

Dr. Babasaheb Ambedkar Technological University
Lonere – 402 103

Institute of Petrochemical Engineering
(Diploma Wing)



Curriculum Revision Project w.e.f. A.Y. 2017-18

Proposed Syllabus Structure for Second and Third Year
and

Course Contents for Second Year (w.e.f. A.Y. 2018-19)

for the Programmes

Diploma in Computer Engineering

and

Diploma in Information Technology

Dr. Babasaheb Ambedkar Technological University
Institute of Petrochemical Engineering, Lonere

VISION:

To transform the Institute into a seat of learning and contemplations so as to provide comprehensive technical education of Diploma and post diploma level and create world-class technicians oriented towards lifelong learning.

MISSION:

We, in this Institute, commit ourselves to realise our vision through:

1. Continuous quality improvement of faculty and staff
2. Adapting a vibrant curriculum and scientific delivery and
3. A culture of transforming appropriate technologies to rural areas and the underprivileged people

PROGRAMME: DIPLOMA IN COMPUTER ENGINEERING

VISION:

To create persistently changing environment for the rural masses to make them state-of-the-art computer professionals for nation building and humanity at large.

MISSION:

No.	Mission
M1	To train rural pupils for their all-dimensional development with various aspects like personality development and state-of-the-art technology training.
M2	To maintain and upgrade computing facilities for quality learning environment.
M3	To develop in rural masses professional attitude, ethical and intellectual standards.
M4	To train the students to cope-up with ever-changing field of Computing and to pursue advanced graduate studies.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs): PEOs are the broad statements that describe career and professional accomplishments that the programme is preparing the diploma graduates to achieve.

After about four to five years of professional experience, diploma computer engineers will be able to:

NO.	PEO
PEO1	Become computer professional who are knowledgeable and technically competent in the field of computing and able to adapt themselves to the state-of-art technologies.
PEO2	Effective in oral and written communication, efficient contributor to the team with a capability of being a leader.
PEO3	Solve computing and information technology problems innovatively, creatively, ethically with social responsibility towards country, community and human kind at large.
PEO4	Demonstrate entrepreneurship skills and recognize the need of lifelong learning for successful career advancement.

PROGRAM OUTCOMES (POs): Programme Outcomes describe what students should know and be able to do at the end of the programme. Following are the Programme outcomes of the Diploma in Computer Engineering:

NO	PO
PO1	Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the computer engineering problems.
PO2	Discipline knowledge: An ability to apply computer engineering knowledge to solve core and/or applied computer-engineering problems.
PO3	Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve computer-engineering problems.
PO4	Engineering Tools: Apply appropriate computing technologies and tools with an understanding of the limitations.
PO5	The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to computer engineering practice.
PO6	Environment and sustainability: Understand the impact of the computer engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.
PO7	Ethics: Apply ethical principles and commit to professional ethics, responsibilities, and norms of the engineering practice.
PO8	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.
PO9	Communication: An ability to communicate effectively in verbal and written form.
PO10	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes in computing and engineering.

PROGRAM SPECIFIC OUTCOMES (PSOs): What students will be able to do in the Computer Engineering specific industry soon after diploma programme):

NO	PSO
PSO1	An ability to demonstrate knowledge, technical and management skills.
PSO2	An ability to use problem-solving techniques for development of quality application software.
PSO3	An ability to maintain computing systems and networks.

PROGRAMME: DIPLOMA IN INFORMATION TECHNOLOGY**VISION**

To impart quality technical education to produce highly skilled technologist in the era of information technology and serve the society for helping the country to attain new height in Information Technology.

MISSION

NO	MISSION
M1	Implement Effective & efficient Teaching–Learning practices and provide the lifelong learning and leadership skills
M2	Promote collaboration with industry to bridge the gap between academic and industrial application in emerging IT Technologies

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs are the broad statements that describe career and professional accomplishments that the programme is preparing the diploma graduates to achieve.

After about four to five years of professional experience, diploma in Information technology engineers will be able to:

NO	PEO
PEO1	Provide socially responsible, environment friendly solutions to Information technology related broad-based problems adapting professional ethics
PEO2	Adapt state-of-the-art Information Technology broad-based techniques to work in multi-disciplinary work environments
PEO3	Solve broad-based problems individually and as a team member communicating effectively in the world of work

PROGRAM OUTCOMES (POs)

Programme Outcomes describe what students should know and be able to do at the end of the programme. Following are the Programme outcomes of the Diploma in Information Technology:

NO	PO
PO1	Basic knowledge: Apply knowledge of basic mathematics, science and basic engineering to solve the problems related to application of computers and communication services in storing, manipulating and transmitting data, often in the context of a business or other enterprise
PO2	Discipline knowledge: Apply Information Technology knowledge to solve broad-based Information Technology related problems
PO3	Experiments and practice: Plan to perform experiments, practices and to use the results to solve Information Technology related problems.
PO4	Engineering tools: Apply appropriate Information Technology related techniques/tools with an understanding of the limitations
PO5	The engineer and society: Assess societal, health, safety and legal issues and the consequent responsibilities relevant to practice in the field of Information technology
PO6	Environment and sustainability: Apply Information Technology related engineering solutions for sustainable development practices in environmental contexts
PO7	Ethics: Apply ethical principles for commitment to professional ethics, responsibilities and norms of practice in the field of Information Technology
PO8	Individual and team work: Function effectively as a leader and team member in diverse/ multidisciplinary teams
PO9	Communication: Communicate effectively in oral and written form
PO10	Life-long learning: Engage in independent and life-long learning along with the technological changes in the IT and allied industry

