CURRICULUM FOR
DIPLOMA OF ASSOCIATE ENGINEER
IN
INFORMATION AND COMMUNICATION TECHNOLOGIES
(3 - Years Course)
## Scheme of studies DAE Information and Communication Technology

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>T</th>
<th>P</th>
<th>C</th>
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</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
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<tr>
<td>Gen 111</td>
<td>Islamiat/Pakistan</td>
<td>1</td>
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<td>Eng 112</td>
<td>English</td>
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<tr>
<td>A-.Math-123</td>
<td>Applied Math (For ICT Practitioners)</td>
<td>3</td>
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<tr>
<td>Phy-132</td>
<td>Applied Physics</td>
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<td>Ch-112</td>
<td>Applied Chemistry</td>
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<td>3</td>
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<tr>
<td>ICT-112</td>
<td>Information System</td>
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<tr>
<td>ICT-123</td>
<td>Design and development principles of software</td>
<td>2</td>
<td>3</td>
<td>3</td>
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<tr>
<td>ICT-133</td>
<td>Network Fundamentals</td>
<td>2</td>
<td>3</td>
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<tr>
<td>ICT-143</td>
<td>Computer Systems Basics</td>
<td>2</td>
<td>3</td>
<td>3</td>
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<tr>
<td>ICT-152</td>
<td>Client Side Customization of Web pages</td>
<td>0</td>
<td>6</td>
<td>2</td>
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<tr>
<td><strong>Totals:</strong></td>
<td></td>
<td>15</td>
<td>24</td>
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| **Second Year** |                                           |   |   |   |
| Gen 211        | Islamiat / Pakistan Studies                     | 1 | 0 | 1 |
| Math-223       | Applied Mathematics II                          | 3 | 0 | 3 |
| MGM-212        | Communication and employability skills for IT    | 3 | 2 |   |
| ICT-212        | Object-Oriented Programming                     | 1 | 3 | 2 |
| ICT-223        | Computer Architecture                           | 2 | 3 | 3 |
| ICT-232        | Communication technologies                      | 1 | 3 | 2 |
| ICT-243        | Organizational System Security                  | 2 | 3 | 3 |
| ICT 253       | Routing Protocols and concept                   | 2 | 3 | 3 |
| ICT 263       | LAN switching and Wireless                      | 2 | 3 | 3 |
| ICT 272       | Website Production and management                | 1 | 3 | 2 |
| **Totals:**   |                                                        | 16 | 24 | 24 |

| **Third Year** |                                           |   |   |   |
| Gen 311        | Islamiat / Pakistan Studies                    | 1 | 0 | 1 |
| Eng 311        | Technical Report Writing                       | 1 | 0 | 1 |
| Mgm 312        | Impact of the use of IT on Business Systems     | 1 | 3 | 2 |
| ICT-312        | E-Commerce                                   | 1 | 3 | 2 |
| ICT-323        | Network Management                           | 1 | 6 | 3 |
| ICT-332        | Operating System                             | 1 | 3 | 2 |
| ICT-343        | Principles of Computer Networks               | 1 | 6 | 3 |
| ICT-352        | IT Systems Troubleshooting and Repair          | 2 | 6 | 4 |
| ICT-364        | Project                                     | 0 | 9 | 4 |
| ICT-373        | Accessing the WAN                            | 2 | 3 | 3 |
| **Totals:**   |                                                        | 10 | 39 | 23 |

| Grand Totals: | 42 | 87 | 70 |
ICT
1st Year
Developed by Engr. Syed Waji-ul-Husnain Sherazi (HOD-IT GCT Rawalakot AK) and Experts of COSC-UK with the Guidance of British Council.

Assisted by Zubair Khan, Senior Instructor GCTR-AK.
Developed by Engr. Syed Waji - ul - Husnain Sherazi (HOD - IT GCT Rawalakot AK) And Experts of COSC - UK with the Guidance of British Council Assisted by Zubair Khan Senior Instructor GCTR - AK
قرآن مجید

تقریباً تمام طلاب طور کے کتب یا اور دیگر کتابوں کا کام دیکھتے ہیں۔ صبحیہ سہارہ طلاب علم کے لئے جالے کا کام
تربیت انجیئن کی طرف رکھتا ہے۔
تربیت انجیئن کے نیلہ کی نصیرت بھی ہیں۔
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## موضوعات

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## تدريسی مقاصد

- 1. مطابق مکانی اکثر مباحث از ابتدا تا اتمام بر اساس گروه
- 2. موضوعات کاملاً مطلوب باید کرک
- 3. کلیانی به منظور کاهش کرک
- 4. ایجاد ضعیفی بر مبنای موضوعات به مرحله پیکر کرک
- 5. افزایش اثرات مبهم کرک
- 6. لزوم زمانی که درس باید کرک
- 7. لزوم تهیه کرک
- 8. صفحات که پیشنهاد می‌کند
- 9. موضوعات که در کلیانی
- 10. موضوعات که در کلیانی کرک
موجودات

جعلاض الآتاق

1. جل عمارتي

7. جل البتلاع

8. جل البتلاع

9. جل البتلاع

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50. جل البتلاع
علمي تحریریہ

یہ عالمی تحریریہ کے برجام کی جانب سے لایا گیا ہے۔

تقریب ان کے جدید عالمی تحریریہ کے برجام کی جانب سے لایا گیا ہے۔
DAE in Information and Communication Technology

Course Code:  Eng 112  T  P  C
Course Title: English  0  1  1

Standard first course on English language in technology courses. It intends to provide students with working knowledge and skills in using the English language. It covers grammar, composition and translation. It is entirely class discussion.

Course Objectives: At the end of the course the students are expected to be able to
• Communicate in English language effectively, spoken or written
• Express ideas in English language that are grammatically correct
• Compose text in English language
• Integrate English language as second language

COURSE OUTLINE

<table>
<thead>
<tr>
<th>Contents</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>ENGLISH PAPER &quot;A&quot;</strong></td>
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<tr>
<td>PROSE/TEXT</td>
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<tr>
<td>First eight essays of Intermediate English Book-II</td>
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<td>CLOSE TEST</td>
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<tr>
<td>A passage comprising 50-100 words will be selected from the text. Every 11th word or any word for that matter will be omitted. The number of missing word will range between 5-10. The chosen word may or may not be the one used in the text, but it should be an appropriate word.</td>
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<td><strong>ENGLISH PAPER &quot;B&quot;</strong></td>
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<td><strong>1. GRAMMAR</strong></td>
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<td>1.1. Sentence Structure.</td>
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<td>1.2. Tenses.</td>
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<td>1.3. Parts of speech.</td>
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<td>1.4. Punctuation.</td>
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<tr>
<td>1.5. Change of Narration.</td>
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<tr>
<td>1.6. One word for several</td>
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<tr>
<td>1.7. Words often confused</td>
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<tr>
<td><strong>2. COMPOSITION</strong></td>
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<td>3. Letters/Messages</td>
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<td>4. Job application letter</td>
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<tr>
<td>5. For character certificate/for grant of scholarship</td>
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<tr>
<td>6. Telegrams, Cablegrams and Radiograms, Telexes, Facsimiles</td>
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<td>8. Environmental Pollution, Duties of a Student.</td>
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<td><strong>9. TRANSLATION</strong></td>
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<td>9.1. Translation from Urdu into English.</td>
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<tr>
<td>9.2. For Foreign Students: A paragraph or a dialogue.</td>
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<tr>
<td><strong>Total Hours:</strong> 32</td>
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References
• Intermediate English Book II
• An English Grammar and Composition of Intermediate Level
• A handbook of English Students, Gatherer
PAPER-A

1. Demonstrate Better Reading, Comprehension and Vocabulary
2. Manipulate, skimming and scanning of the text.
3. Identify new ideas.
4. Reproduce facts, characters in own words
5. Write summary of stories
6. Understand Facts of the Text
7. Rewrite words to fill in the blanks recalling the text.
8. Use own words to fill in the blanks.

PAPER-B

1. Apply the Rules of Grammar in Writing and Speaking
   1.1. Use rules of grammar to construct meaningful sentences containing a subject and a predicate.
   1.2. State classification of time, i.e. present, past and future and use verb tense correctly in different forms to denote relevant time.
   1.3. Identify function words and content words.
   1.4. Use marks of punctuation to make sense clear.
   1.5. Relate what a person says in direct and indirect forms.
   1.6. Compose his writings.
   1.7. Distinguish between confusing words.
2. Apply the Concepts of Composition Writing to Practical Situations
   2.1. Use concept to construct applications for employment, for character certificate, for grant of scholarship.
   2.2. Define and write telegrams, cablegrams and radiograms, telexes, facsimiles
   2.3. Describe steps of writing a good composition
   2.4. Describe features of a good composition.
   2.5. Describe methods of composition writing
   2.6. Use these concepts to organize facts and describe them systematically in practical situation.
3. Applies Rules of Translation
   3.1. Describe confusion.
   3.2. Describe rules of translation
   3.3. Use rules of translation from Urdu to English in simple paragraph and sentences.
1) BE ABLE TO MANIPULATE AND SOLVE ALGEBRAIC EQUATIONS

1.1. Arithmetic:
   1.1.1. Basic operations (add, divide, multiply, subtract);
   1.1.2. Order of operations, fractions, decimals and percentages, application to useful calculations eg within spreadsheets

1.2. Quadratic Equations:
   1.2.1. Solution of Quadratic Equation, Nature of roots of the given quadratic equation, Relation between roots and coefficients of the general quadratic equation, Formation of quadratic equation when its roots are given.

1.3. Solution Of Equations With Unknowns:
   1.3.1. Graphically; other techniques eg by factorization, algebraically;
   1.3.2. Applications e.g. to equations of lines of best fit within spreadsheets

1.4. Basic Algebra:
   1.4.1. Rules of algebra;
   1.4.2. Indices and powers;
   1.4.3. Solution of linear equations

1.5. Solution Of Equations With Unknowns:
   1.5.1. Graphically;
   1.5.2. Other techniques e.g. by factorization, algebraically;
   1.5.3. Applications e.g. to equations of lines of best fit within spreadsheets

2) BE ABLE TO USE THE TECHNIQUES OF COORDINATE GEOMETRY

2.1 Coordinate geometry:
   2.1.1. Cartesian coordinates;
   2.1.2. Distance between two points;
   2.1.3. Transformations (translation of point, rotation about origin, reflection, composite transformation);
   2.1.4. Application to plotting of points and drawing of shapes within computer programs

2.2. AREA OF TRIANGLES AND QUADRILATERALS:
   2.2.1. Area of trapezium, Area of Triangles, Area of Quadrilateral, Distance of a Point from a Line.

2.3. Equation of a straight line:
   2.3.1. Gradients, intercepts and mid-points;
   equation of a straight line in the forms y=mx+c, ax+by+c=0, and y-y1=m(x-x1);
   2.3.2. Parallel and perpendicular lines.
   2.3.3. The four quadrants, distance formula, the ratio formula, equation of straight line, intercept form, normal form, non intersecting lines, intersecting lines, line through the point of intersection of two given lines.

2.4. THE CIRCLE:
   2.4.1. Equation of a circle, Circle through three points;

3. SETS AND REAL NUMBER

3.1. SET:
   3.1.1. Order of 8 Set, Equivalent Sets Equal Sets, Disjoint Sets Singleton Set, Empty Set or Null Set Finite and Infinite Sets, Countable Sets, Subsets, Overlapping Sets Power Set, Universal Sets, Van Diagram

3.2. OPERATIONS ON SETS:
   3.2.1. Union of Sets Intersection of Sets, Difference of Sets, Complement of a Set, Cartesian product of Sets

3.3. REAL AND COMPLEX NUMBERS:
4. THE COMPLEX NUMBER SYSTEM

4.1. Complex numbers, Fundamental Operations on Complex Numbers, Geometrical Representation of Complex Number, Properties of Complex Numbers, Conjugate of Complex Numbers, Absolute Value of a Complex Number, Forms of a complex number, Cartesian Form, Polar Form, Product of Complex Numbers in Polar Form, Quotient of Complex Numbers in Polar Form, Integral Power of a Complex Number in Polar Form, Exponential Form, Conversion of a Complex Number from Cartesian Form into the Polar Form, Pharos Algebra.

5. BE ABLE TO APPLY MATRIX METHODS

5.1. Matrices:
- 5.1.1. Method of representing ordered data;
- 5.1.2. Relationship with computer program variable arrays;
- 5.1.3. Index notation.

5.2. Operations:
- 5.2.1. Add, subtract, scalar multiplication;
- 5.2.2. Multiply two matrices;
- 5.2.3. Inverse;
- 5.2.4. Transpose

5.3. Techniques:
- 5.3.1. Solving simultaneous linear equations;
- 5.3.2. Vector transformation and rotation;
- 5.3.3. Maps and graphs

6. BE ABLE TO USE NUMBER AND LOGICAL SYSTEMS

6.1. Standard form (scientific notation):
- 6.1.1. Basic operations (addition, subtraction, multiplication and division);
- 6.1.2. Order of magnitude calculations;
- 6.1.3. Applications e.g. data storage, hard-drive access

6.2. Number systems:
- 6.2.1. Binary, octal, denary and hexadecimal;
- 6.2.2. The Most Significant Bit and the Least Significant Bit Counting in the Binary System, Inter-conversion of Binary and Decimal Numbers, Binary Arithmetic, Addition and Subtraction, Multiplication and Division, Complements, conversion between number systems;
- 6.2.3. Applications e.g. data storage, data transfer, data encryption, ASCII code, dotted decimal notation, binary notation,

6.3. Logic descriptors and operators:
- 6.3.1. AND, OR, XOR, NAND;
- 6.3.2. Order of precedence;
- 6.3.3. Venn diagrams;
- 6.3.4. Boolean logic;
- 6.3.5. Truth tables;
- 6.3.6. Applications e.g. search queries in databases or internet searches, computer processors, Boolean gates

6.4. INTERCONVERSION OF SUMS AND PRODUCTS:
- 6.4.1. Conversion of Products To Sums or Differences, Conversion of Sums or Differences To Products

6.5. COMPUTER CODES:
- 6.5.1. Octal Number System Counting in the Octal System, Inter-conversion of Octal & Decimal Numbers, Inter-conversion of Octal and Binary Numbers, Hexadecimal Number System,
6.6. BOOLEANALGEBRA AND GATE NETWORKS

6.6.1 Logic, truth tables statement, Logical Connectives, Propositions, Conditional and Bi-
conditional Statements, logical addition, logical multiplication, complementation, truth
tables, Boolean algebra rules, De-Morgan’s Theorems, Sum of products and product of sums,
Gates, Definitions.

7. BE ABLE TO INTERPRET DATA

7.1. Representing data:
7.1.1. Comparing data sets using back-to-back stem and leaf diagrams eg pulse rates of
7.1.2. Students before and after exercise;
7.1.3. Mean;
7.1.4. Median;
7.1.5. Mode;
7.1.6. Interquartile range;
7.1.7. Histograms;
7.1.8. Variance;
7.1.9. Standard deviation

7.2. Gathering data:
7.2.1. Methods of gathering quantity data eg measurements, questionnaires, surveys;
7.2.2. Extraction of required information from raw data;
7.2.3. Limitations of data gathered

7.3. Interpreting data:
7.3.1. e.g. analyzing summary data, proving hypotheses, identifying trends and patterns

8. BE ABLE TO APPLY SEQUENCES AND SERIES, PROBABILITY AND RECURSION

8.1. Sequences and series:
8.1.1. Nth term of a sequence;
8.1.2. Generation of recurrence relationship;
8.1.3. Arithmetic and
8.1.4. Geometric sequences and series;
8.1.5. Sum to n terms of an arithmetic and geometric series;
8.1.6. Sum to infinity of a
8.1.7. Geometric series;
8.1.8. Σ notation

8.2. Probability:
8.2.1. Events e.g. union, intersection, complementary, mutually exclusive, independent;
8.2.2. Space
8.2.3. Diagrams e.g. sum of scores when two dice are thrown;
8.2.4. Visualizing events using Venn diagrams;
8.2.5. Tree
8.2.6. Diagrams

8.3. Recursion:
8.3.1. Series e.g. Fibonacci, factorial, natural numbers;
8.3.2. Termination condition;
8.3.3. Recursive algorithms;
8.3.4. Factorial, quick sort, binary search

9. BINOMIAL THEOREM:

9.1.1. Preliminaries, The Factorial Notation, Permutation, Expansion of a binomial for positive
integral index, The Binomial Theorem, The general term of a binomial, Expansion of a binomial for
a given index, Application of the binomial series, Root Extraction, Approximation, Identification.

10. FUNDAMENTALS OF TRIGONOMETRY:
10.1. BASICS:  
10.1.1. Measurement of angles, The Degree Measure (Sexagesimal System) The Radian Measure or Circular Measure, Relation Between Degree And Radian Measure, Relation Between Length of An Arc And Central Angle

10.2. TRIGONOMETRIC RATIOS (OR FUNCTIONS)

10.2.1. The General Angle, Trigonometric Functions of An Angle, Signs of the Values of Trigonometric Functions If the Four Quadrants, Trigonometric Ratios of Some Known Angles.

10.3. TRIGONOMETRIC IDENTITIES:

10.3.1. Fundamental trigonometric identities, The fundamental law of trigonometry, Distance Formula, Deduction From The Fundamental Law, Summary of The Above Formulas , Double Angle Identities, Half Angle Identities

10.4. SOLUTION OF TRIANGLES:


11. PARTIAL FRACTIONS:

11.1.1. Type-I when the factors of the denominator are all linear and distinct, Type-II when the factors of the denominator are all linear but some are repeated  
11.1.2. Type-III when the denominator has irreducible quadratic factors which are non-repeated.  
11.1.3. Type-IV when the denominator has repeated irreducible quadratic factors.

Total Hours: 96

References
A large number of Advanced GCE and upper tier GCSE Mathematics texts are available and most are appropriate. In addition, a number of CD or web-based self-teach materials have been published for GCSEand Advanced GCE and many of these will be appropriate.

Websites:  www.gcseguide.co.uk/standard_deviation.htm Standard deviation www.wikipedia.org  
Wikipedia For more details contact  gc.tr.ak@gmail.com, gpi_ak@yahoo.com.

Abstract and Essential guidance for teachers
In any area of computing or IT we encounter mathematics, whether choosing or assessing bandwidth speeds, planning how much data storage is needed, creating spreadsheets, programming or interpreting and analysing data. This unit provides an introduction to some of the mathematical techniques essential for a career in the IT industry as well as providing a foundation for further study.

Learners will gain an understanding of the mathematics needed along with experience of applying mathematics to IT problems using techniques encompassing basic arithmetic to the collating and interpretation of larger datasets. This will provide a base for learners to enhance their current skills and then apply them to other areas of the course, such as programming or networking. Learners will discover the use of analytical skills in order to apply them to realistic IT problems. This unit will cover topics ranging from algebraic equations, geometry and charts through to number systems and the issues around collecting and interpreting data.

Learning outcomes on completion of this unit a learner should:
1 Be able to manipulate and solve algebraic equations
2 Be able to use the techniques of coordinate geometry
3 Be able to use number and logical systems
4 Be able to plan, gather and interpret data.

Delivery
The learning outcomes could be delivered in the order presented however some of the content relates to isolated sets of skills and knowledge and the order could be varied. It is likely that learners will come to this unit with a wide variety of prior knowledge and experience. For this reason it is suggested that is the unit is flexibly delivered using workshops. This allows all learners to progress and accumulate expertise at different rates and to a different extent. Necessarily, some of the content at this level is theoretical. Learners might not understand some of the practical applications until they study at a higher level. Where possible, connections with IT-related applications should be made to provide the content of exercises and assignments. It is recommended that all data sets provided should relate to real-life scenarios. Sample helpdesk data, for example, could provide an excellent opportunity to study records of technical faults and other IT related data. Tutors may wish to split learners into small groups to work on the same data sets and then compare results and conclusions to generate discussion and stimulate further learning. It may be appropriate for each group to produce a short presentation to present their findings using some graphical representation. For more details contact gctr.ak@gmail.com, gpi_ak@yahoo.com.

Essential resources
Learners should have access to computers with appropriate software. For coverage of logical operations, centers might need some form of simulation software such as Logic Works or MM Logic. Also, some prepared datasets for both delivery and assessment of the second learning outcome is necessary.

DAE in Information and Communication Technology
A non-calculus course in Newtonian mechanics and optics. It provides the students with the necessary concepts and principles applied to physical sciences. It covers the standard topics of kinematics (motion), mechanics, sound and optics. The course comes with practical component.

**Course Objectives**
At the end of the course the students are expected to be able to

- Understand qualitatively and quantitatively fundamental concepts of physical phenomena in mechanics, sound and optics.
- State and understand basic physical laws and principles governing physical phenomena.
- Describe and explain physical events using the concepts and principles of physics
- Solve technological problems of practical application using the concepts and principles of physics
- Observe accurately and recognize physical phenomenon governed by physical principles
- Appreciate the simplicity and logic of nature through physical laws

**COURSE OUTLINE**

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5.7. Resonance  
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6. Sound  
6.1. Longitudinal Waves  
6.2. Intensity, Loudness, Pitch and Quality Of Sound  
6.3. Units of Intensity of Level and Frequency Response AF Ear  
6.4. Interference of Sound Waves Silence Zones, Beats  
6.5. Acoustics  
6.6. Doppler Effect  

7. Light  
7.1. Review Laws of Reflection and Refraction  
7.2. Image Formation by Mirrors and Lenses  
7.3. Optical Instruments  
7.4. Wave Theory of Light  
7.5. Interference, Diffraction, Polarization of Light Waves  
7.6. Applications of Polarization in Sunglasses, Optical Activity And Stress Analysis  

8. Optical fiber  
8.1. Optical Communication and Problems  
8.2. Review Total Internal Reflection and Critical Angle  
8.3. Structure of Optical Fiber  
8.4. Fiber Material and Manufacture  
8.5. Optical Fiber – Uses  

9. Lasers  
9.1. Corpuscular Theory of Light  
9.2. Emission and Absorption of Light  
9.3. Stimulated Absorption and Emission of Light  
9.4. Laser Principle  
9.5. Structure and Working of Lasers  
9.6. Types of Lasers with Brief Description.  
9.7. Applications (Basic Concepts)  
9.8. Material Processing  
9.9. Laser Welding  
9.10. Laser Assisted Machining  
9.11. Micro Machining  
9.12. Drilling, Scribing and Marking  
9.13. Printing  

Total Hours: 64  

References  
- **Fundamentals of Physics Vol. I and II**, Tahir Hussain  
- **Fundamentals of Physics Vol. I and II**, Farid Khawaja  
- **Schaum's Series Physics**, Wells and Slusher  
- **Advanced Level Practical Physics**, Nelkon and Osborn  
- **Practical Physics**, Mehboob Ilahi Malik and Inam-ul-Haq  
- **Lasers - Principles and Applications**, Wilson  
- **Experimental Physics Note Book**, M. Aslam Khan and M. Akram Sandhu  

LIST OF PRACTICALS  
1. Draw graphs representing the functions:  
2. Find the volume of a given solid cylinder using Vernier calipers.
3. Find the area of cross-section of the given wire using micrometer screw gauge.
4. Prove that force is directly proportional to (a) mass, (b) acceleration, using Fletcher's trolley.
5. Verify law of parallelogram of forces using Grave-sands apparatus.
6. Verify law of triangle of forces and Lami's theorem.
8. Locate the position and magnitude of resultant of like parallel forces.
9. Determine the resultant of two unlike parallel forces.
10. Find the weight of a given body using principle of moments.
11. Locate the centre of gravity of regular and irregular shaped bodies.
12. Find Young's Modules of Elasticity of a metallic wire.
14. Study of frequency of stretched string with length.
15. Study of variation of frequency of stretched string with tension.
16. Study resonance of air column in resonance tube and find velocity of sound.
17. Find the frequency of the given tuning fork using resonance tube.
18. Find velocity of sound in rod by Kundt's tube.
19. Verify rectilinear propagation of light and study shadow formation.
20. Study effect of rotation of plane mirror on reflection.
21. Compare the refractive indices of given glass slabs.
22. Find focal length of concave mirror by locating centre of curvature.
23. Find focal length of concave mirror by object and image method.
24. Find focal length of concave mirror with converging lens.
25. Find refractive index of glass by apparent depth.
26. Find refractive index of glass by spectrometer.
27. Find focal length of converging lens by plane mirror.
28. Find focal length of converging lens by displacement method.
29. Find focal length of diverging lens using converging lens.
30. Find focal length of diverging lens using concave mirror.
31. Find angular magnification of an astronomical telescope.
32. Find angular magnification of a simple microscope (magnifying glass).
33. Find angular magnification of a compound microscope.
34. Study working and structure of camera.
35. Study working and structure of sextant.
36. Draw graphs representing the functions:
37. Find the volume of a given solid cylinder using Vernier calipers.
38. Find the area of cross-section of the given wire using micrometer screw gauge.
39. Prove that force is directly proportional to (a) mass, (b) acceleration, using Fletcher's trolley.
40. Verify law of parallelogram of forces using Grave-sands apparatus.
41. Verify law of triangle of forces and Lami's theorem.
42. Verify law of polygon of forces using Grave-sands apparatus.
43. Locate the position and magnitude of resultant of like parallel forces.
44. Determine the resultant of two unlike parallel forces.
45. Find the weight of a given body using principle of moments.
46. Locate the centre of gravity of regular and irregular shaped bodies.
47. Find Young's Modules of Elasticity of a metallic wire.
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65. Find focal length of diverging lens using concave mirror.
66. Find angular magnification of an astronomical telescope.
67. Find angular magnification of a simple microscope (magnifying glass)
68. Find angular magnification of a compound microscope.
69. Study working and structure of camera.
70. Study working and structure of sextant.

Phy 132 – Applied Physics
LEARNING OBJECTIVES

1. Measurement
   1.1. Use concepts of measurement to practical situations and technological problems
   1.2. Write dimensional formulae for physical quantities
   1.3. Derive units using dimensional equations
   1.4. Convert a measurement from one system to another
   1.5. Use concepts of measurement and Significant figures in problem solving.

2. Scalars and Vector
   2.1. Use concepts of scalars and vectors in solving problems involving these concepts
   2.2. Explain laws of parallelogram, triangle and polygon of forces
   2.3. Describe method of resolution of a vector into components
   2.4. Describe method of addition of vectors by rectangular components
   2.5. Differentiate between dot product and cross product of vectors
   2.6. Use the concepts in solving problems involving addition resolution and multiplication of vectors.

3. Motion
   3.1. Use the law of conservation of momentum and concepts of angular motion to practical situations.
   3.2. Use law of conservation of momentum to practical/technological problems.
   3.3. Explain relation between linear and angular motion
   3.4. Use concepts and equations of angular motion to solve relevant technological problems.

4. Torque, Equilibrium and Rotational Inertia
   4.1. Use concepts of torque, equilibrium and rotational inertia to practical situation/problems
   4.2. Explain Torque
   4.3. Distinguish between Centre of gravity and centre of mass
   4.4. Explain rotational Equilibrium and its conditions
   4.5. Explain Rotational Inertia giving examples
   4.6. Use the above concepts in solving technological problems.

