

Revised Application Documentation: Version 4 /22 August, 2016

QUALIFICATION FILE – O level

Name and address of submitting body:

National Institute of Electronics and Information Technology (NIELIT)

(An ISO 9001:2008 Certified Organisation)

Electronics Niketan, 6 CGO Complex, Lodhi Road, New Delhi-110003.

Ministry of Electronics and Information Technology (MeitY)

Telephones- 011-24363330-1-2, 24366577-79-80

Name and contact details of individual dealing with the submission

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List of documents submitted in support of the Qualifications File

1. Detailed Curriculum(Annexure -I)
2. Govt. Entry requirement in recruitment notification.(Annexure -II)
 - 1) Government of Rajasthan Dept. Of Personnel vide no: 7(2) DOP/A II/2006 dated 14.03.2016 decided “O” level or Higher level Course as a eligible criteria for applying job.
 - 2) Government of Daman & Diu vide no: 1-1-87-CS/PF/2823 dated 16.12.2013 decided CCC and any higher level course can apply in Group B and C posts.
 - 3) Rajya Sabha Secretariat, Govt. Of India vide Advt. No. 1/2016 “O” level course as a qualification for applying Junior Parliamentary Interpreter(English/Hindi, Assamese, Marathi, Urdu), Junior Parliamentary Reporter(Hindi, English) and various Posts.

- 4) Recognition by Arunachal Pradesh Govt. vide no: DIT/S &T/118/2009 dated 12.09.2013 NIELIT courses for the purpose of employment and for capacity building.
3. Recognition given by state Govt. (Annexure -II)
 - 1) Recognition from MHRD vide notification (43) dated 01.03.1995”O level course equivalent to computer foundation course.
 - 2) Approval of AICTE-O level aligned with level 5 of NVEQF which is now submitted into NSQF
 - 3) Recognition by Sun Rise University-Alwar vide no: REC/SRU/2014 date 19.08.2014 O level is equivalent to DCA (Diploma in Computer Application) for lateral entry to 3rd Semester BCA Programme.
 - 4) Recognition by AISECT University vide no; NIELIT/Tech/(19)13/2048 dated 17.06.2014 O level is equivalent to DCA(Diploma in Computer Application) as one bridge course.
 - 5) Recognition by DR CV Raman University Bilaspur vide no: NIELIT/Tech/(19)/13/2048 date 17.06.2014 O level is equivalent to DCA (Diploma in Computer Application) as one bridge course.
 - 6) Recognition by Government of Odisha, industry department vide no. VTTI-26/2004. Dated 29.10.2005, “O” Level as equivalent to I.T.I Course
 4. Multiple entry exit channel(Annexure -III)
 5. Write up on Evolution of Course(Annexure- IV)
 6. Year wise no. of students registered and certified (Annexure - V)
 7. Constitution of Governing Council/Academic Advisory Committee(Annexure VI)
 8. Previous Question Paper- <http://nielit.gov.in/content/old-question-papers-0>(Annexure - VII)

QUALIFICATION FILE SUMMARY

Qualification Title	O level
Qualification Code	NIELIT/IT/1/20
Body/bodies which will assess candidates	Examination Cell, National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan Lodhi Road, New Delhi. 110003.
Body/bodies which will award the certificate for the qualification.	National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan Lodhi Road, New Delhi. 110003.
Body which will accredit providers to offer the qualification.	National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan Lodhi Road, New Delhi. 110003. Presently, Accreditation No: O1283
Occupation(s) to which the qualification gives access	Junior programmer,EDP Assistants/Web Designer/Lab Demonstrator
Proposed level of the qualification in the NSQF.	5
Notional Learning Hours	480 hours.
Entry requirements / recommendations.	<ul style="list-style-type: none"> ➤ Any graduate from recognized university/ institute is eligible to register at 'O' level without any experience. ➤ 10 + 2 or ITI Certificate (one year) after class 10 followed in each case, by one-year relevant experience. (Job experience in IT, including teaching in a recognized institution as faculty member, excludes coaching. ➤ A pass in the NCVT-DP&CS (Data Processing & Computer Software) Examination conducted by DGE&T (Govt. of India).

Progression from the qualification.

In Academic

After completion of this course, students can go for „A“ level Course (Equivalent to Advance Diploma in computer Applications for the purpose of employment to posts and services under the Central Government vide their notification No: F 18-23/92-TD.V/TS-IV dated 10th April 1996) then „B“ level Course (Equivalent to MCA under Ministry of Human Resource Development, Govt. of India vide their notification No. : F2/ 6/ 97-TS.IIIa (.) 54 dated 26th September 2000)

Professional

Initially candidate can work as Junior Programmer,

whose role would be to assist the programmer/analyst in writing, coding and testing of software programs and applications then Programmer and Web Administrator

Planned arrangements for RPL.