PROGRAM SPECIFIC OUTCOMES (PSOs)

NO	PSO
PSO1	Modern Information Technology: Use latest technologies for operation and application of information
PSO2	Information Technology Process: Maintain the information processes using modern information and communication technologies

Dr. Babasaheb Ambedkar Technological University's

Institute of Petrochemical Engineering

(Curriculum Revision Project from Academic Year 2017-18)

Diploma in Computer Engineering/Information Technology

Year: Second

Semester: Third (w.e.f. Academic Year 2018-19)

Sr. No.	Course Code	Course Title	Teaching Scheme/Contact Hours			Examination Scheme					
			TH	TU	PR	Credits	MSE	ESE	TW	PR/OR	Total
1	DCE2101	Database Management Systems	3	1		4	30	70			100
2	DCE2102	Digital Techniques	3	1		4	30	70			100
3	DCE2103	Object Oriented Programming	3	1		4	30	70			100
4	DCE2104	Environmental and Sustainable Energy Technologies	3	1		4	30	70			100
5	DCE2105	Web Page Design Lab	2		4	6			50	50#	100
6	DCE2106	Database Lab			2	2			25	50	75
7	DCE2107	Digital Lab			2	2			25	50	75
8	DCE2108	Object Oriented Programming Lab			4	4			50	50#	100
		Total	14	4	12	30	120	280	150	200	750

Examination with External examiner

ESE: End Semester Examination

MSE: Mid-Semester Examination

Dr. Babasaheb Ambedkar Technological University's

Institute of Petrochemical Engineering

(Curriculum Revision Project from Academic Year 2017-18)

Diploma in Computer Engineering/Information Technology

Year: Second

Semester: Fourth (w.e.f. Academic Year 2018-19)

Sr. No.	Course Code	Course Title	Teaching Scheme/Contact Hours			Examination Scheme					
			TH	TU	PR	Credits	MSE	ESE	TW	PR/OR	Total
1	DCE2201	Microprocessor and Interfacing	3	1		4	30	70			100
2	DCE2202	Data Communication and Networks	4			4	30	70			100
3	DCE2203	Software Engineering	3			3	30	70			100
4	DCE2204	Data Structure and Algorithms	3	1		4	30	70			100
5	DCE2205	Programming in Java	3			3	30	70			100
6	DCE2206	Hardware and Networks Lab			4	4			50	50#	100
7	DCE2207	Microprocessor Lab			2	2			25	25	50
8	DCE2208	Java Lab			2	2			25	25	50
9	DCE2209	Data Structures Lab			4	4			25	25#	50
		Total	16	2	12	30	150	350	125	125	750

Examination with External examiner

ESE: End Semester Examination

MSE: Mid-Semester Examination

Semester: III**Course: Database Management System****Course code: DCE2101****Teaching and Examination Scheme:****Credits: 4**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
3	--	1	3	70	30	--	--	100

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Read and draw E-R diagrams.
2. Select and nominate Primary and other keys from the database tables.
3. Write Logical and conditional statements for database query.
4. Create Normalized Database structure files using normal forms.
5. Develop procedures and functions.
6. Learn indexing and hashing techniques for data storing and retrieval.

Course Details:

UNIT	CONTENTS	HOURS	MARKS
I	1.1. Introduction: What is database? Purpose of Database systems. View of Data - Data Abstraction, Instances and schemas. Data Models - E-R Model, Relational Model, Other Data Model. Database Languages - Data Definition Language, Data Manipulation Language Database Users and User Interfaces, Database Administrator, Database system structure - Storage Manager, The Query processors. 1.2. Entity-Relationship Model: Entity sets, attributes, relationship sets. Constraints – Mapping Cardinalities, Participation constraints, Keys - Entity Sets, Relationship Sets. Entity-relationship diagram, Weak Entity Sets, Generalization, Aggregation, examples of E-R Model.	7	15
II	2.1. Relational Data Model: Relational Structure: Tables (Relations), Rows (Tuples), Domains. Keys: Candidate Key, Primary Key, Super Key, Alternate key, Foreign Key. 2.2. Integrity Constraints: Integrity constraints, Types of integrity constraints: Domain integrity constraint, Entity integrity constraint, Referential integrity constraint. 2.3. Query Language: Relational Algebra, Relational Calculus. 2.4. Relational Database Design: Pitfalls in relational database design, Functional Dependencies, Normalization, Types of Normalization 1NF, 2NF, 3NF, BCNF.	7	20
III	3.1. Structured Query Language (SQL):- Basic structure of SQL, Data Definition Language (create, alter, truncate, drop),	7	15