5. Wave Motion
   5.1. Use concepts of wave motion in solving relevant problems
   5.2. Explain Hooke’s Law of Elasticity
   5.3. Derive formula for Motion under an elastic restoring force
   5.4. Derive formulae for simple harmonic motion and simple pendulum
   5.5. Explain wave form with reference to S.H.M. and circular motion
   5.6. Explain Resonance
   5.7. Explain Transverse vibration of a stretched string
   5.8. Use the above concepts and formulae of S.H.M. to solve relevant problems.

6. Sound
   6.1. Understand concepts of sound
   6.2. Describe longitudinal wave and its propagation
   6.3. Explain the concepts: Intensity, loudness, pitch and quality of sound
   6.4. Explain units of Intensity of level and frequency response of ear
6.5. Explain phenomena of silence zones, beats
6.6. Explain Acoustics of buildings
6.7. Explain Doppler effect giving mathematical expressions.

7. Light
7.1. Use the concepts of geometrical optics to mirrors and lenses
7.2. Explain laws of reflection and refraction
7.3. Use mirror formula to solve problems
7.4. Use the concepts of image formation by mirrors and lenses to describe working of optical instruments, e.g. microscopes, telescopes, camera and sextant.
7.5. Understand wave theory of light
7.6. Explain wave theory of light
7.7. Explain phenomena of interference, diffraction, polarization of light waves
7.8. Describe uses of polarization

8. Optical Fiber
8.1. Understand the structure, working and uses of optical fiber
8.2. Explain the structure of the optical fiber
8.3. Explain its principle of working
8.4. Describe use of optical fiber in industry and medicine.

9. Lasers
9.1. Explain the theory about light
9.2. Describe emission and absorption of light
9.3. Describe stimulated absorption and emission of light
9.4. State laser principle
9.5. Describe the structure and working of lasers
9.6. Describe different types of lasers
9.7. Describe basic application of lasers
Total Contact Hours
Theory  32
Practical  64

Pre-requisite: The student must have studied the subject of elective chemistry at Secondary, school level.

AIMS  After studying this course a student will be able to:
1. Understand the significance and role of chemistry in the development of modern technology.
2. Become acquainted with the basic principles of chemistry as applied in the study of relevant Technology.
4. Gains skill for the efficient conduct of practical’s in a Chemistry lab.

COURSE CONTENTS
1  INTRODUCTION AND FUNDAMENTAL CONCEPTS  2 Hrs
  1.1 Orientation with reference to this technology
  1.2 Terms used & units of measurements in the study of chemistry
  1.3 Chemical Reactions & their types

2  ATOMIC STRUCTURE  2 Hrs
  2.1 Sub-atomic particles
  2.2 Architecture of atoms of elements, Atomic No. & Atomic Weight
  2.3 The periodic classification of elements periodic law
  2.4 General characteristics of a period and group

3  CHEMICAL BOND  2 Hrs
  3.1 Nature of chemical Bond
  3.2 Electrovalent bond with examples
  3.3 Covalent Bond (Polar and Non-polar, sigma & Pi Bonds with examples
  3.4 Co-ordinate Bond with examples

4  WATER  2 Hrs
  4.1 Chemical nature and properties.
  4.2 Impurities
  4.3 Hardness of water (types, causes & removal)
  4.4 Scales of measuring hardness (Degrees Clark
  4.5 Boiler feed water, scales & treatment
  4.6 Sea-water desalination, sewage treatment

5  ACIDS, BASES AND SALTS  2 Hrs
  5.1 Definitions with examples
  5.2 Properties, their strength, basicity & Acidity
  5.3 Salts and their classification with examples
  5.4 pH-value and scale

6  OXIDATION & REDUCTION  2 Hrs
6.1 The process, definition & examples
6.2 Oxidizing and reducing agents
6.3 Oxides and their classifications

7 NUCLEAR CHEMISTRY 2 Hrs
7.1 Introduction
7.2 Radioactivity (alpha, beta and gamma rays)
7.3 Half life process
7.4 Nuclear reaction & transformation of elements

8 CEMENT 2 Hrs
8.1 Introduction
8.2 Composition and manufacture
8.3 Chemistry of setting and hardening
8.4 Special purpose cements

9 GLASS 2 Hrs
9.1 Composition and raw material
9.2 Manufacture
9.3 Varieties and uses

10 PLASTICS AND POLYMERS 2 Hrs
10.1 Introduction and importance
10.2 Classification
10.3 Manufacture
10.4 Properties and uses

11 PAINTS, VARNISHES AND DISTEMPER 2 Hrs
11.1 Introduction
11.2 Constituents
11.3 Preparation and uses

12 CORROSION 2 Hrs
12.1 Introduction with causes
12.2 Types of corrosion
12.3 Rusting of iron
12.4 Protective measures against corrosion

13 REFRACTORY MATERIALS AND ABRASIVE 2 Hrs
13.1 Introduction to Refractories
13.2 Classification of Refractories
13.3 Properties and Uses
13.4 Introduction to Abrasives
13.5 Artificial and Natural Abrasives and their uses

14 ALLOYS 2 Hrs
14.1 Introduction with need
14.2 Preparation and Properties
14.3 Some Important alloys and their composition
14.4 Uses

15 **FUELS AND COMBUSTION**
15.1 Introduction of fuels
15.2 Classification of fuels
15.3 Combustion
15.4 Numerical Problems of Combustion

2 Hrs

16 **LUBRICANTS**
16.1 Introduction.
16.2 Classification.
16.3 Properties of lubricants.
16.4 Selection of lubricants:

1 Hr

17 **POLLUTION**
17.1 The problem and its dangers.
17.2 Causes of pollution.
17.3 Remedies to combat the hazards of pollution.

1 Hr

**BOOKS RECOMMENDED**
1. Text Book of Intermediate Chemistry (I & II)
2. Ilmi Applied Science by Sh. Atta Muhammad
4. Chemistry for Engineers by P.C. Jain (New Delhi, India)
1 UNDERSTAND THE SCOPE, SIGNIFICANCE AND FUNDAMENTAL ROLE OF THE SUBJECT
1.1 Define chemistry and its important terms
1.2 State the units of measurements in the study of chemistry
1.3 Write chemical formula of common compounds
1.4 Describe types of chemical reactions with examples

2 UNDERSTAND THE STRUCTURE OF ATOMS AND ARRANGEMENT OF SUB ATOMIC PARTICLES IN THE ARCHITECTURE OF ATOMS
2.1 Define atom.
2.2 State the periodic law of elements.
2.3 Describe the fundamental sub atomic particles
2.4 Distinguish between atomic ho. and mass no.; isotopes and isobars
2.5 Explain the arrangements of electrons in different shells and sub energy levels
2.6 Explain the grouping and placing of elements in the periodic table

3 UNDERSTAND THE NATURE OF CHEMICAL BOND
3.1 Define chemical bond
3.2 Describe the nature of chemical bond
3.3 Differentiate between electrovalent and covalent bonding
3.4 Explain the formation of polar and non polar, sigma and pi-bond with examples
3.5 Describe the nature of coordinate bond with examples

4 UNDERSTAND THE CHEMICAL NATURE OF WATER
4.1 Describe the chemical nature of water with its formula
4.2 Describe the general impurities present in water
4.3 Explain the causes and methods to removing hardness of water
4.4 Express hardness in different units like mg/Liter, p.p.m, degrees Clark and degrees French
4.5 Describe the formation and nature of scales in boiler feed water
4.6 Explain the method for the treatment of scales
4.7 Explain the sewage treatment and desalination of sea water

5 UNDERSTAND THE NATURE OF ACIDS, BASES AND SALTS
5.1 Define acids, bases and salts with examples
5.2 State general properties of acids and bases
5.3 Differentiate between acidity and basicity and use the related terms
5.4 Define salts, state their classification with examples
5.5 Explain p-H value of solution and pH scale

6 UNDERSTAND THE PROCESS OF OXIDATION AND REDUCTION
6.1 Define oxidation
6.2 Explain the oxidation process with examples
6.3 Define reduction
6.4 Explain reduction process with examples
6.5 Define oxidizing and reducing-agents and give it least six examples of each
6.6 Define oxides
6.7 Classify the oxides and give example
UNDERSTAND THE FUNDAMENTALS OF NUCLEAR CHEMISTRY
7.1 Define nuclear chemistry and radio activity
7.2 Differentiate between alphas, Beta and Gamma particles
7.3 Explain half-life process
7.4 Explain at least six nuclei reactions resulting in the transformation of some elements
7.5 State important uses of isotopes

UNDERSTAND THE MANUFACTURE, SETTING AND HARDENING CEMENT
8.1 Define port land cement and give its composition
8.2 Describe the method of manufacture
8.3 Describe the chemistry of setting and hardening of cement
8.4 Distinguish between ordinary and special purpose cement

UNDERSTAND THE PROCESS OF MANUFACTURE OF GLASS
9.1 Define glass
9.2 Describe its composition and raw materials
9.3 Describe the manufacture of glass
9.4 Explain its varieties and uses

UNDERSTAND THE NATURE AND IMPORTANCE OF PLASTICS POLYMERS
10.1 Define plastics and polymers
10.2 Explain the mechanism of polymerization
10.3 Describe the preparation and uses of some plastics/polymers

KNOW THE CHEMISTRY OF PAINTS, VARNISHES AND DISTEMPERS
11.1 Define paints, varnishes and distemper
11.2 State composition of each
11.3 State methods of preparation of each and their uses

UNDERSTAND THE PROCESS OF CORROSION WITH ITS CAUSES AND TYPES
12.1 Define corrosion
12.2 Describe different types of corrosion
12.3 State the causes of corrosion
12.4 Explain the process of rusting of iron
12.5 Describe methods to prevent/control corrosion

UNDERSTAND THE NATURE OF REFRACTORY MATERIALS AND ABRASIVE
13.1 Define refractory materials
13.2 Classify refractory materials
13.3 Describe properties and uses of refractories
13.4 Define abrasive.
13.5 Classify natural and artificial abrasives
13.6 Describe uses of abrasives

UNDERSTAND THE NATURE AND IMPORTANCE OF ALLOYS
14.1 Define alloy
14.2 Describe different methods for the preparation of alloys
14.3 Describe important properties of alloys
Enlist some important alloys with their composition, properties and uses

15 UNDERSTAND THE NATURE OF FUELS AND THEIR COMBUSTION
15.1 Define fuels
15.2 Classify fuels and make distinction of solid, liquid & gaseous fuels
15.3 Describe important Fuels
15.4 Explain combustion
15.5 Calculate air quantities in combustion, gases

16 UNDERSTAND THE NATURE OF LUBRICANTS.
16.1 Define a lubricant
16.2 Explain the uses of lubricants
16.3 Classify lubricants and cite examples
16.4 State important properties of oils, greases and solid lubricants
16.5 State the criteria for the selection of lubricant tor, particular purpose/job

17 UNDERSTAND THENATURE OF POLLUTION
17.1 Define Pollution (air, water, food)
17.2 Describe the causes of environmental pollution.
17.3 Enlist some common pollutants.
17.4 Explain methods to prevent pollution
1.1. Characteristics:
   1.1.1. distinction between data and information;
   1.1.2. type of information (qualitative, quantitative);
   1.1.3. primary;
   1.1.4. secondary;
   1.1.5. characteristics of good information eg valid, reliable, timely, fit-for-purpose, accessible, cost-effective, sufficiently accurate, relevant, having the right level of detail, from a source in which the user has confidence, understandable by the user;
   1.1.6. Transformation of data into information
   1.1.7. Collection, storage, processing and manipulation, retrieval, presentation

1.2. Sources of information:
   1.2.1. Internal e.g. financial, personnel, marketing, purchasing, sales, manufacturing, administration;
   1.2.2. External e.g. government, trade groupings, commercially provided, databases, research;
   1.2.3. Reliability of data sources

2. UNDERSTAND HOW ORGANISATIONS USE BUSINESS INFORMATION

2.1. Purposes:
   2.1.1. Operational support e.g. monitoring and controlling activity;
   2.1.2. Analysis
   2.1.3. Identify patterns or trends;
   2.1.4. Decision making (operational, tactical, strategic);
   2.1.5. Gaining commercial advantage

2.2. Functional areas:
   2.2.1. Sales, purchasing, manufacturing, marketing, finance, personnel, administration

2.3. Information flows:
   2.3.1. Internal information flows;
   2.3.2. Information flows to external bodies;
   2.3.3. Information flow diagrams

3. UNDERSTAND THE ISSUES AND CONSTRAINTS IN RELATION TO THE USE OF INFORMATION IN ORGANISATIONS

3.1. Legal issues:
   3.1.2. Other relevant legislation eg Computer Misuse Act 1990

3.2. Ethical issues:
   3.2.1. Codes of practice e.g. on use of email, internet, whistle blowing’;
   3.2.2. Organizational policies;
   3.2.3. Information ownership

3.3. Operational issues:
   3.3.1. Security of information;
   3.3.2. Backups;
   3.3.3. Health and safety;
   3.3.4. Organizational policies;
   3.3.5. Business continuity plans;
   3.3.6. Costs e.g. additional resources
   3.3.7. Acquired, cost of development;
   3.3.8. Impact of increasing sophistication of systems eg more trained personnel, more complex software.

4. KNOW THE FEATURES AND FUNCTIONS OF INFORMATION SYSTEMS

4.1. Tools:
   4.1.1. Databases;
   4.1.2. Artificial intelligence and expert systems;
   4.1.3. Internet;
4.1.4. Others e.g. data mining systems, predictive modeling
4.1.5 Introduction to ERP

4.2. Information system examples:
4.2.1. Marketing (sales performance, competitors etc), financial (financial costs, investment
returns etc), human resources (HR)
4.2.2. Staffing, professional development etc
4.2.3. Management information systems (MIS)
4.2.4. Features;
4.2.5. Benefits;
4.2.6. Effectiveness criteria e.g. accuracy, sustainability, response times, confidence

4.3. Key elements of information systems:
4.3.1. Data;
4.3.2. People;
4.3.3. Hardware;
4.3.4. Software;
4.3.5. Telecommunications

4.4. Information systems functions:
4.4.1. Input;
4.4.2. Storage;
4.4.3. Processing;
4.4.4. Output;
4.4.5. Control and
4.4.6. Feedback loops;
4.4.7. Closed and open systems

List of Practical
1. Searching useful information on internet. 3
2. Making account on different sites 3
3. Working on MS-Excel for Making Data Useful 3
4. Working on MS-Access 3
5. Working on MS-Publisher 3
6. Working Ms-Groove. 3
7. Working on Databases 3
8. Securing Information 3
9. Securing Communication for transferring business information. 3
10. Use of Intelligent Software 3
11. Securing your business website. 3

Textbooks
Anderson H and Yull S — BTEC Nationals IT Practitioners: Core Units for Computing
and IT (Newnes, 2002) ISBN 0750656840
Bocic P, Chaffey D, Greasley A and Hickie S — Business Information Systems:
Technology Development and Management (FT Prentice Hall, 2005) ISBN 0273688146

Website
www.comp.glam.ac.uk/pages/staff/tdhutchings/chapter1.html


Unit content with objectives
1. KNOW THE NATURE AND FEATURES OF PROGRAMMING LANGUAGES 12
   1.1 Structured & Unstructured Programming
   1.2. Programming paradigms &Types of language:
1.2.1. Procedural languages;
1.2.2. Object-oriented;
1.2.3. Visual languages;
1.2.4. Other e.g. script and markup languages;
1.2.5. Simple overviews and uses
1.2.6. Supporting tools and environments eg CASE tools, IDE

1.3. Reasons for choice of language:
1.3.1. Organizational policy;
1.3.2. Suitability in terms of available features and tools;
1.3.3. Availability of trained staff;
1.3.4. Reliability;
1.3.5. Development and maintenance costs;
1.3.6. Expandability

1.4. Features:
1.4.1. Variables e.g. naming conventions, local and global variables, arrays;
1.4.2. Loops e.g. conditional (pre-check, post-check), fixed;
1.4.3. Conditional statements;
1.4.4. Case statements;
1.4.5. Logical operators;
1.4.6. Assignment statements;
1.4.7. Input statements;
1.4.8. Output statements

1.5. Data types:
1.5.1. Text;
1.5.2. Integer;
1.5.3. Floating point;
1.5.4. Byte;
1.5.5. Date;
1.5.6. Boolean other e.g. chars, smallint;
1.5.7. Benefits of appropriate choice of data type eg additional validation, efficiency of storage

2. BE ABLE TO USE SOFTWARE DESIGN AND DEVELOPMENT TOOLS

2.1. Software development life cycle:
2.1.1. Determination of scope, requirements gathering and specification, design, code, test, maintain

2.2. Design tools:
2.2.1. Appropriate to problem eg structure diagrams, DFDs, ERM / ERP

2.3. Software structures:
2.3.1. Appropriate to language chosen eg iteration, decisions, modules, functions, procedures, classes and objects, abstraction of data;
2.3.2. Pre-defined code;
2.3.3. Readability e.g. comments, appropriate names for variables, indentation;
2.3.4. Quality of code eg efficiency, reliability, robustness, usability, portability, maintainability

3. BE ABLE TO DESIGN AND CREATE A PROGRAM

3.1. Requirements specification:
3.1.1. Inputs, outputs, processing, user interface;
3.1.2. Constraints e.g. hardware platforms, timescales for development

3.2. Design:
3.2.1. Related to specific design technique chosen;
3.2.2. Structure e.g. functions, procedures, objects;
3.2.3. Data;
3.2.4. File

3.3. **Technical documentation:**
3.3.1. Requirements specification;
3.3.2. Appropriate to language eg form design, flowcharts, pseudo code, structured English, action charts, data dictionary, class and instance diagrams

3.4. **Review:**
3.4.1. against specifications requirements

4. **BE ABLE TO DOCUMENT, TEST, DEBUG AND REVIEW A PROGRAMMED SOLUTION 12**
4.1. **Testing and debugging:**
4.1.1. Test strategy;
4.1.2. Test plan structure eg test, date, expected result, actual result, corrective action;
4.1.3. Error messages;
4.1.4. Specialist software tools eg debug

4.2. **User documentation:**
4.2.1. Details of hardware platform required, loading instructions, user guide;
4.2.2. Getting help

4.3. **Review:**
4.3.1. Against specifications requirements;
4.3.2. Interim reviews

5. **5 WORKING WITH PROGRAMMING LANGUAGE C**
5.1. **The C Integrated Development Environment (IDE)**
5.1.1. IDE Setup and Use of IDE;
5.1.2. Files used in C Program Developer;
5.1.3. The Structure of C Programs

5.2. **Conditional Control Construct:**
5.2.1. Decisions for e.g. The if Statement, The if-else Statement, The else-if Statement;
5.2.2. The switch Statement, The Conditional Operator

5.3. **Iterative Control Construct:**
5.3.1. Loops eg The for Loop, The while Loop, The do while Loop

5.4. **Functions:**
5.4.1. Simple Functions and Value-Returning Functions;
5.4.2. Parameter Passing Using Multiple Functions and External Variable;
5.4.3. Preprocessor Directives, Recursion

5.5. **Arrays, Strings and pointers**
5.5.1. Single and Two-dimensional Arrays, Strings
5.5.2. Introduction to Pointer;
5.5.3. Returning Data from Functions, Pointers and Arrays Pointers and Strings, Double Indirection, Pointers to Pointers

5.6. **Files:**
5.6.1. Types of Disk I/O and Standard Input/Output,
5.6.2. Binary and Text Mode, Record Input/Output and Random Access,
5.6.3. Error conditions and Redirection
Indicative reading for learners

Textbooks
Bowman K – Systems Analysis:
Knuth D – The Art of Computer Programming:
ISBN-13 978-076455684

Websites
visualbasic.about.com

References
- C++ How to Program, 2Ed., Deitel and Deitel, Prentice-Hall
- Mastering Turbo C, Stan Kelly-Bootle, Sybex Computer Books Inc

Abstract and Essential guidance for teachers
There is a comprehensive range of generic application software and utilities which are available to businesses across many different sectors. Examples are spreadsheets and databases, as well as more focused packages such as payroll or computer aided design (CAD). Sometimes, however, a business need is identified that cannot be addressed in this way and in these situations it is necessary to build a solution using an appropriate computer language.

In order to develop a programmed software solution which meets business and user needs it is necessary to understand the problem and be very clear in terms of the user requirements. Problems are often caused by poor understanding of user need as well as poor planning. A wide range of different languages is available with quite different characteristics and features. Although as part of this, learners will be focusing on one particular language, they will build an appreciation of why different high-level languages are available and why they are chosen in particular situations. This unit focuses on the whole design and development process and would be an appropriate place to start programming before undertaking more focused programming language units. The unit examines the business context within which solutions can be developed along with possible constraints.

This unit also includes the documenting and testing required as an integral part of creating a computer program. A major part of learners’ time will be spent on familiarising themselves with fundamental software development processes and concepts. This gives learners a firm foundation for them to tackle the more focused programming units.

Although the specific language to be used is not defined, learners will be expected to produce and test programs to meet a given need or address a particular problem.

Learning outcomes
On completion of this unit a learner should:
1 Know the nature and features of programming languages
2 Be able to use software design and development tools
3 Be able to design and create a program
4 Be able to document, test, debug and review a programmed solution.

Essential guidance for tutors

Essential resources
Learners will need individual access to a particular programming language and development environment. They will also need a more limited access, possibly by demonstration to other different types of languages.
ICT 133 network Fundamentals (updated)  tpC 233

Unit content with objectives

1.0 LIVING IN A NETWORK-CENTRIC WORLD  5
   1.1 Chapter Introduction
   1.2 Communicating in a Network-Centric World
   1.3 Communication – An Essential Part of Our Lives
   1.4 The Network as a Platform
   1.5 Devices:
       1.5.1 Servers, workstations, printers, routers, switches
       1.5.2 Wireless access points, VoIP devices, PDAs.
   1.6 Network Infrastructure:
       1.6.1 System eg small scale system (less than 255 potential devices), medium scale
       1.6.2 System (less than 65535 potential devices), large scale system (over
           65536 potential devices).
   1.7 The Architecture of the Internet
   1.8 Trends in Networking (Network design):
       1.8.1 Logical topology, eg star, bus, ring, hierarchical, mesh. Physical:
       1.8.2 eg copper cabling infrastructure, wireless, fibre
   1.9 Chapter Labs
   1.10 Chapter Summary

2.0 COMMUNICATIONS OVER THE NETWORKS  6
   2.1 Chapter Introduction
   2.2 The Platform for Communications
   2.3 LANs, WANs, and Internetworks
   2.4 Protocols
   2.5 Using Layered Models (OSI):
   2.6 ISO seven layer Open Systems Interconnection model
   2.7 Network Addressing
   2.8 Sub-networking:
       2.8.1 eg: class A, Class B, Class C. Private:
       2.8.2 RFC 1918 Multiple hosts: more than two workstations
   2.9 Chapter Labs
   2.10 Chapter Summary

3.0 OSI APPLICATION LAYER FUNCTIONALITY  5
   3.1 Applications – The Interface between the Networks
   3.2 Making Provisions for Applications and Services
   3.3 Application Layer Protocols and Services Examples
   3.4 Chapter Labs
   3.5 Chapter Summary

4.0 OSI TRANSPORT LAYER  5
   4.1 Roles of the Transport Layer
   4.2 The TCP Protocol – Communicating with Reliability
   4.3 Managing TCP Sessions
   4.4 The UDP Protocol – Communicating with Low Overhead
   4.5 TCP/IP Layers: DARPA four layer transmission control protocol/internet protocol model
   4.7 Chapter Labs
   4.8 Chapter Summary
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<td>10.5 Calculating the Subnets</td>
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<td>10.6 Device Interconnections</td>
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<td>10.7 Chapter Labs</td>
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11.0 Configuring and Testing Your Network

11.1 Chapter Introduction
11.2 Configuring Cisco Devices – IOS basics
11.3 Applying a Basic Configuration Using Cisco IOS
11.4 Verifying Connectivity
11.5 Monitoring and Documenting Networks
11.6 Chapter Labs
11.7 Chapter Summary

12.0 Technological change

12.1 New devices,
12.2 Bandwidth usage,
12.3 Speed increase,
12.4 Mobility,
12.5 Security considerations

Practical Work

Chapter 1: Communicating over the Network

Chapter 2: Communicating over the Network

Chapter 3: Application Layer Functionality and Protocols
Activity 3-1: Data Stream Capture Lab 3-1: Managing a Web Server Lab 3-2: E-mail Services and Protocols Skills Integration Challenge: Configuring Hosts and Services

Chapter 4: OSI Transport Layer

Chapter 5: OSI Network Layer
Lab 5-1: Examining a Device's Gateway Packet Tracer Companion: Examining a Device's Gateway Lab 5-2: Examining a Route Packet Tracer Companion: Examining a Route Skills Integration Challenge: Routing IP Packets
Chapter 6: Addressing the Network: IPv4
Lab 6-1: Ping and Trace route
Packet Tracer Companion: ping and trace route
Lab 6-2: Examining ICMP Packets
Packet Tracer Companion: Examining ICMP Packets
Activity 6-2: IPv4 Address Subnetting
Lab 6-3: Subnet and Router Configuration
Packet Tracer Companion: Subnet and Router Configuration
Skills Integration Challenge: Planning Subnets and Configuring IP Addresses

Chapter 7: OSI Data Link Layer
Lab 7-1: Frame Examination
Skills Integration Challenge: Data Link Layer Issues

Chapter 8: OSI Physical Layer
Lab 8-1: Media Connectors Lab Activity
Skills Integration Challenge: Connecting Devices and Exploring the Physical View

Chapter 9: Ethernet
Lab 9-1: Address Resolution Protocol
Packet Tracer Companion: Address Resolution Protocol
Lab 9-2: Cisco Switch MAC Table Examination
Lab 9-3: Intermediary Device as an End Device
Packet Tracer Companion: An Intermediary Device as an End Device
Skills Integration Challenge: Switched Ethernet

Chapter 10: Planning and Cabling Networks
Lab 10-1: How Many Networks?
Lab 10-2: Creating a Small Lab Topology
Packet Tracer Companion: Creating a Small Topology
Lab 10-3: Establishing a Console Session with HyperTerminal
Lab 10-3 (Alternative): Establishing a Console Session with TeraTerm Packet Tracer Companion: Establishing a Console Session with PT Terminal
Lab 10-4: Establishing a Console Session with Mincom
Skills and Integration Challenge: Planning and Cabling Networks

Chapter 11: Configuring and Testing Your Network
Lab 11-1: Network Latency Documentation with ping
Lab 11-2: Basic Cisco Device Configuration
Packet Tracer Companion: Basic Cisco Device Configuration
Lab 11-3: Managing Device Configuration
Packet Tracer Companion: Managing Device Configuration
Lab 11-4: Configure Host Computers for IP Networking
Lab 11-5: Network Testing
Lab 11-6: Network Documentation with Utility Commands
Lab 11-7: Case Study: Datagram Analysis with Wireshark
Skills Integration Challenge: Configuring and Analyzing Networks
Learning outcomes On completion of this unit a learner should:
1 Understand the diverse types of network systems and devices in common use and how the different technologies operate and communicate.
2 Understand the OSI and TCP/IP and their relationship to the operation of network systems.
3 Be able to configure workstations to communicate across a network.
4 Be able to design a sub-network scheme.
5 Be able to recommend improvements to an existing network infrastructure.

