

عدد الساعات الاسبوعية				اسم المادة	
عدد الوحدات	م	ع	ن	باللغة الانكليزية	باللغة العربية
4	3	2	1	Networks Simulation	محاكيات الشبكات الحاسوب

أهداف المادة: تهدف المادة الى تعريف الطالب بأستخدام برنامج المحاكاة التي تستخدم في بناء هيكلية الشبكة وحساب القياسات والخصائص الرئيسية للشبكة بأستخدام برنامج Packet tracer and NS-2

Weeks	Syllabus
1 st , 2 nd , 3 rd , 4 th , 5 th , 6 th , 7 th	Introduction to Networks Simulation <ul style="list-style-type: none"> • Introduction • Simulator vs Emulator • Why Simulation? • Benefits and limitations of simulations • Simulation techniques as an engineering tool for analyzing, planning, dimensioning, monitoring, and building real operating networks. • Event driven vs Time driven simulation techniques • The use of measurement data and configuration data from real networks in simulation.
8 th , 9 th , 10 th , 11 th	Networking Basics <ul style="list-style-type: none"> • Networking terminology • Common physical and logical topologies. • Networking architectures and protocols, network connections, and the Open Systems Interconnection (OSI) model. • Network Elements (HUBs, SWITCHs (L2, L3), ROUTERs, etc..)
12 th , 13 th , 14 th	Network Implementation with simulation <ul style="list-style-type: none"> • Understanding IP addressing, assigning IP addresses, mapping logical host names to IP addresses, routing, and accessing the Internet. • Why IPv6 is necessary and how multicasting works. • Implementing Routing techniques (static and dynamic).
15 th , 16 th	Network Management <ul style="list-style-type: none"> • Remote management. • Network monitoring tools, and elements to optimize the performance of the network (Solar winds, PRTG, etc..).
17 th , 18 th , 19 th	Troubleshooting

	<ul style="list-style-type: none"> • Systematic methodology for troubleshooting. • Tools to troubleshoot network connectivity problems, and commands to gather network information and troubleshoot IP configuration problems. • Troubleshooting name resolution, switching and routing problems.
<p>20th , 21st , 22nd , 23rd , 24th , 26th , 27th , 28th</p>	<p>Modeling Networks</p> <ul style="list-style-type: none"> • Introduction to system models. • Event Probability - events, axioms of probability, conditional probability, independence, and Bayes theorem. • Discrete Probability Models - random variables, expected values, cumulative distribution, Bernoulli trials; binomial, Poisson and geometric distributions. • Continuous Probability Models - density function; uniform, exponential and normal distributions; central limit theorem, confidence bounds. • Basic Queueing Models - arrival processes, Little's Law, classification, M/G/1, M/D/1 and M/M/1, occupancy and delay, closed-loop model. • Introduction to Discrete-Event Simulation - random numbers, event-oriented time advance, state machines, object-oriented java applications. • Statistical Estimation - point estimation and confidence intervals. • Computer and Network Performance Models - modeling and analysis of systems used to illustrate the various topics.
<p>29th , 30th</p>	<p>Verification and Validation of Simulation Models</p> <ul style="list-style-type: none"> • Model Building, Verification, and Validation • Verification of Simulation Models • Calibration and Validation of Models

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6	4	2	2	Engineering Analysis	التحليلات الهندسية

أهداف المادة:

تهدف مادة الى مساعدة الطالب على فهم القوانين والمسائل الرياضية اللازمة لغرض حل الدوائر الكهربائية

المعدة.

Weeks	Syllabus
1 st ,2 nd ,3 rd ,4 th ,5 th ,6 th ,7 th	Laplace transform, Properties, theorems and applications
8 th ,9 th ,10 th ,11 th ,12 th ,13 th ,14 th	Z-transform, properties, theorems, and applications
15 th ,16 th ,17 th ,18 th ,19 th	Probability (Basic terminology, probability and set notation, law of probability, independent events) , Statistics(Graphical representation, measure of central tendency, measure of dispersion)
20 th ,21 th ,22 th ,23 th	Numerical computations (bisection method, false position method, Newton-Raphson method, solution of algebraic and transcendental equations, solution of linear simultaneous equations 1)Direct methods a)Gauss elimination B)Gauss Jordan 2)Iterative method a)Jacobi's B)Gauss-seidel iteration)
24 th ,25 th	Solution of nonlinear equation (Newton-Raphson method)
26 th ,27 th ,28 th	Numerical solution of ordinary differential equation (Picard's , Euler's method)
29 th ,30 th	Matrices (Matrix operations, related matrices, solution of linear system of equations, linear transformations, Cayley-Hamilton theorem)