	Data Manipulation Language (insert, select, update, delete), set operators, aggregate functions, Joins, views. 3.2. Security and Integrity: Security and Authorization- Security violations, Authorization, Authorization and views. Security Specification in SQL (grant, revoke, commit, save point, rollback). Encryption and Authentication – Encryption Techniques, Authentication.		
IV	Advanced SQL: 4.1 Views: What are Views? Create View, Updating Views, Views and Joins, Views and Sub queries, What Views cannot do? Dropping Views. 4.2 Sequences: Creating Sequences, Altering Sequences, Dropping Sequences. 4.3 Indexes: Index Types, Creating of an Index: Simple Unique, and Composite Index, Dropping Indexes. 4.4 Synonyms: Creating Synonyms, Dropping a Synonym.	7	15
V	5.1 PL/SQL: Introduction of PL/SQL, Advantages of PL/SQL, The PL/SQL Block Structure, PL/SQL execution environment, PL/SQL data Types, Variables, Constants 5.2 Control Structure: Conditional Control, Iterative Control, Sequential Control. 5.3 Cursors: Implicit and Explicit Cursors, Declaring, Opening and Closing a Cursor, Fetching a Record from Cursor, Cursor for loops, Parameterized Cursors. 5.4 Procedures: Advantages, Creating, Executing and Deleting a Stored Procedure. 5.5 Functions: Advantages, Creating, Executing and Deleting a Function.	8	20
VI	DBMS Storage Structure And Access Methods: 6.1 File Structure: Storage Hierarchy, Sequential, Direct Access. 6.2 Indexing Techniques: 1. What is Indexing? Structure & operations on Index File. 2. Types of Indexes, Tree-Structure, B+ Tree Index. 6.3. Hashing Techniques: What is Hashing? Hash Function, Dynamic Hashing. Extendible Hashing.	6	15

Learning Resources:**A) Books:**

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Abraham, Silberschatz, Henry, Korth, S.Sudershan	Database System Concept	Tata Mc-Graw Hill Publications, Fifth Edition, 2005.

2	Vikram Vaswani	MySQL : The Complete Reference	Tata Mc-Graw Hill Publications, First Edition, 2001.
3	Ivan Bayross	SQL, PL/SQL – The Programming language of Oracle	BPB Publications, 4th Edition, 2009

B) Web sites for reference:

1. www.codex.cs.yale.edu
2. www.oracle.com/technology/index.html
3. www.dbms.ca/
4. www.mysqltutorial.org
5. <http://nptel.ac.in>

Semester: III**Course: Digital Techniques****Course code: DCE2102****Teaching and Examination Scheme:****Credits: 04**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
3	--	1	3	70	30	--	--	100

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Convert number in one number system to another: decimal, binary, octal and hexadecimal.
2. Design simple logic circuits.
3. Design MUX/DEMUX circuits.
4. Classify logic families using their characteristics.
5. Design of synchronous and asynchronous counter using flip-flops.
6. Differentiate between ADC and DAC.

Course Details:

UNIT	CONTENTS	HOURS	MARKS
I	1.1 NUMBER SYSTEMS: Digital numbers, Octal, decimal Hexadecimal, binary numbers, binary-addition, Subtraction, multiplication, division. Conversion of number system. Use of compliment in binary arithmetic, 9's and 10's compliment arithmetic. BCD number system. 1.2 LOGIC GATES: Study of basic AND, OR, NOT, NOR, EX-OR, EX-NOR, NAND logic gates. Realization of logic gates using universal gate.	8	20
II	2.1 BOOLEAN ALGEBRA: Fundamentals of Boolean Algebra, Basic laws, De- Morgan's Theorem, Evaluation of logic expression, algebraic reduction of Boolean Expressions, Introduction to logic design, Karnaugh map representation of logic functions, Simplification of logical function using K-map (2,3,4 variable), Sum of Products and Product of Sums, Don't care conditions. COMBINATIONAL LOGIC DESIGN: Design example-half adder, full adder, half subtractor, full subtractor, BCD to seven-segment decoder (using k-map), Gray to binary code converter (using K-map).	8	20

III	COMBINATIONAL LOGIC DESIGN USING MSI AND LSI CIRCUITS: Multiplexer (:1), de-multiplexer (1:4), Decoder (3:8), encoder (8:3) using combinational logic design, BCD adder using 7483, ALU (74181), Digital comparator (7485), Parity generator/checkers (74180). Code converters: BCD to binary (74184), Binary to BCD (74185A). Priority encoder – decimal to BCD (74147), octal to binary priority encoder (74148), Hex to binary priority encoder using 74148 encoders. Decoders/drivers for display device: BCD to decimal decoder/driver (7447, 7448).	8	16
IV	LOGIC FAMILIES: Digital integrated circuits – its introduction, Introduction to RTL, DTL, IIL, ECL, MOS families. Propagation delay time, speed, power consumption, fan-in, fan-out. Introduction to TTL and CMOS logic families. Analysis of open Collector and tri-state logic. Input/output parameters, advantages and applications. IC interfacing, TTL driving CMOS, CMOS driving TTL.	4	10
V	SEQUENTIAL LOGIC CIRCUITS: Introduction: one bit memory cell. Flip Flop – S-R, Clocked R-S, T, D, J-K, Master slave. Triggering of flip flops, analysis of clocked sequential circuits, state reduction and assignment, flip flop excitation table, design procedures, design of counters, and design with state equation. Registers, shift registers, working with SISO, SIPO, PIPO, and PISO shift registers. Counters – ripple counters, synchronous and asynchronous counters, timing sequences, Ring and Johnson counter, application of counters.	10	24
VI	ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERTERS: 6.1 DAC -Weighted resistor and R-2R ladder-circuit diagram, working, advantages and disadvantages-DAC specification. 6.2 ADC -Ramp, dual slope and successive approximation-circuit diagram, working, advantages and disadvantages-ADC-specification	4	10