Text books
Network Fundamentals, CCNA Exploration Companion Guide By Mark Dye, Rick McDonald, Antoon Rüfi
Published Oct 29, 2007 by Cisco Press
Network Fundamentals, CCNA Exploration Labs and Study Guide By Antoon Rüfi, Priscilla Oppenheimer, Belle Woodward, Gerlinde Brady Published Jan 18, 2008 by Cisco Press
CCNA Exploration Course Booklet: Network Fundamentals, Version 4.0 By Cisco Networking Academy
Published Sep 10, 2009 by Cisco Press
gctr.ak@gmail.com, gpi_ak@yahoo.com

Abstract and Essential guidance for teachers
This course is a comprehensive introduction to the basics of computer networking and telecommunications principles. The course covers the skills and knowledge typical of the networking sector, in which an ICT network technician would need to understand to successfully complete their work. In particular learners will be taught how to attach a computer to a network system, complete copper cabling, devise a subnet scheme, plan and recommend improvements to a network infrastructure and also be able to troubleshoot simple communication problems with networking hardware. In addition to this, learners will understand and apply commonly used networking technologies in a variety of contexts.

In most organisations, it is accepted that network management is essential in order to run support systems efficiently and effectively. Learners will appreciate what takes place in the daily operation of a network and how differing systems interact with each other.

Learning outcomes
On completion of this unit a learner should:
1 Understand the diverse types of network systems and devices in common use and how the different technologies operate and communicate.
2 Understand the OSI and TCP/IP and their relationship to the operation of network systems.
3 Be able to configure workstations to communicate across a network.
4 Be able to design a sub-network scheme.
5 Be able to recommend improvements to an existing network infrastructure.

Essential resources
This course must be taught in a computer lab with internet access in order to assess learners via the Cisco online assessment system. The web is a great source of technical information and access to computers is necessary.

If another room for lab work is available, then the cabling and network configuration part of the class can be taught in this classroom. One lab computer for every two learners is an ideal situation but many classes have up to three to four learners per lab computer. Lab computers do not need to be the latest or newest systems, but it helps if they are all identical. It is recommended not to use the computers used by other classes as learners may tear down the machines. There should be a supply of redundant computers for this task.

**Teacher resources**

- One LCD Projector (or TV with hookup to computer).
- Workstation hooked up to network (both LAN and Net) with CD ROM and CD burner for making copies of CDs and for collecting/showing learner work and using tutor CDs that come with texts.

**Lab resources**

- Computers on LAN with internet access — suggested ratio of one for every learner (for theory work).
- One Server saving class work (learner presentation etc).
- One Web server to host the Cisco electronic content.
- One Lab area with tables, electrical outlets, extra network jacks and, if possible, elevated storage shelves for routers, switches and monitors.
- One or two storage cabinets for tools and consumables.
- Storage area for lab computers and spare parts (shelving, cabinet etc).
- Lab (tear-down) computers — suggested ratio of one for every two learners, or VM-Ware, Virtual PC emulators.
- Packet Tracer.

ICT-143 Computer systems Basics  tpC 233

**Unit content with objectives**

1. **UNDERSTAND THE HARDWARE COMPONENTS OF COMPUTER SYSTEMS**
1.0 Basic Circuits:
1.0.1. Introduction to electrical and electronic circuits;
1.0.2. Basic units of electronics(watt, amp etc)
1.0.3. Electronic Essentials

1.1. System unit components:
1.1.1. Processors and options;
1.1.2. Motherboard;
1.1.3. BIOS;
1.1.4. Power
1.1.5. Supply;
1.1.6. Fan and heat sink;
1.1.7. Hard drive configuration and controllers eg IDE, EIDE, master, slave;
1.1.8. Ports e.g. USB, parallel, serial;
1.1.9. Peripherals e.g. printer, camera, scanner, plotter;
1.1.10 Internal memory (RAM, ROM, cache);
1.1.11. Specialized cards e.g. network, graphic cards

1.2. Backing store:
1.2.1. Types e.g. disks, pen drives, optical media, flash memory cards;
1.2.2. Portable and fixed drives;
1.2.3. Performance factors e.g. data transfer rate, capacity

1.3. Data transmission:
1.3.1. Communication paths e.g. buses;
1.3.2. Modems;
1.3.3. Processor speed (impact on use, potential for over clocking);
1.3.4. RAM speed;
1.3.5. Impact of transmission media

1.4. Considerations for selection:
1.4.1. Cost;
1.4.2. User requirements e.g. software to be used, need for maintenance contract, outputs required, need for integration with other systems such as home entertainment, processing power, storage capacity;
1.4.3. Accessibility for disabled users

2. Understand the Software Components of Computer Systems

2.1. Operating system software:
2.1.1. Operating system examples eg LINUX, Windows, MAC, OS;
2.1.2. Command line and GUI operating systems;
2.1.3. Operating system functions and services eg machine and
2.1.4. Peripheral management, security, file management;
2.1.5. Device drivers

2.2. Software utilities:
2.2.1. Virus protection;
2.2.2. Firewalls;
2.2.3. Clean up tools eg for cookies, internet history, defragmentation;
2.2.4. Drive formatting

3. Be able to undertake Routine Computer Maintenance

3.1. Software maintenance:
3.1.1. Upgrade software eg virus definition files;
3.1.2. Installation of patches;
3.1.3. Scheduling of maintenance tasks;
3.1.4. Utility software aimed at users eg defragmentation, clean-up, system profilers;
3.1.5. Other third party utility software eg compression utilities, spyware removal
3.2. Hardware maintenance:
   3.2.1. Cleaning equipment;
   3.2.2. Install and configure new peripherals eg printers;
   3.2.3. Install and configure additional or replacement device
   3.2.4. Hard drive, graphics card, sound card, optical media, network interface card;
   3.2.5. Other issues e.g. regulatory requirements risks, health and safety issues

3.3. File management:
   3.3.1. Create folders;
   3.3.2. Back-up procedures;
   3.3.3. Others e.g. delete files

PRACTICAL WORK
1) Studying the need to plan scheduled routine and non-routine computer systems maintenance
   3
2) Identifying an upgrade opportunity for hardware and one for software through use of monitoring
   tools.3
3) Studying the need to plan scheduled routine and non-routine computer systems maintenance
   3
4) Identifying housekeeping procedures that need to be performed on computer systems.
   3
5) Studying health and safety risks facing the user and practitioner whilst working with computer
   systems,
      Identifying for each one appropriate legislative guidelines and recommending precautions
      3
6) Studying the need for policies and procedures to control the maintenance of computer systems
   activities
      in organizations
   3
7) Studying the sustainability and environmental issues that relate to the maintenance and upgrading
   of
      computer systems.
   3
8) Studying health and safety risks facing the user and practitioner whilst working with computer
   systems,
      identifying for each one appropriate legislative guidelines and recommending precautions 3
9) Recommending one possible hardware upgrade and one possible software upgrade based on their
   respective benefits and drawbacks
   3
10) Discussing and evaluating improvements to computer systems achieved by routine housekeeping
    procedures.
    3

Learning outcomes
On completion of this unit a learner should:
1 Understand the hardware components of computer systems 2 Understand the software
components of computer systems 3 Be able to undertake routine computer maintenance.

Indicative reading for learners
Textbooks
Anderson H and Yull S — BTEC Nationals IT Practitioners:
Core Units for Computing and IT (Newnes, 2002) ISBN 0750656840
Dick D — The PC Support Handbook:
Unit abstract
Most IT practitioners will at some stage have to set up, use, customize and maintain a computer system or systems. In order to do so effectively they will need to understand the components that make up a computer system. The operating system interacts with the hardware components in order to make a functioning machine. As this relationship is so close, this unit develops skills in hardware components and the operating systems. Although the Microsoft operating system currently dominates the market, it is not the only operating system and learners should explore at least one other. There are many different manufacturers of computer systems and each manufacturer will produce a wide range of models with different specifications. Deciding which particular model is appropriate for a given situation depends on a variety of factors. These are explored in this unit so that successful learners can make informed choices when choosing and purchasing systems. In terms of software, the operating system itself often provides utility programmes that assist the user in managing the machine. However other third party software utility programmes such as virus checkers are also used extensively. This unit considers both types of utility software. Computer users also need the skills required to set up and carry out routine maintenance of computer systems. Although this unit does not cover extensively fault finding and repair, it includes the basic maintenance skills that would normally be expected of most computer users.

Learning outcomes on completion of this unit a learner should:
1 Understand the hardware components of computer systems
2 Understand the software components of computer systems
3 Be able to undertake routine computer maintenance.

Delivery
There is no requirement for learners to build computer systems from components such as graphics cards, sound cards or a motherboard. It will be necessary however, for learners to have access to some typical peripherals such as printers, CD ROMs and webcams.
In learning outcomes 1 and 2 although practical evidence is not required, it is recommended that learners undertake real workshop activities, for example in the use of LINUX. The ordering of the content can, in general, guide the delivery; however learners may appreciate regular practical workshop activities that allow them to put the theory in context. It will also prepare learners for providing the formal summative evidence required. For more details contact gctr.ak@gmail.com, gpi_ak@yahoo.com. However, If teachers are needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husnain HOD –IT GCT Rawalakot-AK with the guidance of COSC and BC, feel free to contact him. Learning outcome 3 is the only ‘be able to’ outcome and learners are required to develop and then evidence practical skills. No operating system is defined and practical activities could be delivered through, for example, any Windows version, Unix or Linux.

Essential resources
Learners will need access to appropriate computer hardware; this may be old working computer systems, no longer fit for normal class room delivery. Many experienced centres retain their computers when they are no longer useful for IT lessons for such purposes. Many web retailers offer computer components at exceptionally low prices; most areas have computer shops and computer recycling organisations which will happily donate older components. Health and safety considerations mean that learners will require access to potentially dedicated and safe workshop facilities particularly for P5 where learners will need to demonstrate competence in activities that will involve an ‘open’ machine.
ICT 152: Client Side Customization of web Pages tPC-062

Unit content with objectives

1. Web site
   1.1. The Web and the Internet
       1.1.1. Internet;
       1.1.2. Web Browsers;
       1.1.3. Hyperlinks and URL;
   1.2. Web Page Designing
       1.2.1. Web Page Planning;
       1.2.2. Tools;
   1.3. HTML
       1.3.1. Basics HTML Elements;
       1.3.2. Structure of HTML Code;
       1.3.3. Categories of HTML Body Elements;
       1.3.4. HTML Views;
       1.3.5. HTML Rules of Nesting;
   1.4. HTML Elements:
       1.4.1. Head Section Elements;
       1.4.2. Body Section Formatting;
       1.4.3. Block-level Elements;
       1.4.4. Text-level Elements;
       1.4.5. Font-style Elements;
       1.4.6. Phrase Elements;
   1.5. Web Linking:
       1.5.1. Internal and External Links;
       1.5.2. Anchor;
       1.5.3. Link Format;
       1.5.4. Link Maintenance;
   1.6. Graphics:
       1.6.1. Image Element;
       1.6.2. Image Attributes;
       1.6.3. Image Links;
       1.6.4. Image Maps and Files;

2. UNDERSTAND THE FUNDAMENTALS OF CSS
   2.1. Characteristics of CSS:
       2.1.1. CSS frameworks;
       2.1.2. Implementation styles e.g. in-line, header, external;
       2.1.3. Box model e.g. width, margins, padding, border, content area, inline, block;
       2.1.4. Selectors;
       2.1.5. Type, class, ID;
       2.1.6. Accessing CSS from HTML;
   2.2. Uses of CSS:
       2.2.1. Background colour, background images, formatting text, applying;
       2.2.2. Borders and padding, heading styles, positioning elements, creating columns;

3. UNDERSTAND THE FUNDAMENTALS OF A CHOSEN SCRIPTING LANGUAGE 20
   3.1. Characteristics of scripting languages:(Java Script)
       3.1.1. Nature of language (object oriented and event driven);
       3.1.2. Objects;
       3.1.3. Methods;
3.1.4. Handling events;
3.1.5. Hiding scripts from older browsers;
3.1.6. Security issues (reading/writing client files, opening/closing user windows, reading information from other browser windows);
3.1.8. Including scripts inside HTML
3.2. Uses of a scripting language:
   3.2.1. Alerts, confirming choices, prompting the user,
   3.2.2. Redirecting the user, browser detection, creating rollovers,
   3.2.3. Checking/validating input, handling forms, maintaining cookies;
3.3. Scripting language constructs:
   3.3.1. Syntax eg dot operator, values, variables, operators, assignment, comparisons;
   3.3.2. Loops eg for, for/in, do/while;
   3.3.3. Decision making eg if, if/else, switch/case;
   3.3.4. Functions (calling, parameter passing);
   3.3.5. Handling events eg onfocus, onload, onblur, onmouseover;
   3.3.6. Methods eg write(), click(), open(), selected();
   3.3.7. Properties eg name, width, ID, value;
3.4 Jquery/AJAX:
   3.4.1 Jquery Syntax
   3.4.2 Jquery Effects
   3.4.3 Jquery using HTML
   3.4.4 Jquery using AJAX
4. BE ABLE TO CONTROL LAYOUT OF A WEB PAGE USING CSS
4.1. Design:
   4.1.1. Layout planned using appropriate graphical or other tool;
4.2. Headings:
   4.2.1. Styling eg adding colour, font size, font weight, background image;
   4.2.2. Spacing eg applying padding, margins, borders;
4.3. Lists:
   4.3.1. Styling the <ul>, <a> and <li> elements;
   4.3.2. Adding a hover effect;
   4.3.3. use for navigation eg horizontal navigation, vertical navigation;
4.4. Links and pseudo classes:
   4.4.1. Setting pseudo class order;
   4.4.2. Adding background images;
   4.4.3. Styling eg removing underlines, adding borders, increasing active area;
5. BE ABLE TO CREATE AN INTERACTIVE WEB PAGE
5.1. Script requirements:
   5.1.1. Inputs;
   5.1.2. Outputs;
   5.1.3. Processing;
5.2. Design script:
   5.2.1. use of appropriate tools eg flowchart, pseudo code to design the required script;
5.3. Implement script:
   5.3.1. Using appropriate objects their properties and methods;
   5.3.2. Writing;
   5.3.3. Required functions creation of interactive web pages eg, rollovers, clocks and calendars,
   5.3.4. client-side processing of calculations, forms validation, mouse movement followers;
5.4. Good practice:
6. BE ABLE TO TEST AND REVIEW A WEB PAGE WHICH USES CSS AND JAVASCRIPT

6.1. Testing

6.1.1. Layout matches design;
6.1.2. Interactivity works as specified;
6.1.3. Check layout and interactivity work on different platforms eg Microsoft internet Explorer, Firefox, Opera, Chrome, Safari;

Learning outcomes on completion of this unit a learner should:
1. Understand the fundamentals of CSS
2. Understand the fundamentals of a chosen scripting language
3. Be able to control layout of a web page using CSS
4. Be able to create an interactive web page
5. Be able to test and review a web page which uses CSS and JavaScript.

Indicative reading for learners Textbooks
Curriculum developer cell 0092 3442183831
Weakley R — Sams Teach Yourself CSS in 10 Minutes (Sams, 2005) ISBN 0672327457

Websites
World www.w3schools.com/css/default.asp W3Schools
gct.ak@gmail.com, gpi_ak@yahoo.com
Abstract and Essential guidance for teachers

There is increasing expectation that website design will adhere to web standards and that websites will consist of sophisticated, interactive web pages. This requires website designers and creators to be familiar with standard tools, techniques and languages to create such websites. In particular, web standards are beginning to expect mark-up to be done in XHTML, layout to be controlled by cascading style sheets (CSS) and client side interactivity by a scripting language such as JavaScript or VBScript. XHTML is a stricter version of HTML and adheres to XML standards. CSS and JavaScript or VBScript are powerful scripting languages used to create sophisticated layouts and interactivity on web pages, respectively. A key feature of CSS Java/VBScript is that the script (code) is stored on the clients’ system rather than host server systems. As they do not need to interact with a web server, this can save resources and network bandwidth. CSS are capable of creating complex, sophisticated layouts which are easy to maintain and update across the whole website or individual pages. Java/VBScript is able to validate information that users enter into a form before it is sent to a web server for processing.

This specialist unit will provide an introduction to the creation of web pages having some compliance with web standards. Layout will, therefore, be controlled by CSS, and interactivity controlled by a client side scripting language such as JavaScript or VBScript. For more details contact gctr.ak@gmail.com, gpi_ak@yahoo.com. However, If teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husnain HOD –IT GCT Rawalakot-AK with the guidance of COSC and BC, feel free to contact him. Learners will develop an understanding of the fundamental characteristics of CSS and a chosen scripting language. Learners will develop web pages with sophisticated layouts and in which calculations can be performed by combining the two tools.

Learning outcomes on completion of this unit a learner should:

1 Understand the fundamentals of CSS
2 Understand the fundamentals of a chosen scripting language
3 Be able to control layout of a web page using CSS
4 Be able to create an interactive web page
5 Be able to test and review a web page which uses CSS and JavaScript.
ICT

2nd Year
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اترس معاقد

عمومی مقاصد

یہ جملہ جو تعلیم کی روشنی میں موجود کی اعیان کا ائمہ "تیرکان" ہیں، جو تعلیم کے اینے

تفصیل مقاصد:

تیرکان کی تعلیم میں دلیلاً شرکت کرنے کے
تیرکان کی تعلیم کی تعلیم کے
تیرکان کی آیات کی روشنی میں آفیم موسکا کے یہ وصف یقین کے
تیرکان کی آیات کی روشنی میں آفیم موسکا کے وصف ایہ ایہ کے

اطالعہ دوہر

عمومی مقاصد:

اطالعہ کا تعلیم میں رونا کے
اطالعہ کی تعلیم کے
اطالعہ یہ جملہ جو تعلیم کی روشنی میں آفیم الیک موسکا کے وصف یقین کے

فریبد تعلیم کی روشنی میں تعلیم کے مکمل کی روشنی میں

فریبد میں کی روشنی میں تعلیم کے مکمل کی روشنی میں

 Frage میں مکمل کی روشنی میں

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صوہ مقاصد:
خصوصی متقاضیین: اسلامی معاشرت کی خصوصیات سے افکار جعل کر کے

اسلامی معاشرت کا صمیمی وجہ پانی کر کے

اسلامی معاشرت کی اقتدار معاشرتی خصوصیات سے افکار جعل کر کے

اسلامی معاشرت میں عمل و انسان کی افکار جعل کر کے

تیلکے ہفوں سے پانی کر کے

مذہبی افکار، پروپرتی پانی کر کے

انسانی قبضہ اسلامی معاشرت سے

اعلی تربیتی ترقی کے

ممکنہ خصوصیات کو تحلیل کر کے بارہ میں اقدامات کو مال کے

اسلامی ریاست

عموی طاقت: اسلامی ریاست کی خصوصیت پانی کر کے

خصوصی متقاضی:

پانی کے کچھ ترقی کے

ان کی افکار کے معاشرتی خصوصیات پانی کر کے

ان کے معاشرتی افکار و معاشرتی پانی کر کے

اسلامی ریاست کے قوم کی پیشہ ور جوح کے

ذخیرہ
موضوعات

ماہرین قرآن کی مختلف وجوه کے علم کے لیے طبعی تعلیم پیش کرنے کے لیے اہم وجوہات

- قرآن کیر
- قرآن تجویز
- قرآن تعلیم
- غنیہ ذیلی
- وجوہات الوجوہ
- نسل ووقت
- غنیہ شعور
- علاقوں کا کیا
- کل مفہوم
- تصورات کا کیا کل
- الوجہات

موضوع الوجوهات

تدوین مقاصد

لگن مذکورہ:

طالب علم: الوجوهات کی اہمیت پر سوالات سے جواب دیں اور نظریات کے نصیحتی مقاصد;
طالب علم اس کلیہ کے
موہوقات کو سملی بنا کر گئے
گلی زندگی سے تعیین کی معاشرت کے
اثر فیصلہ اور حاشیہ پر موہوقات کے متعلق فیصلہ اور اپنی اپنی درجہ بندی کے
کل کیا کام

یہ علما کے لیے اپنے گروپ کے
کل موہوقات سے مختلف
کل موہوقات سے مختلف
Course Code: Math 223
Course Title: Applied Mathematics II

The higher mathematics course of calculus. It provides the student the mathematical skills and knowledge applicable to technology. It covers standard topics of differential and integral calculus such as limits and differentiation of different functions, and their integration. This is all classroom discussion.

Course Objectives
At the end of the course the students are expected to be able to
- Understand the concepts of function and limits, differentiation, definite integral and integration.
- Perform differentiation and integration of algebraic, trigonometric, logarithmic and exponential functions.
- Apply methods of differentiation in solving problems of rates, minima and maxima.
- Solve technological problems of practical applications using the methods of differential and integral calculus.
- Manipulate mathematical expressions involving differentiation and integration with ease and confidence
- Demonstrate clarity and logic in expressing problems and their solutions

COURSE OUTLINE

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<td>2.4 Differential Coefficient of Xn, (ax + b)n and Three important rules</td>
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<td>3. Differentiation of Algebraic Functions</td>
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<td>4.2 Differential Coefficient of Cosec x, Sec x, Cot x</td>
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<td>6. Rate Of Change of Variable</td>
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<td>7.3 Important Rules</td>
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8. Methods of Integration
   8.1. Integration by substitution
   8.2. Integration by parts
9. Definite Integrals
   9.1. Properties
   9.2. Application to area
10. Plane Analytic Geometry and Straight Line
    10.1. Coordinate System
    10.2. Distance Formula and Ratio Formulas
    10.3. Inclination and Slope of a Line
    10.4. The slope Formula
11. Equations of Straight Line
    11.1. Some important Forms
    11.2. General Form and Angle Formula
    11.3. Parallelism and Perpendicularity
12. The Equations of Circle
    12.1. Standard form of Equation
    12.2. Central form of Equation and General form of Equation
    12.3. Radius and Coordinates of the Centre

Total Hours: 96

References

- Calculus and Analytic Geometry, Thomas Finny
- Polytechnic Mathematics Series Vol. I and II, Prof. Riaz Ali Khan, Majeed Sons, Faisalabad
- Calculus and Analytic Geometry, Prof. Sana Ullah Bhatti, Punjab Text Book Board, Lahore.
Math 233 – Applied Mathematics II LEARNING OBJECTIVES

1. Functions and Limits
   1.1. Use the concept of functions and their limits in solving simple problems.
   1.2. Define a function.
   1.3. List all types of functions.
   1.4. Explain the concept of limit and limit of a function.
   1.5. Explain fundamental theorems on limits.
   1.6. Derive some important limits.
   1.7. Solve simple problems on limits.

2. Differentiation
   2.1. Understand the concept of differential coefficient.
   2.2. Derive mathematical expression for a differential coefficient
   2.3. Explain geometrical interpretation of differential coefficient.
   2.4. Differentiate a constant, a constant associated with a variable and the sum of finite number of functions.
   2.5. Solve related problems.

3. Differentiation of Algebraic Functions
   3.1. Use rules of differentiation to solve problems of algebraic functions.
   3.2. Differentiate xn and (ax+b)n.
   3.3. Derive product, quotient and chain rules.
   3.4. Find derivatives of implicit functions and explicit functions
   3.5. Differentiate parametric forms, functions with respect to another function and by rationalization.
   3.6. Solve problems using these formulas.

4. Differentiation of Trigonometric Functions
   4.1. Use rules of differentiation to solve problems involving trigonometric functions.
   4.2. Differentiate from first principle sin x, Cos x, tan x.
   4.3. Derive formulas for derivation of Sec x, Cosec x, Cot x.
   4.4. Find differential coefficients of inverse trigonometric functions.

5. Differentiation of Logarithmic and Exponential Functions
   5.1. Use rules of differentiation to logarithmic and exponential functions.
   5.2. Derive formulas for differential coefficient of logarithmic and exponential functions.
   5.3. Solve problems using these formulas.

6. Rate of Change of Variable
   6.1. Understand rate of change of one variable with respect to another.
   6.2. Write expression for velocity, acceleration and slope of a line.
   6.3. Define maxima and minima values, point of inflection.
   6.4. Explain criteria for maxima and minima values of a function.
   6.5. Solve problems involving rate of change of variables.

7. Integration
   7.1. Apply concept of integration in solving technological problems
   7.2. Explain the concept of integration.
   7.3. Write basic theorems of integration.
   7.4. List some important rules of integration.
   7.5. Derive fundamental formulas of integration.
   7.6. Solve problems based on these formulas/rules.

8. Methods of Integration
   8.1. Understand different methods of integration.
   8.2. List standard formulas.
   8.3. Integrate a function by substitution method.
   8.4. Find integrals by the method of integration by parts.
   8.5. Solve problems using these methods.

9. Definite Integral
   9.1. Understand the methods of solving definite integrals.
   9.2. Define definite integral.
   9.3. List properties of definite integrals using definite integrals.
9.4. Find areas under the curves.
9.5. Solve problems of definite integrals.

10. **Plane Analytic Geometry and Straight Line**
    10.1. Understand the concept of plane analytic geometry.
    10.2. Explain the rectangular coordinate system.
    10.3. Locate points in different quadrants.
    10.4. Derive distance formula, prove section formulas and Derive Slope formula.
    10.5. Solve problem using the above formulas.

11. **Equations of Straight Line**
    11.1. Use equations of straight line in solving problems
    11.2. Define a straight line.
    11.3. State general form of equation of a straight line.
    11.4. Derive slope intercept and intercept forms of equations of a straight line.
    11.5. Derive expression for angle between two straight lines.
    11.6. Derive conditions of perpendicularity and parallelism of two straight lines.
    11.7. Solve problems involving these equations/formulas.