- It will be incorporated once RPL strategy is finalized.
- Presently only candidates who undergo training shall be assessed

Formal structure of the qualification

Title of unit or other component (include any identification code used)	Mandatory/ Optional	Estimated size (learning hours)	Level
M1-R4: To familiarize with various computer Hardware & Software component Processing Packages & Database concepts	Mandatory	120	5
M2-R4: Acquire Knowledge of internet technology, its connectivity , network communicaiton, web designing concepts & Security		120	
M3-R4: Develop Concepts of Programming and Solving the Problem Through „C“ Language		120	
M4-R4: Elective: (One Module out of the following three modules to be chosen)	Optional	120	
M4.1-R4: Develop Concepts .NET Technology & its application			
M4.2-R4 Develop Concepts of Multimedia & its application			
M4.3-R4 Getting Knowledge of PC Assembly, its utility & key concepts of Networking .			
Project	Mandatory		

SECTION 1

ASSESSMENT

Name of assessment body:

Examination Cell,

National Institute of Electronics and Information Technology
6-CGO Complex, Electronics Niketan
Lodhi Road, New Delhi. 110003.

Will the assessment body be responsible for RPL assessment?

Give details of how RPL assessment for the qualification will be carried out and quality assured.

Presently only candidates undergoing training shall be assessed. Later on candidates having experience and knowledge shall be assessed. The information will be provided on finalization of such procedure.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:

The emphasis is on practical demonstration of skills & knowledge based on the performance criteria. Each OUTCOME is assessed & marked separately. Student is required to pass in all OUTCOMES individually and marks are allotted. Following assessment methodologies are used.

- A. Written Assessment (Multiple Choice Questions)
Practical Assessment (The Practical examination will be based on the syllabi M1-R4, M2-R4, M3-R4 and M4-R4 modules of „O“ Level course.)
- B. Project (The Project is carried out by the student under guidance and support of faculty and management of the respective Institute / Organization)

The assessment results are backed by following evidences.

- 1 The assessor collects a copy of the attendance for the training done under the scheme. The attendance sheets are signed and stamped by the In charge / Head of the Training Centre.
- 2 The assessor verifies the authenticity of the candidate by checking the photo ID card issued by the institute as well as any one Photo ID card issued by the Central/Government. The same is mentioned in the attendance sheet.
- 3 The assessor assigns roll number.
- 4 The assessor takes photograph of all the students along with the assessor standing in the middle and with the centre name/banner at the back as evidence.

ASSESSMENT EVIDENCE

Complete the following grid for each grouping of NOS, assessment unit or other component as listed in the entry on the structure of the qualification on page 1.

Job Role

Junior Programmer

Title of Unit/Component:

(Detailed Curriculum attached As Annexure-I)

Assessable Outcomes	Assessment criteria for the outcome	Total Mark	Written(Part-I)	Written(Part-II)
1. To familiarize with various computer Hardware, Software component Processing Packages & Database concepts	Foundation level knowledge required to understand computer and its operations	100	60	40
	Learn and execute the hardware and software components of the computer.			
	Learn basic concept of operating system and get knowledge about various different operating systems			
	Use the packages of word processing, spread sheet and presentation in detail			
	Learn and apply various data base concepts and operations			
	Manage the issues related to IT and IT applications.			
	Total			
2. Knowledge of internet technology, its connectivity , network communication, web designing concepts & Security	Review the current topics in Web & Internet technologies.	100	60	40
	Describe the basic concepts for network implementation			
	Follow the basic working scheme of the Internet and World Wide Web.			
	Learn and apply fundamental tools and technologies for web design			
	Follow design rules in constructing web pages and sites			
	Effectively deal with programming issues relating to VB Script, JavaScript, Java, ASP, Front Page and Flash.			
	Figure out the various security hazards on			