Learning Resources:**A) Books:**

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Morris Mano	Digital Design	Pearson Education, 5 th edition
2	R.P. Jain	Modern Digital Electronics	Tata McGraw Hill, 6 th edition
3	Malvino Leach	Digital Principles	McGraw Hill, 4 th edition

B) Websites:

<http://nptel.ac.in>

Semester: III**Course: Object Oriented Programming****Course Code: DCE2103****Teaching and Examination Scheme:****Credits: 04**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
3	--	1	3	70	30	--	--	100

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Analyse OOP advantages over other programming concepts.
2. Select appropriate control structure to solve a given problem.
3. Design a class to implement data encapsulation.
4. Design a class using constructors and destructors.
5. Apply function overloading to implement polymorphism.
6. Apply inheritance mechanism to achieve code reusability.

Course Contents:

UNIT	CONTENTS	HOURS	MARKS
I	Principles of Object Oriented Programming and Elements of C++ Language: Basic concepts of OOP, Comparison of procedural programming and OOP, advantages of OOP, OOP Languages, Definitions, Class, objects, concepts of inheritance and encapsulation, Operator overloading, Dynamic binding over view of OOP using C++, Basic program construction, main and functions, Program statements, Class declaration, Comments, C++ compilation. Tokens and identifiers, Character sets and symbols, Keywords, C++ identifiers variables and constants, Integers and characters, Constants and symbolic constants, Dynamic initialization of variables, reference variables, Enumerated Variables, Data types, basic data types, Array and strings, User defined data types, Operators, manipulators, type conversions and type cast operators, console I/O: cin, cout functions, Control statements, The if statements, if-else, else....If : switch statements, loops: for and while do statements, break , continue, go to	7	15
II	Functions: Simple functions, declaration of functions, calling functions, function definition, passing arguments and returning values, passing constants and variables, reference variables and arguments, overloaded functions, inline functions, default arguments, returning by reference.	7	15
III	Classes and Objects: Declaration of classes and objects in C++, class definition, declaration of members, object as data types, object as function arguments, array of objects, returning objects	7	20

	from junction, structures and class.		
IV	Constructors and Destructors: Constructors, basic constructors, parameterized constructors, constructors with default arguments, dynamic initialization of objects, copy constructors, use of copy constructor, shallow copying and deep copying, dynamic constructors, destructors, constraints on constructors and destructors.	7	20
V	Operator Overloading, Polymorphism and Virtual Function: Overloading unary operators, operator keyword, arguments and return values, limitations of increment operators, overloading binary operators, and arithmetic operators. Examples: Addition of polar coordinates and concatenation of strings, multiple overloading, comparison operators, arithmetic and assignments operators, data and type conversions, conversion between basic types, conversion between objects and basic types, conversion between objects of different classes, constraints on type conversion. Virtual functions and polymorphism, friend functions and static functions, comparison of macros and inline functions.	7	15
VI	Inheritance: Derived class and base class, defining a derived class, accessing a base class members, the protected access specifier, derived class constructors, overriding the member functions, class inheritance, abstract base class, constructors and member functions, inheritance, public and private inheritance, access combinations and usage of access specifier, classes and structures, multiple inheritance, constructors in multiple inheritance, ambiguity in multiple inheritance	7	15

Learning Resources:**A) Books:**

Sr. No.	Author	Title	Publication
1	E. Balaguruswamy	Object Oriented Programming with C++	Tata McGraw Hill
2	Robert Lafore	Object Oriented Programming with C++	Galgotia Publication
3	Yashwant Kanetkar	Let us C++	BPB Publications

B) Websites:

<http://nptel.ac.in>

Semester: III**Course: Environmental and Sustainable Energy Technologies****Course code: DCE2104****Credits: 4****Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
3	--	1@	3	70	30	--	--	100

Course Outcomes: On successfully completion of this course, the students will be able to:

1. State importance of awareness about environment in general public
2. Define natural resources and identify problems associated with them.
3. Understand structure and functions of ecosystem.
4. Understand importance of biodiversity.
5. Discuss issues is environmental pollution.
6. Collect and organize information on different environment protection acts.