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6	4	2	2	Control Engineering Fundamentals	اسس هندسة السيطرة

أهداف المادة:

الهدف من هذه المقرر إعطاء الدارس معلومات عن المفاهيم الاساسية لنظرية التحكم الخطي وتصميم أنظمة

التحكم

Weeks	Syllabus
1 st , 2 nd	Introduction To Control Systems, Open And Closed Loop System.
3 rd , 4 th , 5 th , 6 th	Mathematical modeling of physical systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.
7 th , 8 th	Block diagrams.
9 th , 10 th	Time-domain analysis of closed loop control systems and error analysis
11 th , 12 th	P, PI, PD and PID Modes of Feedback Control, Realization of PID Controller Using Active and Passive Elements.
13 th , 14 th	Stability analysis and Rouths stability Criterion
15 th , 16 th , 17 th	Root Locus Technique.
18 th , 19 th , 20 th	Analysis of control system in frequency domain and Bode Diagrams
21 th	Design of control systems and Compensation concepts.
22 th , 23 th , 24 th , 25 th	Control system design using root locus method.
26 th , 27 th , 28 th , 29 th	Control system design using Bode Diagrams.
30 th	Definitions of Non Linear Systems.

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6	4	2	2	Computer Networks Fundamentals	أسس شبكات الحاسوب

أهداف المادة: تعريف الطالب بأنواع الشبكات الأساسية وكيفية ربطها وكيفية تناقل المعلومات خلال الشبكة إضافة الى البروتوكولات المستخدمة خلال الشبكات

Weeks	Syllabus
1 st , 2 nd	Introduction, and classify the computer networks according to application, size, transmission technology.
3 rd	LANs: Topologies, CSMA/CD, Token Access protocols, and IP addressing
4 th	Connection-Oriented Versus Connectionless Service, and Service Primitives
5 th , 6 th	The ISO reference Model, and TCP/IP Reference Model.
7 th	Metropolitan Area Networks, Wide Area Networks, Internetworks, and VPNs
8 th	Digital signal (size of : text files, image files, voice files, and videos files)
9 th	Bandwidth-Limited Signals, The Maximum Data Rate of a Channel
10 th	guided transmission media, and wireless transmission
11 th	Communication satellites: Geostationary, Medium-Earth Orbit, and Low-Earth Orbit Satellites
12 th , 13 th	Digital modulation and multiplexing: Baseband, Pass band, FDM, TDM, and CDM
14 th · 15 th , 16 th	public switched telephone network: Structure of the Telephone System, DSL, and Trunks and Multiplexing, and Switching(Circuit switching & packet swishing)
17 th	cable television:
18 th , 19 th ·20 th	DATA LINK LAYER DESIGN ISSUES: Framing, Error Control, and Flow Control
21 st , 22 th	ELEMENTARY DATA LINK PROTOCOLS
23 th , 24 th	SLIDING WINDOW PROTOCOLS
25 th	Network Layer (Store-and-Forward Packet Switching)
26 th	Network layer(Implementation of Connectionless Service)
27 th ·28 th	Network layer (Implementation of Connection-Oriented Service)
29 th	Network layer(Routing Algorithms)
30 th	Network layer(Broadcast Routing)

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6	4	2	2	Real Time systems Design	تصميم منظومات الزمن الحقيقي

أهداف المادة: التعرف على المبادئ المستخدمة في تصميم منظومة متقدمة بالاعتماد على الحاسبة الإلكترونية للتعامل معها بشكل

Weeks	Syllabus
1 st , 2 nd , 3 rd	Definitions of RTS.
4 th , 5 th	Signals, Systems, Specification.
6 th , 7 th , 8 th	Analog computer components, Systems.
9 th , 10 th , 11 th	ADC, DAC: [Definition, Types, Specifications, Errors, C/Cs and Interfacing choosing].
12 th	Introduction to Digital systems.
13 th , 14 th	Basic interfacing devices.
15 th	Data Transfer controlling.
16 th	Un programmable interfacing devices.
17 th , 18 th , 19 th , 20 th , 21 th	Programmable interfacing devices [8-bit compatible, General purpose, Timers, Peripheral controller].
22 th , 23 th , 24 th , 25 th , 26 th	Interrupts [Introduction, Types (hardware & software), Controller 8259A], Handshaking and interrupts methods.
27 th , 28 th , 29 th , 30 th	DMA, Serial Interfacing [Introduction, Standards, Types, Controller].