	the Internet and need of security measures			
	Total	100	60	40
3. Develop Concepts of Programming and Solving the Problem Through „C“ Language	Develop efficient algorithms for solving a problem	100	60	40
	Use the various constructs of a programming language viz. conditional, iteration and recursion			
	Implement the algorithms in “C” language			
	Use simple data structures like arrays, stacks and linked list in solving problems.			
	Understand File Handling in “C”.			
	Total	100	60	40
Elective: (One Module out of the following three modules to be chosen)				
4. Develop Concepts of .NET Technology & its applications	Learn Basics of .NET Framework	100	60	40
	Use C# Programming language using C# Libraries			
	Learn and apply ASP .NET and VB.NET Programming language			
	Learn Advanced Programming constructs and .NET Architecture			
	Total	100	60	40
5. Develop Concepts of Multimedia & its application	Learn and update the Key Concepts of current Multimedia Technology like Audio and Video representations			
	Learn Multimedia Authoring Basics, Tools and Flash			
	Total	100	60	40
6. Getting Knowledge of PC Assembly, its utility & key concepts of Networking	Follow Knowledge of Assemble and disassemble a PC	100	60	40
	Effective use miscellaneous utilities such as: Compression, CD writing, Antivirus etc.			
	Establish and configure Networking Concept			
	How to Perform simple network administration operation			

	Total	100	60	40
	Practical	100	80 (Practical)	20 (Viva-Voice)
	Grand Total	500	320	180

Means of assessment 1

The theory examination for each module would be for duration of three hours and the total marks for each subject would be 100. One Practical examination of three hours duration and 100 marks. Laboratory/ Practical work will be conducted at Institutions / organizations, which are running the course. The Society will be responsible for holding the examination for theory and practical both for the students from Accredited Centres and student at large.

Pass Percentage

To qualify for a pass in a module, a candidate must have obtained at least 50% in each theory and practical examination. The marks will be translated into grades, while communicating results to the candidates. The gradation structure is as below:-

Pass percentage	Grade
Failed (<50)	F
50%-54%	D
55%-64%	C
65%-74%	B
75%-84%	A
85% and over	S

SECTION 2

EVIDENCE OF NEED

What evidence is there that the qualification is needed?

Recognition has been given by the Government of India to NIELIT „O“ level examination conducted by the NIELIT as equivalent to Foundation Course in IT for the purpose of employment to the posts and services under Central Government.

What is the estimated uptake of this qualification and what is the basis of this estimate?

NIELIT is having 35 centres and 900 accredited centres spread all over India and minimum capacity of each centre is 20 so approx. 75000 candidates per year can appear in this course.

What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?

As the understanding and adoption models of QPs evolve in the industry and across its sub-sectors, we foresee consolidation of qualification packs as a natural progression. The Qualification does not exist as per information available in public domain.

The Ministry of Human Resource Development, Govt. of India has recognized 'O' level examination conducted by the Computer Society of India (CSI) under the Department of Electronics Accreditation of Computer Courses (NIELIT) Scheme as equivalent to Foundation Level course for the purpose of employment to posts and services under the Central Government w.e.f 1st March 1995 vide their notification No: F 18-23/92-TD.V/TS-IV dated 1st March 1995.

**What arrangements are in place to monitor and review the qualification(s)?
What data will be used and at what point will the qualification(s) be revised or updated?**

The Qualification is to be monitored and reviewed every two years.

The following data will be used

1. Results of assessments
2. Employer feedback will be sought post-placement
3. Student feedbacks
4. Workshops and seminar for reviewing the qualifications
5. Industry Requirements
6. Consultation/ Tie-up with Industries or Expert for review of the Curriculum.

SECTION 3
SUMMARY EVIDENCE OF LEVEL

Level of qualification: 5

Summary of Direct Evidence:

Justify the NSQF level allocated to the QP by building upon the five descriptors of NSQF. Explain the reasons for allocating the level to the QP.

Generic NOS is/are linked to the overall authority attached to the job role.

Title : O Level			Level : 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF Level Descriptors	NSQF Level
Process required	There job is to work in familiar, predictable, routine situation of clear choice. The Knowledge intents Advance Programming language application.	Job that requires well developed skill, with clear choice of procedures in familiar context.	5
Professional knowledge	After acquiring professional knowledge on O level Course, they can able to operate computer properly. They get the knowledge of internet & web page Designing concept. The candidate gets knowledge of programming language of multimedia & practical implementation of it. They must have good understandings of application Architecture.	Knowledge of facts,A principles, processes and general concepts, in a field of work or study.	5
Professional skill	They plan tests, prepare tests cases, generate test data and perform testing on test data using tool and quality concept. They can be competent to identify technical requirements in terms of hardware, software and other IT related devices.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	5
Core skill	After acquiring this technical skill, they will involve in innovation and efficiency in task management to build, enhance and sustain high levels of professional conduct and performance. They understand the technique, analyze its behavior and try to fix or enhancement it.	Desired mathematical skill; understanding of social, political; and some skill of collecting and organizing information, communication.	5
Responsibility	They would able to assisting the Programmer/analyst in writing, coding and testing of software programs and applications. They assist in the analysis and design phase of the project and amending software errors in a timely, accurate fashion and provide status. reports where required.	Responsibility for own work and learning and some responsibility to other's works and learning.	5

SECTION 4

EVIDENCE OF RECOGNITION OR PROGRESSION

What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

This qualification has comprises both technical and analytic skills and this course give link to higher qualification which is existing like A, B and C level.