Course Details:

UNIT	CONTENTS	HOURS	MARKS
I	Nature of Environmental Studies: <ul style="list-style-type: none"> • Definition, Scope and Importance of the environmental studies • Importance of the studies irrespective of course • Need for creating public awareness about environmental issues 	6	10
II	Natural Resources and Associated Problems: 2.1 Renewable and Non-renewable resources: Definition, Associated problems 2.2 Forest Resources: <ul style="list-style-type: none"> • General description of forest resources • Functions and benefits of forest resources • Effects on environment due to deforestation, Timber extraction, Building of dams, waterways etc. 2.3 Water Resources: <ul style="list-style-type: none"> • Hydrosphere: Different sources of water • Use and overexploitation of surface and ground water • Effect of floods, draught, dams etc. on water resources and community 2.4 Mineral Resources: <ul style="list-style-type: none"> • Categories of mineral resources 	8	20

	<ul style="list-style-type: none"> Basics of mining activities Mine safety Effect of mining on environment 2.5 Food Resources: <ul style="list-style-type: none"> Food for all Effects of modern agriculture World food problem 		
III	Ecosystems: <ul style="list-style-type: none"> Concept of Ecosystem Structure and functions of ecosystem Energy flow in ecosystem Major ecosystems in the world 	6	15
IV	Environmental Pollution: <ul style="list-style-type: none"> Definition Air pollution: Definition, Classification, sources, effects, Prevention Water Pollution: Definition, Classification, sources, effects, prevention Soil Pollution: Definition, sources, effects, prevention Noise Pollution: Definition, sources, effects, Prevention 	6	15
V	E-waste Management: <ul style="list-style-type: none"> Composition of E-Waste and its generation rates across the world The various processes of informal E-Waste management and its ill-effects on health and society Formal Metal extraction processes from E-Waste Life-Cycle-Analysis (LCA) and sustainable engineering from electrical and electronics industry perspectives The existing E-Waste Management rules in India and comparison with other countries around the world The Extended Producer Responsibility (EPR) and other take-back system 	8	20
VI	Social Issues and Environment: <ul style="list-style-type: none"> Concept of development, sustainable development Water conservation, Watershed management, Rain water harvesting: Definition, Methods and Benefits Climate Change, Global warming, Acid rain, Ozone Layer Depletion, Nuclear Accidents and Holocaust: Basic concepts and their effect on climate Concept of Carbon Credits and its advantages 	8	20

@ Faculty may use tutorial hours for assignments, site visits and report preparation.

Learning Resources:**A) Books:**

Sr. No.	Author	Title	Publication
1	Anindita Basak	Environmental Studies	Person Education
2	R. Rajgopalan	Environmental Studies from Crises to Cure	Oxford University Press
3	Dr. R.J. Ranjit Daniels, Dr. Jagdish, Krishnamurthy	Environmental Studies	Wiley India
4	Peavy H.S., Rowe D.R., Tchobanoglous G.	Environmental Engineering	Tata McGraw Hill
5	Cunningham W.P., Cunningham M.A.	Principles of Environmental Science	Tata McGraw Hill
6	Johari R.	E-Waste: Implications, Regulations and Management in India and Current Global Best Practices	TERI Press, New Delhi

B) Websites:

1. World Wide Fund for Nature (WWF-I), New Delhi: <http://www.wwfindia.org>
2. Center for Science and Environment (CSE), New Delhi: <http://www.cseindia.org/>
3. Centre for Environment Education (CEE), Ahmedabad, <http://ceeindia.org/cee/index.html>
4. UttarkhandSevaNidhi (UKSN), Almora: <http://usnpss.org/>
5. BharatiVidyapeeth Institute of Environment Education and Research (BVIEER), Pune, ieer.bharativedyapeeth.edu/default.aspx
6. Salim Ali Center for Ornithology and Natural History (SACON), Coimbatore, <http://www.sacon.in/ptel.ac.in>
7. Wildlife Institute of India (WII), Dehradun, <http://www.wii.gov.in/>
8. Botanical Survey of India (BSI), <http://164.100.52.111/>
9. Zoological Survey of India (ZSI), <http://zsi.gov.in/>
10. Central Pollution Control Board, <http://www.cpcb.nic.in/>
11. National Environmental Engineering Research Institute, <http://neeri.res.in/>
12. Ministry of Environment and Forest, <http://envfor.nic.in/>
13. <http://nptel.ac.in>

Semester: III**Course: Web Page Design Lab****Course code: DCE2105****Teaching and Examination Scheme:****Credit: 6**

Teaching Scheme		Examination Scheme					
TH	PR	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
2	2	-	-	-	50#	50	100

Examination with external examiner

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Design simple web pages- using HTML.
2. Organize information using Tables, collect information from users using forms and present information using Frames.
3. Use style sheets to gain full control of formatting within Web page.
4. Embed multimedia in Web pages.
5. Integrate html pages, multimedia elements to develop Web sites.
6. Use Dreamweaver to develop web pages.

