 1 (RAR) | Monday | 1200 - 1400 | BW-2-R14 |
|  | Friday | 1100 - 1200 | BW-2-R14 |
| Section 2 (MMD) | Monday | 1600 - 1800 | BW-G-R14 |
|  | Tuesday | 1000 - 1100 | BW-G-R14 |

**Consultation Hours:**

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| --- | --- |
| Monday: | 1000 – 1200 |
| Thursday: | 1000 – 1200 |

**Course Descriptions:**

This course aims at giving the students the fundamental concepts and terminology of data communication and networking with emphasis on network technologies, applications, architectures and hardware, standards and protocols. Students also will be exposed with the concept of TCP/IP protocol, Ethernet standards and the organization of the Internet.

Objectives of the Course:

This course aims to:

1. Introduce basic concepts and theories of data communication and networks.
2. Introduce devices used for data communication and explain their functions.
3. Explain the various standards and protocols used in computer networks.
4. Provide an overview to the Internet and its applications.

Course Outcomes:

At the end of this course, students should be able to:

1. Define important terms related to data communication and computer networks.
2. Identify the functions of various network devices.
3. Explain the operation of hubs, switches and routers.
4. Explain the purpose of the Ethernet standard, TCP/IP and other common protocols used in the Internet.
5. Identify the usage of various Internet applications.

Programme Educational Objectives (PEO) for Bachelor of Computer Science (Hons.)

The programme should prepare graduates who:

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| --- | --- |
| PEO1 | Are able to apply knowledge and technical competencies in Computer Science that is suitable to the task being performed. |
| PEO2 | Are competent in analyzing, modeling, designing, developing and evaluating computing solutions. |
| PEO3 | Uphold professional and ethical attitudes, and able to demonstrate skills in communication, leadership and teamwork with awareness towards the responsibility to the Almighty and the society. |
| PEO4 | Possess strong analytical and critical thinking to solve problems by applying the knowledge and skills acquired in Computer Science. |
| PEO5 | Possess skills for lifelong learning, research and career development. |
| PEO6 | Have entrepreneurial skills and a broad business and real world perspective. |

Programme Outcome for Bachelor of Computer Science (Systems and Networking) (Hons.)

At the end of the program, graduates should be able to:

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| --- | --- |
| PO1 | Demonstrate knowledge and understanding of basic principles, concepts and theories of computer science related to the field of systems and networking. |
| PO2 | Apply current techniques and tools that can help in analyzing, modeling, developing and evaluating computing solutions. |
| PO3 | Possess social skills, self-confidence, respect for others, ability to communicate in social contexts, self-awareness and be responsible. |
| PO4 | Demonstrate professionalism with social and ethical considerations in accordance to ethical and legal principles. |
| PO5 | Demonstrate teamwork, leadership, interpersonal and communication skills |
| PO6 (a) | Demonstrate analytical and critical thinking skills in solving problems and proposing solutions. |
| PO6 (b) | Apply theoretical principles of computer science to design, implement, test and evaluate computer and network system solutions |
| PO7 | Apply skills and principles of lifelong learning in academic and career development. |
| PO8 | Demonstrate basic entrepreneurial and business skills. |