Please attach any documents giving further information about any of the topics above.

SECTION 5

EVIDENCE OF INTERNATIONAL COMPARABILITY

List any comparisons which have been established.

Refer Annexure-VI

Detailed Curriculum

**Name of Unit of
Qualification**

: IT Tools and Business System

Duration

: 120 Hours

Outcome	Contents	Hrs.
Acquire the foundation level knowledge required to understand computer and its operations	Computer Appreciation: Characteristics of Computers, Input, Output, Storage units, CPU, Computer System, Binary number system, Binary to Decimal Conversion, Decimal to Binary Conversion, ASCII Code, Unicode	4
Understand the hardware and software components of the computer and Multimedia	Computer Organization: Central Processing Unit - Processor Speed, Cache, Memory, RAM, ROM, Booting, Memory- Secondary Storage Devices: Floppy and Hard Disks, Optical Disks CD-ROM, DVD, Mass Storage Devices: USB thumb drive. Managing disk Partitions, File System Input Devices - Keyboard, Mouse, joystick, Scanner, web cam, Output Devices- Monitors, Printers – Dot matrix, inkjet, laser, Multimedia- What is Multimedia, Text, Graphics, Animation, Audio, Images, Video; Multimedia Application in Education, Entertainment, Marketing. Names of common multimedia file formats, Computer Software- Relationship between Hardware and Software; System Software, Application Software, Compiler, names of some high level languages, free domain software.	6
Understand the basic concept of operating system and get knowledge about various different operating systems.	Operating System: Microsoft Windows- An overview of different versions of Windows, Basic Windows Elements, File management through Windows. Using essential accessories: System tools –Disk cleanup, Disk defragmenter, Entertainment, Games, Calculator, Imaging – Fax, Notepad, Paint, WordPad. Command Prompt- Directory navigation, path setting, creating and using batch files. Drives, files, directories, directory structure. Application Management: Installing, uninstalling, Running applications. Linux- An overview of Linux, Basic Linux elements: System Features, Software Features, File Structure, File handling in Linux: H/W, S/W requirements, Preliminary steps before installation, specifics on Hard drive repartitioning and booting	13

	a Linux system.	
Understand to use the package of word processing	Word Processing: Word processing concepts: saving, closing, Opening an existing document, Selecting text, Editing text, Finding and replacing text, printing documents, Creating and Printing Merged Documents, Character and Paragraph Formatting, Page Design and Layout. Editing and Profiling Tools: Checking and correcting spellings. Handling Graphics, Creating Tables and Charts, Document Templates and Wizards.	6
Understand to use the Package of Spreadsheet Concepts	Spreadsheet Package: Spreadsheet Concepts, Creating, Saving and Editing a Workbook, Inserting, Deleting WorkSheets, entering data in a cell / formula Copying and Moving from selected cells, handling operators in Formulae, Functions: Mathematical, Logical, statistical, text, financial, Date and Time functions, Using Function Wizard. Formatting a Worksheet: Formatting Cells – changing data alignment, changing date, number, character or currency format, changing font, adding borders and colors, Printing worksheets, Charts and Graphs – Creating, Previewing, Modifying Charts. Integrating word processor, spread sheets, web pages.	9
Understand to use the Package of Presentation Concepts.	Presentation Package: Creating, Opening and Saving Presentations, Creating the Look of Your Presentation, Working in Different Views, Working with Slides, Adding and Formatting Text, Formatting Paragraphs, Checking Spelling and Correcting Typing Mistakes, Making Notes Pages and Handouts, Drawing and Working with Objects, Adding Clip Art and other pictures, Designing Slide Shows, Running and Controlling a Slide Show, Printing Presentations.	5
Understand various data base concepts and operations.	Data Base Operations: Data Manipulation-Concept: Database, Relational Database, Integrity. Operations: Creating, dropping, manipulating table structure. Manipulation of Data: Query, Data Entry Form, Reports	13
Understand the issues related to IT and IT applications.	Information Technology and Society: Indian IT Act, Intellectual Property Rights – issues. Application of information Technology in Railways, Airlines, Banking, Insurance, Inventory Control, Financial systems, Hotel management, Education, Video games, Telephone exchanges, Mobile phones, Information kiosks, special effects in Movies	4

Practical/Tutorials	Practical assignment is the understanding of theory module.	60
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Text books:

1. P.K. Sinha and P. Sinha, “Foundations of Computing” , BPB Publication, 2008.
2. Sagman S, “MS Office for Windows XP”, Pearson Education, 2007.
3. ITL Educational Society, “Introduction to IT”, Pearson Education, 2009.
4. Miller M, “Absolute Beginners Guide to Computer Basics”, Pearson Education, 2009.