Course Details:

UNIT	CONTENTS	HOURS
I	<p>1.1 Introduction to Web Designing: Internet, Client server architecture, basics of Web site, Types of websites, Web publishing, Web contents, Static and Dynamic web Contents, How to host a website.</p> <p>1.2 Introduction to HTML: Components of HTML - Tags, Elements, Attributes, Closed and open tags, Structure tags -<DOCTYPE>, <HTML>, <HEAD>, <TITLE>, Meta tags <BODY> elements. Block level tags - Block Formatting, Heading, Paragraph, Comments, line breaks, alignment, divisions, text alignment and font size Text Level Tag - Bold, Italic, underlined, strike-through, superscript, Subscript. Horizontal Rules – colors in Web page, background color, Text color, Link color, Special characters. Lists - Ordered lists, Unordered lists, Definition list, Nesting lists The Div tag, The Object tag.</p> <p>1.3 Linking HTML Documents: URLs, types of URLs, absolute URLs, relative URLs, Linking HTML documents - The Anchor tag, Linking to document in same folder, Linking to document in different folder, Linking to Document on</p>	7

	the Web, Linking to specific location within document	
II	<p>2.1 Including Images and Sound: Image formats - GIF, JPEG, and PNG. The HTML img tag, Alignment, Height and Width, HSPACE and VSPACE, Wrapping Text, Image as a link, Image Maps, Embedding sound files-<code><embed></code>, <code></embed></code>, <code><bgsound></code>, <code></bgsound></code></p> <p>2.2 Tables: Tables - creating Basic tables, tags, table, tr, td, th. Editing of Rows and Columns of table - row span, column span, add caption. Formatting tables using attributes – display, border, border color, background, align width, no wrap, cell spacing, and cell height.</p>	4
III	<p>3.1 Forms and Frames: Creating Forms, Form controls, Text controls, Password fields, Radio Buttons, Check boxes, Reset and submit buttons. The <code><TEXTAREA></code>, <code><SELECT></code> and <code><OPTION></code> tags Frames -Introduction to frames, Advantages and disadvantages of using frames, creating Basic Frames, Frame targeting.</p> <p>3.2 DHML Style Sheets: Adding style to document, Linking to a style sheet, Embedding style Sheet, Using inline style, Style sheet properties, Font properties, Color and background properties, Text properties, Box properties</p>	5
IV	<p>Dreamweaver: Working with HTML Tables Creating HTML tables, Creating tables in standard mode, Sorting table data, Importing tables from other program</p>	3
V	<p>5.1 Dreamweaver: 5.1 Frames and Using CSS Using Cascading style sheets, Creating a new CSS rule, Working with external CSS files, Working with Div elements. Creating frames in Dreamweaver, Setting targets and links in frames, Changing frame Properties</p> <p>5.2 Dreamweaver: Working with Active Contents and HTML Forms Dreamweaver and Flash – Inserting SWF file, Creating and inserting Flash button, Inserting Flash video, Using HTML form controls – Radio buttons, Check boxes, Drop down list, Text field and Text area, Submit and Reset Button.</p> <p>5.3 Finalizing the Site: Using Browser Compatibility Feature, Working with Broken links, Publishing the Website, Changing local and remote sites, Site Management</p>	7
VI	Introduction to Content Management System like WordPress, Joomla, Drupal etc.	2

List of Experiments:

1. Create Web page and apply some block level tags, text level tags.
2. Create web pages using paragraph-formatting tags.
3. Use ordered list and unordered list in web page.

4. Create Web page using hyperlinks to same page and other pages.
5. Use Dreamweaver to include images with different alignments and wrapped text.
6. Use Meta tags.
7. Create two frames, one frame having URLs to images, when the URL is clicked, load the image in another frame.
8. Create tables and format tables using basic table tags and different attributes using Dreamweaver.
9. Create a frameset that divides browser window into horizontal and vertical framesets.
10. Create a simple HTML form using Dreamweaver.
11. Create Web page and apply style rules using Dreamweaver.
12. Use flash Animation in web pages using Dreamweaver.
13. Introduction and demonstration of any one CMS like WordPress, Drupal, Joomla, etc.

Software:

1. Browser: Microsoft Internet Explorer, Mozilla Firefox, Macromedia Dreamweaver CS3, Chrome
2. Editor: Notepad, Notepad++, Sublime etc.

Learning Resources:**A) Books:**

Sr.No.	AUTHOR	TITLE	PUBLISHER
1	Thomas a. Powell	HTML & XHTML : The Complete Reference	Tata McGraw Hill, 4 th Edition, 2003.
2	Kogent Solutions Inc.	Dreamweaver CS3 in Simple Steps	DreamTech Press, 2009.
3	D.S.Ray and E. J.Ray	Mastering HTML & XHTML	Sybex Publication, 2002.
4	Kris Jamsa, Konrad kind, Andy Anderson	HTML and Web Design Tips and Techniques	Tata McGraw Hill, 1 st Edition, 2002.

B) Websites:

1. www.wordpress.com
2. <http://nptel.ac.in>

Semester: III**Course: Database Lab****Course code: DCE2106****Teaching and Examination Scheme:****Credits: 02**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
--	2	--	--	--	--	50	25	75

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Create database table and apply integrity constraints.
2. Write and execute SQL queries using DDL, DML, and DCL
3. Write and execute SQL queries to implement Views.
4. Write and execute PL/SQL code using decision making and looping constructs.
5. Write and execute PL/SQL code to implement cursors.
6. Write and execute PL/SQL code to implement procedure and functions.

Intellectual skills

1. Write the fields of database
2. Decide proper specifications
3. Execute Query Processing and transaction processing.
4. Prepare appropriate data tables

Motor Skills:

1. Ability to handle keyboard and mouse.
2. Ability to work on SQL> prompt or editor.
3. Ability to handle syntactical and logical errors.
4. Ability to handle data.