12. **The Equations of Circle**
    12.1. Solve technological problems using equation of circle.
    12.2. Define a circle.
    12.3. Describe standard, central and general forms of the equation of a circle.
    12.4. Convert general form to the central form of equation of a circle.
    12.5. Deduce formulas for the radius and the coordinates of the center of a circle from the general form.
    12.6. Derive equation of the circle passing through three given points.
    12.7. Solve problems involving these equations.
1. **UNDERSTAND THE ATTRIBUTES OF EMPLOYEES THAT ARE VALUED BY EMPLOYERS**

1.1. *Specific job-related:*
   - 1.1.1. Technical knowledge;
   - 1.1.2. Working procedures and systems including health and safety

1.2. *General:*
   - 1.2.1. Planning and organizational skills;
   - 1.2.2. Time management;
   - 1.2.3. Team working;
   - 1.2.4. Verbal and written communication skills;
   - 1.2.5. Numeric skills;
   - 1.2.6. Other eg creativity

1.3. *Attitudes:*
   - 1.3.1. Determined;
   - 1.3.2. Independent;
   - 1.3.3. Working with integrity;
   - 1.3.4. Tolerant;
   - 1.3.5. Dependable;
   - 1.3.6. Problem-solving;
   - 1.3.7. Other eg leadership, confidence, self-motivation

1.4. *Organizational aims and objectives:*
   - 1.4.1. General as relevant to all employees;
   - 1.4.2. Specific as relevant to the role of individuals;
   - 1.4.3. Responsibilities of the individual in promoting organisational brand or image

2. **UNDERSTAND THE PRINCIPLES OF EFFECTIVE COMMUNICATION**

2.1. *General communication skills:*
   - 2.1.1. Cultural differences;
   - 2.1.2. Adapting content and style to audience eg modulating voice, terminology, format;
   - 2.1.3. Providing accurate information;
   - 2.1.4. Differentiating between facts and opinions;
   - 2.1.5. Techniques for engaging audience interest eg changing intonation,
   - 2.1.6. Use of technology such multimedia or use of animation in presentations;
   - 2.1.7. Question and answer sessions

2.2. *Interpersonal skills:*
   - 2.2.1. Methods for communicating interpersonally eg verbal
   - 2.2.2. Exchanges, signing, lip reading;
   - 2.2.3. Techniques and cues eg body language, use of
   - 2.2.4. Intonation, use of ‘smileys’, capitalisation of text in emails;
   - 2.2.5. Positive and negative language;
   - 2.2.6. Paying attention and active engagement eg nodding, summarizing or paraphrasing;
   - 2.2.7. Understanding barriers eg background noise, distractions, lack of concentration;
   - 2.2.8. Types of question eg open, closed, probing;
   - 2.2.9. Appropriate speeds of response
2.3. *Communicate in writing:*
  2.3.1. Following organisational guidelines and procedures;
  2.3.2. Identifying and conveying key messages in writing eg letter, fax, email;
  2.3.3. Using correct grammar and spelling;
  2.3.4. Structuring writing into a logical framework;
  2.3.5. Identifying relevant information in written communications;
  2.3.6. Reviewing and proof reading own written work;
  2.3.7. Conveying alternative viewpoints;
  2.3.8. Reviewing and editing documents created by others;
  2.3.9. Note taking

3. **BE ABLE TO EXPLOIT ICT TO COMMUNICATE EFFECTIVELY**

3.1. *Communications channels:*
  3.1.1. Word-processed documents;
  3.1.2. Presentations;
  3.1.3. Web pages;
  3.1.4. Email;
  3.1.5. Specialist channels eg blogs, vlogs, podcasts, video conferencing;
  3.1.6. Benefits and disadvantages

3.2. *Software:*
  3.2.1. Word-processing;
  3.2.2. Presentation package;
  3.2.3. Other eg email software, specialist software for the visually impaired

3.3. *Software tools:*
  3.4. Proofing tools eg thesaurus, spell checkers;
  3.5. As available within software packages eg conversion of tabular information to graphics, text readers

4. **BE ABLE TO IDENTIFY PERSONAL DEVELOPMENT NEEDS AND THE WAYS OF ADDRESSING THEM**

4.1. *Identification of need:*
  4.1.1. Self-assessment;
  4.1.2. Formal reports eg following appraisal meetings;
  4.1.3. Other e.g. customer feedback, performance data

4.2. *Records:*
  4.2.1. Personal development plans including target setting;
  4.2.2. Other e.g. appraisal records

4.3. *Methods of addressing needs:*
  4.3.1. Job shadowing, formal courses or training (external, internal);
  4.3.2. Other eg team meetings, attending events

4.4. *Learning styles:*
  4.4.1. Examples of systems eg (active/reflective, sensing/intuitive, visual/verbal, sequential/global);
  4.4.2. Identification of preferred style;
  4.4.3. How to benefit
  4.4.4. From knowing your learning style;
  4.4.5. Understanding how other people’s learning
  4.4.6. Styles impact on team working
5. Skills

5.1. Listening Skills:
   5.1.1. Principles of Active Listening;
   5.1.2. Skills of Active Listening;
   5.1.3. Barriers to Listening;
   5.1.4. Reasons of Poor Listening. Giving Feedback.

5.2. Interviewing Skills:
   5.2.1. Significance of Interviews;
   5.2.2. Characteristics of Interviews;
   5.2.3. Activities in an Interviewing;
   5.2.4. Situation;
   5.2.5. Types of Interviews;
   5.2.6. Interviewing Strategy.

5.3. Report Writing:
   5.3.1. Goals of Report Writing;
   5.3.2. Report Format;
   5.3.3. Types of Reports;
   5.3.4. Report Writing Strategy.

5.4. Group Communication:
   5.4.1. Purposes of Conducting Meetings;
   5.4.2. Planning a Meeting;
   5.4.3. Types of Meetings;
   5.4.4. Selection of a Group for Meeting;
   5.4.5. Group Leadership Skills;
   5.4.6. Running a Successful Meeting;
   5.4.7. Active Participation Technique

List of Practical

1. Word Processing Software 6
2. Working on Presentation based software 6
3. Working on e-mail 3
4. Communication on website 3
5. On line applications, eg testing, interviewing, applying. 3
6. Working on specialist channels eg blogs, vlogs, podcasts, video conferencing; 6
7. Making personal development plans 3
8. Studying how people can learn from internet 3
9. Using software for report writing 6

Learning outcomes
1 Understand the attributes of employees that are valued by employers
2 Understand the principles of effective communication
3 Be able to exploit ICT to communicate effectively
4 Be able to identify personal development needs and the ways of addressing them.

Indicative reading for learners

Textbooks
ISBN 0131600125

CD Teaching-you Communication Skills (Focus Multimedia Ltd, 2005) ASIN B000A6BBH0
ICT 212  objeCt orienteD progrAmming tpC-132

1. UNDERSTAND THE CHARACTERISTICS OF OBJECT ORIENTATION

1.1. Characteristics of objects & objects:
   1.1.1. Identification of objects;
   1.1.2. Classification;
   1.1.3. Inheritance;
   1.1.4. Polymorphism;
   1.1.5. Encapsulation;
   1.1.6. Public classes;
   1.1.7. Private classes;
   1.1.8. Public methods;
   1.1.9. Private methods.
   1.1.10. Objects in VB:
   1.1.11. ActiveX;
   1.1.12. OLE Processing;
   1.1.13. Modules and Class Modules;
   1.1.14. Object Members;
   1.1.15. Class Module Properties

1.2. Introduction to Visual Basic
   1.2.1. Visual programming;
   1.2.2. Visual Basic Integrated Development Environment;

1.3. Variables:
   1.3.1. Public instance variables;
   1.3.2. Private instance variables;
   1.3.3. Static references

1.4. Visual Basic Statement Types;
   1.4.1. Variables;
   1.4.2. Expressions and Operators;
   1.4.3. Conditional Statement;
   1.4.4. Logical Operators Iteration

1.5. Visual Basic Programming
   1.5.1. Event-driven Programs;
   1.5.2. Controls and Properties;
   1.5.3. Labels, Buttons and Textboxes

1.6. Modular Programming Subroutines and Functions;
   1.6.1. Invocation;
   1.6.2. Passing of Parameter;
   1.6.3. Visual Basic Built-in Function

1.7. Debugging Visual Basic Debugger;
   1.7.1. Breakpoints;
   1.7.2. Stepping Through Program

1.8. GUI Interface Menus;
   1.8.1. Tool Bars
   1.8.2. Dialog Boxes;

1.9. Graphics Controls Image Control;
   1.9.1. Line and Shape Control;

1.10. Database Programming Files;
   1.10.1. Tables;
   1.10.2. Data Control;
   1.10.3. Data Form

1.11. Application Distribution Compilation;
   1.11.1. Project Properties;
   1.11.2. Application Setup

1.12. Software engineering:
1.12.1. Overview;
1.12.2. Features eg modularity, encapsulation, reuse, method overloading, instance variables, classes, abstract classes, interfaces

2. BE ABLE TO USE SIMPLE OBJECT ORIENTED DESIGN METHODS

2.1. Simple object oriented design method:
   2.1.1. Class responsibilities collaboration cards;
   2.1.2. Class diagram;
   2.1.3. Dependencies and inheritances

3. BE ABLE TO USE OBJECT ORIENTED CONCEPTS TO CREATE & TEST “OBJECT ORIENTED PROGRAM”

3.1. Classes:
   3.1.1. Identification attributes, methods, the control of scope of attributes and methods, inheritance, aggregation, association, polymorphism

3.2. Objects:
   3.2.1. Constructors, destructors;
   3.2.2. Building a program with reusable objects

3.3. Pre-defined:
   3.3.1. Class library, downloaded, imported

3.4. Test:
   3.4.1. Valid declarations;
   3.4.2. Debugging code;
   3.4.3. Comment code;
   3.4.4. Naming conventions;
   3.4.5. Checking functionality against requirements

List of Practical

2. Control and Properties 5
3. Creation of Label, Button and Textboxes 3
4. Program Using Conditional Statement 3
5. Program Using Looping 3
6. Program Making Menus, Toolbars and Dialog Box 6
7. Program Making Graphics Objects 6
8. Individual Major Project: Moderately-sized program in Visual Basic 6

Learning outcomes on completion of this unit a learner should:

1 Understand the characteristics of object orientation
2 Be able to use simple object oriented design methods
3 Be able to use object oriented concepts to create and test an object oriented program.
Books and References

Schildt H — C++: A Beginner’s Guide, 2nd Edit

Abstract and Essential guidance for teachers
Object oriented programming is an industry-proven method for developing reliable modular programs and is popular in software engineering. Consistent use of object oriented techniques can lead to shorter development life cycles, increased productivity and therefore lower the cost of producing and maintaining systems. Programming with objects simplifies the task of creating and maintaining complex applications. Object oriented programming is a way of modelling software that maps programming code to the real world. This unit starts by looking at the characteristics of object oriented programming and takes learners through design and program development. Object orientation is now the cornerstone of many languages; it is dominant in Visual Basic, C++, Java, the Microsoft .Net environment, Action Script and many other systems.

Learning outcomes

On completion of this unit a learner should:
1 Understand the characteristics of object orientation
2 Be able to use simple object oriented design methods
3 Be able to use object oriented concepts to create and test an object oriented program. ion (McGraw-Hill Education, 2003)

Delivery
It is likely that, for most learners, this will not be their first contact with formal programming but it will be their first contact with object oriented programming. It is very important that they use a methodical approach to creating object oriented programs. This will be particularly valuable should learners progress to higher-level courses that involve programming. A number of small programs should be used to demonstrate object oriented concepts. In order to achieve the merit and distinction criteria, larger programmes that combine a number of the concepts stated in the unit will be required.
Any appropriate language can be chosen as the basis of the practical aspects of this unit. An object oriented program should include a simple object oriented design, fully documented class, code, and interfaces (screens, forms, printouts, etc). It is recommended that learners begin to program early on in the delivery. To be most valuable, these programming activities should steadily increase in complexity and give lots of opportunity for formative feedback. For more information contact, getr.ak@gmail.com, gpi_ak@yahoo.com.

Once provided with the focus of an assessed task, learners should be encouraged to break down the task and submit material in stages for assessment. These stages might naturally be design, documented class, production of program, testing/debugging and documentation.
Unit content with objectives

1. UNDERSTAND HOW DATA CAN BE REPRESENTED WITHIN COMPUTER SYSTEMS 12
   1.1. Numeric data:
       1.1.1. Conversions between different representations of data;
       1.1.2. Representing integer numbers in different number bases;
       1.1.3. Converting between number bases using integer numbers eg denary to binary,
       1.1.4. Denary to hexadecimal, binary to hexadecimal;
       1.1.5. Performing arithmetic operations in different number bases;
       1.1.6. Representing fixed-point numbers in different number bases;
       1.1.7. Representing floating-point numbers in binary
   1.2. Boolean logic:
       1.2.1. Logic gates;
       1.2.2. Truth tables;
       1.2.3. Use of logic gates in integrated circuits;
       1.2.4. Logical operations eg AND, OR, NOT, NAND, NOR, XOR
   1.3 Fundamentals:
       1.3.1 Digital logic;
       1.3.2 Tri-state logic;
       1.3.3 Boolean algebra
   1.4. Coding of data:
       1.4.1. Sign and magnitude;
       1.4.2. Two’s complement;
       1.4.3. Floating point;
       1.4.4. Binary coded decimal;
       1.4.5. Coding of character data eg ASCII (American Standard Code for Information Interchange)
       1.4.6. Sound (compression, sampling resolution, sampling rate, streaming audio quality);
       1.4.7 Video (compression, encoding, streaming, quality);
       1.4.8. Digital data; analogue signals; digital signals; data conversion eg analogue to digital;

2. UNDERSTAND THE FUNCTIONS OF COMPUTER SYSTEM COMPONENTS 14
   2.1. Key components:
       2.1.1. Central Processing Unit (CPU);
       2.1.2. Memory;
       2.1.3. Interfaces;
       2.1.4. Clock;
       2.1.5. Buses, diagrammatic representation;
       2.1.6. Von Neuman architectures
   2.2. Central Processing Unit:
       2.2.1. Control unit;
       2.2.2. ALU (Arithmetic Logic Unit);
       2.2.3. General purpose registers;
       2.2.4. Special purpose registers eg instruction pointer, accumulator;
       2.2.5. Core eg single, multiple;
       2.2.6. Features e.g. pipelining, multiprocessing, parallel processing;
       2.2.7. Polling;
       2.2.8. Interrupts
   2.3. Memory:
       2.3.1. I/O maps;
       2.3.2. Direct Memory Access (DMA);
       2.3.3. ROM (Read Only Memory);
       2.3.4. Cache;
       2.3.5. RAM (Random Access Memory) eg static, dynamic, flash
2.4. **Buses:**
   2.4.1. System bus;
   2.4.2. Address bus;
   2.4.3. Control bus;
   2.4.4. Physical connections to components eg Central Processing Unit,
   2.4.5. Memory, input/output (I/O) devices, system buses;

2.5. **Peripherals:**
   2.5.1. types eg hard disc, printer, scanner, network card

3. **UNDERSTAND THE PRINCIPLES OF PROCESSOR OPERATIONS**

3.1. **CPU**

- instruction sets:
  3.1.1. Reduced Instruction Set Computer (RISC);
  3.1.2. Complex Instruction Set Computer (CISC);
  3.1.3. Clock rate;
  3.1.4. Performance levels

- Addressing:
  3.2.1. Modes eg immediate;
  3.2.2. Relative;
  3.2.3. Address bus;
  3.2.4. Addressing in the fetch-execute cycle

3.3. **Machine**

- operations:
  3.3.1. How they are organised and represented;
  3.3.2. Role of the instruction decoder;
  3.3.3. Low-level programs;
  3.3.4. Assembly code instructions eg fetch, load, add;
  3.3.5. Decision making and branching;
  3.3.6. Using registers, transferring data between registers, fetch-execute cycle;
  3.3.7. Program storage;
  3.3.8. Data storage;

4. **ADDRESSING UNDERSTAND THE OPERATION AND USE OF LOGIC GATES**

4.2. **Representation of gates and logical circuits:**
   4.2.1. Truth tables;
   4.2.2. Venn diagrams;

4.3. **Logic circuits:**
   4.3.1. Half adder;
   4.3.2. Full adder;
   4.3.3. Flip-flops;
   4.3.4. Practical applications eg simple memory circuit, multiplexer

5. **BE ABLE TO CREATE LOW-LEVEL PROGRAMS**

5.1. **Fundamental Concepts:**
   5.1.1. Address, Data and Control Buses;
   5.1.2. Fundamental Control Bus;
   5.1.3. Tristate Devices in Bus-based Systems Definition of Terms;
   5.1.4. Microcomputer Block Diagram.;
   5.1.5. Memory Devices;
   5.1.6. I/O ports;
   5.1.7. Basic Operation of Computer Roles of Addressing and Control Signals;
5.2. **Low-level programs/Use of instruction set:**
   - 5.2.1. Assembly code;
   - 5.2.2. Machine code;
   - 5.2.3. Using registers;
   - 5.2.4. Transferring data between registers;
   - 5.2.5. Load instructions;
   - 5.2.6. Testing functionality;
   - 5.2.7. Fetch-execute cycle program storage;
   - 5.2.8. Data storage;
   - 5.2.9. Addressing;
   - 5.2.10. Interrupts;
   - 5.2.11. Exceptions;
   - 5.2.12. Documentation;

5.3. **Addressing modes:**
   - 5.3.1. Immediate addressing;
   - 5.3.2. Relative addressing
   - 5.3.3. Direct addressing
   - 5.3.4. Register indirect addressing
   - 5.3.5. Based Relative addressing
   - 5.3.6. Index Relative addressing
   - 5.3.7. Based Index Relative addressing

5.4. **Uses of low-level programs:**
   - 5.4.1. Advantages eg reduced storage need;
   - 5.4.2. Increased speed of execution;
   - 5.4.3. Disadvantages eg difficult to code and maintain;
   - 5.4.4. eg arithmetic calculations;
   - 5.4.5. Simple graphical displays directly accessing memory locations

5.5. **Introduction to Intel 8088/86:**
   - 5.5.1. Definition of Terms;
   - 5.5.2. Instruction Decoder;
   - 5.5.3. Accumulator, ALU, Condition Flags, Addressing Registers and Program counter;
   - 5.5.4. Block Diagram of Intel 8088/86 Microprocessor;
   - 5.5.5. Functional Pin Definitions for the 8088/86 Power and Clocking Requirements of 8088/86;
   - 5.5.6. 8088/86 Data Bus Multiplexing and De-Multiplexing. Production of Conventional Control Signals from the 8088/86 Control Signals

5.6. **Programming the Intel 8088/86 Programming Model:**
   - 5.6.1. Instruction Groups in the 8088/86 Instruction Set;
   - 5.6.2. Data Transfer Group Arithmetic Group and Logical Group;
   - 5.6.3. Branch Group;
   - 5.6.4. Stack and Machine Control;
   - 5.6.5. Addressing Modes of the 8088/86;
   - 5.6.6. Main features of SDK-88/86 Keyboard Monitor;
   - 5.6.7. Subroutines;
   - 5.6.8. Basic Operation of 8088/86 Stack and Stack Pointer;

5.7. **Intel 8088/86 System Timing and Bus Multiplexing**
   - 5.7.1. Definition of terms;
   - 5.7.2. 8088/86 Machine Cycles;
   - 5.7.3. Memory Read and Memory Write;
   - 5.7.4. I/O Read and I/O Write Interrupt Acknowledge and Bus Idle;
   - 5.7.5. Production of Required Instruction Cycle;
   - 5.7.6. Timing Diagram for Common 8088/86 Instructions;
   - 5.7.7. Purpose and implementation of the 8088/86 Wait, Halt and Hold states.;
   - 5.7.8. Interpretation of 8088/86 State Transition Diagram;
5.8. Interfacing to Intel 8088/86:
5.8.1. Isolated I/O and Memory Mapped I/O;
5.8.2. Absolute Address and Linear Address Decoding;
5.8.3. Unconditional and Polled I/O;
5.8.4. Interrupt Driven I/O;
5.8.5. Interrupt Service Routine;
5.8.6. Interrupt Vector;
5.8.7. Direct Memory Access;
5.8.8. Device Request Flag and Service Request Flag;
5.8.9. Strobed Ports;
5.8.10. Design of Simple Input and/or Output Ports;
5.8.11. 8088/86 Vectored Interrupt System;
5.8.12. Use of Priority Interrupt Control Unit in 8088/86-based Systems;
5.8.13. Fundamentals of DMA-driven I/O in 8088/86-based System

LIST OF PRACTICALS
1. Introduction of SDK-88/86 Bus System. 3
   Introduction to SDK-88/86 Power Supply and Timing.
   Introduction to SDK-88/86 Functional Elements.
2. Introduction to Flowcharting 3
   Algorithm Design Using Flowcharts
   Applications of ASCII Code.
3. The SDK-88/86 Keyboard Monitor Program. 3
   Entry and Disassembly of Simple Programs.
   Use of Delay Programs.
4. Use of Subroutine Concepts. 3
   Programming of Arithmetic Instructions.
   Program Subroutines II.
5. Programming of Logic statements. 3
   Program Subroutines III.
   Program BCD to Binary Conversion.
6. Programming of Multiplication and Division – optional Exercise. 3
   Program Indirect Addressing.
   Program Indirect Addressing II – Optional Exercise.
7. Familiarize with the 8088/86 System Timing. 3
   Introduce 8088/86 System Wait State Insertion.
   Familiarize with the SDK-88/86 Memory Systems.
8. Introduce SDK-88/86 I/O System. 3
   Interface Isolated Output Ports.
   Interfacing of Memory Mapped Output Ports.
9. Interface Isolated Input Ports. 3
   Interfacing of Memory Mapped Input Ports.
   Interface Polled I/O (Programmable I/O)
10. Interfacing of 8088/86 Interrupt Driven I/O. 3
    Interfacing of 8088/86 Interrupt Driven I/O II.
    Use 8255A Programmable Peripheral Interface.
11. Use 8155 Static RAM with I/O Ports and Timer. 3
References
The 80x 86 Families
Design, Programming and Interfacing, John Uffenbach
MCS-88/86 Users Manual, Intel Corporation
Microprocessor Architecture, Programming & Applications with the 8088/86/8080A, Ramesh, S. Gaonkar, MacMillan

Indicative reading for learners Textbooks
1904467520
Blum R — Professional Assembly Language Programming (John Wiley & Sons, 2005)
ISBN-13 978-1904995098 (Curriculum developer communication # 00923442183831)
Website: freecomputerbooks.com/compscArchitectureBooks.html

Abstract and Essential guidance for teachers
There are a large number of different types, brands and configurations of computer systems and, although the system components may differ, all systems share the same underlying computer architecture principles. This unit examines these principles and explores the fundamentals of how computer systems work. The focus is on the technical detail including how the components function at an electronic level. Learners will examine the use of simple logic gates to create logic circuits and examine how these simple circuits can then be used to carry out basic functions such as addition. Learners will also explore how various types of data can be represented and then stored within computer systems. This is followed by a study of the low-level components and an analysis of how these components interact to manipulate the data using the fetch-execute cycle. Low-level program instructions make up the fetch-execute cycle and both machine and assembly code languages are investigated along with their interaction with the various registers that make up the central processing unit. Learners will have the opportunity to develop simple programs in a low-level language.

Learning outcomes on completion of this unit a learner should:
1 Understand how data can be represented within a computer system
2 Understand the low-level components of computer systems
3 Understand the operation and use of logic gates
4 Be able to create low-level programs
Delivery

It is recommended that this unit be delivered either after or in conjunction with Computer Systems. Simulation software could be used extensively in this unit for example to develop their understanding of logic gates and their operation however practical experiments should be used as much as possible with specialist equipment. Other software that simulates the internal operation of the processor would also be very valuable to confirm understanding. Also, for learning outcome 4, low-level programming, learners could make use of suitable simulation software with a reduced instruction set as opposed to programming in pure assembly code. For more details contact gctr.ak@gmail.com, gpi_ak@yahoo.com

Essential resources

Learners will need access to hardware that enables them to practise setting up and using combinational logic circuits. There are many suppliers of this kind of hardware in the market. For low-level programming, there are various microprocessor training kits on the market that include assembler programming language based on Intel’s 8080 microprocessor. These can be useful for helping learners to program in low-level languages and to understand the fetch-execute cycle. The hardware usually has an instruction set that is upwards compatible with all Intel CPUs. Simple assembler programs can be written that can drive output devices such as buzzers. This kind of hardware brings programming to life and can show what is happening in the various registers as program instructions and data are processed. Alternatively, a software application that simulates a simple CPU and an associated assembly language could be used. This type of software usually covers the basic elements of assembly language programming. Learners are able to put the theory into practice using the simulator to run programs in a controlled way, seeing all CPU activity step by step.
1. **Know the main elements of data communications systems**
   
   1.0 **Introduction to signal and systems**
      
      1.0.1 Signal in time domain
      1.0.1 Signal in frequency domain
      1.0.1 System in time domain
      1.0.1 System in frequency domain
      1.0.1 Bandwidth of Signal and system

   1.1. **Communication devices**:
      
      1.1.1. Wireless devices eg third generation (3G) cellular phone,
      1.1.2. Wireless personal data assistant (PDA), wireless laptop;

   1.2. **Signal theory**:
      
      1.2.1. Digital signalling methods;
      1.2.2. Representing data electronically (bits, bytes, packet structures);
      1.2.3. High frequency (HF) radio, microwave, satellite;
      1.2.4. Other issues eg bandwidth, data compression;

   1.3. **Data elements**:
      
      1.3.1. Sequence numbers

   1.4. **Methods of electronic communication**:
      
      1.4.1. Parallel eg universal serial bus (USB);
      1.4.2. Serial eg RS-232;
      1.4.3. Other e.g. infra red, Bluetooth®, WiFi;

   1.5. **Transmission media**:
      
      1.5.1. Radio, microwave, satellite;
      1.5.2. Features and benefits;
      1.5.3. Transmission lines

2. **UNDERSTAND THE COMMUNICATION PRINCIPLES OF COMPUTER NETWORKS**
   
   2.1. **Features of networks**:
      
      2.1.1. Wireless;
      2.1.2. Multiplexed, ATM, WAP, broadband;
      2.1.3. Network software eg network operating system;
      2.1.4. Network connection software;

   2.2. **Network components**:
      
      2.2.1. Servers;
      2.2.2. Workstation;
      2.2.3. Network cards eg Ethernet, wireless, token ring;

   2.3. **Interconnection devices**:
      
      2.3.1. Wireless devices

3. **UNDERSTAND TRANSMISSION PROTOCOLS AND MODELS**
   
   3.1. **Model**:
      
      3.1.1. Example eg open system interconnection (OSI) model:
      3.1.2. Levels and relationship with connection devices

   3.2. **Protocols**:
      
      3.2.1. Bluetooth®, Wifi, IrDa, cellular radio;
      3.2.2. Examples GSM/UMTS, WAP, WML;
      3.2.3. 802.11x standards;
      3.2.4. Wireless security protocols eg WEP
3.3. **TCP/IP model:**
3.4. Levels and relationship with connection devices

**4. UNDERSTAND INTERNET COMMUNICATIONS**

4.1. **Internet communication/WAN protocols:**
   - 4.1.1. Terminology eg HTTP, HTTPS, FTP, SMTP;
   - 4.1.2. Uniform resource locator;
   - 4.1.3. Worldwide web;
   - 4.1.4. Blogs, wikis, video conferencing, vlogs;

4.2. **System requirements:**
   - 4.2.1. Hardware and software system requirements eg for wired or mobile systems;
   - 4.2.2. Communication services eg email, video, internet;
   - 4.2.3. Software;
   - 4.2.4. Configuration;

4.3. **Direct Communication:**
   - 4.3.1. Chat, video communication, email, web phone

**LIST OF PRACTICALS**

1. Identifying various hardware components of a network, Studying network card 3
2. Splicing a coaxial cable 3
3. Terminating twisted pair cable, Terminating coaxial cable 3
4. Installing structured cabling system 3
5. Installing simple network 3
6. Installing concentrators or hubs 3
8. Use of Network Tools and Analyzers, Digital Multimeters (DMM), Testing devices 3
9. Time-Domain Reflectometers (TDRs) 3
10. Advanced Cable Testers. 3
11. Using Network Monitors, Troubleshooting Network Connectivity 3

**Textbooks**


ISBN-13 978-0321123817


**Websites**

gctr.ak@gmail.com, gpi_ak@yahoo.com
www.howstuffworks.com How Stuff Works www.webopedia.com Webopedia
Abstract and Essential guidance for teachers

New and developing communication technologies are used within the business world to maximise productivity and access information, whether an employee is working in the office or travelling the globe. This unit focuses on communication technologies, examining their use within social and business communities. Learners will explore the devices and communication technologies they use on a daily basis and gain an understanding of systems including mobile internet. Communications technology includes a large range of devices which are used in the business and social communities. Devices include many of the next generation wireless devices, games consoles and newer generations of mobile phones with voice and video streaming. This unit explores these devices along with their transmission methods and the underlying protocols that enable connectivity and transmission of data.

Learning outcomes on completion of this unit a learner should:

1. Know the main elements of data communications system
2. Understand the communication principles of computer networks
3. Understand transmission protocols and models
4. Understand internet communications.

