2014

كلية تقنية الحاسوب

طرابلس

College of Computer Technology Tripoli

بكالوريس شبكات الحاسوب

2014 www.cctt.edu.ly

كلية تقنية الحاسوب طرابلس

مكتب الشؤون العلمية والتقنية

قسم شبكات الحاسوب

برنامج البكالوريس / قسم شبكات الحاسوب

يهدف هذا البرنامج لتزويد الخريج بالمهارات اللازمة والضرورية للنجـاح في مجال شبكات الحاسوب وتقنية المعلومات . ويتيح البرنامج للطالب التعرف علي البروتوكولات المستخدمة والتقنيات الحديثة و وتطبيقاتها مما سيسهل عليه الإنخراط والعطاء من اليوم الأول في سوق العمل.
معامل الشبكات بالكلية حديثة ومجهزة مما يتيح للطالب التطبيق العملي بمحاكاة الإنظمة الحالية في الشبكات المحلية واللاسلكية وشبكات واسعة النطاق سترفع من ثقة الخريج بالنفس وتمكنه من مواجهة التحديات والصعوبات التي قد تواجهه.
حرص البرنامج منذ تأسيسه علي تزويد الطالب بالشهادات العالمية من شركة أنظمة سيسكو وذلك بفتح أكاديمية سيسكو بالكلية و إجراء إمتحانات الشهائد من داخل الكلية مما يعطي الطالب الحظ الأوفر عند التقدم الي الشركات وجهات العمل.
يتكون البرنامج من أربع (6) فصول دراسية متخصصة في مجال الشبكات بعد إنهاء الطالب جميع متطلبات السنة الأولي للمواد العامة بالكلية.

المهـــارات العامة للبرنـامج:

- تطوير قدرة الطالب علي التحدث والكتابة باللغة الإنجليزية وكتابة الرسائل والتقارير العلمية والفنية.
- القدرة علي عرض المشاريع وطرح الأفكار والتحدث للجمهور
- البناء علي قدرة الطالب في التحليل الرياضي والإستنباط والتعلم الذاتي
- القدرة علي البحث في المشاريع العلمية والتقنية وتوثيقها

المـــهارات الإبتدائية للبرنـامج:

- تركيب ، تجميع ، تحديد الأعطاب لمكونات الحاسب الآلي والأجهزة الطرفية وصيانتها.
- تثبيت ، تحديث و إعادة إسترجاع لأنظمة التشغيل والبرامج الملحقة
- فهم طريقة عمل و وظيفة القطع الإلكترونية والكهربية المستخدمة في الشبكات
- تركيب شبكات متكاملة حسب المخطط الموضوع وتنفيذه
- تركيب وتجهيز الكوابل والتمديدات طبقاً للمواصفات والمعايير الدولية
- إستخدام الإجهزة والمعدات اللازمة لإختبار التوصيلات والكوابل والمقابس.
- تطبيق إعدادات أجهزة الشبكة (المحولات والموجهـات) وفقاً لما هو مطلوب
- توثيق توصيلات الشبكة ورسم الكيان المادي للشبكة

- تركيب وصيانة الشبكات المنزلية والمكتبية

المهــارات المتقدمة للبرنامج:

- تصميم الشبكات حسب متطلبات المؤسسة وإمكاناتها
- تحليل وتوثيق متطلبات سعة وسرعة الإتصال وأعداد أجهزة الشبكة لزيادة الإنتاجية
- إختيار الأجهزة الضرورية لتحقيق متطلبات المؤسسة أو الشركة وتوثيق الشبكة المنطقية
- أختبار الطرق الأمنية للشبكة ولوائح المؤسسة الداخلية لضمان أمن الشبكة والأجهزة الطرفية
- تثبيت وتحديث برامج الحماية وإعدادت الجدار الناري و وصول المستخدم للشبكة
- الإعدادت المتطورة لإجهزة التحويل والتوجيه لزيادة إنتاجية الشبكة
- مراقبة آداء الشبكة وتحديد جهات الإزدحام و إختناقات عنق الزجاجة
- تحديد نقاط الضعف في أمن الشبكة وطرق تأمينها والأدوات المستخدمة
- إعداد إجهزة الشبكة والأجهزة الطرفية لحمل الصوت VOIP في الشبكة وضمان جودة الصوت
- إعدد الشبكات الخاصة VPN وطرق الوصول للشبكة الخاصة عن بعد
- إضافة و تغيير و والغاء قوائم الوصول والتحكم ACLs
- إعداد وتغيير قواعد الجدار الناري وأنظمة كشف الإختراقات IDS و أنظمة تفادي الإختراق IPS
- تحديد الأعطاب و تحليل مصادرها وصيانتها وتوثيق الحلول وكتابة التقارير
- تصميم وتثبيث الشبكات اللآسلكية لتلبي حاجة المؤسسة في التنقل والأمن والإنتاجية
- تعلم لغة البرمجة الجرافية لمحاكات أنظمة الإتصالات ، لقياس الإشارات السلكية واللاسلكية وكآداة للبحث العلمي والبدء في مشروع التخرج.

المهارات الذاتية والمهنية للطالب:

وبالإضافة إلي المهارات التي يكتسبها الخريج في مجال تخصصه (شبكات الحاسوب) فأن البرنامج ركز علي مهارات شخصية وعلي المستوي الذاتي ليتقنها الطالب من خلال مشروع التخرج والعمل الميداني منها:

- القدرة علي البحث والإستخلاص والتحليل
- القدرة علي العرض وطرح الأفكار بوضوح والعرض المرئي والتوثيق العلمي المنهجي الصحيح
- التعرف علي سوق العمل وإحتياجاته وطرق النجاح في المقابلات الشخصية و كتابة السيرة الذاتية
- تعلم مهارات العمل ضمن الفريق وتنسيق العمل والإنضباط
- إكتساب مهارات إدارة المشاريع الصغري والمتوسطة ، الإلتزام بالجدول الزمني ، تحديد الموارد ، التنباء بالمعوقات وتحليل نسب المخاطر ، المعالجات الفورية وغيرهـا

جدول الوحدات الدراسية المقررة / قسم شبكات الحاسوب

Term 1	Subject	Hours	Prerequisite
IT 100	IT Essentials	3/3	None
IT 111	Fund. of Programming in C	4/0	None
CT 113	Electrical Circuits I	4/0	None
MA 150	Mathematics I	4/0	None
EN 160	English Language 1	4/0	None
	Total Credit 20	22	

Term2	Subject	Hours	Prerequisite
CT 115	computer Organ./Architect	4/0	IT 100
IT 112	Programming in Visual C	3/3	IT 111
CT 117	Digital Systems I	3/3	None
MA 151	Mathematics II	4/0	MA 150
EN 161	English Language 2	4/0	EN 160
	Total Credit 20	24	

Term3	Subjects	Hours	Prerequisite
NT 211	Funds of Networking CCNA 1	3/3	None
CT 216	Electronic Circuits and Devices	3/3	None
MA 252	Differential Equations	4/0	MA 151
NT 220	Signals and Systems	3/3	None
EN 262	English Language 3	4/0	EN 161
	Total Credit 20	24	

Term4	Subjects	Hours	Prerequisite
NT 212	Routing Protocols CCNA 2	3/3	NT 211
NT 214	Measurements & Instruments	3/3	None
NT 221	Principles of Communication	4/0	NT 220
NT 202	Data Communications	4/0	None
EN 263	English Language 4	4/0	EN 262
	Total Credit 20	26	

Term5	Subject	Hours	Prerequisite
NT 314	LAN Switching CCNA 3	3/3	NT 211
NT 322	Wireless Networks	3/3	NT 211
NT 324	Mobile Communications	4/0	NT 221
NT 326	Graphical Programming	3/3	IT 112
EN 364	English Language 5	2/0	EN 263
EN 300	Technical Documentation I	2/0	EN 263
	Total Credit 20	26	

Term6	Subject	Hours	Prerequisite
NT 315	Accessing the WAN CCNA 4	3/3	NT212+NT314
NT 328	Network Security 1	3/3	NT 211
NT 330	Optical Networks (New)	4/0	NT 211
NT 332	Network Infra/ AD config.	3/3	NT 211
EN 365	English Language 6	2/0	EN 364
EN 301	Technical Documentation II	2/0	EN 300
	Total Credit 20	26	

Term7	Subject	Hours	Prerequisite
NT 429	Network Security II	3/3	NT 328
NT 434	Voice over IP	3/3	NT 315
NT 436	Network Admins and Monitor	3/3	NT 322
IT 470	Project Management.	3/3	None
CT 436	Research Methods	2/0	None
	Total Credit 18	26	

Term8	Subject	Hours	Prerequisite
NT 402	Selected Topics	3/3	None
NT 404	On Field Practice	1/3	None
NT 444	Research Thesis	0/3	All Sub.
	Total Credit 7	13	

Total Credit Units = 145

- **Refreshment year (semester 1 & 2) is general for all departments.**
- **Subject Code:**

Subject Code Abbreviations		Numbering System
EN	English Language subjects	1st digit from left: signifies the year 2nd and 3rd digit from left: for numbering purposes.
MA	Mathematics subjects	
IT	Information Technology Dept.	
NT	Networking Dept.	
CT	Control Dept.	

الفصل الدراسى الاول

Code	Subject	Credit Hours	Theoretical Hours	Practical Hours	Prerequisite
IT 100	IT Essentials	4	3	3	None
IT 111	Fund. of Programming	4	4	0	None
CT 113	Electrical Circuits 1	4	4	0	None
MA150	Mathematics I	4	4	0	None
EN 160	English Language 1	4	4	0	None

Subject	IT Essentials	**Course Code**	**IT 100**	**Theoretical**	3 hrs / wk
Semester	1	**Prerequisite**	None	**Practical**	3 hrs / wk

البرنـــــامج التعلـــيمي	
1. مفـــاهيـــم عـــامة: • الأجهزة والبرامج و تقنية المعلومات • . أساسيات الحاسوب • مكونات الحاسوب. • أداء الحاسوب.	**الأسبوع 2-1**
2. الأجهزة: • وحدة المعالجة المركزية. • الذاكرة. • وحدات الإدخال. • وحدات الإخراج. • وحدات التخزين.	
3. البرامج : • أنواع البرامج. • برامج نظم التشغيل.برامج التطبيقات. • واجهات المستخدم الرسومية. • تطوير النظم.	
4. شبكات المعلومات : • الشبكات المحلية والواسعة. • الإنترانت والإكسترانت. • الإنترنت. • الشبكات الهاتفية.	**الأسبوع 3 - 5**
5. تقنية المعلومات في الحياة اليومية: • الحواسيب في العمل. • العالم الإلكتروني.	
6. الصحة والأمان والبيئة: • التقنية الحيوية. • مسائل صحية.	

	• تحذيرات مسبقة. • سرية المعلومات. • فيروسات الحاسوب. • حقوق النسخ. • الحماية القانونية للبيانات.
الأسبوع 6 - 8	**7. الأنظمة العددية و تحويلاتها:** • النظام العشري. • النظام الثنائي. • النظام الثماني. • النظام السادس عشر. • التحويل ما بين جميع الانظمة.
الأسبوع 9 - 11	**8.البوابات المنطقية:** • AND – OR – NOT – NAND – NOR – XOR XNOR • الشكل المقابل للبوابة. • جدول الصدق. • التعبير المنطقي. • إستخراج التعبير المنطقي من الدائرة المنطقية. • رسم الدائرة المنطقية من التعبير المنطقي. • إعطاء قيم للمدخلات و إيجاد قيم المخرجات
الاسبوع 12- 14	**9. الجزء العملي:** • التعرف على جهاز الحاسوب ومكوناته (System Unit) • التعرف على نظام التشغيل (Microsoft Windows) • التعرف على تطبيق معالج النصوص (Microsoft Word) • التعرف على تطبيق العروض التقديمية (Microsoft PowerPoint)

Course Assessment:

Course Work	Mid-Term Tests	Final Exam Practical	Final Examination
10	30	20	40

NOTE: Course Work may include assignments, projects and practical activities.

Subject	Fund. of Programming	**Course Code**	IT111	**Theoretical**	4 hrs / wk
Semester	1	**Prerequisite**	None	**Practical**	0 hrs / wk

Program Learning Components	
Week 1-2	**1. Programming and Problems Analysis:** • Problems solving using computer. • Steps of problems solving. • Software. • Definition Of Software. • Types of software. • Software development stages. • Data types. • Variables. • Constants. • Reserved words.
Week 3-5	**2. Statements:** • Assign statements. • Decision statements. • Input /output statements. • Control statement. • Loops. • Math Operations. • Relational Operations. • Logical Operations. • String Operations.
Week 6-8	**3. Flowchart:** • The definition of flowcharts. • The characteristics of flowcharts. • Figures and shapes used in flowcharts: process box, choose box, input, output box. • Algorithms: problem solving using algorithm multiplication or sorting list. • Samples of solved mathematical problems like matrix

	multiplication or sorting list of names.
Week 9-10	**4. Types Of Flowchart:**
	• Sequential Flowchart. • Brainchild Flowchart. • Looping Flowchart. • TDMA Of FDMA.
Week 11-12	**5. Looping And Control:**
	Using of mathematical and logical operation in looping and decision the production of output by executing flowchart.

Course Assessment:

Course Work	Mid-Term Tests	Final Examination
10	30	60

NOTE: Course Work may include assignments, projects and practical activities.

الدوائر الكهربية 1

Subject	Electrical Circuits 1	**Course Code**	CT 113	**Theoretical**	4 hrs. / wk.
Semester	1	**Prerequisite**	None	**Practical**	0 hrs. / wk.

Program Learning Components		
Week 1-2	**1. Voltage, Current and Resistance:** • Explain Metric system and Electrical units. • Use of Scientific notations and metric prefixes. • Discuss charge, current, voltage and resistance. • Ohm's law and basic calculations. • Explain Power formulas, power supply and voltage drops.	**Resources** Projector. Simulation using HE© software package.
Week 3	**2. Series Circuits:** • Determine total series resistance. • Ohm's law in series circuits. • Adding voltage sources in series. • Apply Kirchhoff's voltage law. • Determine Power in series circuits. • Using voltage dividers.	**Resources** Projector. Multisim software package.
Week 4	**3. Parallel Circuits** • Identify parallel circuit. • Determine total parallel resistance. • Apply Ohm's law in parallel circuits. • Adding current sources in parallel. • Apply Kirchhoff's current law. • Using current dividers. • Determine Power in parallel circuits.	**Resources** Projector. Multisim software package.
Week 5	**4. Series-Parallel Combination Circuits** • Identifying and analyzing the circuits. • Simplifying ladder networks. • Convert voltage source to current source. • Convert current source to voltage source	**Resources** Projector.