List of Practical /Assignments / Experiments: (Use Oracle and MySQL to carry out the experiments):

1. Designing E-R diagrams. Designing a Normalized Database.
2. Creating & Executing DDL commands in SQL. & apply various Integrity constraints on table.
3. Creating & Executing DML commands in SQL.
4. Writing Queries using various operators & Arithmetic, String Functions.
5. Executing Data Conversion functions such as To_char (), To_Number () and To_date ().
6. Execute various Date functions and display special date formats using To_char () function.
7. Executing Queries using the Select Command with Where, Having, Group by and order by clauses also execute the queries using aggregate functions.
8. Execute the queries for implementation of Inner, Outer and Cross Join.
9. Executing DCL commands in SQL.
10. Implementation of Views.
11. Execute Indexes, Sequences, Snapshots and synonyms in SQL.
12. Write the basic PL/SQL Programs and using if then else, for, while and nested loop.
13. Write a PL/SQL code to implement implicit and explicit cursors.
14. Write PL/SQL Programs based on Exceptions handling
15. Write PL/SQL code for creating Procedures, functions.

Semester: III**Course: Digital Lab****Course code: DCE2107****Teaching and Examination Scheme:****Credits: 02**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
--	02	--	--	--	--	50	25	75

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Verify truth table of logic circuits.
2. Study data sheets of different ICs.
3. Assemble logic circuits.
4. Test the logic circuits.
5. Construct circuits using different ICs.
6. Debug and troubleshoot digital circuits

Skills to develop:**1. Intellectual skills:-**

- Identification and selection of IC's and components.
- Understand and interpret the circuit diagram.
- Understand and verify the working of given circuit using truth table.

2. Motor Skills:-

- Ability to mount the components and make connections.
- Ability to give various combinations of inputs.
- Ability to observe and record the output on truth table.
- Ability to read data sheets of components.

List of Practical /Assignments / Experiments:

1. Verify the truth tables of logic gates.
2. Construction of basic gates using universal gates.
3. Verification of De-Morgan's theorem.
4. To study digital IC datasheets and noting down the characteristics of TTL and CMOS logic Family
5. Construction of half adder and full adder.
6. Multiplexer using IC 74153.
7. Demultiplexer/Decoder.
8. Binary to gray code converter.
9. Verification of truth tables of flip-flops using ICs 7474, 7476.
10. Construction of shift register using IC 7495.
11. Design of decade counter using IC 7490.
12. To study digital to analog converter and analog to digital converter.

Semester: III Course: Object Oriented Programming Lab Course Code: DCE2108

Teaching and Examination Scheme:

Credits: 4

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
--	04	--	--	--	--	50#	50	100

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Develop simple C++ programs using control structures
2. Develop C++ programs using arrays and strings
3. Develop C++ programs using classes and objects
4. Use functions in C++ programs
5. Develop C++ programs using constructors and destructors
6. Implement various object oriented programming concepts like polymorphism, inheritance, virtual function using C++.

Skills to develop:

Intellectual Skills:

- Make use of constructors and destructors for initialization and memory management
- Select proper control structure for decision making
- Use proper looping structure in appropriate place
- Develop right type of function/procedure for modular programming

Motor skills:

- Operate the computer System
- Use and navigate integrated development environment

Suggested list of experiments:

1. Edit/Compile/Execute a Program to display some text on the screen.
2. Edit/Compile/Execute a Program to calculate the average of two numbers and display it on the screen.
3. Edit/Compile/Execute a Program to find the largest of three numbers using inline function.
4. Edit/Compile/Execute a Program to find the area of circle and triangle using function overloading.
5. Edit/Compile/Execute a Program to display a number triangle.
6. Edit/Compile/Execute a Program to find the largest number in an array.
7. Edit/Compile/Execute a Program to display details of a person.
8. Edit/Compile/Execute a Program to demonstrate the use of static data members.
9. Edit/Compile/Execute a Program to display a matrix.
10. Edit/Compile/Execute a Program to find the product of two matrices.
11. Edit/Compile/Execute a Program to compare two strings.

Semester: IV**Course: Microprocessor and Interfacing****Course code: DCE2201****Teaching and Examination Scheme:****Credits: 04**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
3	--	1	3	70	30	--	--	100

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Differentiate between Microprocessors and Microcontrollers.
2. Select and use proper instruction from set for assembly language program.
3. Convert algorithms to assembly language programs.
4. Write Procedure and Macro in Assembly Language Program
5. Draw memory-interfacing diagram.
6. Identify 8255 operating modes.