Reference Books:

1. Turban, Mclean and Wetherbe, “Information Technology and Management” John Wiley & Sons.
2. Mansfield Ron, “Working in Microsoft Office”, 2008, Tata McGraw-Hill
3. Balagurusamy E, “Fundamentals of Computers”, 2009, Tata McGraw-Hill
4. Mavis Beacon, “All-in-one MS Office” CD based views for self learning, BPB Publication, 2008
5. Perry G, “MS Office 2007”, Pearson Education, 2008.
6. D“Suoza & D“souza, “Learn Computer Step by Step”, Pearson Education, 2006.
7. Kulkarni, “IT Strategy for Business”, Oxford University Press

Name of Unit of Qualification

: INTERNET TECHNOLOGY AND WEB DESIGN

Duration

: 120 Hours

Performance Criteria(OUTCOME) No.	Contents	Hrs.
Understand the current topics in Web & Internet technologies	Introduction to Internet: Internet, Growth of Internet, Owners of the Internet, Anatomy of Internet, ARPANET and Internet history of the World Wide Web, basic Internet Terminology, Net etiquette. Internet Applications – Commerce on the Internet, Governance on the Internet, Impact of Internet on Society – Crime on/through the Internet.	2
Understand the basic concepts for network implementation.	TCP/IP – Internet Technology and Protocol: Packet switching technology, Internet Protocols: TCP/IP, Router, Internet Addressing Scheme: Machine Addressing (IP address), E-mail Addresses, Resources Addresses	3
Understand the basic working scheme of the Internet and World Wide Web	Internet Connectivity: Connectivity types: level one, level two and level three connectivity, Setting up a connection: hardware requirement, selection of a modem, software requirement, modem configuration, Internet accounts by ISP: Telephone line options, Protocol options, Service options, Telephone line options – Dialup connections through the telephone system, dedicated connections through the telephone system, ISDN, Protocol options – Shell, SLIP, PPP, Service options – E-mail, WWW, News Firewall etc.	3
Understand the basic concepts for network Communication	Internet Network: Network definition, Common terminologies: LAN, WAN, Node, Host, Workstation, bandwidth, Interoperability, Network administrator, network security, Network Components: Servers, Clients, Communication Media, Types of network: Peer to Peer, Clients Server, Addressing in Internet: DNS, Domain Name and their organization,	4

	understanding the Internet Protocol Address. Network topologies: Bust, star and ring, Ethernet, FDDI, ATM and Intranet.	
Understand the Services on Internet (Definition and Functions)	Services on Internet (Definition and Functions): E-mail, WWW, Telnet, FTP, IRC and Search Engine.	4
Understand the basic protocol, structure and clients of Electronic Mail	Electronic Mail: Email Networks and Servers, Email protocols –SMTP, POP3, IMAp4, MIME6, Structure of an Email – Email Address, Email Header, Body and Attachments, Email Clients: Netscape mail Clients, Outlook Express, Web based E-mail. Email encryption- Address Book, Signature File.	7
Understand the Current Trends on Internet	Current Trends on Internet: Languages, Internet Phone, Internet Video, collaborative computing, e-commerce.	3
Understand fundamental tools and technologies for web designing and browsing	Web Publishing and Browsing: Overview, SGML, Web hosting, HTML. CGL, Documents Interchange Standards, Components of Web Publishing, Document management, Web Page Design Consideration and Principles, Search and Meta Search Engines, WWW, Browser, HTTP, Publishing Tools.	10
Comprehend the technologies for Hypertext Mark-up Language (HTML).	HTML Programming Basics: HTML page structure, HTML Text, HTML links, HTML document tables, HTML Frames, HTML Images, multimedia	12
Deal with programming issues relating to VB Script, JavaScript, Java, ASP, Front Page and Flash	Interactivity Tools: ASP, VB Script, JAVA Script, JAVA and Front Page, Flash	8
Figure out the various security hazards on the Internet and need of security measures	Internet Security Management Concepts, Information Privacy and Copyright Issues: Overview of Internet Security, Firewalls, Internet Security, Management Concepts and Information Privacy and	4