**Course Contents and Weekly Schedule:**

| Week | Topic | Activity |
| --- | --- | --- |
| **Week 1**  21/05/18 - 27/05/18 | Course Outline Distribution  Chapter 1- What is a Computer Network?   * Computer network topology * Wired versus wireless networks |  |
| **Week 2**  28/05/18 - 03/06/18  \*\*29th May (Tues):  Wesak Day | Chapter 1 - What is a Computer Network? (cont)   * Representing digital data * Working with digital data * Communication protocols and OSI reference model * Ethernet LANs * Network operating systems | ASSIGNMENT 1  (Chap 1) |
| **Week 3**  04/06/18 - 10/06/18 | Chapter 2- Network Topology   * Physical versus logical topology * Fully connected networks * Star, bus, ring and hybrid networks * Network hierarchy |  |
| **Week 4**  11/06/18 - 17/06/18  \*\*15th June (Fri):  Syawal | Chapter 2 - Network Topology (cont)   * Subnets * Network access points * Public versus private networks * Troubleshooting | QUIZ 1  (Chap 2) |
| 18/06/18 - 24/06/18 | INTERMISSION |  |
| **Week 5**  25/06/18 - 01/07/18 | Chapter 3 - Networking Hardware   * Ethernet cabling * The network interface card (NIC) * Repeaters, transceivers, hubs and switches * Routers and firewalls * Satellite network systems * Troubleshooting |  |
| **Week 6**  02/07/18 - 08/07/18 | Chapter 4 - Ethernet Technology   * The Ethernet frame format * CSMA/CD * Ethernet controller * Ethernet technologies * Wireless Ethernet (WiFi) |  |
| **Week 7**  09/07/18 - 15/07/18 | Chapter 5 - The TCP/IP Protocols   * RFCs * IP and IP address * TCP and UDP | MID EXAM  (13/07/20178) |
| **Week 8**  16/07/18 - 22/07/18 | Chapter 5 - The TCP/IP Protocols (cont)   * ARP * TCP/IP support protocols and applications * IPv6 * Troubleshooting |  |
| **Week 9**  23/07/18 - 29/07/18 | Chapter 6 - Switching and Routing   * Hubs versus switches * Inside a switch * Store-and-forward switch * Cut-through switch * Spanning trees * Switches versus routers | QUIZ 2  (Chap 5) |
| **Week 10**  30/07/18 - 05/08/18  \*\*04 – 06 Aug: Convocation\*\* | Chapter 6 - Switching and Routing (cont)   * Autonomous systems * Interior gateway protocols * Exterior gateway protocols * Classless inter-domain routing |  |
| **Week 11**  06/08/18 - 12/08/18  \*\*06 Aug (Mon): Convocation | Chapter 6 - Switching and Routing (cont)   * Distance-vector routing * Link-state routing * Policy routing * Multi-protocol label switching * Troubleshooting | ASSIGNMENT 2  (Chap 6) |
| **Week 12**  13/08/18 - 19/08/18 | Chapter 7 - Network Applications   * Web and HTTP * Email and SMTP * FTP * Telnet * Troubleshooting |  |
| **Week 13**  20/08/18 - 26/08/18  **\*\*22 Aug (Wed):**  **Aidil Adha** | Chapter 8 - The Internet   * The organization of the Internet * Internet versus intranet * Network address translation (NAT) |  |
| **Week 14**  27/08/18 - 02/09/18  **\*\*31 Aug (Fri):**  **National Day** | Chapter 8 - The Internet (cont)   * Virtual private networks (VPN) * Troubleshooting | QUIZ 3  (Chap 7) |
| 03/09/18 -21/09/18  \*\*11 Sept (Tues): Awal Muharram  16 Sept (Sun): Malaysia Day | FINAL EXAM | |

Reference:

|  |  |
| --- | --- |
| Main | 1. Jr. Kenneth C. Mansfield, James L. Antonakos, Computer Networking from LANs to WANs: Hardware, Software and Security, Course Technology Cengage Learning, 2010. |
| Additional | 1. Kurose, Ross. Computer Networking: A Top-Down Approach Featuring the Internet, 5th Edition, Addison-Wesley, 2007. 2. Stallings W., Data and Computer Communication, 8th. Edition, Prentice Hall, 2007. |

Assessment:

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| --- | --- | --- |
| Assessment | Percentage (%) | Remark |
| Quiz | 15 | * Several unannounced, in-class quizzes will be given to the students * Minimum of 3 quizzes |
| Assignments | 15 | * Consists of individual and group assignments. * Minimum of 2 assignments |
| Mid-Term Test | 20 | Tentatively in Week 7  Friday 13/07/2018(5pm – 7pm : Library) |
| Final Exam | 50 |  |

Class Policies:

1. Dress in proper attire corresponding to Universiti Tenaga Nasional dress code.
2. Attendance is compulsory and will be taken regularly.

* Attendance for less than 80% of the lectures will result in students being barred from taking the Final Exam.

1. If you are absent from lecture due to

* Sickness : MC is required
* Emergency : letter of guardian is required

Any MC or letter should be given to the lecturer on the next day.

Failure to do so will result to no make up for any quizzes or exam.

1. The lecturer reserves the right to give pop-quizzes whenever deemed appropriate. Latecomers will not get extended time.
2. Cheating and any attempt thereto will not be tolerated and penalized according to the seriousness of the offense.
3. All assignments must be submitted on time. Deducted of 25% of marks or ZERO mark will be given for the late submitter (based on case by case basis).