Week	5. Circuit Analysis Methods	Resources
6-7	• Explain Mesh Analysis (General Approach). • Undertake First-Midterm Test. • Explain Nodal Analysis (General Approach).	Projector. Multisim package.
Week 8-10	**6. Network Theorems**	**Resources**
	• Explain and apply superposition theorem. • Explain and apply The venin's theorem. • Explain and apply Norton's theorem. • Explain maximum power transfer theorem.	Projector. Multisim package.
Week 11-12	**7. Capacitance**	**Resources**
	• Explain the capacitor and type of capacitors. • Determining series and parallel connections. • Charging and discharging of capacitors and current and voltage relationship. • Undertake Second-Midterm Test.	Projector. Multisim package.

Course Assessment:

Course Work	Mid-Term Tests	Final Examination
10	30	60

Textbook: Introductory Circuit Analysis 10th Edition by Boylestad.

Note to student: contact CCTT Library to get a free DVD e-book Code (CT 113).

NOTE: Course Work may include assignments, projects and practical activities.

رياضيــات 1

Subject	Mathematics 1	**Course Code**	MA150	**Theoretical**	4 hrs / wk
Semester	One	**Prerequisite**	None	**Practical**	0 hrs / wk

Program Learning Components	
Week 1-4	**1. Matrices and Determinants** • matrices and matrix arithmetic • Types of Matrices • Evaluating Determinants by Row Reduction and Cramer's Rule • Properties of determinants • The adjoins and inverse of a matrix 2x2 , 3x3 • Solution of Homogenous and Non homogenous system of • linear Equations by Gauss Elimination and Cramer's rule
Week 5-7	**2. Vectors:** • Introduction to Vectors • Cartesian and Polar Representation • Vector Arithmetic • Dot Product and Projection • Cross Product and Parallel Lines • Properties of vectors • Parametric equations for the Line • Plane equation
Week 8-12	**3. Differentiation** • Definition of the Derivative of a function • Geometric meaning of the derivative • Basic differentiation rules • Implicit differentiation • Applying the chain rule • Derivatives of Trigonometric functions • Derivatives of logarithmic and exponential functions • Derivatives of Inverse Trigonometric functions • Higher Order Derivatives / L'hopital's Rule

Course Assessment:

Course Work	Mid-Term Tests	Final Examination
10	30	60

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

1- Calculus by Anton , Bivens, Davis , 8^{TH} Edition
2- Linear Algebra by Seymour Lipshutz
3- Calculus and Analytical Geometry by Fisher and Ziebur

لغة إنجليزيــة 1

Subject	English language 1	**Course Code**	EN160	**Theoretical**	4 hrs / wk
Semester	One	**Prerequisite**	None	**Practical**	0 hrs / wk

Program Learning Components	
Week 1-4	**1. Grammar:** *** NOUNS**: **Functions of nouns **Countable and uncountable nouns ** Plural from nouns **Definite and indefinite articles ***PRONONUNS**: **Subject pronouns **Object pronouns **Possessive pronouns **Possessive adjective **Demonstrative pronouns ***TENSES** **Present simple **present continuos **past simple **Past continuos **future simple (EACH OF THE TENSES MENTIONED ABOVE SHOULD BE PRESENTED IN THE AFFIRMATIVE, NEGATIVE AND INTERPROGATIVE FROMS. THE MOST COMMON ADVERBS SHOULD BE PRESENTED WITH EACH TENSES) ***INTERROGATIVES**: **WHO **WHOM **WHAT **WHEN **WHERE **WHOSE **WHOM **WHICH

	WHY **HOW (MANY,MUCH,TALL,…ETC) ***ADIECTIVE : ** Positions of adjectives **proper adjectives **Comparative adjectives **Superlative adjectives **Irregular adjectives ***PREPOSITIONS:** **Prepositions of time **Prepositions of place **Prepositional adjectives
Week 5-7	**2. LCOMPREHENSION:** **Reading for appreciation :** (FOUR OR FIVE SIMPLE AND SHORT PASSGES TAKEN FROM SELECTIONS FOR DEVELOPING READING SKILSS) **Reading for information:** (THREE SIMPLE PASSGES AND DIALOGUES ABOUT THE FIELD OF COMPUTER AND IT'S MOST COMMON TERMS)
Week 8-10	**3. COMPOSITION** : **STUDENT SHOULD BE TAUGH HWO TO WRITE SIMPLE SENTCENS CONSISTING OF :** *NOUN+VERB(subject and predicate of sentence) *NOUN+VERB+NOUN(subject and predicate , object) *NOUN+VERB+NOUN+NOUN (indirect , direct obj) *NOUN+ VERB+ adjective+NOUN *ADJECTIVE+ NOUN +ADJECTIVE+ NOUN *NOUN+ADVERB+VERB *NOUN+ADVERB+VERB+NOUN *NOUN+VERB+ADVERB *NOUN+VERB+NOUN+ADVERB *NOUN+VERB+PREPOSITION+NOUN *NOUN+VERB+PREPOSITION+NOUN+ADVERB *VERB+NOUN *ADVERB +VERB+NOUN
Week 11	**4. FUNCTUATION AND SPELING :** *Capitalization *Full stop *Question mark

	*Doubling final consonants *Omission of final (E) *Changing final (y) **(C)=a)(s) **(K) **(TCH)
Week 12	**5. PRONUNCIATION:**
	(MORE CONCENTRATION SHOULD BE GIVEN TO THE SOUNDS WHICH DO NOT OCCUR IN ARABIC LANGUAGE OR LIBYAN DIALOG SUCH AS (P),(V),(TH)..AND THOSE WHICH DO NOT HAVE THE SAME POINT OF ARTICULATION SUCH AS (R), (L)…..)

Course Assessment:

Course Work	Mid-Term Tests	Final Examnation
10	30	60

الفصل الدراسى الثانى

Code	Subject	Credit Hours	Theoretical Hours	Practical Hours	Prerequisite
CT115	Computer Organ./Architect	4	4	0	IT100
IT112	Programming in Visual C	4	3	3	IT111
CT117	Digital Systems 1	4	3	3	None
MA151	Mathematics 2	4	4	0	MA150
EN161	English Language 2	4	4	0	EN160

تنظيم الحاسبات

Subject	Computer Organ./Architect	**Course Code**	CT115	**Theoretical**	4 hrs / wk
Semester	Two	**Prerequisite**	IT100	**Practical**	0 hrs / wk

Objective: To Provide the opportunity to Understand Structure of Computers to be able to utilize architecture to develop System Program

	Topic	**Description**
Week 1	1. Introduction and Terms. 2. Computer Hardware Units. 3. Computer Software. 4. The Software Development Cycle.	Including The Subject of Computer architecture and organization. General view and Von-Nueman architecture highlighting program tasks and components, software development environment and producing executable machine code.
	Topic	**Description**
Week 2	1. Computer Description. 2. Computer main functions and data flow. 3. Performance criteria CISC Computer and Risk Computers. 4. Technology Constraint.	Explaining the architecture versus Organization Structure versus function. The main function of computers. Computer classification into Microcomputer versus Minicomputers and technology constraint for each class.
	Topic	**Description**
Week 3	1. Central processing unit. 2. The functions the CPU. 3. The role of the control unit in the CPU 4. Internal CPU buss and the external system bus.	The structure of the CPU : ALU , CU , General Register , Special Register and Buses . Introduction the function of the CPU , Then knowing how the CPU synchronizes its functions internally and externally by the control unit and the system bus.

	Topic	Description
Week 4	1. Case Study: the architecture organization for Intel 8086 microprocessor. 2. Intel 8086 CPU. 3. Intel 8086 Flag Register.	Introduction and analyzing the Intel 8086 CPU architecture: Bus interface Unit BIU, Execution Unit EU and operations Parallelism. Example in assembly how flags are affected by instructions.
Week 5	**Topic**	**Description**
	1. Memory organization and the physical address calculation. 2. Interrupt system in Intel 8086.	How the main memory for 8086 cpu is organized and divided into segments. and how is the address space in mapped into a virtual space with physical address calculation mechanism. Then the student should know the interrupts , vectors and handling.
Week 6	**Topic**	**Description**
	1. Instructions Execution and Sequencing. 2. Machine code programming. 3. Instruction fetching and executing cycle. 4. Instruction format.	Explaining how the CPU executes and instructions from decoding the instruction format and interrupting the meaning of the instruction. This is well demonstrated using a sample from machine code programming: Op-code field and operand(s) field.
Week 7	**Topic**	**Description**
	1. Instruction sequencing state diagram. 2. Operations done by the instruction. 3. CPU tasks to complete the execution of an instruction. 4. Place of data to be manipulated.	Following how a CPU completes the execution of an instruction. What stages to follow and what the operations are done by the instruction. Where data can be found to be manipulated as sources of information.
Week 8	**Topic**	**Description**
	1. Immediate addressing mode. 2. Direct and indirect addressing mode. 3. Register and register indirect addressing mode. 4. Displacement and stack addressing mode.	Introduction and analyzing various addressing modes used by most architectures. Examples are taken from addressing modes used by Intel 8086 CPU for real demonstration. Other addressing modes can be easily

		derived from those mentioned addressing mode.
Week 9	**Topic**	**Description**
	1. Mid Term Exam.	Testing the knowledge gained by students so far.
Week 10	**Topic**	**Description**
	1. Memory hierarchy and performance factors. 2. Semi conductors memory. 3. Memory cell Structure.	Memory organization. Memory as a store for programming and data: RAM, ROM, PROM, EPROM, EEPROM, Flash memory, Data line, Control line and select line and the bit storage media.
Week 11	**Topic**	**Description**
	1. Mapping techniques: Direct mapping, set associative mapping and full associative mapping. 2. Replacement strategies: FIFO, LRU, LFU. 3. Write policies: write back write through.	Cash memory organization and management. Example for mapping techniques, replacement strategies and write policies.
Week 12	**Topic**	**Description**
	1. Mechanisms for data input and output. 2. Memory mapped devices and isolated addressed device. 3. Programming and interrupted input/output.	Input and output techniques handling. Introducing the concept of device interface. Highlighting how devices are treated from the software point of view: example for each method.
Week 13	**Topic**	**Description**
	1. Direct memory access (DMA). 2. DMA controller architecture. 3. DMA programming and functions.	Introducing the concept, general structure and comparing and outputting using DMA.
Week 14	**Topic**	**Description**
	1. External buses classifications. 2. PC2 bus structure and operations. 3. ISA and EISA bus structures, attributes and functionality. 4. USB features, structures.	System bus architectures. Introducing and comparing different buses structures.

Course Assessment:

Mid Term	Lap Activities	Final Exam
25%	15%	60%

Text Box and References:

1. "Computer Architecture and Organization" john P.Hayes, 2nd Edition.
2. "The Intel Microprocessor 8086/80286…/Pentium Pro Processor: Architecture Programming and Interfacing" Barry B.Bary, 5th Edition 2000.

البرمجة بلغة السي

Subject	Programming in Visual C	**Course Code**	IT112	**Theoretical**	3 hrs / wk
Semester	2	**Prerequisite**	IT111	**Practical**	3 hrs / wk

Program Learning Components		
Week 1	**Topic**	**Description and Practical Work**
	1. Basic of C programming. 2. Variables and data Type. 3. Operators and Expressions. 4. Basic input and output statement.	Getting Stated With first step for C programming : The General program structure, variables and abstract data type. Arithmetic and logical Expression. Writing First simple C program.
Week 2	**Topic**	**Description and Practical Work**
	1. Variables declaration. 2. Simple built-in Data types. 3. Constant and their use. 4. Memory allocation and binding for variables and constants.	Understanding the sue of variables and constants for data holding during manipulation. Using constants for fixed data values. Getting knowledge how memory space is allocated for variables holding different data types. The role of declaration statement for memory allocation.
Week 3	**Topic**	**Description and Practical Work**
	1. Decision statement and program control flow selection. 2. The simple **IF** Statement. 3. The tow way **IF…ELSE** Statement. 4. The multi selection.	Using the language available selection programming constructs. Conditional selection in different version with one way, tow ways and multiways selections. Intensive examples are to be provided that demonstrate the use and benefits of those constructor.
Week 4	**Topic**	**Description and Practical Work**
	1. Iteration Statements and program compaction. 2. **FOR** Statement as counting loop.	Learning the need for program compaction and eliminating reparations of code parts by building program construct blocks using iteration statements.

	3. **WHILE** statement as pretested loop. 4. **DO...WHILE** statement as post tested loop.	The difference and usage of those statements are clarified by example during lab activities sessions.
Week 5	**Topic**	**Description and Practical Work**
	1. Function and program decomposition. 2. Types of functions. 3. Parameters passing methods between functions. 4. Standard library functions.	Learning how to split programs into functional unit as subprograms. By this splitting the programmers gain tow benefits: avoiding the reparations of code and reusing modules in more than one program as well as using ready developed modules from system library and other programmers.
Week 6	**Topic**	**Description and Practical Work**
	1. Compound data structures. 2. Arrays. 3. Pointers and addresses. 4. Structures and unions. 5. Enumerators.	Collecting related data into one data structures under one name to ease its access, manipulations memory utilization and speeding up the processing time. Practical activities focuses on how to access the elements of each compound data type and what operations can be performed on it.
Week 7	**Topic**	**Description and Practical Work**
	1. String as special arrays of type character. 2. Data inputting and outputting from strings. 3. Handling strings as one unit of data. 4. Library functions for strings.	A string get special attention and treatment in most of modern programming language. The student has to know how VC/VC++ treats string and what library function are available to work with string in word/text processing applications.
Week 8	**Topic**	**Description and Practical Work**
	1. Classes, Objects and inheritance. 2. Overriding, overloading and polymorphism of functions between classes. 3. Interface and abstract classes and the general program prototype.	Adding the related functions for related data types/ structures in one programming unit to form a class. This steps enters the students smoothly into VC++ programming. Function organization between classes is treated by over loading functions in the same class, overriding function between subclasses and polymorphism in different cases in the same hierarchy.