Delivery

This unit could be delivered as part of a system support and networking focus including other units with networking content. The emphasis in this unit is on practical activity to give learners the ability to understand how modern ICT can be used to enhance the commercial and personal environment. The delivery of this unit’s theoretical side should be focused on the most up-to-date technology available, including all the latest developments of mobile communications such as third generation technology. However, if teachers needed more guidance regarding this curriculum which is developed by Engr. Wajih-ul-Husnain HOD –IT GCT Rawalakot-AK with the guidance of COSC and BC, feel free to contact him. With the unit being practically based, learners should be given opportunities to use the main technologies listed in the unit content, such as 3G hardware and mobile computing technology like a wireless PDA.
ICT-243 organizational system security  tpC-233

Unit content with objectives
1. KNOW POTENTIAL THREATS TO ICT SYSTEMS AND ORGANISATIONS
   1.1. Unauthorized access:
       1.1.1. Internal and external;
       1.1.2. Access causing damage to data or jamming resources eg viruses;
       1.1.3. Accessing systems or data without damage;
       1.1.4. Specific;
       1.1.5. Examples eg phishing, identity theft, piggybacking, hacking;
   1.2. Damage to or destruction of systems or information:
       1.2.1. Natural disasters;
       1.2.2. Malicious damage (internal and external causes);
       1.2.3. Technical failures;
       1.2.4. Human errors;
       1.2.5. Theft;
   1.3. Information security:
       1.3.1. Confidentiality;
       1.3.2. Integrity and completeness of data;
       1.3.3. Availability of data as needed;
   1.4. Threats related to e-commerce:
       1.4.1. Website defacement;
       1.4.2. Control of access to data via third party suppliers;
       1.4.3. Other e.g. denial of service attacks;
   1.5. Counterfeit goods:
       1.5.1. Products at risk eg software, DVDs, games, music;
       1.5.2. Distribution mechanisms eg boot sales, peer-to-peer networks;
   1.6. Organisational impact:
       1.6.1. Loss of service;
       1.6.2. Loss of business or income eg through loss of customer records;
       1.6.3. Increased costs;
       1.6.4. Poor image
2. UNDERSTAND HOW TO KEEP SYSTEMS AND DATA SECURE
   2.1. Physical security:
       2.1.1. Locks;
       2.1.2. Visitors passes;
       2.1.3. Sign in/out systems;
       2.1.4. Others eg guards, cable shielding;
   2.2. Biometrics:
       2.2.1. Retinal scans;
       2.2.2. Fingerprint;
       2.2.3. Other eg voice recognition;
   3. Software and network security:
       3.1.1. Encryption techniques eg public and private key;
       3.1.2. Call back;
       3.1.3. Handshaking;
       3.1.4. Diskless networks;
       3.1.5. Use of backups;
       3.1.6. Audit logs;
       3.1.7. Firewall configuration;
       3.1.8. Virus checking software;
       3.1.9. Use of virtual private networks (VPN);
       3.1.10. Intruder detection systems;
       3.1.11. Passwords;
       3.1.12. Levels of access to data;
       3.1.13. Software updating;
       3.1.14. Disaster recovery eg backup systems, whole system replacement, tiers of recovery;

4. UNDERSTAND THE ORGANISATIONAL ISSUES AFFECTING THE USE OF ICT SYSTEMS
4.1. **Security policies and guidelines:**
   4.1.1. Disaster recovery policies;
   4.1.2. Updating of security procedures and scheduling of security audits;
   4.1.3. Codes of conduct eg email usage policy, internet usage policy,
   4.1.4. Software acquisition and installation policy;
   4.1.5. Surveillance and monitoring policies;
   4.1.6. Risk management;
   4.1.7. Budget setting;

4.2. **Employment contracts and security:**
   4.2.1. Hiring policies;
   4.2.2. Separation of duties;
   4.2.3. Ensuring compliance including disciplinary procedures;
   4.2.4. Training and communicating with staff as to their responsibilities;

4.3. **Code of conduct:**
   4.3.1. Email usage policy;
   4.3.2. Internet usage policy;
   4.3.3. Software acquisition and installation policy;
   4.3.4. User area usage policy;
   4.3.5. Account management policy;

4.4. **Laws:**
   4.4.2. Copyright, Designs and Patents Act 1988;

4.5. **Copyrights:**
   4.5.1. Open source;
   4.5.2. Freeware;
   4.5.3. Shareware;
   4.5.4. Commercial software;

4.6. **Ethical decision making:**
   4.6.1. Freedom of information versus personal privacy
   4.6.2. Electoral roll, phone book and street maps put together
   4.6.3. Permission e.g. to use photographs or videos, CCTV footage;

4.7. **Professional bodies:**
   4.7.1. Business Software Alliance (BSA), Federation Against Software Theft (FAST),
   4.7.2. British Computing Society (BCS), Association of Computing Machinery (ACM);

4.8. **Ethical decision making:**
   4.8.1. Freedom of information versus personal privacy (electoral roll, phone book and
   4.8.2. Street maps put together);
   4.8.3. Permission e.g. to use photographs or videos, CCTV footage

4.9. **Professional bodies:**
   4.9.1. Organizations e.g. Business Software Alliance (BSA),
   4.9.2. Federation Against Software Theft (FAST), British Computing Society (BCS),
   4.9.3. Association of Computing Machinery (ACM)
List of Practicals

1. **Studying Damage to or destruction of systems or information:**
   1.1. Natural disasters;
   1.2. Malicious damage (internal and external causes);
   1.3. Technical failures;
   1.4. Human errors;
   1.5. Theft
2. **Working Information security:**
   2.1. Confidentiality;
   2.2. Integrity and completeness of data;
   2.3. Availability of data as needed;
3. **Facing Threats related to e-commerce:**
   3.1. Website defacement;
   3.2. Control of access to data via third party suppliers;
   3.3. Other e.g. denial of service attacks;
4. **Studying Organisational security:**
   4.1. Loss of service;
   4.2. Loss of business or income eg through loss of customer records;
5. **Physical security:**
   5.1. Locks;
   5.2. Sign in/out systems;
   5.3. Others e.g. guards, cable shielding;
6. **Working with Biometrics:**
   6.1. Retinal scans;
   6.2. Fingerprint;
   6.3. Other e.g. voice recognition;
7. **Maintaining Software and network security:**
   7.1. Encryption techniques eg public and private key;
   7.2. Call back;
   7.3. Handshaking;
   7.4. Diskless networks;
   7.5. Use of backups;
   7.6. Audit logs;
   7.7. Firewall configuration;
   7.8. Virus checking software;
   7.9. Use of virtual private networks (VPN);
   7.10. Intruder detection systems;
   7.11. Passwords;
   7.12. Levels of access to data;
   7.13. Software updating;
   7.14. Disaster recovery eg backup systems, whole system replacement, tiers of recovery;
8. **Implementing Security policies:**
   8.1. Disaster recovery policies;
   8.2. Updating of security procedures and scheduling of security audits;
   8.3. Codes of conduct eg email usage policy, internet usage policy;
   8.4. Software acquisition and installation policy;
   8.5. Surveillance and monitoring policies;

Textbooks
Heathcote P — *A Level ICT* (Payne Gallway, 2004) ICT Curriculum dev celi0923442183831

Websites
[www.acm.org](http://www.acm.org) Association of Computing Machinery, [www.bcs.org](http://www.bcs.org) British Computing Society
[www.bsa.org.uk](http://www.bsa.org.uk) Business Software Alliance, [www.fast.org.uk](http://www.fast.org.uk) Federation Against Software Theft, gctr.ak@gmail.com, gpi_ak@yahoo.com
[www.ico.gov.uk](http://www.ico.gov.uk) Information Commissioners Office
ABSTRACT AND ESSENTIAL GUIDANCE FOR TEACHERS

Ensuring the security of computer systems and, crucially, the information that is held on computer systems is vital. Organisations and customers require confidence in these matters and it is critical to the successful deployment and use of ICT. Security in this unit covers physical security of computer systems as well as software-based security using, for example, passwords, access rights and encryption. Occasionally, security problems relate directly to malicious intent but in other circumstances, for example software piracy, they can occur by accident or unknowingly. The successful completion of this unit will ensure that all learners and new entrants to the IT industry understand the underlying principles as well as being able to apply these principles to ensure the security of the systems they will using. Specific technologies, risks and preventative measures are considered as well as organisational issues, constraints and policies that impact security. Usually security measures are in place to serve and protect our privacy and our rights. Security procedures can threaten these rights, for instance the right to have private email. The trade off between security and freedom raises important ethical issues and this unit also allows learners to consider ethical decisions and how they can be managed effectively in a modern organisation.

Learning outcomes on completion of this unit a learner should:

1 Know potential threats to ICT systems and organisations
2 Understand how to keep systems and data secure
3 Understand the organisational issues affecting the use of ICT systems.

Delivery

This unit is best achieved through teaching strategies which cover all the learning styles and which utilise a wide range of techniques and tools such as lectures, active research, practicals, discussions, presentations. For more detail contact gctr.ak@gmail.com, gpi_ak@yahoo.com. However, If teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husnain HOD –IT GCT Rawalakot-AK with the guidance of COSC and BC, feel free to contact him. Visiting expert speakers or visits to other organisations could also add to the relevance of the subject. The use of discussion is an excellent delivery method to adopt where learners are exploring the ethical and moral issues which affect the ICT industry. Similarly a formal presentation of findings could contribute to both the assessments for key skills in communication and assessment for this unit when learners are identifying crimes and countermeasures and describing disaster recovery methods.

Essential resources

The Information Commissioners Office produces excellent teaching and learning materials which highlight the need for control over data. These can provide a useful introduction to the need for privacy, subject’s rights, and organizations obligations under the Data Protection Act 1998. Similarly, there are superb reports produced by the Business Software Alliance which show the amounts of software piracy by area and country of the world. The British Computing Society and the Association of Computing Machinery have sections of their sites devoted to ethical conduct and codes of practice which could be used to enrich the teaching and learning experience.
ICT 253 routing protocols & Concepts  tpC-233

Unit content with objectives
1 INTRODUCTION TO ROUTING AND PACKET FORWARDING
1.0 Chapter Introduction
(Routing techniques: eg Link state routing protocols, distance vector routing protocols, hybrid routing protocols, static routes, default routes)
1.1 Inside the Router
1.2 CLI Configuration and Addressing
1.3 Building the Routing Table
1.4 Path Determination and Switching Functions
1.5 Link state routing protocols
1.6 Router Configuration Labs
1.7 Chapter Labs
1.8 Chapter Summary

2 Static Routing  5
2.0 Chapter Introduction
2.1 Routers in Networks
2.2 Router Configuration Review
2.3 Exploring Directly-Connected Networks
2.4 Static Routes with “Next Hop” Addresses
2.5 Static Routes with Exit Interfaces
2.6 Summary and Default Static Routes
2.7 Managing and Troubleshooting Static Routes
2.8 Static Route Configuration Labs
2.9 Chapter Labs
2.10 Chapter Summary

3 Introduction to Dynamic Routing Protocols  5
3.0 Chapter Introduction (WAN network infrastructure: eg more than one router interconnected, another router preconfigured for connection and communication)
3.1 Introduction and Advantages
3.2 Classifying Dynamic Routing Protocols
3.3 Metrics
3.4 Administrative Distances
3.5 Routing Protocol and Subnetting Activities
3.6 Chapter Labs
3.7 Chapter Summary

4 Distance Vector Routing Protocols  5
4.0 Chapter Introduction
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
4.6 Chapter Labs
4.7 Chapter Summary

5 RIP version 1  5
5.0 Chapter Introduction (Routing protocol: eg: RIP, RIP version 2, EIGRP, OSPF)
5.1 RIPv1: Distance Vector, Class full Routing Protocol
5.2 Basic RIPv1 Configuration
5.3 Verification and Troubleshooting
5.4 Automatic Summarization
5.5 Default Route and RIPv1
5.6 Chapter Labs
5.7 Chapter Summary

6 VLSM and CIDR 5
6.0 Chapter Introduction (Address management: eg VLSM, CIDR)
6.1 Class full and Classless Addressing
6.2 VLSM
6.3 CIDR
6.4 VLSM and Route Summarization Activity
6.5 Chapter Labs
6.6 Chapter Summary

7 RIPv2 5
7.0 Chapter Introduction
7.1 RIPv1 Limitations
7.2 Configuring RIPv2
7.3 VLSM and CIDR
7.4 Verifying and Troubleshooting RIPv2
7.5 RIPv2 Configuration Labs
7.6 Chapter Labs
7.7 Chapter Summary

8. THE ROUTING TABLE: A Closer Look 5
8.0 Chapter Introduction
     (Commands: enable mode, privilege mode, configuration mode, memory write commands, show commands, console password configuration, interface, ip addressing, routing, telnet configuration, router status and troubleshooting)
8.1 The Routing Table Structure
8.2 Routing Table Lookup Process
8.3 Routing Behavior
8.4 Routing Table Labs
8.5 Chapter Labs
8.6 Chapter Summary

9 EIGRP 5
9.0 Chapter Introduction
9.1 Introduction to EIGRP
9.2 Basic EIGRP Configuration
9.3 EIGRP Metric Calculation
9.4 DUA
9.5 More EIGRP Configuration
9.6 EIGRP Configuration Labs
9.7 Chapter Labs
9.8 Chapter Summary

10 LINK-STATE ROUTING PROTOCOLS 5
10.0 Chapter Introduction
10.1 Link-State Routing Protocols
10.2 Implementing Link-State Routing Protocols
11 OSPF
11.0 Chapter Introduction
11.1 Introduction to OSPF
11.2 Basic OSPF Configuration
11.3 The OSPF Metric
11.4 OSPF and Multi-access Networks
11.5 More OSPF Configuration
11.6 OSPF Configuration Labs
11.7 Chapter Labs
11.8 Chapter Summary
11.9 Chapter Quiz

12 NETWORK:
12.1 e.g. small business system,
12.2 Academic system,
12.3 Public system,
12.4 Case study scenario,
12.5 Switched infrastructure,
12.6 Routed infrastructure
12.7 Test: e.g. top down, bottom up, systematic

List of Practicals
Chapter 1 Introduction to Routing and Packet Forwarding
Exercise 1-1: Basic Router Configuration
Lab 1-1: Cabling a Network and Basic Router Configuration
Lab 1-2: Basic Router Configuration
Lab 1-3: Challenge Router Configuration
Packet Tracer Skills Integration Challenge

Chapter 2 Static Routing
Lab 2-1: Basic Static Route Configuration
Packet Tracer Companion: Basic Static Route Configuration
Lab 2-2: Challenge Static Route Configuration
Lab 2-3: Troubleshooting Static Routes
Packet Tracer Companion: Troubleshooting Static Routes
Packet Tracer Skills Integration Challenge

Chapter 3 Introduction to Dynamic Routing Protocols
Lab 3-1: Subnetting Scenario
Packet Tracer Skills Integration Challenge

Chapter 4 Distance Vector Routing Protocols
Lab 4-1: Routing Table Interpretation
Packet Tracer Skills Integration Challenge

Chapter 5 RIP Version
Lab 5-1: Basic RIP Configuration
Lab 5-2: Challenge RIP Configuration
Lab 5-3: RIP Troubleshooting
Packet Tracer Skills Integration Challenge Introduction
Chapter 6 VLSM and CIDR
Activity 6-1: Basic VLSM Calculation and Addressing Design
Activity 6-2: Challenge VLSM Calculation and Addressing. Troubleshooting a VLSM Addressing Design
Activity 6-3: Basic Route Summarization; Challenge Route Summarization
Packet Tracer Companion: Challenge Route Summarization
Troubleshooting Route Summarization
Packet Tracer Companion: Troubleshooting Route Summarization
Packet Tracer Skills Integration Challenge: VLSM and CIDR

Chapter 7 RIPv2
Lab 7-1: RIPv2 Basic Configuration
Packet Tracer Companion: RIPv2 Basic Configuration
Lab 7-2: RIPv2 Challenge Configuration
Packet Tracer Companion: RIPv2 Challenge Configuration
Lab 7-3: RIPv2 Troubleshooting
Packet Tracer Companion: Troubleshooting RIPv2 Configuration
Packet Tracer Skills Integration Challenge: Configuring and Troubleshooting RIPv2

Chapter 8 The Routing Table: A Closer Look
Lab 8-1: Investigating the Routing Table Lookup Process
Scenario A: Level 1 and Level 2 Routes
Packet Tracer Companion: Investigating the Routing Table Lookup Process
Scenario B: Classful and Classless Routing Behavior
Lab 8-2: show ip route Challenge
Packet Tracer Companion: show ip route Challenge Lab
Packet Tracer Skills Integration Challenge in the Topology

Chapter 9 EIGRP
Lab 9-1: Basic EIGRP Configuration
Lab 9-2: Comprehensive EIGRP Configuration, Challenge EIGRP Configuration
Packet Tracer Companion: Challenge EIGRP Configuration
Challenge Lab 9-3: EIGRP Design and Configuration, EIGRP Troubleshooting
Packet Tracer Companion: EIGRP Troubleshooting
Packet Tracer Skills Integration Challenge: EIGRP Configuration

Chapter 10 Link-State Routing Protocols
Packet Tracer Skills Integration Challenge: EIGRP and RIPv2 Configuration

Chapter 11 OSPF
Lab 11-1: Basic OSPF Configuration
Scenario A: Basic OSPF Configuration
Scenario B: Configure OSPF on a Multi access Network Packet Tracer Companion:
Basic OSPF Configuration
Lab 11-2: Challenge OSPF Configuration
Packet Tracer Companion: Challenge OSPF Configuration
Lab 11-3: OSPF Troubleshooting Lab
Packet Tracer Companion: OSPF Troubleshooting
Packet Tracer Skills Integration Challenge: OSPF Configuration

**ABSTRACT AND ESSENTIAL GUIDANCE FOR TEACHERS**

This course is a comprehensive introduction to the principles of router configuration and management, as well as the operational functionality of routing protocols. The course covers the skills and knowledge typical of the networking sector, in which an ICT network communications expert would need to understand to successfully complete their work. In particular learners will be taught how to configure and connect a Wide Area Network, integrate various routing protocols, and configure routers to perform routing decisions. In addition to this, learners will understand and apply commonly used networking technologies in a variety of contexts. In most organisations, it is accepted that network management is essential in order to run support systems efficiently and effectively. Learners will appreciate what takes place in the daily operation of a network infrastructure & how differing systems interact with each other. For more details contact gctr.ak@gmail.com, gpi_ak@yahoo.com.

**Learning outcomes on completion of this unit a learner should:**
1. Be able to identify and understand different routing protocols
2. Configure a router to communicate with a WAN infrastructure
3. Test and troubleshoot a network system
4. Apply VLSM and CIDR to a routed network environment.

**Essential resources**

This course must be taught in a computer lab with internet access in order to assess learners via the Cisco online assessment system. The web is a great source of technical information and access to computers is necessary. If another room for lab work is available, then the cabling and network configuration part of the class can be taught in this classroom. One lab computer for every two learners is an ideal situation but many classes have up to three to four learners per lab computer. Lab computers do not need to be the latest or newest systems, but it helps if they are all identical. It is recommended not to use the computers used by other classes as learners may tear down the machines. There should be a supply of redundant computers for this task.

**Teacher resources**

One LCD Projector (or TV with hookup to computer).
Workstation hooked up to network (both LAN and Net) with CD ROM and CD burner for making copies of CDs and for collecting/showing learner work and using tutor CDs that come with texts.

**Lab resources**

Computers on LAN with internet access - suggested ratio of one for every learner (for theory work).
One Server saving class work (learner presentation etc).
One Web server to host the Cisco electronic content.
One Lab area with tables, electrical outlets, extra network jacks and, if possible, elevated storage shelves for routers, switches and monitors.
One or two storage cabinets for tools and consumables.
Storage area for lab computers and spare parts (shelving, cabinet etc).
Lab (tear-down) computers — suggested ratio of one for every two learners, or VM-Ware, Virtual PC emulators.
**Unit content with objectives**

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<td>1.4 Chapter Summary</td>
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<tr>
<td>2</td>
<td>BASIC SWITCH CONCEPTS AND CONFIGURATION</td>
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<td></td>
<td>2.0 Chapter Introduction (Hosts: eg workstation, server, printer)</td>
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<td></td>
<td>2.1 Introduction to Ethernet/802.3 LANs</td>
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<td>2.2 Forwarding Frames Using a Switch</td>
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<td>2.3 Switch Management Configuration</td>
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<td>2.4 Configuring Switch Security</td>
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<td>2.5 Chapter Labs</td>
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<td>2.6 Chapter Summary</td>
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<td>3</td>
<td>VLANs</td>
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<td>3.0 Chapter Introduction</td>
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<td>(LAN TECH. VLAN, Trunking, encapsulation, VTP server or client, port security, dot1q)</td>
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<td>3.1 Introducing VLAN</td>
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<td>3.2 VLAN Trunking</td>
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<td>3.3 Configure VLANs and Trunks</td>
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<td>3.4 Troubleshooting VLANs and Trunks</td>
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<td>VTP</td>
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<td>4.0 Chapter Introduction</td>
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<td>4.1 VTP Concepts</td>
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<td>4.2 VTP Operation</td>
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<td>4.3 Configure VTP</td>
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<td>4.5 Chapter Summary</td>
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<td>STP</td>
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<td>5.0 Chapter Introduction</td>
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<td>5.1 Redundant Layer 2 Topologies</td>
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<td>5.2 Introduction to STP</td>
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<td>5.3 STP Convergence</td>
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<td>5.4 PVST+, RSTP and Rapid PVST+</td>
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<td>5.5 Chapter Labs</td>
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<td>5.6 Chapter Summary</td>
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<td>6</td>
<td>INTER-VLAN ROUTING</td>
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<td>6.0 Chapter Introduction</td>
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<td>(Commands: eg: enable mode, privilege mode, configuration mode, memory write commands, show commands, console password configuration, interface, ip addressing, routing, telnet configuration, router or switch status and troubleshooting)</td>
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<td>6.1 Inter-VLAN routing</td>
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<td>6.2 Configuring Inter-VLAN Routing</td>
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<td>6.3 Troubleshooting Inter-VLAN Routing</td>
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<td>6.4 Chapter Labs</td>
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<td>6.5 Chapter Summary</td>
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<td>7</td>
<td>BASIC WIRELESS CONCEPTS AND CONFIGURATION</td>
<td>10</td>
</tr>
</tbody>
</table>
7.0 Chapter Introduction

(Wireless Technology: eg: 802.11 standards, WEP, WPA, TKIP, SSID)

7.1 The Wireless LAN
7.2 Wireless LAN Security
7.3 Configure Wireless LAN Access
7.4 Troubleshooting Simple WLAN Problems
7.5 Chapter Labs
7.6 Chapter Summary

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Packet Tracer Skills Integration Challenge

Chapter 2 Basic Switch Concepts and Configuration  4
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Lab 2-2: Managing Switch Operating System and Configuration Files
Lab 2-3: Managing Switch Operating System and Configuration Files Challenge
Packet Tracer Skills Integration Challenge

Chapter 3 VLANs  4
Lab 3-1: Basic VLAN Configuration
Packet Tracer Companion: Basic VLAN Configuration
Lab 3-2: Challenge VLAN Configuration
Lab 3-3: Troubleshooting VLAN Configurations
Packet Tracer Skills Integration Challenge

Chapter 4 VTP  6
Lab 4-1: Basic VTP Configuration
Packet Tracer Companion: Basic VTP Configuration
Lab 4-2: VTP Configuration Challenge
Packet Tracer Companion: Challenge VTP Configuration
Lab 4-3: Troubleshooting VTP Configuration
Packet Tracer Companion: Troubleshooting VTP Configuration
Packet Tracer Skills Integration Challenge

Chapter 5 STP  4
Lab 5-1: Basic Spanning Tree Protocol
Lab 5-2: Challenge Spanning Tree Protocol
Lab 5-3: Troubleshooting Spanning Tree Protocol
Packet Tracer Companion: Troubleshooting Spanning Tree Protocol
Packet Tracer Skills Integration Challenge

Chapter 6 Inter-VLAN Routing  6
Lab 6-1: Basic Inter-VLAN Routing Packet Tracer Companion: Basic Inter-VLAN Routing
Lab 6-2: Challenge Inter-VLAN Routing
Packet Tracer Companion: Challenge Inter-VLAN Routing
Chapter 7 Basic Wireless Concepts and Configuration

Packet Tracer Exercise 7-1: Wireless LAN Configuration
Lab 7-1: Basic Wireless Configuration
Lab 7-2: Challenge Wireless WRT300N
Packet Tracer Companion: Challenge Wireless WRT300N
Lab 7-3: Troubleshooting Wireless Configuration
Packet Tracer Companion: Troubleshooting Wireless WRT300N
Packet Tracer Skills Integration Challenge

ABSTRACT AND ESSENTIAL GUIDANCE FOR TEACHERS

This course is a detailed exploration of variable length sub-networking and the control of address wastage, routing protocol configuration and management, as well as the management and configuration of LANS, VLANS, Wireless Systems and trunked connections. The course covers the skills and knowledge typical of the networking sector, in which an ICT network communications expert would need to understand to successfully complete their work. In particular learners will be taught how to configure and connect a Wide Area Network with a comprehensive Local Area Network infrastructure, integrate various routing protocols, and configure routers and switches to perform routing, switching and security decisions. In addition to this, learners will understand and apply commonly used networking technologies in a variety of contexts. For more details contact gctr.ak@gmail.com, gpi_ak@yahoo.com.

Learning outcomes on completion of this unit a learner should:

1 Be able to configure a switched and trunked VLAN infrastructure
2 Be able to test and troubleshoot a VLAN infrastructure
3 Enable a VTP client/server structure to operate and manage a LAN
4 Understand address wastage and devise a scheme to resolve addressing issues
5 Understand the operation of switch based infrastructures and apply port level security
6 Be able to configure a wireless network

Delivery
Cisco LAN Switching and Wireless (CCNA3 Exploration) is a proprietary course within the Cisco Networking Academy program, the curriculum, assessment and support materials are only available to institutions participating in the program. Cisco makes these available at no cost for any non-profit institution; there are some costs for instructor training and support. For detailed information please consult this web link: www.cisco.com/web/learning/netacad/get_involved/BecomeAnAcademy.html & gctr.ak@gmail.com, gpi_ak@yahoo.com. However, if teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajee-ul-Husnain HOD –IT GCT Rawalakot-AK with the guidance of COSC and BC, feel free to contact him. If the learner is following the Cisco course in parallel with the DAE National Diploma course then it is recommended that the two aspects of the assessment are integrated so that tasks being completed as part of the practical preparation for Cisco are used as the basis of the additional assessment for the Merit and Distinction criteria.

Essential resources
This course must be taught in a computer lab with internet access in order to assess learners via the Cisco on line assessment system. The web is a great source of technical information and access to computers is necessary. If another room for lab work is available, then the cabling and network configuration part of the class can be taught
in this classroom. One lab computer for every two learners is an ideal situation but many classes have up to three to four learners per lab computer. Lab computers do not need to be the latest or newest systems, but it helps if they are all identical. It is recommended not to use the computers used by other classes as learners may tear down the machines. There should be a supply of redundant computers for this task.

**Teacher resources**

- One LCD Projector (or TV with hookup to computer).
- Workstation hooked up to network (both LAN and Net) with CD ROM and CD burner for making copies of CDs and for collecting/showing learner work and using tutor CDs that come with texts.

