


**COURSE SYLLABUS
(ELECTRICAL & ELECTRONICS ENGINEERING PROGRAM)**

FACULTY OF ENGINEERING DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING UNIVERSITI PERTAHANAN NASIONAL MALAYSIA NAME DAN COURSE CODE : DATA COMMUNICATION & MULTIMEDIA SYSTEM, EEC4113	 <small>Utara Melayu Bangsanya</small>	M/S : 1 / 8
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Lecture Hours : 3 hrs x 14 weeks Credit : 3 LECTURER: MR. MUHAZAM BIN MUSTAPHA Room No. : Bistari 08-R-16 Tel. No. : E-Mail : muhazam@upnm.edu.my No. of Student : 22 students (4ZK25)	Revision : 2 Date of Issue : 30 Jun 2009 Last Amendment : 14 July 2010 Edition : 3 Procedure No : PK(0). UPNM. AKAD. 01
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PRE REQUISITE :

SYNOPSIS:

This will enhance the students' knowledge on data communication and computer networks. It explains the basic process of data communication, protocol, interfacing and internetworking between computer networks and switching components in telecommunication system. At the end of the course, the students should be able to understand the system used in representation, distribution, transmission and reception of data. The students are also equipped with basic digital multimedia knowledge. They will be taught about the way multimedia data being send over the network especially over the internet.

MAIN REFERENCE :

1. William Stallings, *Data and Computer Communications*, Prentice Hall, 6/7th edition 2000
2. James F. Kurose, Keith W. Ross, *Computer Networking*, Addison Wesley, 4th edition 2008
3. Nigel Chapman, Jenny Chapman, *Digital Multimedia*, John Wiley & Sons, 3rd edition 2009

OTHER REFERENCE :

1. B. A Forouzon, *Data and Computer Network*, McGraw Hill, 2000
2. F. Hallsall, *Data Communication, Computer Network and Open System*, Addison Wesley, 6th Edition 1998

Prepared by : Name: Muhazam bin Mustapha Signature : Date : July 14 th 2010	Certified by : Name: Nik Ghazali Nik Daud Head of Department Signature : Date : July 14 th 2010
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M/S : 2 / 8

NAME DAN COURSE CODE :

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OBJECTIVE :

The course will enhance the student's knowledge on data communication and computer networks, with a mixture of intermediate level of multimedia manipulation skills. While being able to theoretically explain the basic process of data communication, protocol, interfacing and internet, the students are also expected to be able to put the knowledge into a practical use by being able to programmatically manipulate data and multimedia over the network.


COURSE OUTCOME :

CO1	Explain the concept of data communication using layered approach based OSI and TCP/IP and their applications.
CO2	Extensive knowledge of the various types of computer networks for LAN and WAN.
CO3	Beginners level of programming skills with ability to manipulate data and multimedia using a latest software technology on a mainstream platform.
CO4	Intermediate level of knowledge in relating data and multimedia to internet technology.

LESSON PLAN :

WEEK	LECTURE	TOPIC / CONTENT	REMARK
1	1, 2 3	Chapter 1 Introduction: Communication models, architecture & protocols (TCP/IP and OSI Reference Model) Chapter 2 Baseband data encoding: NRZ, NRZI, Manchester Bipolar (MB), Differential MB, On-Off Keying Pulse Width Modulation, Binary with 8 Zeroes Substitution	12 - 16 Jul
2	4, 5 6	Chapter 2 Baseband data encoding: (continuation) Chapter 3 Broadband data encoding: Amplitude/Frequency Shift/Phase Keying, Quadrature Amplitude Modulation, FHSS, DSSS	19 - 23 Jul
3	7 8, 9	Chapter 3 Broadband data encoding: (continuation) Chapter 4 Flow control (Data Link Layer): Stop & Wait, pipeline, piggyback / no-piggyback protocols, sliding windows, line utilization	26 - 30 Jul
4	10, 11, 12	Chapter 5 Error control: Error detection via Parity, Longitudinal/Vertical/Cyclic Redundancy Checks, Effect of window size on error correction, Error Correction via ARQ, self-correcting codes, HDLC.	2 - 6 Aug
5	13, 14, 15	Chapter 6 Medium Access Control Sublayer: Channel Allocation problem, Multiple Access Protocols: ALOHA-based schemes	9 - 13 Aug
6	16 17, 18	Chapter 6 MAC: IEEE 802.x: Ethernet, Token Ring & Token Bus, MAC in WLANs, topology Chapter 7 Network Layer: circuit & packet Switching: concepts, Space division switch, routing, signaling, IP address	16 - 20 Aug
7	19, 20, 21	Chapter 7 Network Layer: shortest path routing, congestion detection and control, internetworking.	23 - 27 Aug
8	22, 23, 24	Chapter 8 Security: models for cryptography: symmetric key, public key	30 Aug - 3 Sep
		MID SEMESTER BREAK	4 - 19 Sep

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9	25, 26 27	Chapter 8 Security: authentication, firewalls, steganography TEST 1 (covers until chapter 7)	20 - 24 Sep
10	28, 29, 30	Chapter 9 Networked Multimedia: higher levels of TCP/IP & OSI, transport, session, presentation, application, and protocols (HTTP, FTP, etc), programming example; live, stored, format and compression of audio & video streaming, issues and techniques, packet jitter, delay, loss, end-to-end, interleaving, RTSP	27 Sep - 1 Oct
11	31, 32 33	Chapter 9 Networked Multimedia: representation, audio, video, stored, live, applications: IPTV, YouTube, Flash, Internet Radio, VoIP, Skype Briefing on PBL for the course	4 - 8 Oct
12	34, 35 36	Chapter 10 Text Based Multimedia: XML, web services, SOAP, RESTful, .NET support, other platform support Chapter 10 Text Based Multimedia: applications, images, RIFF, file formats, headers, MIME, RSS feed, SVG, MathML	11 -15 Oct
13	37 38, 39	Chapter 10 Text Based Multimedia: (continuation) Conclusions: Revision	18 - 22 Oct
14	40, 41 42	Conclusions: PBL Defense Viva TEST 2 (covers chapter 8 till the end)	25 - 29 Oct
		REVISION WEEK	1 - 5 Nov
		FINAL EXAMINATION (50 %)	8 - 26 Nov
		FINAL BREAK SEMESTER 1	27 Nov - 2 Jan 2011