Week 9	**Topic**	**Description and Practical Work**
	1. Mid Term Exam.	Testing the knowledge gained by students so far.
Week 10	**Topic**	**Description and Practical Work**
	1. VC project setting. 2. Massage box Format. 3. Standard controls. 4. Windows messages and notification.	Learning how to start with developing a complete project as an application. Learning the available controls in VC++ to design the graphical user interface GUI.
Week 11	**Topic**	**Description and Practical Work**
	1. Continue with controls. 2. Examples. 3. Command line parsing. 4. Mapping and error handling.	Learning how to start with developing a complete project as an application. Learning the available controls in VC++ to design the graphical user interface GUI.
Week 12	**Topic**	**Description and Practical Work**
	1. Files creation. 2. Data inputting from files. 3. Data outputting to files.	Dealing with files: file type, file formats and file attributes. When using text files and when using Binary file. Importing data from files and exporting data to files. Space management in memory and on disks.
Week 13	**Topic**	**Description and Practical Work**
	1. Introduction to applications development. 2. The capabilities of VC++ for windows Applications. 3. What is next of VC++	Tow lab sessions to develop a semi windows application to highlight the capabilities of VC++ to develop interactive windows application.
Week 14	**Topic**	**Description and Practical Work**
	1. General reviw.	Reviewing what have been studied and what is left for applications development using VC++.

Course Assessment:

Mid Term Exam	Home works and Lap Activities	Final lap Exam	Final Exam
15%	25%	20%	40%

Text Box and References:

1. "Microsoft Visual C++" by Julian T.And Andy Olsen 2002.
2. "Programming in C" 5th Edition by ritch and karnighan.

أنظمة رقميــة 1

Subject	Digital Systems I	**Course Code**	CT117	**Theoretical**	3 hrs / wk
Semester	2	**Prerequisite**	None	**Practical**	3 hrs / wk

Program Learning Components			
Week 1-5	**1. Understanding the various types of Binary Arithmetic and Boolean algebra.** **2. To introduce the concept of basic logic gates.**	**Resources**	**Practical**
	• **To understand the:** Binary arithmetic. Boolean algebra. • **Comprehend fully the concept of:** -basic logic gates. [and, or, not, nand, nor, ex-or, exnor].	-Lesson Plan -Chalk board -Comprehensive workbook of control engineering and systems and data sheets.	To be able to design and Implement combinations of logic circuits.
Week	**3. Introducing Boolean Algebra and minimization** **4. Techniques. Designing combinations of logic circuits.**	**Resources**	**Practical**
6-9	**Comprehension of:** Boolean algebra and its associated theorems. **To understand the**: Logic minimization using Boolean theorems and K-Map **To understanding the functional logic unit such as:** Encoders, decoders, multiplexers,	-Lesson Plan. -Chalk board. -Comprehensive workbook of control engineering and systems and data sheets.	Supervise the laboratory and support students in their practical work.

	demultiplexers, Half Adder, Full Adder.....etc		
Week	**5. Understanding and ability to design Sequential circuits and analysis.**	**Resources**	**Practical**
10-14	**To understanding the**: Basic unit of sequential circuits. **Comprehension of the design and analysis process for**: synchronous logic design. Asynchronous counters& registers. *Parallel registers, shift registers *Ripple counter, up – down counter Int. ROM, Ram, Pla, Prom, EPROM.	-Lesson Plan. -Chalk board. -Comprehensive workbook of control engineering and systems and data sheets.	Supervise the laboratory and support students in their practical work.

Course Assessment:

Course Work	Mid-Term Tests	Final Exam Practical	Final Examination
10	30	20	40

NOTE: Course Work may include assignments, projects and practical activities.

ريـاضـيات 2

Subject	Mathematics II	**Course Code**	MA151	**Theoretical**	4 hrs / wk
Semester	2	**Prerequisite**	MA150	**Practical**	0 hrs / wk

Program Learning Components	
Week 1-6	**1. Integration**
	Definition of indefinite and definite Integration Properties of Integration Integration by substitution Integrals of Inverse Trigonometric functions Trigonometric substitutions Further Substituting Powers of Trigonometric functions Completing the square Partial Fractions Integration by Parts
Week 10-7	**2. Applications of Integration**
	Area under a curve Area between 2 curve Area under a curve (method Riemann) compute the arc length of a function Numerical Integration (Trapezoidal and Simpsons Rules)
Week 14-11	**3. Complex Numbers**
	Introduction to complex numbers Cartesian Representation of complex numbers Complex Number Arithmetic Modulus , complex conjugate , Division The Argand Diagram Complex Equations De Moivres theorem Eulers Rule Roots of Complex Numbers

Course Assessment:

Course Work	Mid-Term Tests	Final Examination
10	30	60

Text books:

1. Calculus by Anton, Bivens, Davis, 8th Edition.
2. Liner Algebra by Seymour Lipshutz.
3. Calculus and Analytical Geometry by Fisher and Ziebur.

لغة إنجليزيــة 2

Subject	English language2	**Course Code**	EN161	**Theoretical**	4 hrs / wk
Semester	2	**Prerequisite**	EN160	**Practical**	0 hrs / wk

Program Learning Components	
Week 1-4	**2. Grammar:** * **Tenses** ** Present perfect continuous ** Past perfect continuous ** Future perfect continuous * **If cause** ** Probable conditions ** Improbable conditions ** Impossible conditions * **Gerund** ** As subject ** After prepositions ** The perfect gerund ** The passive gerund * Direct and indirect speech (reported speech)
Week 5-7	**6. COMPREHENSION:** * Units 8 of (oxford of computing) ***** Using dictionary
Week 8-10	**7. BASIC LOGIC GATES:** * The mechanics of composition ** Methods of starting ** Continuity and paragraphing ** Methods if ending ** Somme types of composition ** Language and style * Spelling and pronunciation ** (ce , ci , ti) before a vowel have the sound of (sh) as in cetaceans , gracious , motion , partial ** (si) after an accented vowel , is pronounced like (zh) confusion

	* Summarizing ** Paragraphs ** Letters
Week 11-12	**8. SPELLING AND PRONUNATION**
	Students are given the must common words which have pronunciation but Different spelling such as : ACCEPT / EXERT ANT/AUNT BREAK/BRAKE CHEQUE/ CHECK CRITIC / CRITIQUE CURRENT / CURR COMPLEMENT/COMPLEMENT CUE/QUEUE DRAFT/DRAUGHTDEAR/DEER HOLE / WHOLEHEAR/ HERE HIRE/HIGHER MAIL/ MALEPEACE/PIECE QUIFT / QUITERIGHT / WRITE PRECED / PROCEED PREPOSITION / PROPOSITION TALL/TALE WAIT/ WEIGHTWAY/WEIGH WEEK / WEAK THEIR / THEREKNEW/ NEW READ/RED
Week 13-14	**9. NUMBER REPRESENTATION**
	Students are given the most common abbreviations more, concentration on those which are related computer science such as : * GRAMMAR ** N. NOUN ** SING SINGULAR ** PRON.PRONOUN ** PL.PLURAL ** V.VERB ** SYN. SYNONYM ** ADV ADVERB ** ANT.ANTONYM ** ADJ. ADJECTIVE ** PUNCT.PUNCTUATION ** PREP.PREPOSITION ** MUSC. MUSCULINI ** CONJ. CONJUNCTION ** FEM.FEMININE * TITLES OF PERSONS ** DR. DOCTOR ** MR. MISTER ** MRS. MISTER'S ** PROF. PRFESSOR

Course Assessment:

Course Work	Mid-Term Tests	Final Exam Practical
10	30	60

الفصل الدراسى الثالث

Code	Subject	Credit Hours	Theoretical Hours	Practical Hours	Prerequisite
NT211	Funds of Networking CCNA 1	4	3	3	**None**
CT216	Electronic Circuits 1	4	3	3	**None**
MA252	Differential Equations	4	4	0	**MA151**
NT220	Signals and Systems	4	3	3	**None**
EN262	English Language 3	4	4	0	**EN161**

Subject	Funds of Networking CCNA 1	**Course Code**	NT211	**Theoretical**	3 hrs / wk
Semester	3	**Prerequisite**	None	**Practical**	3 hrs / wk

Program Learning Component

Week 1	**1. Introduction to Network World**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain the importance of data networks and the internet in supporting business communications. Explain how communication works in data networks.	Flash Video	Flash Video
Week 2	**2. Communication over the Network**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain LANs WANs and Internetworking • Understand the role of Protocols • Explain the layered Model • Explain Network Addressing	On-line Cisco curriculum	Chapter Labs
Week 3	**3. Application Layer Functionality and Protocols**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain the role of application layer • Making provisions for services • Explain application layer protocols	On-line Cisco curriculum	Chapter Labs
Week 4-5	4. **OSI Transport Layer**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain the role of transport layer • Making provisions for services • Explain and managing TCP protocol sessions. • Understand UDP protocol low overhead.	On-line Cisco curriculum	Chapter Labs
Week 6	5. **OSI Network Layer**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain IPv4	On-line Cisco	Chapter Labs

	• Explain Network-dividing Devices • Explain How data packets are routed	curriculum	
Week 7-8	6. **IPv4 Addressing**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain how IPv4 Addressing works • Is it on my network? • Calculating Addresses • Testing the network layer.	On-line Cisco curriculum	Chapter Labs
Week 9	7. **Data Link Layer**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain media access control techniques. • Framing the data. • Addressing the data	On-line Cisco curriculum	Chapter Labs
Week 10	8. **The Physical Layer**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain communication signals. • Explain Physical signaling and encoding. • Physical connections	On-line Cisco curriculum	Chapter Labs
Week 11-12	9. **The Ethernet**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain Ethernet communication through LAN. • Ethernet Frame. • Explain Ethernet media access control. • The differences between hubs and switches. • Understand address resolution Protocol.	On-line Cisco curriculum	Chapter Labs
Week 13	10.**Planning and Cabling Networks**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Making LANs physical connections. • Devices Interconnections. • Developing addressing schemes. • Calculating subnets.	On-line Cisco curriculum	Chapter Labs
Week 14	11.**Planning and Cabling Networks**		
	Specific Learning Outcomes	**Resources**	**Practical**

	• Explain IOS basics • Configuring Cisco devices • Verifying connectivity. • Monitoring and documenting networks.	On-line Cisco curriculum	Chapter Labs

Course Assessment:

Course Work	Test	Laps	Final Exam	Final Exam Partical
10	30	10	20	30

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

1. Cisco Online Curriculum
2. CCNA: Cisco Certified Network Associate Study Guide.5th Edition by Todd Lammle
3. Network+ Certification Bible

Subject	Electronic Circuits1	**Course Code**	CT216	**Theoretical**	3 hrs / wk
Semester	Three	**Prerequisite**	None	**Practical**	3 hrs / wk

Program Learning Component

Week 1-3

1. Introduction to Semiconductors

Specific Learning Outcomes	Resources	Practical
• Explain Semiconductors, Conductors and Insulators. • Discuss conduction in semiconductor. • Describe N-type and P-type semiconductor. • Analyze Current-Voltage Characteristics of PN junction. • Explain the PN junction and explain the three diode models.	Projector. Simulation of hole & electron movement.	Identify diode packages. Test defective diodes using ohmmeter and DMM.

Week 4-5

2. Diode Applications

Specific Learning Outcomes	Resources	Practical
• Explain the operation of a half wave rectifier. • Explain the operation of a full wave rectifier. • Analyze power supply filter • Analyze the role limiting and clamping circuits. • Analyze the operation of diode voltage multipliers. • First Mid-term Evaluation Test	Projector. Simulation using Multisim software package.	Reading diode data sheet. Troubleshoot diode circuits.

Week 6-7

3. Special Diode and Two Terminal Devices

Specific Learning Outcomes	Resources	Practical
• Describe the characteristics of Zener diode.	Projector. Simulation using	Reading different diodes data sheets.

	• Zener diode application in limiting and regulation circuits. • Explain varactor diode circuits. • Discuss the operation of LEDs and Photodiodes. • Describe the characteristics of Solar Cells and Thermostors.	Multisim software package.	Experiment with Zener regulations with varying input voltage.
Week 8-10	4. **Introduction to Bipolar Junction Transistor**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe the basic structure of BJT. • Explain Transistor operation • Discuss transistor bias and current-voltage relations, transistor rating and DC load line. • Explain how BJT is used as voltage amplifier. • Explain how BJT is used as a switch. • Second Mid-term Evaluation Test	Projector. Multisim Simulation package.	Recognize different BJT packages. Identify NPN or PNP transistors using DMM. Troubleshoot faulty BJTs.
Week 11-12	5. **Bipolar Junction Transistor Bias Circuits**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain DC operating point. • Explain Base bias, emitter bias, voltage divider bias and collector feedback bias.	Projector. Multisim package.	Build and test real BJT circuits.
Week 13-14	**Field-Effect Transistors and Biasing**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain the operation of FETs. • Define and discuss important FET parameters. • Analyze FET biasing circuits.	Projector. Multisim. Package.	JFET packages. Build and test real BJT circuits.

Course Assessment:

Course Work	Mid–Term Test	Final Examination	Final Exam Practical

10	30	40	20

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

1. Electronic Devices, 4th Edition by FLOYD.
2. Electronic Fundamentals circuits, devices and Applications, 4th Edition by FLOYD.

Subject	Differential Equations	**Course Code**	MA252	**Theoretical**	4 hrs / wk
Semester	Three	**Prerequisite**	MA151	**Practical**	0 hrs / wk

Program Learning Component

Week 1-3

1. Review of Differentiation and Integration

Specific Learning Outcomes	Resources
• Review of basic differentiation rules. • Review of derivatives of sine's and cosines. • Review of derivatives of logarithmic and exponential functions • Implicit differentiation. • Review of Integration by substitution and by parts. • Review of complex numbers.	Projector.

Week 4-7

2. First Order Differential Equations

Specific Learning Outcomes	Resources
• Identify separable equations • Homogenous and nearly homogenous D.E. • Testing exact D.E. • Integration factors and Bernoulli equations. • Linear First order D.E. • Application to RL and RC circuits. • First Mid-term Evaluation Test.	Projector. Simulation using software package.

Week 8-10

3. Linear Second Order Differential Equations

Specific Learning Outcomes	Resources
• Existence of Linear Second Order Differential Equations. • Finding general solution of : $y'' + Ay' + By = 0$ for $A^2 - 4B \geq 0$ • Background on complex Exponential functions • Finding general solution of : • $y'' + Ay' + By = 0$ for $A^2 - 4B < 0$ • Reducing of order using absent dependent variable.	Projector. Simulation using software packages.