**Lab resources**

- Computers on LAN with internet access— suggested ratio of one for every learner (for theory work).
- One Server saving class work (learner presentation etc).
- One Web server to host the Cisco electronic content.
- One Lab area with tables, electrical outlets, extra network jacks and, if possible, elevated storage shelves for routers, switches and monitors.
- One or two storage cabinets for tools and consumables.
- Storage area for lab computers and spare parts (shelving, cabinet etc).
- Lab (tear-down) computers - suggested ratio of one for every two learners, or VM-Ware, Virtual PC emulators.
Unit content with objectives

1. **TOOLS**
   
   1.1. **Dream weaver basics:**
   - 1.1.1. Starting Dream Weaver;
   - 1.1.2. Dream Weaver Views;
   - 1.1.3. Starting a Page;
   - 1.1.4. Document Title;
   - 1.1.5. Text and Paragraph Formatting;
   - 1.1.6. Images and Background;
   - 1.1.7. Hyperlinks;

   1.2. **Multimedia and Tables:**
   - 1.2.1. Multimedia;
   - 1.2.2. Basic Table;
   - 1.2.3. Text and Images in Table;
   - 1.2.4. Editing Table;

   1.3. **PHP**
   - 1.3.1. Introduction
   - 1.3.2. Programming basics
   - 1.3.3. PHP cookies
   - 1.3.4 PHP session
   - 1.3.5 PHP database connectivity with MSQL
   - 1.3.6 PHP & AJAX

   1.4. **Publishing Pages:**
   - 1.4.1. Stages of Publishing;
   - 1.4.2. Publishing Options;
   - 1.4.3. Publishing FrontPage Web;

   1.5. **Site Creation and Maintenance:**
   - 1.5.1. Personal Web Page;
   - 1.5.2. Small Web Site;
   - 1.5.3. Community Site;
   - 1.5.4. Large Scale Site;

2. **UNDERSTAND WEB ARCHITECTURE AND COMPONENTS**

2.1. **Web architecture:**
   - 2.1.1. Internet Service Providers (ISP);
   - 2.1.2. Web hosting services;
   - 2.1.3. Domain structure;
   - 2.1.4. Domain name registrars;
   - 2.1.5. Worldwide web;

2.2. **Components:**
   - 2.2.1. Hardware eg web, mail and proxy servers;
   - 2.2.2. Routers;
   - 2.2.3. Software eg browser, email;

2.3. **Protocols:**
   - 2.3.1. Transport and addressing eg TCP/IP;
   - 2.3.2. Application layer eg HTTP, HTTPS, SMTP

2.4. **Web functionality:**
   - 2.4.1. Web 2.0;
3. BE ABLE TO DESIGN AN INTERACTIVE WEBSITE

3.1. Identification of need:
   3.1.2. Nature of interactivity eg online transactions, static versus dynamic;
   3.1.3. Client needs and user needs eg image, level of security, development
   3.1.4. Timescales, support and maintenance contracts, costs, visibility on search engines;
   3.1.5. End user needs eg appropriateness of graphics, complexity of site, delivery of content;

3.2. Design tools:
   3.2.1. Concept designing eg mood boards, storyboarding;
   3.2.2. Layout techniques;
   3.2.3. e.g. frames, tables, block level containers (DIV), inline containers (SPAN);
   3.2.4. Templates;
   3.2.5. Colour schemes;
   3.2.6. Screen designs;
   3.2.7. Other e.g. outline of content

3.3. Software:
   3.3.1. Markup languages eg HTML;
   3.3.2. Client side scripting languages eg JavaScript, VBScript;
   3.3.3. Features and advantages of software languages;
   3.3.4. Software development environments;

4. BE ABLE TO CREATE AN INTERACTIVE WEBSITE

4.1. Structure:
   4.1.1. Layout of pages;
   4.1.2. Navigation;
   4.1.3. Format of content and cascading style sheets (CSS);
   4.1.4. Interactive features eg catalogue of products, shopping cart;
   4.1.5. Images and animation;

4.2. Content:
   4.2.1. Proofed, correct and appropriate;
   4.2.2. Reliability of information source;
   4.2.3. Structured for purpose eg prose, bullets, tables;

4.3. Tools and techniques:
   4.3.1. Navigation diagram eg linear, hierarchy or matrix;
   4.3.2. Building interactivity tools eg pseudo code for client-server scripting;
   4.3.3. Adding animation and audio/visual elements;
   4.3.4. Ensuring compliance with W3C;
   4.3.5. meta-tagging;
   4.3.6. Cascading style sheets;

4.4. Review:
   4.4.1. Functionality testing (user environments, links and navigation);
   4.4.2. Content;
   4.4.3. Check against user requirements;
   4.4.4. User acceptance;
   4.4.5. Audit trail of changes;

4.5. Uploading:
   4.5.1. Tools eg ftp;
   4.5.2. Web servers;

5. UNDERSTAND THE FACTORS THAT INFLUENCE WEBSITE PERFORMANCE

5.1. File types:
5.1.1. Image files eg Bitmap, vector, jpg, gif;
5.1.2. Sound files eg wav, mp3;
5.1.3. Video and animation files eg avi, swf;
5.1.4. Conversion between formats;

5.2. User side factors:
5.2.1. Modem connection speed;
5.2.2. PC performance factors eg cache memory, process speed;

5.3. Server side factors performance:
5.3.1. Web server capacity eg available bandwidth, executions to be performed before page load

6. UNDERSTAND CONSTRAINTS RELATED TO THE PRODUCTION AND USE OF WEBSITES

6.1. Security:
6.1.1. Risks eg hacking, viruses, identity theft’

6.2. Security protection mechanisms:
6.2.1. Firewalls;
6.2.2. Secure Socket Layers (SSL);
6.2.3. Adherence to standards eg strong passwords

6.3. Laws and guidelines:
6.3.1. W3C compliance;
6.3.2. Relevant legislation eg Data Protection Act 1998, Computer Misuse Act 1990,

6.4. User perception:
6.4.1. Concerns over privacy of information;
6.4.2. Security of financial Transactions;

LIST OF PRACTICALS

1. Installation of a Web browser
2. Creating Simple HTML Code using a text editor
3. Creating HTML Code using a word processor
4. Formatting Text in HTML code
5. Formatting Paragraphs in HTML code
6. Web Pages with Images
7. Installation of Dream weaver
8. Dream weaver Navigation
9. Text Formatting Using Dream weaver
10. Dynamic Programming with PHP
11. Major Project: Design and Development of Personal Web Page

Textbooks
HTML 4.0. E. Stephen Mack and Janan Platt, Sybex, Inc.
ICT Curriculum developer cell 0923442183831

Websites
www.ico.gov.uk Information Commissioner’s Office
www.w3.org World Wide Web Consortium

Learning outcomes on completion of this unit a learner should:

1 Be able to design an interactive website
2 Be able to create an interactive website  
3 Understand the factors that influence website performance  
4 Understand the constraints related to the production and use of websites

**Guidelines for teachers**

The need for learners to upload their website to a server may require some discussion and negotiation within the centre to ensure that the appropriate facilities are available. Learners should note that if the website is visible to the internet then special care will be needed to ensure compliance with relevant laws and guidelines. There is much scope in this unit for learners to be creative. This should be encouraged but learners must be aware of good practice and work within appropriate guidelines. It is relatively easy to design and build a website but it is not as easy to ensure that the website is robust, high quality and meets requirements. Learners should always bear in mind that the needs of the client and user are more important than their own personal opinions about layout, style, etc. It is possible that some learners will have already designed and built websites before. However, there is a high probability that learners will not be aware of the concepts of good design and practices. Some case study activity might be valuable where learners are asked, possibly in groups, to evaluate websites against a specification. These materials will need to be well prepared to suit. For more details contact gctr.ak@gmail.com, gpi_ak@yahoo.com. However, if teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajeeh-ul-Husnain HOD –IT GCT Rawalakot-AK with the guidance of COSC and BC, feel free to contact him. To ensure progressive development of the topics in this unit, it is advisable to begin with the concepts of good design and how it can be implemented to learners’ websites. Designs can be amended and enhanced as necessary during the design phase. Once implementation has begun, learners should not alter their designs, instead they should explain in an audit trail or logbook what changes have occurred and why. Learners should be encouraged to consider the unit in terms of a real-world environment. To this end they could be called ‘web designers’. They should always use correct technical terminology and think in terms of clients and users. The designing and building of personal/hobbyist sites is very different to that of commercial sites. It is strongly advised that learner’s ‘client’ is someone in the business field, whether fictional or real. Employers will be seeking a web designer who is able to build a site for their organisation, therefore it is essential that learners have this knowledge and experience. The sites could for example, be for a sole trader wanting to sell their product as a pure dotcom, or for a large organization needing to diversify by having a web presence. Although learners may want to include a product catalogue or shopping cart, they do not need to connect it to any sort of payment system. As with all IT areas of study, tutors should research latest and future trends and include them in the delivery of the unit. A relatively recent development in web design and development is the use of CSS. It has become a vital element which is not often specified by employers as it is implicit that potential employees can use it. It is recommended that learners not only have an understanding of its use, but also have experience of implementing it throughout their sites — until this technology is superseded HTML is always the integral language for websites, but it is advisable that learners have at least an awareness of server-side scripts. Although not an assessment requirement, it would be desirable that learners be exposed to languages such as PHP or ASP at a basic level. The decision whether to expand this is left to the discretion of the tutor — potentially linking with other web-based units. All assessment should be carried out on an individual basis. The practice of reusing others’ code, design and content is prevalent on the internet and it should be made clear that this is a breach of copyright and will not be acceptable at any time, especially for assessment in this qualification.

**Essential resources**

Learners will need access to an internet connection. All learners should have access to a computer with the following application software:
• word-processing software
• web authoring software
• at least two web browsers
• web server and file transfer protocol (FTP) client
• graphic manipulation software
• file conversion software.

Access to web authoring software is essential. The implementation of the websites could be done in notepad or another text editor. However, this can be laborious and the overall benefit to learners is questionable. There are various web authoring packages of which ‘Macromedia Dream weaver’ is the current industry standard. Learners should be encouraged to build each feature themselves, rather than choosing wizards or ‘one click’ solutions. For manipulation of file types, learners should experience creating and converting images, animation and audio/visuals. Software such as Adobe Photoshop Elements, Macromedia Flash and CD authoring software (eg Roxio Easy Media Creator, Nero) could be used as these are industry standards, although freeware alternatives would also be acceptable. For the pass criteria, learners must check their websites in at least two different browsers. A good comparison would be Microsoft internet Explorer and Mozilla Firefox.
ICT
3rd Year
تدريس مقاصد

قرآن کی تجویز: نکبت سیریعے لیے کوئی کی روشنی میں اسلام کے مقامی مقاصد لیے عوامل جان کے

نصیب مقاصد: طالب علم اس کو فیصلہ کے

سورة الفاتحة: باب این کوری سورة الفاتحة کی آخری کیات اور انسان الیسی کے لیے سورة الفاتحة کا شمع و توزیع

طالب علم اور نذر کا مقصد ہیں

رب العائشور فرح الخلق ہے

اللہ تم کریک واقع ہے

قیامت کے دن بہتشت اللہ کی ہوگی

حیرت اور استثنا کا حیات صرف اللہ ہے

طالب علم اور نذر کا مقصد ہیں

اللہ پر بھی پر ہے

اللہ کے حسن رحم الخرال قائم ہے

تقریب نبی پر ایمان ہم ضروری ہے

رسول اللہ کا کہا ہے

یہاں صرف ایمان ہے

اسلام ایک کی ہے

کفر ایک کی ہے

اللہ ہی ہے

خانقہ انسان

عمود صفر: اطلالات کے روشنی سے اسلامی قلبات پر عمل ہو گئے

خصوصاً صدر: ایمبا لیکی روشنی سے اسلامی قلبات پر عمل ہو گیا کے
حقوق وفرائض

عوری مقصد: اعلیاء مخصوصاً کا آئی اپھا فقہ سے

تمامی مخصوص

والرکین کے حقوق وفراہیس بیان کر گئے

دیکھوں کے حقوق بیان کر گئے

اسلامی حقوق و فراہیس کی مورت تک اپنے دیدہ کا حملہ کے

احمد ایلادر

عوری مقصد: طالب علم بھی کے کاکر ایلیمی کا مقصود مختصر اطلاعی سے منصوب جوہر

تمامی مخصوص

اعلانی کے مخصوص مقرر کر گئے

دیکھوں میں حقوق بیان کر گئے

اسلامی حقوق و فراہیس کی مورت تک اپنے دیدہ کا حملہ کے

امیر کریم کا اعیسی بیان کر گئے

اسلامی حقوق و فراہیس کی مورت تک اپنے دیدہ کا حملہ کے

امیر کریم کا اعیسی بیان کر گئے

اسلامی حقوق و فراہیس کی مورت تک اپنے دیدہ کا حملہ کے
موضوعات

قیام پاکستان
تاریخی کچین
ریک ہلی اورژن
 tướng برائجہ و کلاک
جیمز میگب
سندہ معاشرت
۱۹۷۳ کا نگہ
ریاست میں نوجوان
شیری پلن کہلہ
قراردویسی
علی کے بھٹ کئے
1962-1966 و 1973 کے معاشرتی انقلاب
پاکستان کا کل دور محور اس کی تحریکی اصطلاح
فرنیوں اور سماک (شیری-گیس-کوئٹہ)

فرنیوں مقاصد

عوامی مقاصد: قیام پاکستان کے بعد وہ دوسری معاشرت سے آگاہ جاکر کہ اور بیان کرے

خصوصی مقاصد:
بندتری کی طرح تکلیف اور اس کی فراہم بیان کرے
ریک ہلی اور پاکستان کے اورژن کے بارے میں بیان کرے
پنجاب اور گلگت کی تفصیلات کی ہدایت بیان کرے
بیلبی کی تفصیلات کی ہدایت بیان کرے
مازدار کی ادائیگی کے بارے میں بیان کرے
ریاست کے اطاق کے بارے میں تفصیلات بیان کرے
ریاست حوالہ کہنی کے ہدایت میں بیان کرے
ضری پلن کے حوالہ کے تفصیلات بیان کرے
قراردویسی کی تفصیلات بیان کرے
۲۲ علماء کے حوالہ اسال بابائن کرے
قیام پاکستان کے بعد معاشرت کی کوشش کی بیان کرے
پاکستان کے کل دور محور کی تحریک انسی بیان کرے
کسی بھی تقریبی سماک (شیری-گیس-کوئٹہ) کے بارے میں بیان کرے
(نیکل طبلہ کے لئے)

نسب اخلاقیات
مل سوکم
موجودات
اسلام دیوار
شیئ زیارت
علی واصف
قرب نذر کا ذمہ
زکوہ و پنڈ کی بکمی
النام کوئی
شکلی
ضرو و وزر
پیمانے
교류
غیر مثبت
اثر و انگز
پیدا کر

(نیکل طبلہ کے لئے)

نسب اخلاقیات
مل سوکم

تدیریس مقاصد

عوامی مقدار: کل تزیق کے لئے اپنی وصف کے ساتھ طلبہ پر پیک و سیک کی نذر کے
خصوص معیار: طالب علم اس کلی بخاک
موجودات کا مطلب ہیں کہ
عملاً واصف کے
موجودات کی اثاث بیان کر کے
یہ شخصت اور معاشرت پر موجودات کے مقابلاً اثرات پیدا کر سکتا ہے
شکل تہ تین کے ساتھ کام کر کے
علی واصف کے اہداف کے
بنا حال اخلاقی طور پر پیکر کے
کارکن کی پیٹی و پنڈ دیکھ کر
کارکنی ہی اثاث کر کے
پاکستان اسلام کی بہترین سے اختیار کر کے
Course Code: Eng 311
Course Title: Technical Report Writing

Third English course in this technology program. It aims to provide students with opportunity to sharpen their skills in using the English language through writing technical reports. It covers the basics of technical writing, techniques, document design, applications of technical writing and oral reports. It is theory class.

Course Objectives
At the end of the course the students are expected to be able to
• Understand the basic techniques of technical writing.
• Use these techniques to write readable technical report
• Compose and write technical reports
• Present effective oral reports
• Write legibly in English language
• Integrate English language as second language

COURSE OUTLINE

Contents Hours
1. Introduction to Technical Writing 2
   1.1. Substance of Technical Writing
   1.2. Nature of Technical Writing
   1.3. Qualities of Good Technical Writers
   1.4. Qualities of Good Technical Writing
2. Fundamentals of Technical Writing 6
   2.1. Composing
   2.2. Cooperative Writing
   2.3. Readers of Technical Writing
   2.4. Collecting and Verifying Information
   2.5. Readable Style
3. Techniques of Technical Writing 6
   3.1. Informing
   3.2. Defining
   3.3. Describing
   3.4. Arguing
4. Document Design in Technical Writing 6
   4.1. Document Design
   4.2. Design Elements of Reports
   4.3. Graphical Elements of Reports
5. Application of Technical Writing 8
   5.1. Correspondence
   5.2. Instructions
   5.3. Proposals
   5.4. Progress Report
   5.5. Feasibility Report
6. Oral Reports 4
   6.1. Preparations
   6.2. Delivery Techniques
   6.3. Presentation
   6.4. Visual Aids

Total Hours: 32

References
• Reporting Technical Information, 7Ed., K. Houp, T. Pearsall, et. al., MacMillan

Eng 311 – Technical Report Writing
LEARNING OBJECTIVES

1. Introduction to Technical Writing
   1.1. Differentiate technical writing from other forms of writing
   1.2. Describe the nature of technical writing
   1.3. List the characteristics of good technical writer
   1.4. Describe the qualities of good technical writing

2. Fundamentals of Technical Writing
   2.1. Compose good technical report
   2.2. Identify the topic and purpose of a technical writing
   2.3. Draft and revise technical report
   2.4. Use fundamentals of technical writing to write good report
   2.5. Plan a technical writing with several writers
   2.6. Identify different readers of technical writers
   2.7. Search literature for topics in technical writing
   2.8. Write letter of inquiry
   2.9. Write report with list and tables
   2.10. Compose technical report that is grammatically correct and readable

3. Techniques of Technical Writing
   3.1. Write readable report that informs
   3.2. Use visual language, analogy, and process description to write technical report
   3.3. Write readable report that define and describe
   3.4. Write readable report that describe a process
   3.5. Write readable and persuasive report that argue
   3.6. Compose technical writing that persuade

4. Document Design in Technical Writing
   4.1. Use correct formatting for technical writing
   4.2. List the elements of a report
   4.3. Describe each element of a report
   4.4. Write report that has all the elements of report
   4.5. Use correctly documentation formats in technical writing

5. Application of Technical Writing
   5.1. Identify different forms of technical writing
   5.2. Write readable correspondence
   5.3. Write readable Instructions
   5.4. Write readable proposals
   5.5. Write readable progress report
   5.6. Write feasibility report

6. Oral Reports
   6.1. Describe elements in preparing an oral report
   6.2. Identify different techniques of oral delivery of report
   6.3. Present report with visual aids
       mgm 312 impact of the use of it on business systems tpc-132

Unit content with objectives

1. KNOW THE INFORMATION TECHNOLOGY DEVELOPMENTS THAT HAVE
   HAD AN IMPACT ON ORGANISATIONS
   1.1. Hardware:
      1.1.1. Developments e.g. increasing power, increasing capacity and sophistication of computer
      1.1.2. Platforms, increasing sophistication of communication technologies

   1.2. Software:
      1.2.1. Developments e.g. increased sophistication and integration of application software;
      1.2.2. Specialized
      1.2.3. Support software e.g. management information systems, decision support software, expert systems,
1.2.4. Security software;  
1.2.5. e-commerce  
1.3. Reasons for upgrading systems:  
1.3.1. External pressures e.g. changing regulatory and legal frameworks, keeping up with competitors;  
1.3.2. Enhanced business opportunities e.g. increasing globalization, potential for outsourcing,  
1.3.3. Improving customer service  
1.4. Benefits:  
1.4.1. Productivity gains;  
1.4.2. Cost reductions;  
1.4.3. Increased profitability;  
1.4.4. Efficiency;  
1.4.5. Improved management  
1.4.6. Information;  
1.4.7. Improved customer service;  
1.4.8. Synergy and integration of systems  
1.5. Impact:  
1.5.1. Cost;  
1.5.2. Impact on procedures;  
1.5.3. Impact on staff e.g. up skilling/training, dealing with redundancies;  
1.5.4. Balancing core employees with contractors and outsourced staff, enabling home and remote working;  
1.5.5. Dealing with impact of regular restructuring on staff;  
1.5.6. Integration of legacy systems;  
1.5.7. Security;  
1.5.8. Legal requirements e.g. data protection, copyright;  

2. UNDERSTAND WHY ORGANISATIONS NEED TO CHANGE IN RESPONSE TO INFORMATION TECHNOLOGY DEVELOPMENTS  
2.1. Organizational challenges:  
2.1.1. Constant changes needed for constant re-engineering of systems;  
2.1.2. Ensuring management is IT aware;  
2.1.3. Need for reduction in complexity and for integrated systems;  
2.1.4. Ensuring payback on investment in IT systems;  
2.1.5. Developing technical infrastructures;  
2.2. External environment:  
2.2.1. Increasing globalization;  
2.2.2. Potential for outsourcing and geosourcing;  
2.2.3. Changing regulatory and legal frameworks;  
2.2.4. Reduced costs of business start-ups;  
2.2.5. Increased potential for competition by global companies at local level using e-commerce  
2.3. Internal environment:  
2.3.1. Need for constant up skilling of workforce;  
2.3.2. Dealing with redundant skills and employees;  
2.3.3. Home and remote working;  
2.3.4. Impact of regular restructuring;  
2.3.5. Managing change;  
2.3.6. Balance of core employees with contractors and outsourced staff;  
2.3.7. Others e.g. delayering as organizational structures flatten;  

3. UNDERSTAND HOW ORGANISATIONS ADAPT ACTIVITIES IN RESPONSE TO INFORMATION TECHNOLOGY DEVELOPMENTS
3.1. Responses/activities:
  3.1.1. Adapting business processes e.g. sales and marketing strategies for global opportunities,
  3.1.2. Purchasing strategies for automated ordering, customer support processes for online systems, financial
  3.1.3. Systems for secure funds transfer, automating manufacturing processes;
  3.1.4. No response e.g. not cost effective, insufficient skills;
  3.1.5. Other e.g. staff training, redundancies;

3.2. Performance:
  3.2.1. Productivity gains;
  3.2.2. Cost reduction, increased profitability;
  3.2.3. Efficiency;
  3.2.4. Improved management information;
  3.2.5. Control;
  3.2.6. Customer service;
  3.2.7. Synergy and integration of systems;

3.3. Managing risk:
  3.3.1. Cyber crime e.g. diverting financial assets, communications sabotage, intellectual property theft, denial of service attacks;
  3.3.2. Preventive technologies e.g. firewalls, access control methods, secure payment systems;
  3.3.3. Disaster recovery;

4. BE ABLE TO PROPOSE IMPROVEMENTS TO BUSINESS SYSTEMS USING IT

4.1. IT developments:
  4.1.1. Recent developments e.g. new applications, wireless technologies, operating systems,
  4.1.2. Innovative software platforms;
  4.1.3. Changing market leaders;
  4.1.4. Future developments

4.2. IT improvements:
  4.2.1. Developments e.g. integrated systems, databases, networks, communication technologies, web presence, management reports

4.3. Business systems:
  4.3.1. Functions e.g. customer relationship management, supplier management, product
  4.3.2. Development, service delivery, people management, stock control, finance

List of practical/Assignments

1. To study role of IT in modern and fully automated organizations
2. Need analysis of software upgrade in an organization
3. Need analysis of Hardware upgrade in an organization
4. Plan to protect Hardware and Software from illegal usage.
5. Cyber crime protection
6. Awareness of recent technologies for improvement in an organization
7. Automating office work
8. To Studying difference between automated organization by IT and non-automated organization
9. To setup remote environment.

Textbooks
Bocj P, Greasley A and Hickie S – Business Information Systems:
ISBN-10 027371662X, Curriculum developer cell 00923442183831 ISBN-
BPP Professional Education — ACCA Paper 2.1 Information Systems:
Study Tex (BPP Professional Education, 2005) ISBN 0751723169
Hickie S, Bocij P, Chaffey D and Greasley A — Business Information Systems:
ABSTRACT AND ESSENTIAL GUIDANCE FOR TEACHERS

The business landscape is being re-shaped as enterprise companies such as Dell, Google and Microsoft evolve to both satisfy and fuel the demand for IT-related products and services. New technologies and ways of working are forcing businesses to re-engineer themselves, as well as stimulating the growth of new businesses that are set up specifically to exploit these technologies. This unit starts by exploring the range of new technologies that have impacted business and then considers why it is necessary for organizations to respond. Some established businesses have failed precisely because they have not been nimble enough in adapting to the new information technologies. This unit looks at how developments in IT, such as the widespread use of networks and the internet, have had an impact on organizations. The business environment has changed as a result of technology so that the border between local, national and global markets is fast disappearing. These concepts are investigated along with the purchasing of the technology itself and the expertise required to install and administer it. The way that organizations have to adapt to technology is explored including activities such as enhanced customer service and support. Downsizing, de-layering, restructuring, re-engineering and re-focusing are the buzzwords that mask and reflect the change that happens internally when IT applications are extended and applied within organizations. If teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husnain (HOD-IT GCTR-AK) with the guidance of COSC and BC, feel free to contact on cell +92 344 2183831. Finally, the impact of changing technology on both employers & employees is developed, looking at issues such as home working. Employment patterns and the expertise required of staff are changing. Flexibility in the face of new information technologies will be essential if organizations and individuals are to survive and flourish in the business world.

Learning outcomes on completion of this unit a learner should:

1 Know the information technology developments that have had an impact on organizations
2 Understand why organizations need to change in response to information technology developments
3 Understand how organizations adapt activities in response to information technology developments.

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User
IT has, and continues to have a significant impact on organizations. Using IT effectively helps ensure that organizations meet their purposes. IT is unusual in that it can also re-shape the purposes of the organization. Organizations have adopted and adapted IT to maintain their competitive advantage and become more efficient. This unit is designed to be taught using practical examples that may draw on some of learners’ own experiences of employment. Learners do not have to have been employed nor do they have to be employed. It can be assumed that learners will, at some point, be part of a workforce in which they use IT. Realistic case study material, visits and presentations from employers can all be effective in enabling the learner to relate to the reality of issues found in the workplace. The order of the learning outcomes can inform the delivery order. Although learners are likely to have some IT background before the course starts, this cannot be assumed and therefore it would be appropriate to deliver this unit later in the program — perhaps after the web management or e-commerce units if they have been chosen. Learners will need to understand how the business landscape has changed in response to IT developments. New businesses are being created to make the hardware and write the software. Some companies such as Adobe, Intel, Cisco Systems and Oracle are young businesses that give employment to many in providing the technical infrastructure. Other companies such as Amazon, Google, eBay and Friends Reunited have been created because they are now technically feasible, whereas other businesses change what and how they operate because of the impact of IT. Tutors are advised to alert libraries and learning resource areas within their centre before the unit starts. However, If teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husain (HOD-IT GCTR-AK) with the guidance of COSC and BC, feel free to contact on cell +92 344 2183831. Searches can be undertaken to identify and capture real life case study material that can either then be used formally in class or provide additional reading for learners in their own time. Local companies in particular can provide useful sources and visits to those places or presentations given can add significant value. It is advised that such visits or presentations are carefully planned to ensure that learners gain maximum advantage.