LEARNING LOAD

NO	TEACHING AND LEARNING ACTIVITIES	HOURS
1	Lectures	42
2	Individual Assignment / Group : <ul style="list-style-type: none"> • Assignment assessment and answering problems 	14
3	Group Projects : <ul style="list-style-type: none"> • Group discussion • Discussion with lecturer • Collection and selection of references at library, internet and industrial • Report writing 	12
4	Project Presentation: <ul style="list-style-type: none"> • Preparation • Group Presentation • Attend Other Group Presentation • Question and Answer 	9

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5	Self / Group Study: <ul style="list-style-type: none"> • Class Preparation • Revision • Revision for Examination 	40
6	Test 1 & Test 2	4
7	Final Exam	3
TOTAL HOURS		124

Course Credit 'Data Comm. & Switching System' 124 hours / 40 hours = 3.1 (3 credit)

METHODOLOGY :

Lecture and Discussion (Tutorials), Independent Work

COURSE EVALUATION :

1.	Quiz	10 %	CO: 1, 2
2.	Assignment	10 %	CO: 1, 2, 3, 4
3.	Test 1 & Test 2	30 %	CO: 1, 2, 3
4.	Final Exam	50%	CO: 1, 2, 4
	Total	100%	

Additional Test, if taken, will be averaged out

Rules & Regulation :

Refer to *Peraturan Akademik UPNM*

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**RELATIONSHIP BETWEEN PROGRAMME OUTCOME (PO)
With COURSE LEARNING OUTCOME (CO)**

No	COURSE OUTCOME (CO)	Relationship Between C.O and P.O. (Includes 8 domains in MQF)										Delivery	Assessment	
		P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10			
CO1	Explain the concept of data communication using layered approach based OSI TCP/IP and their applications.	3					1						Lecture	Test / Quiz / assignment / exam
CO2	Extensive knowledge of the various types of computer networks for LAN and WAN.		3		2								Lecture	Test / Quiz / assignment / exam
CO3	Intermediate level of programming skills with ability to manipulate data and multimedia using a latest software technology on a mainstream platform.	3		2									Lecture	Test / Quiz / assignment / exam
CO4	Intermediate level of knowledge in relating data and multimedia to internet technology.	3			2								Lecture	Assignment

1 = low emphasis, 2 = medium emphasis, 3 = strong emphasis

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RELATIONSHIP BETWEEN (CO) AND GENERIC / SOFT SKILLS

Generic / Soft Skill	C O 1	C O 2	C O 3	C O 4	Evaluation
Communication			1	1	Assignment
Critical Thinking & Problem Solving			3	3	Test / Quiz / assignment / exam
Team Work			1	3	Assignment
Life-long Learning & Information Management	2	2	1	3	Test / Quiz / assignment / exam
Entrepreneurship				1	Assignment
Ethics & Professional Morale					Test / Quiz / assignment / exam
Leadership				1	Assignment
Environmental Awareness					Assignment

Legend:

- 1: Knowledge
- 2: Moderate
- 3: Important/Relevant

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EXAMPLES OF EVALUATION (RUBRIK) :

COURSE OUTCOME (CO)	A (5)	B (4)	C (3)	D (2)	E (1)
Understand the engineering profession as well as the interaction between various engineering disciplines.	Solve problems with less than 20% error	Solve problems with less than 35% error	Solve problems with less than 50% error	Solve problems with more than 60% error	Solve problems with more than 70% error
Understand the engineering fundamentals & elements.	Solve problems with less than 20% error	Solve problems with less than 35% error	Solve problems with less than 50% error	Solve problems with more than 60% error	Solve problems with more than 70% error
Understand the procedure for approaching an engineering problem, determining the necessary data and method of solution and presenting results.	Solve problems with less than 20% error	Solve problems with less than 35% error	Solve problems with less than 50% error	Solve problems with more than 60% error	Solve problems with more than 70% error
Enhance the ability to use software application for the analysis and presentation of engineering data.	Solve problems with less than 20% error	Solve problems with less than 35% error	Solve problems with less than 50% error	Solve problems with more than 60% error	Solve problems with more than 70% error

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NOTE: PROGRAMME OUTCOME (PO) FOR DEFENCE HUMAN RESOURCE MANAGEMENT

MQF has established that Outcome Based Learning emphasizes the development on student's competency in multiple learning environments using the following 8 domains:

- i. Knowledge
- ii. Practical
- iii. Leadership
- iv. Ethics and Professionalism
- v. Environment Awareness
- vi. Entrepreneurship
- vii. Communication
- viii. Life-long Learning

PO1	Ability to acquire and apply knowledge of mathematics, science and engineering
PO2	Ability to analyze and interpret data
PO3	Ability to identify, formulate and solve electrical engineering problems
PO4	Ability to work with modern instrumentation, software and hardware
PO5	Ability to design a system, component or process to fulfill certain specifications
PO6	Ability to communicate effectively
PO7	Ability to function and be productive in a team
PO8	Ability to recognize the need for, and to engage in life-long learning
PO9	Understand the impact of the work of engineers on society
PO10	Understand ethical and professional responsibility

END