	• Reducing of order using absent independent variable. • Second Mid-term Evaluation Test.	
Week 11-12	**4. Higher Order Differential Equations**	
	Specific Learning Outcomes	**Resources**
	• Higher order linear homogenous D.E with constant coefficients. • Solve nth order using characteristic equation. • Explain different roots of characteristic equation distinct, repeated or complex. • Method of undetermined coefficients.	Projector.
Week 13-14	**5. Laplace Transform**	
	Specific Learning Outcomes	**Resources**
	• Defining Laplace transform. • Shifting in the s and t-variable. • Calculating the Laplace transform. • Calculating the Inverse Laplace transform. • Solving typical Engineering Problem. • Understanding Convolution.	

Course Assessment:

Course Work	Mid–Term Test	Final Exam Practical
10	30	60

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

Elementary Differential Equation, by W.E. BOYCE and R.C. DIPRIMA

Subject	Signals and Systems	**Course Code**	NT220	**Theoretical**	3 hrs / wk
Semester	Three	**Prerequisite**	MA252	**Practical**	3 hrs / wk

Program Learning Component

Week 1-2

1. Signal representation

Specific Learning Outcomes	Resources
• Definitions and classifications of signals • Elementary signals • Average and effective value of a signal • Energy and power of a signal • Transformation of the independent variable	Projector

Week 3-4

2. Continuous time systems

Specific Learning Outcomes	Resources
• Introduction and classification of systems • Linear time invariant systems • Systems described by differential equations • Transfer throw linear network	Projector

Week 5-8

3. Linear Second Order Differential Equations

Specific Learning Outcomes	Resources
The Laplace Transform • Introduction • The Unilateral Laplace transform • Properties of LT • Inverse LT • Applications of LT	Projector

Week 9-11

4. The Fourier series

Specific Learning Outcomes	Resources
• The periodic signals • The trigonometric form FS • The one sided spectrum • The exponential form FS	Projector

	• The two sided spectrum	
Week 12-14	**5. The Fourier transform**	
	Specific Learning Outcomes	**Resources**
	• Introduction • The continuous time FT • Properties of FT • Application of FT • Signal Filtering	Projector

Course Assessment:

Course Work	Mid-Term Tests	Final Examination
20	30	50

NOTE: Course Work may include assignments, projects and practical activities.

لغة إنجليزيــة 3

Subject	English language 3	**Course Code**	EN262	**Theoretical**	4 hrs / wk
Semester	3	**Prerequisite**	EN161	**Practical**	0 hrs / wk

Program Learning Component	
Week	**3. Grammar:**
1-5	*** Tenses** ** Present perfect continuous ** Past perfect continuous ** Future perfect continuous *** If clause** ** Probable conditions ** Improbable conditions ** Impossible conditions *** Gerund** ** As subject ** After prepositions ** The perfect gerund ** The passive gerund ** Direct and indirect speech (reported speech)
Week	**1. COMPREHENSION:**
6-10	* 8 units of (oxford of computing) * Using dictionary
Week	**2. BASIC LOGIC GATES:**
11-14	*** The mechanics of composition** ** Methods of starting ** Continuity and paragraphing ** Methods of ending ** Somme types of composition ** Language and style *** Spelling and pronunciation** ** (ce,ci,ti) before a vowel have the sound of (sh) as in cetaceans ,gracious ,motion,partial ** (si) after an accented vowel , is pronounced like (zh) confusion ** When (ci,ti)precede similar combination as in Pronunciation negotiation

	** (h) after (r) has no sound as in rhyme ** (W) before (r) is silent as in write , wrong ** (P) before (s) is mute as in psychology

Course Assessment:

Course Work	Mid-Term Tests	Final Exam Practical
10	30	60

الفصل الدراسى الرابع

Code	Subject	Credit Hours	Theoretical Hours	Practical Hours	Prerequisite
NT212	Routing Protocols CCNA2	4	3	3	**NT211**
NT214	Measurements & Instruments	4	3	3	**None**
NT201	Principles of Communication	4	3	3	**NT220**
NT202	Data Communications	4	4	0	**None**
EN263	English Language 4	4	4	0	**EN262**

Subject	Routing Protocols CCNA 2	**Course Code**	NT212	**Theoretical**	3 hrs / wk
Semester	Four	**Prerequisite**	NT211	**Practical**	3 hrs / wk

Program Learning Component

Week 1	**1. Introduction to routing and Packet Forwarding** 1.1. CLI Configuration and Addressing 1.2. Building the Routing Table 1.3. Path Determination and Switching Forwarding 1.4. Router Configuration Labs
Week 2-3	**2. Static Routing** 2.1. Routers in Networks 2.2. Router Configuration View 2.3. Exploring Directly Connected Networks 2.4. Static Routes with "Next HOP" Address 2.5. Static Routes with Exit Interface 2.6. Summary and Default Static Routes 2.7. Managing and Troubleshooting Static Routes 2.8. Static Routes Configuration lab
Week 4	**3. Introduction to Dynamic Routing Protocols** 3.1. Introduction and Advantages 3.2. Classifying Dynamic Routing Protocols 3.3. Metrics 3.4. Administrative Distances 3.5. Routing Protocols and Subnetting Activities
Week 5	**4. Distance Vector Routing Protocols** 4.1. Introduction to Distance Vector Routing Protocols 4.2. Network discovery 4.3. Routing Table Maintenance 4.4. Routing Loops 4.5. Distance Vector Routing Protocols Today
Week	**5. RIP Version1**

6	5.1. RIPv1: Distance vector, Classful Routing Protocol 5.2. Basic RIPv1 Configuration 5.3. Verification and Troubleshooting 5.4. Automatic summarization 5.5. Default Route and RIPv1
Week 7	**6. VLSM and CIDR** 6.1. Classful and Classless Addressing 6.2. VLSM 6.3. CIDR 6.4. VLSM and Route Summarization Activity
Week 8-9	**7. RIP Version 2** 7.1. RIPv1 Limitations 7.2. Configuring RIPv2 7.3. VLSM and CIDR 7.4. Verifying and Troubleshooting RIPv2 7.5. RIPv2 Configuration Lab
Week 10	**8. The Routing Table** 8.1. The Routing Table Structure 8.2. Routing Table Lookup Process 8.3. Routing Behavior 8.4. Routing Table Labs
Week 11-12	**9. EIGRP** 9.1. Introduction to EIGRP 9.2. Basic EIGRP Configuration 9.3. EIGRP Metric Calculation 9.4. DUAL 9.5. EIGRP Configuration Lab
Week 13	**10. Link-State Routing Protocols** 10.1. Introduction to Link-State Routing Protocols 10.2. Implementing Link-State Routing Protocols
Week 14	**11. OSPF** 11.1. Introduction to OSPF 11.2. Basic OSPF Configuration 11.3. The OSPF Metric 11.4. OSPF and Multi-Access Networks

	11.5. OSPF Configuration Labs

Course Assessment:

Course Work	Mid-Term Tests	Final Exam Practical	Online Final Exam	Final Examination
10	30	10	20	30

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

4. Online Curriculum by Cisco©
5. CCNA: Cisco Certified Network Associate Study Guide.5th Edition by Todd Lammle.
6. Network+ Certification Bible

Subject	Measurements &Instruments	**Course Code**	NT214	**Theoretical**	3 hrs / wk
Semester	4	**Prerequisite**	None	**Practical**	3 hrs / wk

Program Learning Component

Week 1-5

1. To understand the various types of measuring devices for Voltage and Current.

Specific Learning Outcomes	Resources	Practical
To understand the: • Principles of electronic measuring devices. • Unit of electrical quantities. • Electrical and magnetic devices. • SI : international system of units. • Error margins in different measurements. • Causes of errors when dealing with measurements taken by humans, and the environmental effects.	Whiteboard Power point slides and text book	To be able to use all the types of measuring devices. -Ability to use the Multimeter, Oscilloscope and frequency generator

Week 6-9

2. To understand the operation of Oscilloscopes in investigating the properties of waveforms.
3. To understand the mechanism of instruments in various types of measuring devices.

Specific Learning Outcomes	Resources	Practical
• To understand the: • Error classifications • Significance of figures and quantification. • Statistical data analysis, distributed functions, Multi-meter • Instrument mechanism • Operating steps • AC/DC voltage measurements	Whiteboard Power point slides and text book	To be able to use all the types of measuring devices. -Ability to use the Multimeter, Oscilloscope and frequency generator

Week

4. To understand the operation of different types of equipments for testing digital circuits.

10-14	5. To understand the operation of various types of frequency generator		
	Specific Learning Outcomes	**Resources**	**Practical**
	To understand the: • Current, Voltage and Resistance measurements. • Analog and digital meters and their operating principles. • -methods of testing digital circuits. • Logic probes. • Pulsar.	Whiteboard Power point slides and text book	To be able to use all the types of measuring devices. -Ability to use the oscilloscope, multimeter and the frequency generator

Subject	Principles of Communication	**Course Code**	NT221	**Theoretical**	4 hrs / wk
Semester	Four	**Prerequisite**	NT 220	**Practical**	0 hrs / wk

Program Learning Component	
Week 1	**10. Introduction**
	10.1. Spectral analysis 10.2. Frequency translation
Week 2-3	**11. Linear modulation systems**
	11.1. Definition of modulation 11.2. AM,DSB,SSB 11.3. Modulated equations 11.4. Spectrum and BW 11.5. Average power and Efficiency **11.6.** Modulators and Demodulators
Week 4	**12. Angle Modulation**
	12.1. Definition of angle modulation 12.2. FM and PM equations 12.3. Spectrum and BW
Week 5	**13. Sampling**
	13.1. Definition of sampling and sampling theorem 13.2. Switching function and types of sampling 13.3. Spectrum of the sampled signal
Week 6	**14. Analogue pulse modulation**
	14.1. PAM,PWM,PPM 14.2. Modulators and demodulators 14.3. Spectrum and average power
Week 7-9	**15. Digital modulation**
	15.1. Digital and analog signals A /D 15.2. Pulse code modulation 15.3. Differential pulse code modulation 15.4. Delta Modulation

	15.5. Adaptive delta modulation
Week 10	**16. Multiplexing**
	2.1. Definition 2.2. FDM 2.3. TDM
Week 11-12	**17. Digital; Carrier modulation**
	17.1. ASK, PSK, and FSK 17.2. Modulated equations 17.3. Spectrum and BW 17.4. Modulators and Demodulators
Week 13-14	**18. Multi-level Signaling**
	18.1. M-ary signaling 18.2. Bit rate and Baud rate- 18.3. M-ary FSK. 18.4. M-arry PSK 18.5. Combined amplitude and phase keying

Course Assessment:

Course Work	Mid–Term Test	Final Exam Practical	Final Examination
10	30	20	40

NOTE: Course Work may include assignments, projects and practical activities.

Subject	Data Communications	**Course Code**	NT202	**Theoretical**	4 hrs / wk
Semester	4	**Prerequisite**	None	**Practical**	0 hrs / wk

Program Learning Components	
Week 1-2	**1. Baseband data transmission (Line coding)**
	Line code characteristics Return to zero (RT) - Non return to zero (NRZ)-Bipolar Alternate Mark Inversion (AMI) - Code Radix, Redundancy and Efficiency-High Density Bipolar - Coded Mark Inversion-Manchester Line Coding - Bipolar with n Zeros Substitution Codes.
Week 3-4	**2. Multi-User Modulation techniques**
	Introduction to multiple access - FDMA system operation - TDMA system operation - CDMA system operation - Frequency Hopped CDMA - Direct sequence CDMA- Comparisons, advantages and disadvantages of each system.
Week 5-6	**3. The electrical interface**
	Introduction - Transmission media overview - Attenuation and distortion - Noise and channel capacity - Physical layer interface standard - EIA 232D/V.24 - EIA 530 -V.35- X.21- ISDN interface
Week 7-8	**4. Data transmission basics**
	Communication modes - Serial and Parallel transmission - Transmission modes - Asynchrones transmission - Synchrones transmission – Bit synchronisation – character Synchronization – Frame Synchronization.
Week 9	**5. Error Control**
	Bit error rate - Forward error control - Feedback error control - Error detection – Parity – Block sum Check - Cyclic redundancy check
Week 10-11	**6. Medium Access controls**
	Common Geometries for Multi access - Media-Modes of Accessing Communication media – Scheduling Methods- Random Access methods - Frame format of Medium Access control protocols.
Week 12	**7. Integrated services digital networks (ISDN)**
	ISDN Technology - ISDN application - Narrow band ISDN - Broad band ISDN.

Week 13-14	8. Asynchronous Transfer Mode
	ATM Principle - ATM cell structure - ATM Protocol mode functions – ATM adaptation layer – ATM Traffic Management –ATM addressing.

Course Assessment:

Course Work	Mid-Term Tests	Final Exam Practical	Final Examination
10	30	20	40

NOTE: Course Work may include assignments, projects and practical activities.