	Copyright Issues, basics of asymmetric cryptosystems.	
Practicals/Tutorials	Practical assignment is the understanding of theory module.	60

Text books:

1. Greenlaw R and Hepp E “Fundamentals of Internet and www” 2nd EL, Tata McGrawHill,2007.
2. Ivan Bayross, “HTML, DHTML, JavaScript, Perl CGI”, 3rd Edition, BPB Publications.
3. D. Comer, “The Internet Book”, Pearson Education, 2009.

Reference Books:

1. M. L. Young,”The Complete reference to Internet”, Tata McGraw Hill, 2007.
2. Godbole AS & Kahate A, “Web Technologies”, Tata McGrawHill,2008.
3. Jackson, “Web Technologies”, Pearson Education, 2008.
4. B. Patel & Lal B. Barik, ” Internet & Web Technology “, Acme Learning Publishers
5. Leon and Leon, “Internet for Everyone”, Vikas Publishing House.

Name of Unit of Qualification : PROGRAMMING AND PROBLEM SOLVING THROUGH „C“ LANGUAGE

Duration : 60 Hours

Learning Outcome	Topics	Hours
Develop efficient algorithms	Introduction to Programming: The Basic Model of Computation, Algorithms, Flow-charts, Programming Languages, Compilation, Linking and Loading, Testing and Debugging, Documentation.	4
Understand the Algorithms for Problem Solving	Algorithms for Problem Solving: Exchanging values of two variables, summation of a set of numbers, Decimal Base to Binary Base conversion, Reversing digits of an integer, GCD (Greatest Common Division) of 49 two numbers, Test whether a number is prime, Organize numbers in ascending order, Find square root of a number, factorial computation, Fibonacci sequence, Evaluate „sin x“as sum of a series, Reverse order of elements of an array, Find largest number in an array,Print elements of upper triangular matrix, multiplication of two matrices, Evaluate a Polynomial.	10
Understand the basic of „C“ Language	Introduction to ‘C’ Language: Character set, Variables and Identifiers, Built-in Data Types, Variable Definition, Arithmetic operators and Expressions, Constants and Literals, Simple assignment statement, Basic Input/output statement, Simple „C“ programs.	4
Understand Conditional Statements and Loops of „C“ Language	Conditional Statements and Loops: Decision making within a program, Conditions, Relational Operators, Logical Connectives, if Statement, if-else statement, Loops: while loop, do while, for loop, Nested loops, Infinite loops, Switch statement, structured Programming.	7
Understand Arrays of „C“ Language	Arrays: One dimensional arrays: Array manipulation; Searching, Insertion, Deletion of an element from an array; Finding the largest/smallest element in an array; Two dimensional arrays, Addition/Multiplication of two matrices, Transpose of a square matrix; Null terminated strings as array of characters, Standard library string functions	6
Understand Functions of „C“ Language	Functions: Top-down approach of problem solving, Modular programming and functions, Standard Library of C functions, Prototype of a function: Formal parameter list, Return Type, Function call, Block structure, Passing arguments	6

	to a Function: call by reference, call by value, Recursive Functions, arrays as function arguments.	
Understand Storage Classes	Storage Classes: Scope and extent, Storage Classes in a single source file: auto, extern and static, register, Storage Classes in a multiple source files: extern and static.	3
Understand Structures and Unions	Structures and Unions: Structure variables, initialization, structure assignment, nested structure, structures and functions, structures and arrays: arrays of structures, structures containing arrays, unions	6
Understand Pointers	Pointers: Address operators, pointer type declaration, pointer assignment, pointer initialization, pointer arithmetic, functions and pointers, Arrays and Pointers, pointer arrays, pointers and structures, dynamic memory allocation.	6
Understand simple data structures like arrays, stacks and linked list in solving problems.	Self Referential Structures and Linked Lists: Creation of a singly connected linked list, Traversing a linked list, Insertion into a linked list, Deletion from a linked list	4
Understand package of File Processing	File Processing: Concept of Files, File opening in various modes and closing of a file, Reading from a file, Writing onto a file.	4
Practical/Tutorials	Practical assignment is the understanding of theory module.	60

Text Books:

1. Byron S Gottfried “Programming with C” Second edition, Tata McGrawhill, 2007 (Paper back)
2. R.G. Dromey, “How to solve it by Computer”, Pearson Education, 2008.
3. Kanetkar Y, “Let us C”, BPB Publications, 2007.
4. Hanly J R & Koffman E.B, “Problem Solving and Programm design in C”, Pearson Education, 2009.