One novel approach is to use role play within an extended case study — some learners acting the role of managers of a company that has the potential to use technology to increase the efficiency and profitability. Other learners could be asked to take the role of employees or departmental managers who will need to react to the proposals and also consider the impact of the proposed changes on themselves as individuals.
Unit Content with Objectives

1. KNOW THE EFFECTS ON SOCIETY OF E-COMMERCE

1.1. Social implications:
   1.1.1. Changing customer perspective e.g. providing added value, providing service, ease and security;
   1.1.2. Impact on business and society as a whole;
   1.1.3. Economic and social impact due to speed of changes;
   1.1.4. Bricks and clicks (integrating high street and online presence)

1.2. Benefits:
   1.2.1. Global marketplace;
   1.2.2. 24/7 trading;
   1.2.3. Relatively low start-up and running costs;
   1.2.4. Competitive edge;
   1.2.5. Search facilities;
   1.2.6. Pricing opportunities e.g. differences, fluid pricing;
   1.2.7. Gathering customer information;
   1.2.8. Alternative income sources

1.3. Drawbacks:
   1.3.1. Consumer trust;
   1.3.2. Lack of human contact;
   1.3.3. Delivery issues;
   1.3.4. International legislation;
   1.3.5. Product description problems;
   1.3.6. Security issues

1.4. e-commerce entities:
   1.4.1. e-tailors e.g. Amazon.com, ebuyer.co.uk;
   1.4.2. Manufacturers e.g. dell.com;
   1.4.3. Existing retailers e.g. tesco.com, argos.co.uk;
   1.4.4. Consumer led e.g. eBay;
   1.4.5. Informative e.g. bbc.co.uk, nationalrail.co.uk;
   1.4.6. Service providers e.g. easyjet.co.uk, lastminute.com;
   1.4.7. Financial e.g. esure.com, bank sites with web-only accounts

2. UNDERSTAND THE TECHNOLOGIES INVOLVED IN E-COMMERCE

2.1. Hardware and software:
   2.1.1. Web servers;
   2.1.2. Browsers;
   2.1.3. Server software;
   2.1.4. Web authoring tools;
   2.1.5. Database system;
   2.1.6. Programming requirements;
   2.1.7. Storage size;
   2.1.8. Portability;
   2.1.9. Download speeds;
   2.1.10. Browser and platform compatibility

2.2. Networking:
   2.2.1. TCP/IP addresses, ports and protocols;
   2.2.2. Domain names e.g. use of memorable names, multiple registration of domains (.com as well as .co.uk)

2.3. Payment Systems:
   2.3.1. Services available e.g. electronic cheque, PayPal, Notches, credit or debit cards

2.4. Promotion:
   2.4.1. Effective use of search engines e.g. use meta tags, ‘spiders’, paying for prominence
in search result listing;
2.4.2. Newsgroups and forums;
2.4.3. Banners and pop-ups;
2.4.4. Spam;
2.4.5. Site name;
2.4.6. Direct marketing;
2.4.7. Ensuring an effective user interface;
2.4.8. Establishing customer loyalty in a virtual environment

2.5. **Customer interface:**
2.5.1. Usability issues;
2.5.2. Contact information e.g. email, phone contact, FAQ, live-chat;
2.5.3. Providing customer account/profile;
2.5.4. Order tracking;
2.5.5. Dealing with complaints

3. **UNDERSTAND THE SECURITY ISSUES IN E-COMMERCE AND THE LAWS AND GUIDELINES**

3.1. **Security:**
3.1.1. Prevention of hacking;
3.1.2. Viruses;
3.1.3. Identity theft;
3.1.4. Firewall impact on site performance;
3.1.5. SSL;
3.1.6. HTTPS;
3.1.7. RSA certificates;
3.1.8. Strong passwords;
3.1.9. Alternative authentication methods

3.2. **Legislation:**
3.2.2. Freedom of Information Act 2000, copyright legislation

4. **BE ABLE TO PLAN E-COMMERCE STRATEGIES**

4.1. **E-commerce strategy:**
4.1.1. Structure of site;
4.1.2. Hosting;
4.1.3. Promotion;
4.1.4. Issues e.g. cost, security

4.2. **Structure:**
4.2.1. Customer interface e.g. ease of use, display of products, personal details entry, credit card entry, other types of payment, delivery details;
4.2.2. Image;
4.2.3. Style

4.3. **Hosting:**
4.3.1. Choice of ISP;
4.3.2. In house or sub-contracted

4.4. **Promotion:**
4.4.1. Marketing e.g. advertising the site, placing in search engines;
4.4.2. Message board;
4.4.3. Chat rooms

4.5. **Costs:**
4.5.1. Setup;
4.5.2. Maintenance;
4.5.3. Security;
4.5.4. Leasing;
4.5.5. Advertising;
4.5.6. Delivery strategy;
4.5.7. Staff Training;

4.6. **Security:**

4.6.1. Fraud protection;
4.6.2. Hackers;
4.6.3. Viruses

**Practical work**

1. Evaluate an e-commerce site to maximize audience usability. 3
2. Develop & host an e-commerce site using instant storefront services & stand-alone e-commerce software. 3
3. Implement e-commerce-based learning solutions. 3
4. Implement inventory and fulfillment strategies for an e-commerce site. 3
5. Implement payment-processing services for an e-commerce site. 3
6. Define and use standards, initiatives and e-commerce frameworks that support supplier transactions 3
7. Configure Web server software for an e-commerce site. 3
8. Analyze and improve e-commerce site performance. 3
9. Secure e-commerce transactions & Secure an e-commerce site. 3
10. Identify the effects of e-commerce on business operations and revenue generation. 3
11. Identify legal and governmental issues in e-commerce. 3
12. Implement effective marketing for an e-commerce site. 3
13. Implement strategies for effective customer service and manage customer relationships in ecommerce operations. 3
One of the most important developments in business in recent times has been the increasing use of e-commerce. It has revolutionized many marketplaces and opened up opportunities never before imagined. Businesses that are not exploring the use of e-commerce are in danger of finding themselves being overtaken by those who are utilizing this technology. E-commerce uses the internet to build and enhance relationships with customers, partners and other businesses. This can involve processing orders electronically, handling customer service and cooperating with business partners.

E-commerce can be conducted using the internet, intranets, extranets, or a combination of these. The unit starts by looking at the benefits and drawbacks for society of e-commerce and then investigates the technologies involved in e-commerce. This is followed by exploring the security issues surrounding the use of e-commerce, both from the business and the user perspective.

**Learning outcomes on completion of this unit a learner should:**

1. Know the effects on society of e-commerce
2. Understand the technologies involved in e-commerce
3. Understand the security issues in e-commerce and the laws and guidelines that regulate it.

**Delivery**

Learners should already have a good experience of using the internet and an awareness of e-commerce. However they may never have purchased anything online and might be unfamiliar with some of the basic features and characteristics of e-commerce sites. Work experience, visits to appropriate organizations and talks by employers would be especially valuable in this unit. Ideally, learners will develop their understanding in the context of real organizations and if case studies are used, they must be rich in detail and drawn from real-life organizations. However, If teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husnain HOD –IT GCT Rawalakot-AK with the guidance of COSC and BC, feel free to contact him. This unit links well with other web-based units and could be delivered alongside them or integrated. For example, if learners are studying a unit which involves building a website, they could use this as their scenario, investigating whether they should turn it into an e-commerce site.

**Textbooks**


**Websites**

[www.ico.gov.uk](http://www.ico.gov.uk), [gctr.ak@gmail.com](mailto:gctr.ak@gmail.com), [gpi_ak@yahoo.com](mailto:gpi_ak@yahoo.com)  www.w3.org

World Wide Web Consortium
Unit content with objectives

1. UNDERSTAND THE PRINCIPLES OF NETWORK MANAGEMENT  
   6+6
   
   1.1. **Network management functions:**
   
   1.1.1. Configuration;
   1.1.2. Fault management;
   1.1.3. Management;
   1.1.4. Account management;
   1.1.5. Performance variables e.g. network throughput, user response times, line utilization;
   1.1.6. Other activities e.g. planning, designing, installing;
   1.1.7. Network operations e.g. security, data logging, checking performance and traffic;
   1.1.8. Reporting;
   
   1.2. **Networking operating systems:**
   
   1.2.1. examples e.g. Novell Netware, Linux
   
   1.3. **Networking Protocols:**
   
   1.3.1. e.g. SMP, SNMP
   
   1.4. **Design considerations:**
   
   1.4.1. Speed;
   1.4.2. Usability;
   1.4.3. Functionality;
   1.4.4. Cost;
   1.4.5. Flexibility;
   1.4.6. Available expertise;
   1.4.7. Complexity increases with size;
   1.4.8. Security requirements;
   1.4.9. Other e.g. need for internet connectivity;

2. KNOW ABOUT NETWORKING MANAGEMENT TOOLS AND TECHNOLOGIES  
   6+6
   
   2.1. **Network devices:**
   
   2.1.1. Servers;
   2.1.2. Workstations;
   2.1.3. Interconnection devices;
   2.1.4. Network cards;
   2.1.5. Vendor specific hardware;
   
   2.2. **Networking tools:**
   
   2.2.1. Purpose e.g. faults management, performance management;
   2.2.2. *Specific* examples of tools e.g. HP Open view, Cisco Works;
   2.2.3. Using system software e.g. to find network assets;
   
   2.3. **Layout:**
   
   2.3.1. Cabling;
   2.3.2. Topologies;
   
   2.4. **Emerging technologies:**
   
   2.5. Mobile networking, web interfacing, remote monitoring e.g. RMON;
   
   2.6. **Impact of emerging technologies:**
   
   2.6.1. Enhanced capabilities e.g. faster, greater storage capacity, improved control;
   2.6.2. New work methods e.g. home working;
   2.6.3. Ease of use;

3. BE ABLE TO CARRY OUT NETWORK MANAGEMENT ACTIVITIES  
   8+8
   
   3.1. **Regular maintenance activities:**
   
   3.1.1. Backup and restore files;
   3.1.2. User account creation and deletion;
   3.1.3. Design and develop login scripts;
   3.1.4. Virus scans;
   3.1.5. File cleanup;
3.2. **Tools:**
- 3.2.1. Manage performance or fault find e.g. SNMP, HP open view

3.3. **Documentation:**
- 3.3.1. Work logs;
- 3.3.2. Log resources used;
- 3.3.3. System testing;

3.4. **Configuration options:**
- 3.4.1. User accounts location e.g. choosing server and setting rights;
- 3.4.2. Drive mappings;
- 3.4.3. Other e.g. virus scanning options;

3.5. **Security features:**
- 3.5.1. e.g. VPN access, firewall management, access control lists, device hardening;
- 3.5.2. Continuous policy review, forensic analysis, user rights;

3.6. **Security policies and procedures:**
- 3.6.1. Periodically review user access and rights, penetration testing, security
- 3.6.2. Audits, review firewall and access control list policies

4. **MICROSOFT WIN SERVER 2008 ACTIVE DIRECTORY INFRASTRUCTURE:**

4.1.1. Active Directory Environment, Domain Controller (DC) Installation and Configuration, Additional Domain Controller (ADC) Maintenance, Child Domain Controller (CDC), Member Server (MS) Configuration

5. **MICROSOFT WIN SERVER 2008 NETWORK INFRASTRUCTURE:**


6. **MICROSOFT WINDOWS INTERNET INFORMATION SERVER 7.0 (IIS):**

6.1.1. Hyper Text Transfer protocol (HTTP), File Transfer Protocol (FTP), Deployment of Virtual Directory

7. **MICROSOFT WINDOWS EXCHANGE SERVER 2003:**

7.1.1. Creating News Groups in Exchange Server. Simple Mail Transfer Protocol (SMTP), Network News Transfer Protocol (NNTP);

8. **MICROSOFT WINDOWS INTERNET SECURITY AND ACCELERATION SERVER 2004 (ISA):**

8.1.1. ISA Server Installation, Configuration and Maintenance, Data sharing on Internet, Firewall concept and its types, Combine the Multiple Networks into one Network, Security and Performance Monitoring options
- 8.1.2. Installation and Configuration;
- 8.1.3. Hardware Requirements, Installation and De-installation Process of Active Directory, Network Address Translation (NAT) Services, Print Server Management;

9. **RESOURCES MANAGEMENT ON WINDOWS SERVER 2008**

LIST OF PRACTICALS 3 Credit Each

1. Windows Vista/Windows7.0 Client End Installation, Windows Server 2008 Installation and Configuration
2. Hard Disk Partition Management, Exploring Control Panel for Task Scheduling, Local Printer Creation and Sharing
4. User Profile Implementation, System Policy Configuration
5. Active Directory Installation, Configuration and Maintenance
7. Resource Access and Permission Problems Troubleshooting,
8. Backup and Restore the Data, DNS and WINS Installation, Configuration and Maintenance
9. TCP/IP Configuration, DHCP Configuration and Maintenance
10. IIS Installation with its Services, RAS Installation and Configuration,
11. VPN Configuration and Maintenance, FTP Services configuration
12. Distributed File System Installation and Management, NAT Services Configuration and Maintenance, Design and Maintenance of ISA Server Rules

Textbooks
Limoncelli T & Hogan C-The Practice of System and Network Administration (Addison Wesley, 2001)

Abstract and Essential guidance for teachers
In general, network management is a service that employs a variety of tools, applications and devices to assist human network managers in monitoring and maintaining networks. In today’s business world the use of networked computer systems is commonplace and often essential. It is, therefore, important that business network systems run as effectively and efficiently as possible with minimum down-time and flexibility to change as the requirements change. This unit examines the principles of network management, which allows learners to understand the different functions and types of activities that network managers need to understand. In particular, learners need enough knowledge in order to make appropriate judgments when planning and designing a new network. In most situations, specialist software tools are used to assist network managers and learning outcome 2 deals with these tools and techniques. Learners will need to become familiar only with a limited number of products. However a focus on the underlying principles should allow further work in different environments. Some consideration will be given to emerging technologies and how they assist or just impact on network systems. The pace of change in networking technologies and the technologies that support network managers is very rapid and learners will need to be able to adapt and learn new skills continually. Learners will be given the opportunity to plan and carry out a variety of network management activities. The focus will be on the maintenance of the system, including configuration and customization.
Learning outcomes on completion of this unit a learner should:

1 Understand the principles of network management
2 Know about networking management tools and technologies
3 Be able to carry out network management activities.

Delivery:

Much of the content of this unit appears theoretical, however underpinning understanding and knowledge is developed best through practical activity. For some of the grading criteria, learners need to work with a network. It is advised that tutors negotiate, before the start of this unit, access to small networked systems isolated from any corporate network system, that learners can use and configure. Talks from network managers would be particularly valuable, especially if prior discussions with the speaker ensure that the content of the talk is specifically connected to the content in the specification and terminology is consistent. However, If teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husnain (HOD-IT GCT Rawalakot-AK) with the guidance of COSC and BC, feel free to contact him. The unit can be delivered in the order that the content is presented, however to maintain interest and to firm up understanding of theoretical work, practical activities can be arranged in parallel. If resources are limited then providing quality workshop time for a limited and rotating number of learners, while the rest of the group are engaged with other work, may be more effective than hands-off demonstrations to whole groups

Essential Resources:

Learners will need access to a network on which to carry out network management activities. This network will need to be a client/server system as opposed to a peer-to-peer setup. Learners will need full administration rights to the network in order to carry out the full range of management activities. This network should be made up of a minimum of 10 client machines and should ideally include email facilities, shared printing and internet access.
ICT 332  Operating System

Unit content with objectives

1. Computer System Structures
   1.1. Computer System Operation
   1.2. I/O Structure
   1.3. Storage Structure and Hierarchy
   1.4. Hardware Protection

2. Operating System Structures
   2.1. System Components
      2.1.1. Process Management
      2.1.2. Memory Management
      2.1.3. Disk and Storage Management
      2.1.4. File System
   2.2. OS Services and System Calls
   2.3. System Programs and Structure
      System Design and Implementation

SMALL NETWORKING ENVIRONMENT:

3.1.1 Peer-to-peer network with three or more workstations;
3.1.2 IP addressing;
3.1.3 TCP/IP client settings;
3.1.4 Account administration

4. Backup types:
   4.1.1 Full backup;
   4.1.2 Differential backup;
   4.1.3 Incremental backup

5 Group:
   5.1.1 User-defined;
   5.1.2 Built-in

6. Shared resources:
   6.1.1 Files; folders;
   6.1.2 Disks;
   6.1.3 Printers;
   6.1.4 Access control
   6.1.5 Domain environment:
   6.1.6 Windows domain structure

Indicative reading for learners

Textbooks

Website
www.microsoft.com/technet/security/secnews/archive
Delivery
Installing, configuring, and administering Microsoft Windows XP Professional is a proprietary course within the Microsoft IT Academy program, the official curriculum. Support materials are available only to institutions participating in the program. There are costs for membership of the program and for the official curriculum.

There is also a requirement for certification of the instructors engaged in the delivery and support of the 70-270 course material. However, if teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husnain HOD –IT GCT Rawalakot-AK with the guidance of COSC and BC, feel free to contact him. For detailed information please consult this web link: www.microsoft.com/education/msitacademy/default.mspx. gctr.ak@gmail.com, gpi_ak@yahoo.com

If learners are following the Microsoft course in parallel with the DAE ICT course then it is recommended that the two aspects of the assessment are integrated. This means that tasks being completed as part of the practical preparation for the Microsoft MCP certification exam are used as the basis of the additional assessment for the merit and distinction criteria.

Tutor resources
- One LCD Projector (or TV with hookup to a computer).
- Workstation hooked up to network (both LAN and Net) with CD ROM and CD burner for making copies of CDs and for collecting/showing learner work and using tutor CDs that come with texts.

Laboratory resources
- Computers on LAN with internet access or virtual machine running on network connected host — suggested ratio of one for every learner (for practical lab work).
- One server saving class work (learners presentation etc) and to provide a tutor led demonstration of a domain environment.
- One laboratory area with tables, electrical outlets, extra network jacks or where needed switches or hubs for network connectivity.
- Storage area for class sets of laboratory computers or network storage for virtual machine images
Unit content with objectives

1. **KNOW THE TYPES OF NETWORK SYSTEMS AND RELATED STANDARDS**

1.1. **Types of network:**
   - 1.1.1. Local area network (LAN);
   - 1.1.2. Wide area network (WAN);
   - 1.1.3. WAN technologies e.g. frame relay, ISDN, ATM;
   - 1.1.4. Value added network (VAN);
   - 1.1.5. Logical and physical topologies e.g. star, bus, ring, mesh;
   - 1.1.6. Network access methods e.g. CSMA, Token passing;
   - 1.1.7. OSI 7 layer model;
   - 1.1.8. Choice of network to meet business need *Network protocols and standards:*
     - 1.1.9. TCP/IP, apple talk, UDP, 802.2, 802.3, FDDI, 802.5;
     - 1.1.10. Wireless technologies e.g. 802.11, infrared, Bluetooth;
   - 1.1.11. Factors affecting range and speed of wireless technologies;

1.2. **Application layer protocols:**
   - 1.2.1. DNS, DHCP;
   - 1.2.2. HTTP;
   - 1.2.3. FTP;
   - 1.2.4. SMTP;

2. **UNDERSTAND THE HARDWARE AND SOFTWARE USED IN NETWORKING**

2.1. **Network devices:**
   - 2.1.1. Workstations;
   - 2.1.2. Servers e.g. print, mail, file, web, proxy;
   - 2.1.3. Others e.g. network interface cards (NIC);
   - 2.1.4. Features and functions

2.2. **Interconnection devices:**
   - 2.2.1. Modem, repeater, bridge, router, gateway, switch, hub;
   - 2.2.2. Wireless access points;
   - 2.2.3. Purposes, features and functions

2.3. **Connectors and cabling:**
   - 2.3.1. Leased line;
   - 2.3.2. Dedicated line;
   - 2.3.3. Media types e.g. STP, Category 5, coaxial, UTP, fibre optic;
   - 2.3.4. Wireless;
   - 2.3.5. Microwave and satellite links;
   - 2.3.6. Cable standards e.g. 10Base-T

2.4. **Software:**
   - 2.4.1. Network operating system;
   - 2.4.2. Virus checker;
   - 2.4.3. Firewall;
   - 2.4.4. Other e.g. email client

2.5. **Commercial systems:**
   - 2.5.1. Unix, Linux, Windows, Netware, Appleshare;

3. **KNOW THE SERVICES PROVIDED BY NETWORK SYSTEMS**

3.1. **Directory services:**
   - 3.1.1. used for e.g. account management, authentication management, active directory, DNS

3.2. **Telecommunication services:**
   - 3.2.1. Communication e.g. email, internet relay chat (IRC), discussion boards;
   - 3.2.2. Remote access e.g. via mobiles, remote desktop, social networking;

3.3. **File services:**
   - 3.3.1. File transfer;
3.3.2. File sharing;

3.4. Application services:
3.4.1. Application software e.g. database, web, proxy;
3.4.2. Shared resources e.g. printing;
3.4.3. Storage space;
3.4.4. Voice over IP (VoIP);
3.4.5. Mobile working;
3.4.6. Authentication e.g. users, hardware

4. UNDERSTAND HOW NETWORKED SYSTEMS ARE MADE SECURE

4.1. Risk related business issues:
4.1.1. Risks to business;
4.1.2. Costs;
4.1.3. Responsibilities;
4.1.4. Systems and procedures e.g. password policies;
4.1.5. Disaster recovery;
4.1.6. Comparison with security issues for non-networked systems, loss of service;
4.1.7. Loss of business or income e.g. through loss of customer records;
4.1.8. Increased costs;
4.1.9. Loss of confidentiality;
4.1.10. Compromised data integrity;
4.1.11. Security issues e.g. malware (hostile, intrusive, or annoying software or program code),
4.1.12. viruses, Trojans, worms, spyware, adware;

4.2. Securing a system/data:
4.2.1. Passwords, authorization permissions and access control lists;
4.2.2. Backing up and restoring;
4.2.3. Encrypting;
4.2.4. Others e.g. biometrics;
4.2.5. Physical security e.g. CCTV, locks firewalls;
4.2.6. Security risk levels;
4.2.7. Software protection e.g. antivirus, intrusion detection systems;

4.3. Software:
4.3.1. Firewalls;
4.3.2. Malware (hostile, intrusive, or annoying software or program code) e.g. viruses,
4.3.3. Trojans, worms, spyware, adware;
4.3.4. Levels of security risk for different malware;
4.3.5. Software protection e.g. antivirus, intrusion detection systems’

List of Practicals

1. Types of network:
1. Local area network (LAN);
2. Wide area network (WAN);
3. WAN technologies e.g. frame relay, ISDN, ATM;
4. Value added network (VAN);
5. Logical and physical topologies e.g. star, bus, ring, mesh;
6. Network access methods e.g. CSMA, Token passing;
7. Choice of network to meet business need Network protocols and standards:
8. TCP/IP, AppleTalk, UDP, 802.2, 802.3, FDDI, 802.5;
9. Working on wireless technologies e.g. 802.11, infrared, Bluetooth;

2. Application layer protocols:  
   2.1. DNS, DHCP;
   2.2. HTTP;
   2.3. FTP;
   2.4. SMTP;

3. Network devices:  
   3.1. Workstations;
   3.2. Servers e.g. print, mail, file, web, proxy;
   3.3. Others e.g. Network interface cards (NIC);
   3.4. Features and functions

4. Interconnection devices:  
   4.1. Modem, repeater, bridge, router, gateway, switch, hub;
   4.2. Wireless access points; purposes, features and functions

5. Connectors and cabling:  
   5.1. Leased line;
   5.2. Dedicated line;
   5.3. Media types e.g. STP, Category 5, coaxial, UTP, fiber optic;
   5.4. Wireless;
   5.5. Microwave and satellite links;
   5.6. Cable standards e.g. 10Base-T

6. Software:  
   6.1. Network operating system;
   6.2. Virus checker;
   6.3. Firewall;
   6.4. Other e.g. email client
Commercial systems:  
   6.5. Unix, Linux, Windows, Netware, Appleshare;

7. Directory services:  
   7.1. used for e.g. account management, authentication management, active directory, DNS

8. Telecommunication services:  
   8.1. Communication e.g. email, internet relay chat (IRC), discussion boards;
   8.2. Remote access e.g. via mobiles, remote desktop, social networking;

9. File services:  
   9.1. File transfer;
   9.2. File sharing;

10. Application services:  
    10.1. Application software e.g. database, web, proxy;
    10.2. Shared resources e.g. printing;
    10.3. Storage space;
    10.4. Voice over IP (VoIP);
    10.5. Mobile working;
    10.6. Authentication e.g. users, hardware4;

11. Risk related business issues:  
    11.1. Security issues e.g. malware (hostile, intrusive, or annoying software or program code),
    11.2. Viruses, Trojans, worms, spyware, adware;
12. Securing a system/data:

12.1. Passwords, authorization permissions and access control lists
12.2. Backing up and restoring;
12.3. Encrypting;
12.4. Others e.g. biometrics;
12.5. Physical security e.g. CCTV, locks firewalls;
12.6. Security risk levels;
12.7. Software protection e.g. antivirus, intrusion detection systems;

Textbooks


Olier N and Olier V — Computer Networks:
Principles, Technologies and Protocols
for Network Design (John Wiley and Sons Ltd, 2005) ISBN 0470869828

Sybex — Networking Complete (John Wiley and Sons Ltd, 2001) ISBN 0782129145


Hallberg B – Networking:


ISBN-13 978-0321123817

Websites

www.webopedia.com gctr.ak@gmail.com gpi-ak@yahoo.com www.howstuffworks.com
Abstract and Essential guidance for teachers

Learners thinking of careers within network technical support or network management must have a good understanding of the underlying principles of networking and how data travels around networks. This unit starts by exploring the different types of networks and the standards relating to network systems, including local and wide area networks. Networks can be either wired or wireless systems and, although much of the underpinning content is similar, this unit does make reference to both. The hardware and software components used in networks and their operation are explored and learners will build an understanding of their functions and services and how they relate to each other. As users of networks, we work with them mostly through the services that they provide, from simple services such as file sharing and communications to more complex services involving security and account management. For networks to be practical, they must be secure and the nature of them being distributed across several physical locations, perhaps via a WAN, makes the ensuring of security a complex business. Learners will understand key network security issues as well as exploring the technologies used to create secure systems.