لغـة إنجليـزيـة 4

Subject	English language 4	Course Code	EN263	Theoretical	4 hrs / wk
Semester	4	Prerequisite	EN262	Practical	0 hrs / wk

Program Learning Component

Week 1-5	**4. Grammar:** **Affixes** Nouns. Verbs. Adjectives. Adverbs. **Diagramming.** Subject, predicate and complement Kinds of complement Direct object Indirect object Predicate adjective **Adjective and adverb modifiers** Adjective modify nouns or pronouns Adjective phrases modify adjective, verbs Adjective modify adjectives, verbs or other adverbs Adjective phrases modify adjectives, verbs or other adverbs Adjective clauses modify nouns or pronouns **Noun clauses** **Verbal phrases**
Week 6-7	**19. COMPREHENSION:** Oxford Eng. for computing
Week 8-10	**20. COMPOSITION** **Composition with practical purpose** Writing short composition Writing friendly letters Writing business letters **Summarizing** Paragraphs Letters
Week	**4. Spelling and punctuation:**

11	
Week 12-14	**5. Abbreviations**
	Students are given the most common abbreviation with more concentration on those, which are related to computer science

Course Assessment:

Course Work	Mid-Term Tests	Final Examination
10	30	60

الفصل الدراسي الخامس

Code	Subject	Credit Hours	Theoretical Hours	Practical Hours	Prerequisite
NT 314	LAN Switching CCNA 3	4	3	3	**NT 211**
NT 322	Wireless Networks	4	3	3	**NT 211**
NT 324	Mobile Communications	4	4	0	**NT 221**
NT 326	Graphical Programming in LabView	4	3	3	**IT 112**
EN 364	English Language 5	2	2	0	**EN 263**
EN 300	Technical Documentation 1	2	2	0	**EN 263**

Subject	LAN Switching CCNA 3	**Course Code**	NT314	**Theoretical**	3 hrs / wk
Semester	5	**Prerequisite**	NT211	**Practical**	3 hrs / wk

Program Learning Component	
Week 1-2	**12. LAN Design**
	12.1. Switched LAN Architecture 12.2. Matching Switches to Specific LAN Functions
Week 3-4	**13. Basic Switch Concepts and Configuration**
	13.1. Introduction to Ethernet 802.3 LANs 13.2. Forwarding Frames Using a Switch 13.3. Switch Management Configuration 13.4. Configuring Switch Security
Week 5-6	**14. VLANs**
	14.1. Introducing VLANs 14.2. VLAN Trunking 14.3. Configuring VLANs and Trunks 14.4. Troubleshooting VLANs and Trunks
Week 7-8	**15. VTP**
	15.1. VTP Concept 15.2. VTP Operation 15.3. Configure VTP
Week 9-10	**16. STP**
	16.1. Redundant Layer 2 Topologies 16.2. Introduction to STP 16.3. STP Convergences 16.4. PVST+, RSTP and Rapid PVST+
Week 11-12	**17. Inter-VLAN Routing**
	17.1. Introduction to Inter-VLAN Routing 17.2. Configuring Inter-VLAN Routing 17.3. Troubleshooting Inter-VLAN Routing

	17.4.	VLSM and Route Summarization Activity
Week 13-14	**18. Wireless Concepts and Configuration**	
	18.1.	The Wireless LAN
	18.2.	Wireless LAN Security
	18.3.	Configure Wireless LAN Access
	18.4.	Troubleshooting Simple WLAN Problems

Course Assessment:

Course Work	Mid-Term Tests	Online Final Exam	Final Examination	Final Exam Practical
10	30	20	30	10

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

7. Online Curriculum by Cisco©
8. CCNA: Cisco Certified Network Associate Study Guide.5th Edition by Todd Lammle.
9. Network+ Certification Bible

Subject	Wireless Networks	**Course Code**	NT322	**Theoretical**	3 hrs / wk
Semester	5	**Prerequisite**	NT211	**Practical**	3 hrs / wk

Course Description:

This introductory course to Wireless LANs focuses on the design, planning, implementation, operation and troubleshooting of Wireless LANs. It covers an overview of technologies, security, and design with particular emphasis on hands on skills in the following areas:

- Wireless LAN setup & troubleshooting
- 802.11 (a, b, and g) technologies, products & solutions
- Radio Technologies
- WLAN applications and site surveys
- Resilient WLAN products, design, installation, configuration and troubleshooting
- WLAN security
- Vendor interoperability strategies

Program Learning Component

Week 1	**1. Introduction to Wireless LANs** 1.1. What is a wireless LAN? 1.2. Networking Media 1.3. Wireless Technologies 1.4. Components and Topologies 1.5. Wireless LAN Market 1.6. Challenges and Issues
Week 2	**2. Static Routing 802.11 (a, b, g) and Network Interface Cards** 2.1. Routers in Networks 802.11 Standards 2.2. 802.11 MAC Layer 2.3. Physical Layer (PHY) 2.4. Client Adapters 2.5. Aironet Client Utility (ACU) 2.6. ACU Monitoring and Troubleshooting Tools
Week	**3. Wireless Radio Technology**

3	3.1. Waves 3.2. Mathematics for Studying Radio 3.3. Electromagnetic (EM) Waves 3.4. Signals 3.5. Modulation Techniques 3.6. Multiple Access and Bandwidth 3.7. Radio Wave Propagation
Week 4	**4. Wireless Topologies**
	4.1. Components 4.2. WLAN Topologies 4.3. Channel Setup 4.4. Bridge Topologies 4.5. Sample Topologies 4.6. VLAN, QoS , and Proxy Mobile
Week 5	**5. Access Points**
	5.1. Access Point ConnectionRIPv1 5.2. Basic Configuration 5.3. Verify AP Operation 5.4. Network Interface Configuration 5.5. Configure Services 5.6. Wireless Services
Week 6	**6. Bridges**
	6.1. Bridge Connection 6.2. Basic Configuration 6.3. Configuring the radio and Ethernet ports 6.4. Configuring Services 6.5. Cisco Services 6.6. 1400 Series Bridge
Week 7	**7. Antennas**
	7.1. Antennas 7.2. Omni directional Antennas 7.3. Directional Antennas 7.4. Cable and Accessories 7.5. Link Engineering and RF Path Planning 7.6. Antenna Installation
Week 8	**8. Security**
	8.1. Security Fundamentals

	8.2. Basic WLAN Security Technologies 8.3. Configuring Basic WLAN Security 8.4. Enterprise WLAN Authentication 8.5. Enterprise Wireless Encryption 8.6. Other Enterprise Security Services
Week 9-10	**9. Application Design and Site Survey Prep**
	9.1. Site Survey 9.2. Applications 9.3. WLAN Design 9.4. Building-to-building Design 9.5. Site Survey Equipment 9.6. Site Survey Documentation and Utilities
Week 11	**10. Site Survey**
	10.1. Infrastructure Awareness 10.2. Survey 10.3. Mounting and Installation Documentation
Week 12-13	**11. Troubleshooting Management, Monitoring, and Diagnostics**
	11.1. General Approach to Troubleshooting 11.2. OSI Troubleshooting 11.3. Diagnostic Tools 11.4. WLAN Troubleshooting 11.5. System Message Logging 11.6. Enterprise Management
Week 14	**12. Emerging Technologies**
	12.1. Ultra-wideband Wireless 12.2. VoIP and Voice over WLANs 12.3. Mobile Wireless 12.4. Wireless Organizations and Certification

Course Assessment:

Course Work	Mid-Term Tests	Online Final Exam	Final Examination	Final Exam Practical

10	**30**	**20**	**30**	**10**

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

Online Curriculum by Cisco©

Subject	Mobile Communication	**Course Code**	NT324	**Theoretical**	4 hrs / wk
Semester	5	**Prerequisite**	NT221	**Practical**	0 hrs / wk

Program Learning Component

Week 1

1. Understanding the mobile network

Specific Learning Outcomes	Resources	Practical
- principles of cellular network - First generation analog - Second generation TDMA - Second generation CDMA - Third generation System	Power point slide, Whiteboard, text book	

Week 2

2. Transmission fundementals

Specific Learning Outcomes	Resources	Practical
- the cellular concept-system design fundamentals (frequency reuse, channel assignment strategies, handoff strategies, interference and system capacity, trunking and grade of service). - mobile radio propagation:(large-scale path loss, small-scale fading and multi-path), multiple access techniques for wireless communications.	Power point slide, Whiteboard, text book	

Week 3

3. The General Packet Radio Service

Specific Learning Outcomes	Resources	Practical
- GPRS Objectives and Advantages - GPRS Architecture - Characteristics of a GPRS Connection - Logical Functions	Power point slide, Whiteboard	

Week 4

4. Interfaces and Protocols

Specific Learning Outcomes	Resources	Practical
- Layer Model, The Names of the GPRS	Power point	

	Interfaces. - GPRS Procedures, GPRS Attach, Data Transfer. - Activation of a PDP Context . - Physical Implementation in the GPRS Network. - GPRS Signaling - GPRS Protocol Planes	slide, Whiteboard	
Week 5-7	**5. Core element for GPRS network**		
	Specific Learning Outcomes	**Resources**	**Practical**
	- GPRS Mobility Management Procedures. - Session Management Procedures. - Packet Transfer Procedures. - Introduction of EDGE, ECSD and E-GPRS - Serving GPRS Support Node (SGSN) - Gateway GPRS Support Node (GGSN) - Access Network PCU – SGSN (Gb Interface) - Core Network SGSN, GGSN (Gn Interface),Gi element. - Additional Elements in the Core Network - Connections Towards the GSM Network	Power point slide, Whiteboard	
Week 8-10	**6. Planning and dimensioning**		
	Specific Learning Outcomes	**Resources**	**Practical**
	- Network Dimensioning - GPRS Radio Subsystem - User Aspects - Indoor Radio Networks - Roaming and GRX - Architecture of Roaming - GPRS Roaming eXchange (GRX) Network - Procedures - Quality Aspects of GRX	Power point slide, Whiteboard	
Week 11-13	**7. Mobile IP and WAP**		
	Specific Learning Outcomes	**Resources**	**Practical**
	- Mobile IP concept. - Wireless application Protocol - Applications. - Services. - Multimedia Messaging Service (MMS).	Power point slide, Whiteboard	

	- GSM-R. - M-Business and m-Commerce. - Convergence of Fixed, Mobile and Data Networks. - The Roles of GSM, GPRS and UMTS in Converged Networks.		

Subject	Graphical Programming in LabView	**Course Code**	NT326	**Theoretical**	3 hrs / wk
Semester	5	**Prerequisite**	IT112	**Practical**	3 hrs / wk

Program Learning Component

Week 1-2	**8. LabView Basics**		
	Specific Learning Outcomes	**Resources**	**Practical**
	Lab VIEW Basics This introduces the Lab View environment and helps orient students when they open a VI. • Windows • Toolbars • Menus • Palettes.	Projector. PCs and Lab View software	Introducing students to Lab View. Installation of Software on desktops.
Week 3	**9. Virtual Instruments**		
	Specific Learning Outcomes	**Resources**	**Practical**
	Virtual Instruments Virtual instrument components are introduced: • front panel • block diagram • icon/connector • subVIs • Using VIs in other VIs or.	Projector. PCs and LabView software	This Lab illustrates the concept of controls (inputs) and indicators (outputs) and how to wire objects together in the block diagram.
Week 4	**10. Math Script**		
	Specific Learning Outcomes	**Resources**	**Practical**
	Math Script These classes introduces the new interactive Math Script environment, which	Projector. PCs and Labview	The Lab covers both the interactive MathScript environment for

<table>
<tr><td></td><td>combines:
• intuitive graphical dataflow programming
• Mathematics-oriented textual programming environment.
• Math Script Node for integrating textual scripts within the LabVIEW block diagram.</td><td>software</td><td>command line computation and programming</td></tr>
<tr><td rowspan="3">Week 5</td><td colspan="3">11. Debugging Virtual Instruments</td></tr>
<tr><td>Specific Learning Outcomes</td><td>Resources</td><td>Practical</td></tr>
<tr><td>Editing and Debugging VIs
• Resizing
• Coloring
• labeling objects</td><td>Projector.
PCs and LabView software</td><td>Students in this LAB can find errors using execution highlighting, probes, single-stepping, breakpoints, and other debugging tools.</td></tr>
<tr><td rowspan="3">Week 6</td><td colspan="3">12. Sub-Vis</td></tr>
<tr><td>Specific Learning Outcomes</td><td>Resources</td><td>Practical</td></tr>
<tr><td><u>Sub-VIs</u>
These classes emphasize the importance of reusing code and illustrate how to create a VI icon/connector.</td><td>Projector.
PCs and LabView software</td><td>The LAB shows parallels between LabVIEW and text-based programming languages.</td></tr>
<tr><td rowspan="3">Week 7</td><td colspan="3">13. Structures</td></tr>
<tr><td>Specific Learning Outcomes</td><td>Resources</td><td>Practical</td></tr>
<tr><td><u>Structures</u>
These Classes presents loops, case structures, and sequence structures governing the execution flow in a VI.</td><td>Projector.
PCs and LabView software</td><td>In this LAB, the Formula Node is introduced as a way to implement complex mathematical equations.</td></tr>
<tr><td rowspan="3">Week 8-9</td><td colspan="3">14. Arrays and Clusters</td></tr>
<tr><td>Specific Learning Outcomes</td><td>Resources</td><td>Practical</td></tr>
<tr><td><u>Arrays and Clusters</u>
Shows students how they can group data, either with elements of the same type (arrays) or elements of a different type</td><td>Projector.
PCs and LabView software</td><td>This LAB illustrates how to create and manipulate arrays and clusters on the front</td></tr>
</table>

<table>
<tr><td></td><td>(clusters).</td><td></td><td>panel as well as on the block diagram.</td></tr>
<tr><td rowspan="3">Week 10</td><td colspan="3">15. Charts and Graphs</td></tr>
<tr><td>Specific Learning Outcomes</td><td>Resources</td><td>Practical</td></tr>
<tr><td><u>Charts and Graphs</u>
This chapter shows how to display and customize the appearance of single and multiple charts and graphs.</td><td>Projector.
PCs and LabView software</td><td>This LAB covers the annotation and exportation of chart and graph images.</td></tr>
<tr><td rowspan="3">Week 11</td><td colspan="3">16. Data Acquisition</td></tr>
<tr><td>Specific Learning Outcomes</td><td>Resources</td><td>Practical</td></tr>
<tr><td><u>Data Acquisition</u>
Discusses :
• Basic analog and digital signal characteristics
• Acquiring and generating digital signals.</td><td>Projector.
PCs and LabView software</td><td>This LAB introduces Measurement & Automation Explorer (MAX), simulated data acquisition, and the USB DAQ student kits.</td></tr>
<tr><td rowspan="3">Week 12</td><td colspan="3">17.Analysis</td></tr>
<tr><td>Specific Learning Outcomes</td><td>Resources</td><td>Practical</td></tr>
<tr><td><u>Analysis</u>
Students can use LabVIEW in a variety of ways to support signal and system analysis. This class discusses several important analysis topics including:
• how to use LabVIEW for signal generation
• signal processing
• linear algebra
• curve fitting
• formula display on the front panel
• differential equations
• finding roots (zero finder)
• Integration and differentiation.</td><td>Projector.
PCs and LabView software</td><td>This LAB enforces all mathematical tools introduced in the theoretical part.</td></tr>
<tr><td rowspan="3">Week 13-14</td><td colspan="3">18.Applications & Instrument Control</td></tr>
<tr><td>Specific Learning Outcomes</td><td>Resources</td><td>Practical</td></tr>
<tr><td><u>Applications</u>
The concluding classes briefly discusses other LabVIEW features, such as:</td><td>Projector.
PCs and LabView</td><td>Students are introduced to instrument drivers, as well as the use of MAX</td></tr>
</table>

	• Sound Card I/O • simulation and control • new shared variable • Instrument control system • using a GPIB • serial interface	software	to detect and install instrument drivers and the use of Instrument I/O Assistant to communicate with traditional instruments.