Reference Books:

1. E. Balagurusamy, “Programming with ANSI-C”, Fourth Edition, 2008, Tata McGraw Hill.
2. Venugopal K. R and Prasad S. R, “Mastering „C””, Third Edition, 2008, Tata McGraw Hill.
3. B.W. Kernighan & D. M. Ritchie, “The C Programming Language”, Second Edition, 2001, Pearson Education
4. ISRD Group, “Programming and Problem Solving Using C”, Tata McGraw Hill, 2008.
5. Pradip Dey , Manas Ghosh, “Programming in C”, Oxford University Press, 2007.

Name of Unit of Qualification

: APPLICATION OF .NET TECHNOLOGY

Duration

: 120 Hours

Performance Criteria(OUTCOME) No.	Contents	Hrs.
Understand basic of .NET framework	The .NET framework: Introduction, Common Language Runtime, Common Type System, Common Language Specification, The Base Class Library, The .NET class library Intermediate language, Justin- Time compilation, garbage collection, Application installation & Assemblies, Web Services, Unified classes.	3
Understanding Programming Language C# Basics	C# Basics: Introduction, Data Types, Identifiers, variables & constants, C# statements, Object Oriented Concept, Object and Classes, Arrays and Strings, System Collections, Delegates and Events, Indexes Attributes, versioning.	11
Understanding C# Using Libraries	C# Using Libraries: Namespace-System, Input Output, Multi-Threading, Networking and Sockets, Data Handling, Windows Forms, C# in Web application, Error Handling.	7
Advanced Features Using C#	Advanced Features Using C#: Web Services, Windows services, messaging, Reflection, COM and C#, localization. Distributed Application in C#, XML and C#, Unsafe Mode, Graphical Device Interface with C#, Case Study (Messenger Application).	7
Understand ASP.NET 2.0	ASP.NET 2.0: Features of ASP.NET 2.0, Stages in Web Forms Processing, Introduction to Server Controls, HTML Controls, Validation Controls, User control, Data Binding Controls, Configuration, Personalization, Session State, ADO.NET	7
Understand basics of VB.NET programming language	Introduction to Programming with Visual Basic.NET 07 Hrs. <ul style="list-style-type: none"> _ Basic Concepts and a Simple Application _ Using Variables, Constants, Functions _ Processing Decisions 	7

	_ Looping Structures and Lists	
Understand Applications of File and Database	File and Database Applications: File Access, Dialog Boxes, Error Handling, Menus _ Connecting to Databases	8
Advanced Programming Constructs	Advanced Programming Constructs: Sub Procedures, Function Procedures, Modules _ Arrays, Structures, Collections	5
Understand .NET Architecture and Advanced Tools	.NET Architecture and Advanced Tools: Object-oriented Programming _ Creating Distributed Web Applications _ XML and ADO.NET _ Graphics, Printing, Reporting	5
Practical/Tutorials	Practical assignment is the understanding of theory module.	60

Text Books:

1. Joe Mayo, "C# 3.0 Unleashed: With the .NET Framework 3.5", Pearson Education, 2009.
2. Schildt H, "C#: The Complete Reference", Tata McGrawHill, 2007.
3. Powell R & Weeks R, "C# and The .NET Framework", BPB Publications, 2007.
4. Chappell D, "Understanding .NET", Pearson Education, 2007.

Reference Books:

1. Balagurusamy E, "Programming with C#", Tata McGrawHill, 2008.
2. Abolrous S A, "Learn C# Includes the C# 3.0 Features", BPB Publications, 2008.
3. Kanetkar Y and Dani Asang, "Test Your C# .Net Skills part I & II", BPB Publications, 2008.
4. Mitchell Scott, "Sams Teach Yourself ASP .NET 2.0 in 24 Hours, Complete Starter kit (with CD)", Pearson Education, 2006.
5. Onion Fritz and Keith Brown, "Essential ASP .NET 2.0", Pearson Education, 2007.