Learning outcomes on completion of this unit a learner should:

1. Know the types of network systems and related standards
2. Understand the hardware and software used in networking
3. Know the services provided by network systems
4. Understand how networked systems are made secure.
Unit content with objectives

1. KNOW HOW TO IDENTIFY AND SELECT SUITABLE REMEDIES TO REPAIR IT SYSTEMS
   1.1. Identify and select remedies by using:
   1.1.1. Knowledge databases;
   1.1.2. Technical manuals;
   1.1.3. Internet e.g. FAQs and discussion forums, manufacturers’ websites;
   1.1.4. Others e.g. colleagues, training program undertaken, fault history;
   1.2. Types of remedies:
   1.2.1. Repair or replace hardware;
   1.2.2. Fix communication paths;
   1.2.3. Software remedy e.g. reconfigure software, apply software patch;
   1.2.4. Other e.g. instruct user in correct use of equipment, re-install software;
   1.3. Nature of reported faults:
   1.3.1. Complex e.g. with non-specific symptoms;
   1.4. Data security and integrity:
   1.4.1. Data back-up;
   1.4.2. Recovery procedures;
   1.4.3. Maintaining security e.g. virus protection, access rights, physical protection;

2. BE ABLE TO APPLY FAULT REMEDIES TO HARDWARE AND SOFTWARE SYSTEMS
   2.1. Hardware tools and techniques:
   2.1.1. Electrical/electronic test instruments;
   2.1.2. Self-test routines;
   2.1.3. Monitoring devices;
   2.1.4. Suitable tools e.g. screwdrivers, pliers, torch;
   2.2. Software tools and techniques:
   2.2.1. Diagnostics e.g. virus software;
   2.2.2. Test utilities;
   2.2.3. Others e.g. monitoring and error logging programs, system specific applications;
   2.3. Using troubleshooting techniques:
   2.3.1. Substitution;
   2.3.2. Test;
   2.3.3. Change;
   2.3.4. Upgrade;
   2.3.5. Reinstall;
   2.3.6. Software;
   2.3.7. Elimination;
   2.3.8. Applying bug fixes;
   2.3.9. Generating error codes;

3. UNDERSTAND HOW ORGANISATIONAL POLICIES IMPACT DIAGNOSIS AND REPAIR
   3.1. Customer issues:
   3.1.1. Communications;
   3.1.2. Understanding impact of diagnosis and repair on the individual;
   3.1.3. Customer handover and acceptance process following repair;
   3.1.4. Effect of unresolved faults on user and potentially on service to external clients
   3.2. External considerations:
   3.2.1. Relevant legislation;
   3.2.2. Level agreements;
   3.2.3. Escalation procedures;
   3.2.4. Documentation and reporting;
   3.2.5. Legal issues;
3.3. **Organizational considerations:**

3.3.1. Security;
3.3.2. Costs;
3.3.3. Impact of systems downtime;
3.3.4. Disruption of normal working;
3.3.5. Contractual requirements;
3.3.6. Trend analysis of faults reported;
3.3.7. Resource allocation;
3.3.8. Prioritization of jobs’

4. **BE ABLE TO APPLY GOOD WORKING PRACTICES WHEN WORKING ON IT SYSTEMS**

4.1. **Health and safety:**

4.1.1. Correct use of tools e.g. screwdrivers, test meters, utility programs;
4.1.2. Electro static discharge (ESD) and electrical safety;
4.1.3. Using correct manual handing procedures;
4.1.4. Considering fire safety eg keeping exit area free from tools;
4.1.5. Correct disposal of old parts and equipment;
4.1.6. Considering health and safety of other people e.g. keeping work area tidy;
4.1.7. Using laser equipment, trip hazards;
4.1.8. Availability of first aid and supervision;

4.2. **Working practices:**

4.2.1. Obtaining permissions before repairing;
4.2.2. Preparing the worksite;
4.2.3. Recording information e.g. product keys, license number, installation date;
4.2.4. Data backup;
4.2.5. Maintaining security and confidentiality of data;

**List of Practicals**

1. **Identify and select remedies by using:**

1.1. Knowledge databases;
1.2. Technical manuals;
1.3. Internet e.g. faqs and discussion forums, manufacturers’ websites;
1.4. Others e.g. colleagues, training program undertaken, fault history;

2. **Using different Types of remedies:**

2.1. Repair or replace hardware;
2.2. Fix communication paths;
2.3. Software remedy e.g. reconfigure software, apply software patch;
2.4. Other e.g. instruct user in correct use of equipment, re-install software;

3. **Data security and integrity:**

3.1. Data back-up;
3.2. Recovery procedures;
3.3. Maintaining security e.g. virus protection, access rights, physical protection;

4. **Hardware tools and techniques:**

4.1. Electrical/electronic test instruments;
4.2. Self-test routines;
4.3. Monitoring devices;
4.4. Suitable tools e.g. screwdrivers, pliers, torch;

5. **Software tools and techniques:**

5.1. Diagnostics e.g. Virus software;
5.2. Test utilities;
5.3. Others e.g. monitoring and error logging programs, system specific applications;

6. **Using troubleshooting techniques:**
6.1. Substitution;
6.2. Test;
6.3. Change;
6.4. Upgrade;
6.5. Reinstall;
6.6. Software;
6.7. Elimination;
6.8. Applying bug fixes;
6.9. Generating error codes;

7. **Working practices:**
   7.1. Preparing the worksite;
   7.2. Recording information e.g. product keys, license number, installation date;
   7.3. Data backup;
   7.4. Maintaining security and confidentiality of data;

**Textbooks**
French C — *Computer Science* (Continuum International Publishing Group, 2001) ISBN 0826454607

**Websites**
technet.microsoft.com Microsoft Tech Net

**Abstract and Essential guidance for teachers**
The ability to troubleshoot and repair IT systems for hardware and software faults is a valuable skill in IT support. Continuous development of IT systems requires technical support personnel to keep up to date with technical problems in order that they can identify faults quickly and repair as needed.

By completing this unit learners will demonstrate their ability to utilize technical knowledge and expertise to resolve IT problems. Learners will cover theoretical and practical knowledge for diagnosing and troubleshooting computer hardware and software problems. An important part of this unit is to understand health and safety issues and good working practices working on IT systems for fault rectification. This unit is suitable for those considering a career in IT systems support, or for those wanting to gain a better technical understanding of IT support procedures and practices.

**Learning outcomes on completion of this unit a learner should:**
1 Know how to identify and select suitable remedies to repair IT systems
2 Be able to apply fault remedies to hardware and software systems
3 Understand how organizational policies impact diagnosis and repair
4 Be able to apply good working practices when working on IT systems.
Delivery

Successful delivery of this unit requires learners to have sufficient hands-on practice in fault finding and fixing both IT hardware and software problems. Learners need to appreciate the requirement for technical support personnel and their responsibilities. They need to understand the importance of accessing fault remedies to analyze problems and their solutions. They need to be guided to troubleshoot more complicated problems and to record problems and their solutions for future reference.

Learners need to be acquainted with different tools and techniques for troubleshooting IT systems and effective technical support. They need to build up techniques to analyze information and choose what methods need to be applied to fix a specific hardware or a software problem. They also need to appreciate how organizations work and what their values are towards customer satisfaction in applying fault remedies. Tutors need to guide learners in methods of researching and using various resources, tools and techniques for fault rectification. However, if teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husnain (HOD-IT GCT Rawalakot-AK) with the guidance of COSC and BC, feel free to contact him. This unit can be approached from different angles as it not only explores troubleshooting IT systems and applying fault remedies, but also requires learners to work under certain constraints imposed by industry and organizations. Tutors must ensure that learners observe health and safety procedures, as well as good and bad practices when working with IT, and what impact these issues can have. Delivery of this unit should stimulate, motivate and educate learners to take positive steps to integrate into the IT support industry. Learners must be encouraged to develop transferable skills and familiarize themselves with the need for self-development to keep up with the demands of IT support. Tutors should consider integrating different delivery strategies to incorporate actual support issues. These may come from other ICT units the learners are doing or they may be actual requirements of organizations.

Essential resources
Learners will require access to the internet and technology magazines, journals, books, etc for research. Tutors could also present ‘live’ IT/PC problems that need fixing. Learners will also need access to a variety of hardware and software tools, as well as equipment where various faults are present that can be fixed. Learners must be provided with ESD safety equipment and advised of its use. Data banks of previous problems that existed, and solutions provided, could also be researched and used as guides. Access to organizational policies used for repairing IT systems; from the internet or hard copies are essential.
Unit content with objectives

1. UNDERSTAND HOW PROJECTS ARE SPECIFIED AND MANAGED

1.1. Project specification:
   1.1.1. Identification of stakeholders;
   1.1.2. Business case requirements;
   1.1.3. Specific objectives or deliverables;
   1.1.4. Benefits and success factors;
   1.1.5. Project boundaries or scope;
   1.1.6. Constraints;
   1.1.7. Consideration of options;
   1.1.8. Other e.g. ethical issues, sustainable issues, understanding consequences of failure to hit deadlines
   1.1.9. Or produce product;
   1.1.10. Risks and risk mitigation;

1.2. Project life cycles:
   1.2.1. Stages e.g. defining and producing specification, planning and designing, collecting information, implementing, completing and reviewing

1.3. Project management tools:
   1.3.1. General planning and scheduling tools e.g. Gantt charts, PERT charts;
   1.3.2. Critical path methods;
   1.3.3. Specialized software packages e.g. Microsoft Project;

1.4. Resources:
   1.4.1. Information;
   1.4.2. People (expertise and responsibilities) e.g. Project managers, product developers,
   1.4.3. Programmers, systems analysts;
   1.4.4. Equipment or facilities e.g. Software, hardware;
   1.4.5. Money;

1.5. Other issues:
   1.5.1. Effects of changing external factors;
   1.5.2. Monitoring progress;
   1.5.3. Taking corrective actions where necessary;
   1.5.4. Communications;
   1.5.5. Working within relevant guidelines (internal and external) and legislation;
   1.5.6. Dealing with conflict;
   1.5.7. Impact of project outputs on other systems e.g. staff, organizational structures;

1.6. Project methodologies:
   1.6.1. Benefits and drawbacks of formal methodologies;
   1.6.2. Examples e.g. Prince2, sigma, company specific;

2. BE ABLE TO PLAN AN IT PROJECT

2.1. Project plan:
   2.1.1. Purpose;
   2.1.2. Content e.g. identification of phases and activities, timescales;
   2.1.3. Review points;
   2.1.4. Use of appropriate and available software e.g. project management packages,
   2.1.5. Spreadsheets, drawing packages, graphics, databases;

2.2. Detail of activities:
   2.2.1. Potential for parallel or sequential processes, resources needed for each activity;
   2.2.2. Review points e.g. milestones, checkpoints, deadlines;
   2.2.3. Collecting information;

3. BE ABLE TO IMPLEMENT AN IT PROJECT
3.1. **Design:**
   3.1.1. Use of appropriate methods to design a solution to the problem;
   3.1.2. Design documentation;

3.2. **Implementation tools:**
   3.2.1. Appropriate choices made;
   3.2.2. Use of appropriate software or hardware;

3.3. **Deliverables:**
   3.3.1. Product e.g. software application, service, system;
   3.3.2. Other deliverables e.g. user training;
   3.3.3. Technical and user documentation;

3.4. **Monitoring:**
   3.4.1. Routine communications with stakeholders;
   3.4.2. Interim reviews;
   3.4.3. Use of logbooks;
   3.4.4. Routine updating of plan where necessary;
   3.4.5. Others e.g. accessing additional resources where necessary, reacting to unforeseen circumstances;

3.5. **Functional testing of product/service:**
   3.5.1. Test data e.g. Normal, extreme;
   3.5.2. Structured ‘walk-through’;
   3.5.3. Test plan or schedule;

4. BE ABLE TO TEST, DOCUMENT AND REVIEW AN IT PROJECT

4.1. **Completing process:**
   4.1.1. Testing;
   4.1.2. Documentation;
   4.1.3. Review;
   4.1.4. Handover and sign off;
   4.1.5. Other e.g. arranging support;

4.2. **Functional testing of product:**
   4.2.1. Test data e.g. normal, extreme;
   4.2.2. Structured “walk through’;
   4.2.3. Test plan or schedule;

4.3. **Review:**
   4.3.1. Against specification;
   4.3.2. Identification of potential additional development;

4.4. **Review of project management:**
   4.4.1. Actual dates achieved for milestones compared to planned dates with reasons for difference;
   4.4.2. Actual use of resources compared with planned resources needed;
   4.4.3. Others e.g. unanticipated external factors that affected the project;
   4.4.4. Validity of the tools used

4.5. **Technical documentation:**
   4.6. Documentation as appropriate to the particular project chosen

4.7. **User guide:**
   4.7.1. Instructions on how to use the product or service;
   4.7.2. Getting help;
   4.7.3. Known bugs;
   4.7.4. Gaining and using feedback;
   4.7.5. Other e.g. hardware or system requirements;

**PRACTICAL WORK:**
1. Project Proposal with Write Up
2. Evaluation of Project Proposal for Feasibility
3. Fabrication/Construction of Project
4. Consultation and 5th is Presentation

Textbooks

Websites managementhelp.org/plan_dec/project/project.htm www.businessballs.com/project.htm www.prince2.com and gctr.ak@gmail.com

Essential guidance for tutors

Unit Abstract

The constantly changing IT environment requires IT practitioners to be routinely involved in projects that involve the introduction of new systems or redevelopment of old systems. It is common to read about IT projects that over-run their deadline dates, cost more than the estimated cost or do not meet the needs of the clients or users. These problems often arise because of poor project management. To successfully run a project and develop a product, system or service requires a complex integration of skills from across a wide field of expertise. The expertise required extends beyond the IT skills necessary to develop the product or system itself. It involves an understanding of the needs of the business and of such things as the associated systems and procedures, and job functions that need to be taken into account to ensure successful deployment.

Learners will be able to identify an IT project from any area, however the project must have a business dimension and be sufficiently complex to allow planning and management to take place. It must also allow learners the opportunity to manage some resources, in particular and at least, the time allocated for completion. The unit gives learners the opportunity to develop or extend skills such as analysis, synthesis, evaluation and independence. It also enables them to more fully understand, through practice and application, other IT related skills and knowledge. Substantial activity with this unit will be focused on a particular extended project, however, learners will also study general aspects of project management in order to develop transferable skills.

Learning outcomes on completion of this unit a learner should:
1. Understand how projects are specified and managed
2. Be able to plan an IT project
3. Be able to implement an IT project
4. Be able to test, document and review an IT project
**Delivery**

It is essential that learners are made aware of the nature of a project in the sense used in this unit. A project is not just a sequential series of activities which result in the creation of a product, but something altogether more complex involving parallel activities, planning and monitoring, and liaison with a ‘client’. In addition, learners should develop an understanding that project managers need to consider the wider impact of the project on such things as business systems. It is quite possible that an acceptable and functional ‘product’ could fail to be effectively used by the business because staff are not trained, or required supporting resources are not provided, etc. Learners must be strongly encouraged not to focus simply on the production of a product itself. It is likely that much of the evidence they produce in this aspect for example, skills in programming or the ability to design a database could be more appropriate for another unit. Most of the evidence for this unit should relate to learners’ management of the project although this does not mean that the quality of the product is not important and it is expected that the product or service should meet the specification and be fit for purpose. The project must fulfill a need, and must result in the production of a product. The need will be derived from a ‘client’s problem’ which may be real or simulated. It is not envisaged that the project will relate to personal hobbies. It is likely that some technical skills and knowledge will already have been developed in other units and therefore delivery in the later stages (e.g. in the second year of a two-year course) of program however, this is not essential. However, If teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husnain (HOD-IT GCT Rawalakot-AK) with the guidance of COSC and BC, feel free to contact him. Learners should use software to assist in the planning and monitoring of the project, but the software availability should not be a hurdle to completion of the unit. Good planning can be undertaken using general-purpose software such as spreadsheets, graphics and text manipulation. It is useful for learners to be exposed to simple project management software such as Microsoft Project, but it is not essential that it is used to manage their projects. One person, possibly the tutor should act the part of the client, assuming real clients cannot be found. If the need is simulated then there must be significant ‘richness’ and depth in the case study and the ‘simulated’ client must be willing to engage in dialogue to answer questions and provide detail. There should be constant liaison between learners and ‘client’ and, to simulate reality, there should be the possibility of the client hanging their mind about one or more aspects of the project along the way. This change of mind could be relatively minor, but should force some replanning and redesign work. All learners must address the project individually; there is no provision for group work within this unit.

**Essential Resources**

Learners should be aware of specialist project management software and of the features and functions of such packages, although it is perfectly possible to project manage without expensive and specialist project management software. Other resources include supplies of case studies, access to magazines and
newspapers. Where possible, libraries should be alerted prior to the start of the course and asked to collect appropriate cuttings and other references.

**ICT 373: Accessing The Wan**

*Unit content with objectives*

1. **INTRODUCTION TO WANS**
   1.1. Chapter Introduction
   1.2. Providing Integrated Services to the Enterprise
   1.3. WAN Technology Concepts
   1.4. WAN Connection Options
   1.5. Chapter Labs
   1.6. Chapter Summary

2. **PPP**
   2.1. Chapter Introduction
   2.2. Serial Point-to-Point Links
   2.3. PPP Concepts
   2.4. Configuring PPP
   2.5. Configuring PPP with Authentication
   2.6. Chapter Labs
   2.7. Chapter Summary

3. **FRAME RELAY**
   3.1. Chapter Introduction
   3.2. Basic Frame Relay Concepts
   3.3. Configuring Frame Relay
   3.4. Advanced Frame Relay Concepts
   3.5. Configuring Advanced Frame Relay
   3.6. Chapter Labs
   3.7. Chapter Summary

4. **NETWORK SECURITY**
   4.1. Chapter Introduction
   4.2. Introduction to Network Security
   4.3. Securing Cisco Routers
   4.4. Secure Router Network Services
   4.5. Using Cisco SDM
   4.6. Secure Router Management
   4.7. Chapter Labs
   4.8. Chapter Summary

5. **ACLs**
   5.1. Chapter Introduction
   5.2. Using ACLs to Secure Networks
   5.3. Configuring Standard ACLs
   5.4. Configuring Extended ACLs

6. **TELEWORKER SERVICES**
   6.1. **Objectives**
      6.1.1. Describe the enterprise requirements for providing teleworker services
      6.1.2. Explain how broadband services extend Enterprise Networks including DSL, cable, and wireless
      6.1.3. Describe how VPN technology provides secure teleworker services in an Enterprise setting

   **6.2. Describe the Enterprise Requirements for Providing Teleworker Services**
      6.2.1. Describe the benefits of tele-workers for business, society and the environment.
      6.2.2. List remote connection technologies and describe scenarios in which each would be implemented.
6.2.3. Describe the key differences between private and public network infrastructures

6.3. Explain How Broadband Services extend Enterprise Networks
6.3.1. Briefly describe how broadband services allow teleworkers to use the Internet to connect to the Enterprise WAN
6.3.2. Describe how Enterprises use cable connectivity to extend their reach
6.3.3. Describe how Enterprises use DSL connectivity to extend their reach
6.3.4. Describe how Enterprises use broadband wireless connectivity to extend their reach
6.3.5. Describe how Enterprises defend themselves from threats to wireless network security

6.4. Describe How VPN Technology Provides Secure Teleworker Services in Enterprise Setting
6.4.1. Explain the importance and benefits of VPN technology
6.4.2. Compare site-to-site VPNs to remote-access VPNs
6.4.3. Describe the hardware and software components that typically make up a VPN
6.4.4. Describe the characteristics of secure VPNs
6.4.5. Describe the concept of VPN tunneling
6.4.6. Describe the concept of VPN encryption
6.4.7. Describe the concept of IPSec Protocols

6.5. Summary
6.5.1. Requirements for providing teleworker services are:
   6.5.1.1. Maintains continuity of operations
   6.5.1.2. Provides for increased services
   6.5.1.3. Secure & reliable access to information
   6.5.1.4. Cost effective
   6.5.1.4.1. Scalable

6.6. Components needed for a teleworker to connect to an organization’s network are:
6.6.1. Home components
6.6.2. Corporate components

6.7. Broadband services used
6.7.1. Cable
   6.7.1.1. Transmits signal in either direction simultaneously
6.7.2. Dsl
   6.7.2.1. Requires minimal changes to existing telephone infrastructure
   6.7.2.2. Delivers high bandwidth data rates to customers
6.7.3. Wireless
   6.7.3.1. Increases mobility
   6.7.3.2. Wireless availability via:
   6.7.3.3. Municipal wifi
   6.7.3.3.1. WiMax
   6.7.3.3.2. Satellite internet

6.8. Securing teleworker services
6.8.1. VPN security achieved through using
   6.8.1.1. Advanced encryption techniques
   6.8.1.2. Tunneling
6.8.2. Characteristics of a secure VPN
   6.8.2.1. Data confidentiality
   6.8.2.2. Data integrity
   6.8.2.3. Authentication

7. IP ADDRESSING SERVICES
7.1. Chapter Introduction
7.2. Use of IP Addressing Services
7.3. IP Addressing Services Commands
7.4. Advance IP Addressing Services
7.5. Summary

8. NETWORK TROUBLESHOOTING 8

8.1. Chapter Introduction
8.2. Network Troubleshooting tools
8.3. Network Troubleshooting Methods
8.4. Use of required steps to trouble shoot problems
8.5. Summary

PRACTICAL WORK
Ch-1 Introduction to WANs 4
Lab 1-1: Challenge Review Lab
Packet Tracer Exercise: Comprehensive WAN Fundamentals
Packet Tracer Skills Integration Challenge

Chapter 2 PPP 4
Lab 2-1: Basic PPP Configuration Lab
Lab 2-2: Challenge PPP Configuration
Packet Tracer Companion: Challenge PPP Configuration
Lab 2-3: Troubleshooting PPP Configuration
Packet Tracer Companion: Troubleshooting PPP Configuration
Packet Tracer Exercise 2-1: PPP
Packet Tracer Exercise 2-2: PPP Troubleshooting
Packet Tracer Skills Integration Challenge

Chapter 3 Frames Relay 4
Lab 3-1: Basic Frame Relay
Lab 3-2: Challenge Frame Relay Configuration Scenario
Lab 3-3: Troubleshooting Frame Relay
Scenario Lab 3-4: Frame Relay with Sub interfaces Scenario Packet Tracer Skills Integration Challenge

Chapter 4 Network Security 4
Lab 4-1: Basic Security Configuration
Lab 4-2: Challenge Security Configuration
Lab 4-3: Troubleshooting Security Configuration
Packet Tracer Skills Integration Challenge

Chapter 5 ACLs 4
Lab 5-1: Basic Access Control Lists
Packet Tracer Companion: Basic Access Control Lists
Lab 5-2: Access Control Lists Challenge
Packet Tracer Companion: Challenge Access Control Lists
Lab 5-3: Troubleshooting Access Control Lists Packet Tracer Exercise 5.2: Access Control Lists Packet Tracer Skills Integration Challenge

Chapter 6 Teleworker Services 4
Packet Tracer Exercise 6-1: DSL/Cable Configuration Packet Tracer Exercise 6-2:
Chapter 7 IP Addressing Services

Lab 7-1: Basic DHCP and NAT Configuration
Packet Tracer Companion: Basic DHCP and NAT Configuration
Lab 7-2: Challenge DHCP and NAT Configuration
Packet Tracer Companion: Challenge DHCP and NAT Configuration
Lab 7-3: Troubleshooting DHCP and NAT
Lab 7-4: IPv6 Basic Configuration Using an Adtran
Lab 7-5: IPv6 Basic Configuration Using a Frame Switch
Packet Tracer Exercise 7-1: DHCP
Packet Tracer Exercise 7-2: DHCP Troubleshooting
Packet Tracer Exercise 7-3: Configuring NAT, PAT, and Static NAT Packet Tracer Exercise 7-4: Double NAT with DHCP Packet Tracer Skills Integration Challenge

Chapter 8 Network Troubleshooting

Activity 8-1: Troubleshooting Role Play
Lab 8-1: Troubleshooting Enterprise Networks 1
Packet Tracer Companion: Troubleshooting Enterprise Networks
Lab 8-2: Troubleshooting Enterprise Networks
Lab 8-3: Troubleshooting Enterprise Networks Packet Tracer Companion: Troubleshooting Enterprise Networks
Packet Tracer Exercise 8-1: Comprehensive Network Troubleshooting
Packet Tracer Skills Integration Challenge

Abstract and Essential guidance for Teachers

This course is a detailed exploration on the control of address management, WAN technology configuration and management, as well as the wider discipline of network management. The course covers the skills and knowledge typical of the networking sector, in which an ICT network communications expert would need to understand to successfully complete their work. In particular learners will be taught how to configure and connect a Wide Area Network using a variety of technologies as well as configure address management with NAT and DHCP. In addition to this, learners will understand and apply commonly used networking technologies in a variety of contexts, including security, IPv6 and traffic management using access control lists. In most organizations, it is accepted that network management is essential in order to run support systems efficiently and effectively. Learners will appreciate what takes place in the daily operation of a network infrastructure and how differing systems interact with each other.

This course involves hands-on, lab-oriented activities that stress laboratory safety and working effectively in a group environment. Theory aspects are studied and tested online using Cisco’s own electronic curriculum which learners may also access from home. The course is delivered through a blended learning approach where tutor led teaching is combined with the electronic materials and testing. As a B/TEC National learner, your experience will be enhanced by the merit and distinction activities in addition to the CCNA4 Exploration assessment offered by the Cisco Academy Program.
This unit will fully prepare learners to sit the Cisco Accessing the WAN (CCNA4 Exploration) certification and in addition (when completing Networking Fundamentals {CCNA1 Exploration}, Routers and Routing Concepts {CCNA2 Exploration} and LAN Switching and Wireless {CCNA3 Exploration}) it will help you prepare for globally recognized CCNA professional certification.

**Learning outcomes on completion of this unit a learner should:**

1. Be able to implement a WAN
2. Be able to test and troubleshoot a WAN implementation
3. Be able to plan security for a WAN
4. Evaluate a WAN and implement security and network address management technologies.

Assessment and support materials are only available to institutions participating in the program. Cisco makes these available at no cost for any non-profit institution; there are some costs for instructor training and support. However, If teachers needed more guidance regarding this curriculum which is developed by Engr. Syed Wajih-ul-Husnain (HOD-IT GCT Rawalakot-AK) with the guidance of COSC and BC, feel free to contact him. For detailed information please consult this web link: [www.cisco.com/web/learning/netacad/get_involved/BecomeAnAcademy.html](http://www.cisco.com/web/learning/netacad/get_involved/BecomeAnAcademy.html) __gctr.ak@gmail.com, gpi_ak@yahoo.com__ If the learner is following the Cisco course in parallel with the DAE ICT Diploma course then it is recommended that the two aspects of the assessment are integrated so that tasks being completed as part of the practical preparation for Cisco are used as the basis of the additional assessment for the Merit and Distinction criteria.

**Essential resources**

This course must be taught in a computer lab with internet access in order to assess learners via the Cisco on line assessment system. The web is a great source of technical information and access to computers is necessary. If another room for lab work is available, then the cabling and network configuration part of the class can be taught in this classroom. One lab computer for every two learners is an ideal situation but many classes have up to three to four learners per lab computer. Lab computers do not need to be the latest or newest systems, but it helps if they are all identical. It is recommended not to use the computers used by other classes as learners may tear down the machines. There should be a supply of redundant computers for this task.

**Teacher resources**

- One LCD Projector (or TV with hookup to computer).
- Workstation hooked up to network (both LAN and Net) with CD ROM and CD burner for making copies of CDs and for collecting/showing learner work and using tutor CDs that come with texts.

**Lab resources**
Computers on LAN with internet access — suggested ratio of one for every learner (for theory work).

One server saving class work (learner presentation etc).

One web server to host the Cisco electronic content.

One lab area with tables, electrical outlets, extra network jacks and, if possible, elevated storage shelves for routers, switches and monitors.

One or two storage cabinets for tools and consumables.

Storage area for lab computers and spare parts (shelving, cabinet etc).

Lab (tear-down) computers — suggested ratio of one for every two learners, or VM-Ware, Virtual PC emulators.