Course Assessment:

Course Work	Mid-Term Tests	Final Exam Practical	Final Examination
10	30	20	40

NOTE: Course Work may include assignments, projects and practical activities.

Textbook:

Title: LabVIEW 7 Express Student Edition
Author: Robert Bishop
Publisher: Prentice Hall
ISBN: 0-13-123926-0

لغة إنجليزيــة 5

Subject	English Language 5	**Course Code**	EN364	**Theoretical**	2 hrs / wk
Semester	5	**Prerequisite**	EN263	**Practical**	0 hrs / wk

Program Learning Components

Week 1-4	**COMPREHENSION:** Selections from magazines such as: 20.1. P.C. magazine 20.2. Byte magazine 20.3. Data communication 20.4. Word of Computer
Week 5-8	**COMPOSITION:** Composition with creative angle: • Writing the long composition • Writing on specific topics • Writing on general topics • Organizing materials into paragraphs
Week 9-11	**SUMMARIZNG THE TOPICS TAKEN ABOVE:** • Definition of process • Process states • Process transitions • The context of a process
Week 12-14	**BUSINESS** **ACCT. ACCOUNT **ADV. ADVERTIAEMENT **AMT. AMOUNT **APPROX. APPROXIMATE **ASSN. ASSOCIATION **BAL. BALANCE **BBL. BARREL **BROS. BROTHERS **C.O.D EACH ON DELIVERY **C/O. CARE OF **DEPT. DEPARTMENT **EA. EACH **ENC. ENCLOSE **EST. ESTABLISHED **BWD BACKWARD **FWD FORWARD **INT. INTEREST **LTD. LIMITED **CORP. CORPORATE **REC. RECEIPT

Course Assessment:

Course Work	Mid-Term Tests	Final Examination

20	**30**	**50**

التقارير الفنية (بالإنجليزية) 1

Subject	Technical Documentation I	**Course Code**	EN300	**Theoretical**	2hrs / wk
Semester	5	**Prerequisite**	EN263	**Practical**	0hrs / wk

COURSE OBJECTIVES

On completion of this course, students should be able to:

- Identify and strategically target a desired audience for a given communication situation.
- Effectively integrate text and graphic elements to create document designs that clearly convey complex, technical information.
- Identify, incorporate, and accurately cite sources.
- Revise written technical documents for content, organization, and coherence as well as for grammar, tone, and style.
- Contribute meaningfully to collaborative writing projects such as instructions, definition, descriptions, and technical reports.

Week 1	**Contents:**	**Resource**
	• Course overview • Writing process / Audience analysis • Style and tone	LCD projector with a laptop or desktop computer / Screen.
Week 2	**Contents:**	**Resource**
	• Organization: patterns, paragraphs, • headings and grouping • Grammar and mechanics	LCD projector with a laptop or desktop computer / Screen.
Week 3	**Contents:**	**Resource**
	• Lists and parallel structure • Writing effective sentences (theory)	LCD projector with a laptop or desktop computer / Screen.

Week 4	**Contents:**	**Resource**
	• Writing instructions • Writing effective sentences (correction and feedback)	LCD projector with a laptop or desktop computer / Screen.
Week 5	**Contents:**	**Resource**
	• Collaborative writing • Assignment Conferences	LCD projector with a laptop or desktop computer / Screen.
Week 6	**Contents:**	**Resource**
	• Document design and Illustration. • Introduction to definitions and descriptions	LCD projector with a laptop or desktop computer / Screen.
Week 7	**Contents:**	**Resource**
	• Writing Reports of Technical Objects • Describing size, shape, design and utility	LCD projector with a laptop or desktop computer / Screen.
Week 8	**Contents:**	**Resource**
	• Writing Reports of Technical Processes • Describing steps, materials and equipment	LCD projector with a laptop or desktop computer / Screen.
Week 9	**Contents:**	**Resource**
	• Active-passive voice / Your Viewpoint • MID-TERM TEST	LCD projector with a laptop or desktop computer / Screen.
Week 10	**Contents:**	**Resource**
	• Correspondence: Writing Letter, Memos and Emails	LCD projector with a laptop or desktop computer / Screen.
Week 11	**Contents:**	**Resource**
	• Writing Laboratory Reports • Assignment Due	LCD projector with a laptop or desktop computer / Screen.
Week 12	**Contents:**	**Resource**
	• Research report components	LCD projector with a

	• Visuals for data display: selecting and creating.	laptop or desktop computer / Screen.
Week 13	**Contents:**	**Resource**
	• Writing research reports: • Clarity and conciseness. Credibility of • web resources. Documenting sources • and paraphrasing. Referencing.	LCD projector with a laptop or desktop computer / Screen.
Week 14	**Contents:**	**Resource**
	• Writing complete reports • Course summary • Review Workshop	LCD projector with a laptop or desktop computer / Screen.

Course Assessment:

Course Work	Mid-Term Tests	Final Examination
10	30	60

Textbooks:

- Markel, M. (2007). *Technical Communication*. (8th ed). Boston: Bedford/St. Martin's.
- Alred, G., Brusaw, C. and Oliu, W. (2009). *Handbook of Technical Writing*. (9th ed). Boston: Bedford/St. Martin's.

الفصل الدراسى السادس

Code	Subject	Credit Hours	Theoretical Hours	Practical Hours	Prerequisite
NT315	Accessing the WAN CCNA 4	4	3	3	**NT212+NT314**
NT328	Network Security 1	4	3	3	**NT 211**
NT330	Optical Networks	4	4	0	**NT 211**
NT332	Network Infra/ AD config.	4	3	3	**NT 211**
EN365	English Language 6	2	2	0	**EN 364**
EN301	Technical Documentation 2	2	2	0	**EN 300**

Subject	Accessing the WAN CCNA4	**Course Code**	NT315	**Theoretical**	3hrs / wk
Semester	6	**Prerequisite**	NT314	**Practical**	3hrs / wk

Program Learning Component

Week 1	**19.Introduction to WANs**	
	19.1.	Providing Integrated Services to the Enterprise
	19.2.	WAN Technology Concepts
	19.3.	WAN Connection Options
Week 2-3	**20.PPP**	
	20.1.	Serial Point-to-Point Links
	20.2.	PPP Concepts
	20.3.	Configuring PPP
	20.4.	Configuring PPP with Authentication
Week 4-5	**21.Frame Relay**	
	21.1.	Basic Frame Relay Concepts
	21.2.	Configuring Frame Relay
	21.3.	Advanced Frame Relay Concepts
	21.4.	Configuring Advanced Frame Relay
Week 6-7	**22.Network Security**	
	22.1.	Introduction to Network Security
	22.2.	Securing Cisco Routers
	22.3.	Secure Router Network Services
	22.4.	Using Cisco SDM
	22.5.	Secure Router Management
Week 8-9	**23.ACLs**	
	23.1.	Using ACLs to Secure Network
	23.2.	Configuring Standard ACLs
	23.3.	Configuring Extended ACLs
	23.4.	Configuring Complex ACLs
Week 10-11	**24.Teleworker Services**	
	24.1.	Business Requirements for Teleworker Services
	24.2.	Broadband Services

	24.3.	VPN Technology
Week 12	**25.IP Addressing Services**	
	25.1.	DHCP
	25.2.	Scaling Networks with NAT
	25.3.	IPv6
Week 13-14	**26.Network Troubleshooting**	
	26.1.	Establishing the Network Performance Baseline
	26.2.	Troubleshooting Methodologies and Tools
	26.3.	Common WAN Implementation Issues
	26.4.	Network Troubleshooting

Course Assessment:

Course Work	Mid-Term Tests	Online Final Exam	Final Examination	Final Exam Practical
10	30	20	30	10

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

10. Online Curriculum by Cisco©
11. CCNA:Cisco Certified Network Associate Study Guide.5th Edition by Todd Lammle.
12. Network+ Certification Bible

Subject	Network Security I	**Course Code**	**NT 328**	**Theoretical**	3hrs / wk
Semester	6	**Prerequisite**	**NT 211**	**Practical**	3hrs / wk

Program Learning Component	
Week 1	**12. Vulnerabilities, Threats, and Attacks** 1.1. Introduction to Network Security 1.2. Introduction to Vulnerabilities, Threats, and Attacks 1.3. Attack Examples 1.4. Vulnerability Analysis
Week 2	**13. Security Planning and Policy** 13.1. Discussing Network Security and Cisco 13.2. Endpoint Protection and Management 13.3. Network Protection and Management 13.4. Security Architecture 13.5. Basic Router Security
Week 3-4	**14. Security Devices** 3.1. Device Options 3.2. Using Security Device Manager 3.3. Introduction to the Cisco Security Appliance Family 3.4. Getting Started with the PIX Security Appliance 3.5. PIX Security Appliance Translations and Connections 3.6. Manage a PIX Security Appliance with Adaptive Security Device Manager 3.7. Manage a PIX Security Appliance with Adaptive Security Device Manager 3.8. Firewall Services Module Operation
Week 5	**15. Trust and Identity Technology** 4.1. AAA 4.2. Authentication Technologies 4.3. Identity Based Networking Services (IBNS) 4.4. Network Admission Control (NAC)
Week	**16. Cisco Secure Access Control Server**

6	5.1. Cisco Secure Access Control Server for Windows 5.2. Configuring RADIUS and TACACS+ with CSACS
Week 7	**17. Configure Trust and Identity at Layer 3**
	6.1. Cisco IOS Firewall Authentication Proxy 6.2. Introduction to PIX Security Appliance AAA Features 6.3. Configure AAA on the PIX Security Appliance
Week 8	**18. Configure Trust and Identity at Layer 2**
	7.1. Identity-Based Networking Services (IBNS) 7.2. Configuring 802.1x Port-Based Authentication
Week 9	**19. Configure Filtering on a Router**
	8.1. Filtering Technologies 8.2. Cisco IOS Firewall Context-Based Access Control 8.3. Configure Cisco IOS Firewall Context-Based Access Control
Week 10-11	**20. Configure Filtering on a PIX Security Appliance**
	9.1. Configure ACLs and Content Filters 9.2. Object Grouping 9.3. Configure a Security Appliance Modular Policy 9.4. Configure Advanced Protocol Inspection
Week 12-14	**21. Configure Filtering on a Switch**
	10.1. Introduction to Layer 2 Attacks 10.2. Introduction to Layer 2 Attacks 10.3. VLAN Vulnerabilities 10.4. Spanning-Tree Protocol Vulnerabilities 10.5. Wireless Organizations and Certification

Course Assessment:

Course Work	Mid-Term Tests	Online Final Exam	Final Examination	Final Exam Practical
10	30	20	30	10

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

1. Online Curriculum by Cisco©

Subject	Optical Networks	Course Code	NT330	Theoretical	3hrs / wk
Semester	6	Prerequisite	NT 211	Practical	3hrs / wk

Program Learning Component

Week 1

19. Understanding the various optical network technology

Specific Learning Outcomes	Resources	Practical
- This section introduces Synchronous Optical Network (SONET) and the Synchronous Digital Hierarchy (SDH). - Dense Wavelength-Division Multiplexing.	Power point slide, Whiteboard, text book	

Week 2

20. Introducing to Time-Division Multiplexing

Specific Learning Outcomes	Resources	Practical
- Analog Signal Processing - Circuit-Switched Networks - The T-Carrier - The E-Carrier	Power point slide, Whiteboard, text book	

Week 3

21. Fiber-Optic Technologies

Specific Learning Outcomes	Resources	Practical
- A Brief History of Fiber-Optic Communications - Fiber-Optic Applications - The Physics Behind Fiber Optics - Optical-Cable Construction, Propagation Modes - Fiber-Optic Characteristics - Fiber-Optic Communications System - Fiber Span Analysis	Power point slide, Whiteboard	

Week 4

22. Wavelength-Division Multiplexing

Specific Learning Outcomes	Resources	Practical
- The Need for Wavelength-Division Multiplexing	Power point	

	- Wavelength-Division Multiplexing - Coarse Wavelength-Division Multiplexing - Dense Wavelength-Division Multiplexing, The ITU Grid - Wavelength-Division Multiplexing Systems - WDM Characteristics and Impairments to Transmission - Dispersion and Compensation in WDM	slide, Whiteboard	
Week 5	**23. SONET Architectures**		
	Specific Learning Outcomes	**Resources**	**Practical**
	- SONET Integration of TDM Signals - SONET Electrical and Optical Signals - SONET Layers - SONET Framing - SONET Transport Overhead - SONET Multiplexing - SONET Network Elements - SONET Topologies - SONET Protection Architectures - SONET Network Management	Power point slide, Whiteboard	
Week 6	**24. SDH Architectures**		
	Specific Learning Outcomes	**Resources**	**Practical**
	- SDH Integration of TDM Signals - SDH Electrical and Optical Signals - SDH Layers - SDH Framing - SDH Transport Overhead - SDH Multiplexing - SDH Network Elements - SDH Topologies - SDH Protection Architectures - SDH Network Management	Power point slide, Whiteboard	
Week 7	**25. Packet Ring Technologies**		
	Specific Learning Outcomes	**Resources**	**Practical**
	- Ethernet Services - Ethernet over SONET/SDH - Shared Packet Ring - Resilient Packet Ring	Power point slide, Whiteboard	
Week	**26. Multiservice SONET and SDH Platforms**		

8	Specific Learning Outcomes	Resources	Practical
	- Next-Generation SONET and SDH Platforms - ONS 15400 Series of Optical Platforms - Cisco Transport Controller (CTC) - Cisco Transport Manager (CTM)	Power point slide, Whiteboard	
Week 9	**27. Provisioning the Multiservice SONET MSPP**		
	Specific Learning Outcomes	**Resources**	**Practical**
	- Provisioning of Protection Groups - ONS 15454 Timing, Node Inventory - IP Networking of ONS Nodes for OAM&P. - UPSR Configuration, BLSR Configuration - Linear ADM Configurations - Pat-Protected Mesh Networking (PPMN) - Circuit Provisioning	Power point slide, Whiteboard	
Week 10	**28. Provisioning the Multiservice SDH MSPP**		
	Specific Learning Outcomes	**Resources**	**Practical**
	- Provisioning of Protection Groups. - ONS 15454 Timing for SDH - Node Inventory. - IP Networking of ONS 15454 SDH Nodes for OAM&P. - SNCP Configuration, MS-SPRing Configuration. - Subtending Ring Configurations. - Linear ADM Configurations. - SDH Circuit Provisioning.	Power point slide, Whiteboard	
Week 11	**29. Ethernet, IP, and RPR over SONET and SDH**		
	Specific Learning Outcomes	**Resources**	**Practical**
	- Ethernet and IP Services over SONET/SDH - G-Series Provisioning of Ethernet over SONET. - E-Series Provisioning of Ethernet over SONET. - G-Series Provisioning of Ethernet over SDH. - E-Series Provisioning of Ethernet over	Power point slide, Whiteboard	

	SDH.		
Week 12	**30. Optical Network Case Studies**		
	Specific Learning Outcomes	**Resources**	**Practical**
	- Network Design Strategies	Power point slide, Whiteboard	

Subject	Network Infra/ AD Config	**Course Code**	**NT332**	**Theoretical**	3hrs / wk
Semester	6	**Prerequisite**	**NT211**	**Practical**	3hrs / wk

General Opjective

This course provides the skills and knowledge necessary to implement a core Windows Server 2012 infrastructure in an existing enterprise environment. the course primarily covers the initial implementation and configuration of core services including Active Directory Domain Services (AD DS), networking services, and Microsoft Hyper-V Server 2012 configuration.