Name of Unit of Qualification

: INTRODUCTION TO MULTIMEDIA

Duration

: 120 Hours

Performance Criteria(OUTCOME) No.	Contents	Hrs.
Understand the basic of Multimedia	Introduction to Multimedia: What is multimedia, Components of multimedia, Web and Internet multimedia applications, Transition from conventional media to digital media.	8
Understand Usage of Computer Fonts and Hypertext	Computer Fonts and Hypertext: Usage of text in Multimedia, Families and faces of fonts, outline fonts, bitmap fonts International character sets and hypertext, Digital fonts techniques.	10
Understand Audio fundamentals and representation	Audio fundamentals and representations: Digitization of sound, frequency and bandwidth, decibel system, data rate, audio file format, Sound synthesis, MIDI, wavetable, Compression and transmission of audio on Internet, Adding sound to your multimedia project, Audio software and hardware.	10
Understand various Image fundamentals and it's representations	Image fundamentals and representations: Colour Science , Colour, Colour Models, Colour palettes, Dithering, 2D Graphics, Image Compression and File Formats :GIF, JPEG, JPEG 2000, PNG, TIFF, EXIF, PS, PDF, Basic Image Processing [Can Use Photoshop], Use of image editing software, White balance Correction, Dynamic range correction, Gamma correction, Photo Retouching.	10
Understand how Video and Animation work	Video and Animation: Video Basics , How Video Works, Broadcast	10

	Video Standards, Analog video, Digital video, Video Recording and Tape formats, Shooting and Editing Video (Use Adobe Premier for Editing), Video Compression and File Formats. Video compression based on motion compensation, MPEG-1, MPEG-2, MPEG-4, MPEG-7, MPEG-21, Animation: Cell Animation, Computer Animation, Morphing.	
Understand Multimedia Authoring Basics, Tools & Flash	Multimedia Authoring: Multimedia Authoring Basics, Some Authoring Tools, Macromedia Director & Flash.	12
Practicals/Tutorials	Practical assignment is the understanding of theory module.	60

Text Books:

1. Tay Vaughan, "Multimedia making it work", Tata McGraw-Hill, 2008.
2. Rajneesh Aggarwal & B. B Tiwari, "Multimedia Systems", Excel Publication, New Delhi, 2007.
3. Li & Drew, "Fundamentals of Multimedia", Pearson Education, 2009.

Reference Books:

1. Parekh Ranjan, "Principles of Multimedia", Tata McGraw-Hill, 2007
2. Anirban Mukhopadhyay and Arup Chattopadhyay, "Introduction to Computer Graphics and Multimedia", Second Edition, Vikas Publishing House.

Name of Unit of Qualification

: INTRODUCTION TO ICT RESOURCES

Duration

: 120 Hours

Performance Criteria(OUTC OME) No.	Contents	Hrs.
Acquire the knowledge of Assemble and disassemble a PC	PC Assembly and Operation: Assembly and Disassembly of PC and its various Parts, Startup Process (Booting), BIOS Setup, CMOS Setup and meaning of its various setting, Installation of Windows XP operating System, Installation of Other Software Packages such as Ms Office etc. Operation of Printer, Installation of printer driver, Backup and Restore Operations Troubleshooting PC Problems	15
Understand the use of miscellaneous utilities such as: Compression, CD writing, Antivirus etc.	Utilities: Compression Utilities: WinZip, PKZIP, Concept of compression, Defragmenting Hard disk using defrag, Scan Disk for checking disk space, lost files and recovery, Formatting Hard disk, Floppy Disk, Setting System Date and Time, Antivirus Package CD Writing Software – Nero etc.	15
Establish and configure Networking Concepts	Networking Concepts: What is Networking, Local Area Networking (LANs), Metropolitan Area Network , MAN), Wide Area Network (WAN), Networking Topologies, Transmission media & method of communication, Cabling: straight through and cross over, Study of components like switches, bridges, routers, Wifi router etc., communication Protocols, TCP/IP, IP addressing, MAC address, Subnetting	15
Perform simple network administration operation	Network Administration: Installing and configuring the network using Windows NT based System, Administration of Windows NT based network, Creation of user and groups, File Sharing, Printer Sharing.	15
Practicals/Tutorials	Practical assignment is the understanding of theory module.	60

Text Books:

1. Scott and Mueller, "Upgrading and Repairing PCs", Techmedia, New Delhi
2. Troubleshooting, Maintenance and Repairing PCs, Fifth Edition, by Stephen J. Bigelow, Tata McGraw-Hill Publishing Company Limited, New Delhi.
3. PC Upgrade and Maintenance Guide, 15th Edition, by Marks Minasi, BPB Publications
4. Basic of Networking. "NIIT ", Prentice, Hall of India Private Limited.
5. Networking Protocols and Standards. "NIIT ", Prentice, Hall of India Private Limited.
6. William Stallings, "Data and Computer Communication", Prentice, Hall of India Private Limited.