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6	4	2	2	Digital Signal Processing	معالجة الاشارة الرقمية

اهداف المادة:

تعليم الطالب المواضيع الاساسية لمعالج الاشارة واستخداماتها في معالجة اشارات الصوت والصوره واستخدام المرشحات الرقمية.

Weeks	Syllabus
1 st , 2 nd , 3 rd	Introduction to digital signal processing : Basic elements of DSP, DSP vs. ASP, application of DSP, Continues time signals vs. discrete time signals
4 th , 5 th , 6 th	Discrete time signals and sequences
7 th , 8 th , 9 th	Standard of discrete time signals (sequences): Unit sample sequence, Unit step sequence, Unit ramp sequence, Exponential sequence,
10 th , 11 th , 12 th	(classification of discrete time signals)System properties: Static and dynamic system, shift invariant and shift variant system, Causal and non-causal system, linear and nonlinear system, stable and unstable system.
13 th , 14 th	Convolution : Direct form method, graphical method, slide rule method
15 th , 16 th ,	Correlation of discrete time sequence: Cross correlation and auto correlation
17 th , 18 th	Frequency domain representation : Find Frequency response
19 th , 20 th , 21 st	Discrete Fourier transform (DFT), Linear convolution using DFT, Invers Discrete Fourier transform (IDFT)
22 nd , 23 rd , 24 th	Fast Fourier transform(FFT): Butterfly computation , Invers Fast Fourier transform (IFFT)
25 th , 26 th , 27 th	Introduction to Z transform: Definition of Z transform and ROC, Properties of Z transform, Inverse Z transform, application of Z transform(pole & zero plot ,causality and stability of Z transform, solution of difference equation using Z transform
28 th , 29 th , 30 th	Realization of digital filter: Basic FIR filter structure, direct form of FIR structure, Cascaded form of FIR structure, Basic IIR filter structure, direct form of IIR structure, Cascaded form of IIR structure, Parallel form of IIR structure

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6	4	2	2	Digital communication	الاتصالات الرقمية

أهداف المادة: تهيئة الطالب للتعرف على تقنيات الاتصالات الرقمية وأنواع التضمين الرقمي للترددات البينية والعالية بانواعها.

Weeks	Syllabus
1 st	Introduction to digital communication
2 nd	Signal types, General block diagram of digital communication
3 rd	Advantage and disadvantage of digital modulation, digital coding
4 th	Unit impulse signal and Fourier Transform
5 th , 6 th , 7 th , 8 th	Sampling theorem, Pulse Amplitude Modulation (PAM), Time Division Multiplexing (TDM), Pulse width and Pulse Position Modulation (PWM & PPM), S/N in analog pulse modulation
9 th , 10 th , 11 th , 12 th , 13 th , 14 th	Pulse Code Modulation (PCM), Noise Consideration in PCM, Limitation and Modifications of PCM, Information Capacity of PCM, Delta Modulation (DM), Adaptive DM, Delta-Sigma Modulation, Differential PCM (DPCM). Line coding
15 th , 16 th , 17 th , 18 th	Intersymbol Interference (ISI), Pulse Shaping to reduce ISI, Equalizer, Adaptive Equalizer, Matched Filter.
19 th , 20 th , 21 st , 22 nd , 23 rd , 24 th	Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), Coherent and Noncoherent Detection, Differential PSK, Error performance of Binary System.
25 th , 26 th , 27 th , 28 th , 29 th , 30 th	Quadrature Phase Shift Keying (QPSK), Offset QPSK, Minimum Shift Keying, Multilevel Modulation Techniques M-ary PSK, M-ary QAM, Bandwidth Efficiency and power Spectra of modulated Signal, Carrier Recovery and Clock Recovery.