Program Learning Components

Week 1	**Deploying and Managing Windows Server 2012**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe Windows Server 2012. • Describe the management tools available in Windows Server 2012. • Install Windows Server 2012. • Perform post-installation configuration of Windows Server 2012. • Perform basic administrative tasks using Windows PowerShell.		• Deploying Windows Server 2012 • Configuring Windows Server 2012 Server Core • Managing Servers • Using Windows PowerShell to Manage Servers
Week 2	**Introduction to Active Directory Domain Services**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe the structure of AD DS. • Describe the purpose of domain controllers. • Explain how to install a domain controller.		• Installing a Domain Controller • Installing a Domain Controller by Using IFM

Week 3	**Managing Active Directory Domain Services Objects**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Manage user accounts with graphical tools. • Manage group accounts with graphical tools. • Manage computer accounts. • Delegate permissions to perform AD DS administration.		• Delegating Administration for a Branch Office • Creating and Configuring User Accounts in AD DS • Managing Computer Objects in AD DS
Week 4	**Automating Active Directory Domain Services Administration**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Manage user accounts with graphical tools. • Manage group accounts with graphical tools. • Manage computer accounts. • Delegate permissions to perform AD DS administration.		• Creating User Accounts and Groups by Using Windows PowerShell • Using Windows PowerShell to Create User Accounts in Bulk • Using Windows PowerShell to Modify User Accounts in Bulk
Week 5	**Implementing IPv4**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe the TCP/IP protocol suite. • Describe IPv4 addressing. • Determine a subnet mask necessary for subnetting or supernetting. • Configure IPv4 and troubleshoot IPv4 communication.		• Identifying Appropriate Subnets • Troubleshooting IPv4
Week 6	**Implementing Dynamic Host Configuration Protocol**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Install the DHCP server role. • Configure DHCP scopes. • Manage a DHCP database.		• Implementing DHCP • Implementing a DHCP Relay Agent

	• Secure and monitor the DHCP server role.		
Week 7	**Implementing Domain Name System**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe name resolution for Windows operating system clients and Windows Server servers. • Install and manage DNS Server service. • Manage DNS zones.		• Installing and Configuring DNS • Creating Host Records in DNS • Managing the DNS Server Cache
Week 8	**Implementing IPv6**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe the features and benefits of IPv6. • Describe IPv6 addressing. • Describe IPv6 coexistence with IPv4. • Describe IPv6 transition technologies.		• Configuring an IPv6 Network • Configuring an ISATAP Router
Week 9	**Implementing Local Storage**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe the various storage technologies. • Explain how to manage disks and volumes. • Explain how to implement Storage Spaces.		• Installing and Configuring a New Disk • Resizing Volumes • Configuring a Redundant Storage Space
Week 10	**Implementing File and Print Services**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Secure shared files and folders. • Protect shared files and folders by using shadow copies. • Configure network printing.		• Creating and Configuring a File Share • Configuring Shadow Copies • Creating and Configure a Printer Pool

Week 11	**Implementing Group Policy**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Create and manage Group Policy Objects. • Describe Group Policy processing. • Implement a central store for administrative templates.		• Configuring a Central Store • Creating GPOs
Week 12	**Securing Windows Servers Using Group Policy Objects**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe Windows Server operating system Security. • Configure security settings by using Group Policy. • Restrict unauthorized software from running on servers and clients. • Configure Windows Firewall with Advanced Security.		• Increasing Security for Server Resources • Configuring AppLocker and Windows Firewall
Week 13	**Implementing Server Virtualization with Hyper-V**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe virtualization technologies. • Implement Hyper-V. • Manage virtual machine storage. • Manage virtual networks.		• Installing the Hyper V Role onto a Server • Configuring Virtual Networking • Creating and Configuring a Virtual Machine • Using Virtual Machine Snapshots

Course Assessment:

Course Work	Mid-Term Tests	Final Exam Practical	Final Examination
10	30	20	40

NOTE: Course Work may include assignments, projects and practical activities.

لـغة إنجليزية 6

Subject	English Language 6	**Course Code**	NT365	**Theoretical**	2hrs / wk
Semester	Six	**Prerequisite**	NT364	**Practical**	0 wk

Program Learning Component	
Week 1	**1.** **Food: fuel and pleasure.** **Grammar:** 1.1. Present simple & continuous, action and non-action verbs. 1.2. Vocabulary: 1.3. Food and pleasure.
Week 2	**2.** **If you really want to win, cheat.** **Grammar:** 2.1. Past tenses: simple, continuous, and perfect. 2.2. Vocabulary: • Sport
Week 3	**3.** **We are family.** **Grammar:** 3.1. Future forms: going to, present continuous, will/ shall. 3.2. Vocabulary: • Family, personality. • Each other or reflexive pronouns.
Week 4	**4.** 4.1. Practical English: Introductions 4.2. Writing Describing person. 4.3. Exercises in class
Week 5	**5.** **Ka- ching!** **Grammar:** 5.1. -Present perfect and past simple. 5.2. Vocabulary: • Money, phrasal verbs.

Week 6	**6.** **Changing your life.** **Grammar:** 6.1. -Present perfect continuous. 6.2. Vocabulary: • Strong adjectives.
Week 7	**7.** **Race to the sun.** **Grammar:** 7.1. -Comparatives and superlatives. 7.2. Vocabulary: • Transport and travel • How long+ take.
Week 8	**8.** Midterm Exam
Week 9	**9.** 9.1. Writing: 9.2. Telling stories. 9.3. Revising and checking.
Week 10	**10.** **Modern manners.** **Grammar:** 10.1. Must, have to, should (obligation) 10.2. Vocabulary: • Mobile phones.
Week 11	**11.** **Judging by appearances.** **Grammar:** 11.1. Must, may, might, can't (deduction) 11.2. Vocabulary: • Describing people
Week 12	**12.** **If at first you don't succeed** **Grammar:** 12.1. Can, could, be able to (ability and possibility) 12.2. Vocabulary: • Ed/ ing adjectives
Week 13	**13.** 13.1. Writing:

	13.2.	An informal letter.
	13.3.	Revising and checking.
Week 14	**14.**	
	14.1.	Revision

Course Assessment:

Course Work	Mid-Term Exams	Final Examination
20	30	50

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

التقارير الفنية بالإنجليزية 2

Subject	Technical documentation 2	**Course Code**	NT301	**Theoretical**	2hrs / wk
Semester	Six	**Prerequisite**	NT300	**Practical**	0 wk

Program Learning Component	
Week 1	**27.** 27.1. The development of the paragraph: 27.2. -paragraph support & development. 27.3. -Writing concluding sentences.
Week 2	**28.** 28.1. - Peer editing. 28.2. -Using linking words 28.3. - Exercise (Writing a topic in class)
Week 3	**29.** 29.1. Descriptive & process Paragraph: 29.2. -Descriptive paragraphs and reasons for writing them. 29.3. -Organizing and writing descriptive paragraphs using adjectives and prepositions.
Week 4	**30.** 30.1. - Process paragraphs and reasons for writing them. 30.2. -Using transition words to write a process paragraph. 30.3. - Exercise (Writing a topic in class)
Week 5	**31.** 31.1. Writing reports 31.2. - Different types of reports 31.3. - Stages in report writing
Week 6	**32.** 32.1. -Terms of reference 32.2. - Planning your report 32.3. - Collecting information
Week 7	**33.** 33.1. Midterm Exam

Week 8	**34.**
	34.1. Organizing information 34.2. -Structuring your report. 34.3. -Exercise (writing a part of a report)
Week 9	**35.**
	35.1. -Style of writing 35.2. -Layout 35.3. - Presentation
Week 10	**36.**
	36.1. Redrafting and checking
Week 11	**37.**
	37.1. Exercise (writing report in a class)
Week 12	**38.**
	38.1. Exercise (writing report in a class)
Week 13	**39.**
	39.1. Exercise (writing report in a class)
Week 14	**40.**
	40.1. Exercise (writing report in a class)

Course Assessment:

Course Work	Mid-Term Exams	Final Examination
20	30	50

NOTE: Course Work may include assignments, projects and practical activities.

Textbooks:

1- Handbook for Technical Writing, by James H. Shelton, published in 1994 USA.

2- Academic Writing from paragraph to essay. by Lisa A Rumisek. Published in 2005 MACMILLAN.

الفصل الدراسى السابع

Code	Subject	Credit Hours	Theoretical Hours	Practical Hours	Prerequisite
NT429	Network Security II	4	3	3	**NT328**
NT434	Voice Over IP	4	3	3	**NT315**
NT436	Network Admins and Monitor	4	3	3	**NT332**
IT470	Project Management	4	3	3	**None**
CT436	Research Methods	2	2	0	**None**

CCNA Security 2 أمن الشبكـات

Subject	Network Security II	**Course Code**	NT429	**Theoretical**	3hrs / wk
Semester	7	**Prerequisite**	NT328	**Practical**	3hrs / wk

Program Learning Component	
Week 1	**41. Intrusion Detection and Prevention Technology** 41.1. Overview of Intrusion Detection and Prevention 41.2. Inspection Engine 41.3. Cisco IDS and IPS Devices
Week 2-3	**42. Configure Network Intrusion Detection and Prevention** 42.1. Cisco IOS Intrusion Prevention System 42.2. Configure Attack Guards on the PIX Security Appliance 42.3. Configure Intrusion Prevention on the PIX Security Appliance 42.4. Configure Shunning on the PIX Security Appliance
Week 4-5	**43. Encryption and VPN Technology** 43.1. Encryption Basics 43.2. Integrity Basics 43.3. Implementing Digital Certificates 43.4. VPN Topologies 43.5. VPN Technologies 43.6. IPSec
Week 6-7	**44. Configure Site-to-Site VPN Using Pre-shared Keys** 44.1. Prepare a Router for Site-to-Site VPN using Pre-shared Keys 44.2. Configure a Router for IKE Using Pre-shared Keys 44.3. Configure a Router with IPSec Using Pre-shared Keys 44.4. Test and Verify the IPSec Configuration of the Router 44.5. Configure a PIX Security Appliance Site-to-Site VPN using Pre-shared Keys
Week	**45. Configure Site-to-Site VPNs Using Digital Certificates**

8-9	45.1. Configure CA Support on a Cisco Router 45.2. Configure an IOS Router Site-to-Site VPN Using Digital Certificates 45.3. Configure a PIX Security Appliance Site-to-Site VPN Using Digital Certificates
Week 10-11	**46.Configure Remote Access VPN**
	46.1. Introduction to Cisco Easy VPN 46.2. Configure the Easy VPN Server 46.3. configure Easy VPN Remote for the Cisco VPN Client 4.x 46.4. Configure Cisco Easy VPN Remote for Access Routers 46.5. Configure the PIX Security Appliance as an Easy VPN Server 46.6. Configure a PIX 501 or 506E as an Easy VPN Client 46.7. Configure the Adaptive Security Appliance to Support Web-VPN
Week 12	**47.Secure Network Architecture and Management**
	47.1. Layer 2 Security Best Practices 47.2. SDM Security Audit 47.3. Router Management Center (MC) 47.4. Simple Network Management Protocol (SNMP)
Week 13-14	**48.PIX Security Appliance Contexts, Failover, and Management**
	48.1. Configure a PIX Security Appliance to Perform in Multiple Context Mode 48.2. Configure PIX Security Appliance Failover 48.3. Configure Transparent Firewall Mode 48.4. PIX Security Appliance Management

Course Assessment:

Course Work	Mid-Term Tests	Online Final Exam	Final Examination	Final Exam Practical
10	30	20	30	10

NOTE: Course Work may include assignments, tests, projects and practical activities.

Textbooks:

13. Online Curriculum by Cisco©

الصوت عبر الإنترنيت

Subject	Voice Over IP	**Course Code**	NT434	**Theoretical**	3hrs / wk
Semester	7	**Prerequisite**	NT315	**Practical**	3hrs / wk

General Description

The VoIP Course is the addressed to specialists in the VoIP field. The course presents basic IP Telephony concepts and prepares students for the CVOICE Certification.

Program Learning Components

1. Introduction to Voice Technologies
2. Analog and Digital Voice Connections
3. Voice Interface Configuration
4. Voice Dial Peer Configuration
5. VoIP Fundamentals
6. VoIP Signaling and Call Control Protocols
7. Improving and Maintaining Voice Quality

Practical Activities

Lab 1: Analog Voice Equipment configuration
Lab 2: Dial peers and dial plans
Lab 3: H.323
Lab 4: SIP
Lab 5: MGCP
Lab 6: Challenge lab

Course Assessment:

Course Work	Mid-Term Tests	Online Final Exam	Final Examination	Final Exam Practical
10	30	20	30	10

NOTE: Course Work may include assignments, tests, projects and practical activities.

Textbooks:

1. Online Curriculum by Cisco©

إدارة ومراقبة الشبكة

Subject	Network Admin and Monitor	**Course Code**	NT436	**Theoretical**	3hrs / wk
Semester	7	**Prerequisite**	NT332	**Practical**	3hrs / wk

General Opjective

Learn how to administer Windows Server 2012, this course primarily covers the administration tasks necessary to maintain a Windows Server 2012 infrastructure such as Implementing Server Images, User and Group management with Active Directory Domain Services(AD DS) and Group Policy, Remote Access and Network Policies, Data Security, Monitoring and Update Management

Program Learning Components

Week 1	**Deploying and Maintaining Server Images**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe the important features and functionality of Windows Deployment Services. • Configure Windows Deployment Services in Windows Server 2012. • Perform deployments with Windows Deployment Services.		• Installing and Configuring Windows Deployment Services • Creating Operating System Images with Windows Deployment Services • Configuring Custom Computer Naming • Deploying Images with Windows Deployment Services
Week 2	**Configuring and Troubleshooting Domain Name System**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Install the DNS server role.		• Configuring DNS Resource Records

	• Configure the DNS server role. • Create and configure DNS zones. • Configure DNS zone transfers. • Manage and troubleshoot DNS.		• Configuring DNS Conditional Forwarding • Configuring DNS Conditional Forwarding • Troubleshooting DNS
Week 3	**Maintaining Active Directory Domain Services**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Explain the general structure of AD DS. • Implement virtualized domain controllers. • Implement RODCs. • Administer AD DS. • Manage the AD DS database.		• Installing and Configuring a RODC • Configuring AD DS snapshots • Configuring the Active Directory Recycle Bin
Week 4	**Managing User and Service Accounts**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Automate user account creation. • Configure password-policy and account-lockout settings. • Configure managed service accounts.		• Configuring Password-Policy and Account-Lockout Settings • Creating and Associating a Managed Service Account
Week 5	**Implementing a Group Policy Infrastructure**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Understand Group Policy. • Implement and administer GPOs. • Manage Group Policy scope. • Process Group Policy. • Troubleshoot the application of GPOs.		• Creating and Configuring GPOs • Managing GPO Scope • Verifying GPO Application • Managing GPOs
Week 6	**Managing User Desktops with Group Policy**		
	Specific Learning Outcomes	**Resources**	**Practical**

	• Describe and implement Administrative Templates. • Configure folder redirection and scripts by using GPOs. • Configure GPO preferences. • Deploy software by using GPOs.		• Implementing Settings by Using Group Policy Preferences • Configuring Folder Redirection
Week 7	**Configuring and Troubleshooting Remote Access**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Configure network access. • Create and configure a VPN solution. • Describe the role of network policies. • Troubleshoot routing and remote access. • Configure DirectAccess.		• Configuring a VPS Server • Configuring VPN Clients • Configuring the Direct Access Infrastructure • Configuring the Direct Access Clients • Verifying the Direct Access Configuration
Week 8	**Installing, Configuring, and Troubleshooting the Network Policy Server Role**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Install and configure NPS. • Configure RADIUS clients and servers. • Explain NPS authentication methods. • Monitor and troubleshoot NPS.		• Installing and Configuring NPS to Support RADIUS • Configuring and Testing a RADIUS Client
Week 9	**Implementing Network Access Protection**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe how NAP can help protect your network. • Describe the various NAP enforcement processes. • Configure NAP.		• Configuring NAP Components • Configuring VPN Access • Configuring the Client Settings to Support NAP

	• Monitor and troubleshoot NAP.		
Week 10	**Optimizing File Services**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe FSRM. • Use FSRM to manage quotas, file screens, and storage reports. • Implement classification and file management tasks. • Describe DFS. • Configure DFS namespaces. • Configure and troubleshoot DFS Replication.		• Configuring FSRM Quotas • Configuring File Screening and Storage Reports • Installing the DFS Role Service • Configuring a DFS Namespace • Configuring DFS-R
Week 11	**Configuring Encryption and Advanced Auditing**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Encrypt files by using Encrypting File System (EFS). • Configure advanced auditing.		• Encrypting and Recovering Files • Configuring Advanced Auditing
Week 12	**Implementing Update Management**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe the role of WSUS. • Deploy updates with WSUS.		• Implementing the WSUS Server Role • Configuring Update Settings • Approving and Deploying an Update by Using WSUS
Week 13	**Monitoring Windows Server 2012**		
	Specific Learning Outcomes	**Resources**	**Practical**
	• Describe the monitoring tools for Windows Server 2012.		• Establishing a Performance Baseline • Identifying the Source of

	• Use Performance Monitor to view and analyze performance statistics of programs that are running on your servers. • Monitor event logs to view and interpret the events that occurred.		a Performance Problem • Viewing and Configuring Centralized Event Logs

Course Assessment:

Course Work	Mid-Term Tests	Final Exam Practical	Final Examination
10	30	20	40

NOTE: Course Work may include assignments, projects and practical activities.

إدارة المشـــاريع

Subject	Project Management.	**Course Code**	IT470	**Theoretical**	3hrs / wk
Semester	7	**Prerequisite**	None	**Practical**	3 hrs / wk

Course Objectives

This intensive course provides the practical knowledge and hands-on exercises that are required to prepare for starting and completing a project successfully. The success of the project manager depends on his/her understanding of the competencies and structure of project management. Through discussion, facilitation and practical exercises, the course participants will understand the basic concepts of the nine areas of the project management body of knowledge (PMBOK®) during a project's lifecycle (concept, development, implementation, and termination).

Participants

Individuals from various industries directly involved in project management including Project Managers, Project Team Leaders, Team Members and other staff aspiring to become project managers.

Learning objectives

By the end of the course the participants will be able to:

- Understand the basics of the processes and relationships of the nine areas of the Project Management Body of Knowledge.
- Understand the Project lifecycle.
- Generate project requirements and determine the operational success criteria to be achieved by the project's outcome.
- Create a project Work Breakdown Structure (WBS).
- Design a project schedule with activities, duration, and interdependencies.

- Use the Critical Path Method (CPM) and the Program Evaluation and Review Technique (PERT) to create time and resource schedules.
- Develop and document a comprehensive and integrated project plan.

Course Outline

1. An introduction to the field of Project Management and its development.
2. An introduction to the Processes of the Project Management Body of Knowledge.
3. The project lifecycle.
4. Project Manager's Role – Define project manager/project sponsor/functional manager/team member roles and responsibilities and understand the impact of different organizational structures and reward/recognition strategies.
5. Document Relationships – Relate the Statement of Work (SOW), Work Breakdown Structure (WBS) and Specifications to each other.
6. Scheduling Processes – Identify activities, estimate duration, and establish logical relationships.
7. Time scheduling using CPM and PERT techniques.
8. An introduction to resource planning using CPM.
9. Project Control and Reporting.

طـرق بحثية

Subject	Research Methods.	**Course Code**	CT436	**Theoretical**	2hrs / wk
Semester	7	**Prerequisite**	None	**Practical**	0 hrs / wk

الهدف من المادة

إن هدف هذه المادة هي تعليم الطرق العلمية الصحيحة لأساسيات البحث العلمي وكيفية كتابة التقارير العلمية ومشاريع التخرج.

الأسبوع 1	**مقدمة عن الفكر والبحث:** • مفهوم الفكر وأساليبه. • المعرفة والعلم. • مدخل في البحث العلمي ومشاريع التخرج. • شروط البحث العلمي الناجح ومشاريع التخرج.
الأسبوع 2	**التعريف بنظام المكتبة والخدمات المكتبية:** • النظم المكتبية. • تقويم المصادر والمراجع والإفادة منها. • نظام البطاقات والإعارة المؤقتة • استخدام الدوريات.
الأسبوع 3	**طرق ومناهج البحث والمشاريع العلمية:** • الطريقة التاريخية. • دراسات المسح. • دراسات الحالة. • تحليل المحتوى • الطريقة الاحصائية. • طريقة التجربة.
الأسبوع 5-4	**مراحل إعداد البحث ومشاريع التخرج:** • اختيار مشروع البحث أو المشروع. • الاطلاع على البحوث والدراسات السابقة. • خطة البحث العلمي ومشروع التخرج. • القراءات الأولية وتسجيل المعلومات.

الاسبوع 6	**المجتمع الإحصائي في البحوث والمشاريع:** • العينة وعلاقتها بالمجتمع الإحصائي. • طرق اختيار العينة في المجتمع الإحصائي.
الاسبوع 8-7	**عمليات جمع وتصنيف وتحليل المعلومات** • مصادر جمع البيانات • تصنيف البيانات ووسائل تبويبها. • عرض البيانات وتحليلها.
الاسبوع 10-9	**اختبارات الفرضيات في البحث والمشاريع** • الاختبارات المستندة إلى التوزيع الطبيعي. • الاختبارات المستندة الى توزيع مربع كاى • اختبارات المعنويات المستندة إلى توزيع ستورنيت T • اختبار فرضيات حول تساوي عدة أوساط حسابية.
الاسبوع 12-11	**انواع وخصائص التقارير العلمية والعملية** • أهمية التقارير العملية وأهم أهدافها وميزاتها. • أنواع التقارير وأهم استخداماتها. • خصائص التقرير الجيد.
الاسبوع 14-13	**متطلبات كتابة التقارير والبحوث والعلمية ومشاريع التخرج** • أسلوب كتابة التقارير والبحوث والمشاريع العلمية. • تنظيم صفحة العنوان والمقدمة والمحتويات. • متن التقارير او البحث وطريقة توثيق المعلومات. • الاستنتاجات والتوصيات • إعداد قائمة المصادر والملاحق.

Course Assessment:

Course Work	Mid-Term Tests	Final Examination
10	30	60

NOTE: Course work may include assignments, projects and practical activities.

Textbooks:

1. أساسيات البحث ومشاريع التخرج وكتابة التقارير في الإدارة د. علي هادي جبرين.

الفصل الدراسى الثامن

Code	Subject	Credit Hours	Theoretical Hours	Practical Hours	Prerequisite
NT 402	Professional issue	4	3	3	None
NT 403	On Field Practice	2	1	3	None
NT 444	Research Thesis	1	0	3	All Sub

Subject	Professional issue	**Course Code**	NT 402	**Theoretical**	3hrs / wk
Semester	8	**Prerequisite**	None	**Practical**	3 hrs / wk

Course Objectives

- Be familiar with some of the issues you may face as a member of a complex technological society.
- Be able to discuss the benefits offered by computing technology in many different areas and the risks and problems associated these technologies.
- Understand some social, legal, philosophical, political, constitutional and economical issues related to computers and the historical background of these issues
- Be able to determine the impact of the privacy laws on information security policies.
- Understand the issues related to intellectual freedom, intellectual property, and copyright law as they relate to electronic publishing.
- Be able to determine and identify ethical procedures and behaviors in the organization related to information security.
- Be able to identify issues of professional conduct in information technology case studies.
- Learn the areas most impacted by ethical decisions by professionals in the computing field and will gain skills in making such decisions.
- Apply theories of ethics to case situations in the context of organizational use of information technology.
- Understand the ethical issues associated with gathering, storing and accessing genetic information in databases.
- Recognize the differences in ethical codes of conduct in different cultures and

countries.	
Weeks	**Topic**
1-2	Introduction, Course Syllabus and Course Requirements Catalysts for Change Introduction to Ethics
3-4	Networked Communications
5	Intellectual Property
6-7	Privacy
8-9	Computer and Network Security
10-11	Computer Reliability
12	Professional Ethics
13-14	Work and Wealth
15	Discussions of papers

Course Assessment:

Course Work	Mid-Term Tests	Final Exam Practical	Final Examination
10%	30%	20%	40%

NOTE: Course work may include assignments, projects and practical activities.

Textbook:

Title: Ethics for the Information Age
Author(s): Michael J. Quinn
Edition: 4th Edition
Publisher: Prentice Hall/ Pearson Education
Year: 2011

التدريب الميـداني

Subject	On Field Practice	**Course Code**	NT 403	**Theoretical**	1hrs / wk
Semester	8	**Prerequisite**	None	**Practical**	3 hrs / wk

One of the requirements of Bachelor of Science Degree / Higher Diploma Degree in any major is the fulfillment of on field practice during the last term.

Objectives

1. Expose the students to real working environments
2. Involve the students with job search of the available positions relating to their specialization
3. Teach students the skills needed in a team work
4. Raise the chances of graduates to be placed in a highly paid jobs related to their field of studies
5. Improve the presentation skills of students
6. Build a strong relationship between the faculty and the private and public sectors.
7. Refine the program curriculum with the needed skills required for today's technicians and engineers obtained from the inputs of the students and the feedbacks from the facilitators.

Course Requirements

1. Class attendance: 2 hours/weekly in faculty with the instructor
2. One presentation during the semester arranged by the instructor
3. Complete a 60 hours on field job with a schedule approved by the instructor
4. Submit the *Proof of Completion Form* approved and signed by the facilitator
5. Submit a final report at the end of the semester(including one page feedback).

Guideline for Grading

As any other course, the instructor grades the students work and submit the results.

Assessed Activity	Mark %
Class attendance	10
Presentation	20
On Field attendance	20
Facilitator Observations and feedback	40
Final Report	10
Total	100%

The student will be marked as (Fail) if:

- Received less than 50 % of the total mark.
- Failed to complete one of the requirements of the course.
- Submitted a forged document.

Procedures

1. Students register for the class at the registrar office or the related departments as any other course.
2. In first class meeting, students obtains a *Contract Forms* bytheir names. They can choose from a list of participated companies or they may choose their own.
3. After job placement, students return *Contract Forms* signed by the facilitator to the instructor.
4. After a completion of 30 hours on field practice, students can give a presentation on their duties and he may invite co-workers and the facilitator to the presentation.
5. All presentations will be conducted during the class hours and students attendance is compulsory.
6. After completion field practice, the student submits the sealed*Proof of Completion From* approved and signed by the facilitator along with the student final report summarizing his experience, duties, working environment, satisfaction, learning outcomes.

General Remarks

1. Number of Forms: *Contact Formand Proof of Completion Form*
2. Students may suggest their own field practice location provided the approval of the instructor.
3. If Instructor is in doubt about the legitimacy of the company and the commitment of the student, he may pay a field visit and speaks to co-workers and the facilitator.
4. Occasional on-field visits must be stated clearly to students on the first day of classes and should be formally written in the *Contact Form*.
5. For privacy, the facilitator should seal *Proof of Completion Form*