Course Contents:

UNIT	CONTENTS	HOURS	MARKS
I	Basics of Microprocessor: Evolution of Microprocessor and types 8085 Microprocessor: Salient features ,Pin description, Architecture of 8085, Functional Block diagram, Register organization	4	10
II	16 Bit Microprocessor: 8086 2.1 8086 Microprocessor: Salient features, Pin descriptions Architecture of 8086 - Functional Block diagram Register organization, Concepts of pipelining, Memory segmentation, Physical memory addresses generation. 2.2 Operating Modes of 8086: clock Generator, 8288 Bus Controller, 74LS245 Bidirectional Buffer 74LS373, Octal Latch, Minimum Mode operation and its timing diagram, Maximum Mode operation and its timing diagram.	8	20
III	Instruction Set of 8086 Microprocessor 3.1 Machine Language Instruction format, addressing modes 3.2 Instruction set, Groups of Instructions: Arithmetic Instructions, Logical Instructions, Data transfer instructions, Bit manipulation instructions, String Operation, Instructions, Program control transfer or branching Instructions, Process control Instructions.	8	20

IV	The Art of Assembly Language Programming: 4.1 Program development steps: Defining problem, Writing Algorithms, Flowchart, Initialization, checklist, Choosing instructions, Converting algorithms to assembly language programs. 4.2 Assembly Language Programming Tools: Editors, Assembler, Linker, Debugger. 4.3 Assembler directives and Operators	4	10
V	8086 Assembly Language Programming 5.1 Model of 8086 assembly language programs 5.2 Programming using assembler 5.3 Procedure and Macro in Assembly Language Program Defining Procedure - Directives used, FAR and NEAR, CALL and RET instructions, Re-entrant and Recursive procedures, Assembly Language Programs using Procedure 5.4 Defining Macros: Assembly Language Programs using Macros.	10	20
VI	6.1 System Interfacing: Interfacing Techniques (I/O mapped I/O, Memory mapped I/O, Memory & I/O addressing, 8086 addressing and address decoding, Memory interfacing as Even & Odd bank) 6.2 Programmable Peripheral Interface-8255 Features of 8255, Pin diagram, Block Diagram, Operation modes, Control word formats, 8255 Programming.	8	20

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	#Douglas Hall	Microprocessors and Interfacing, programming and Hardware	Second edition TMH
2	#Peter Abel and Nawaz Nizamuddin	IBM PC Assembly language and Programming	Pearson Education.
3	AK Ray and KM Burchandi	Advanced Microprocessors and Peripherals	Second edition TMH

Text Book

B) Websites:

<http://nptel.ac.in>

Semester: IV Course: Data Communication and Networks Course Code: DCE2202

Teaching and examination Scheme:

Credits: 04

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
4	--	--	3	70	30	--	--	100

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Compute signal to noise ratio, bandwidth and data transmission rate of communication channel.
2. Draw IEEE 802.11 architecture
3. Study characteristics of fiber optic cables.
4. Classify transmission errors.
5. Classify IP address.
6. Study different transmission layer protocols.

COURSE CONTENTS:

UNIT	CONTENTS	HOURS	MARKS
I	Concept of Data Communication & Networking: Data Communication – Protocols; Standards; Standards Organizations; Signal Propagation - Analog & Digital Signals; Bandwidth of signal & a medium; Data transmission rate and the bandwidth.	7	16
II	WAN and Wireless LAN: Connecting Devices: Repeaters, Active and Passive Hubs, Bridges, Routers, Two- and Three-layer switches, Gateway. Switching Basics - Circuit Switching; Packet Switching - Datagram approach, Virtual circuit approach; Message Switching, Frame Relay - Introduction; The need for Frame Relay; How Frame Relay works; Frame Relay frame format. Asynchronous Transfer Mode (ATM) – Introduction, Overview of ATM, Packet Size, ATM Cells, Switching, ATM layers. IEEE 802.11 - Architecture- BSS, ESS; Physical layer –FHSS, DSSS, OFDM; MAC layer – DCF, PCF, Bluetooth – Architecture; Bluetooth layers – Media layer, baseband layer, physical links, L2 CAP.	12	20
III	Fibre Optic Communication: Light Propagation - Basic Concepts, Reflection & Refraction, light into the cable; fibre Cables – Construction, Preposition effect, Fibre optic cable modes, Refractive indexes in	9	16

	fibre cores; Light Sources – Light connecting diodes, lasers; Optical detections, fibre Cable Losses - Connector and cable misalignment, Effects of bands in the cable, Absorption losses & scattering.		
IV	Transmission Errors-Detection & Correction Error classification – Delay distortion, Attenuation, Noise; Types of Errors; Error detection -Vertical redundancy check; longitudinal redundancy check; Cyclic redundancy check; Recovery from errors – Stop & Wait, Go-back-in, Sliding Windows.	8	16
V	Transport Protocols and IP Addressing: Connection oriented (TCP) and connectionless protocols (UDP). Internetworking, IPv4, Classful Addressing, Classless Addressing, Subnet, Supernet, NAT table, IPv6, Transition from IPv4 to IPv6.	10	16
VI	Distributed Application Application - Simple Network Management Protocol (SNMP); Simple Mail Transfer Protocol (SMTP); Multipurpose Internet Mail Extension (MIME); HyperText Transfer Protocol (HTTP); File Transfer Protocol (FTP), Uniform Resource Locator (URL).	10	16

Learning Resources:**A) Books:**

Sr. No.	Author	Title	Publisher
1	Achyut S. Godbole	Data Communication & Networking	Tata McGraw-Hill Edition
2	B.A. Forouzan	Data Communication & Networking	Tata McGraw-Hill Edition
3	Michal Miller	Data & Network Communication	Thomson Delmar Learning

B) Websites:

<http://nptel.ac.in>

Semester: IV**Course: Software Engineering****Course code: DCE2203****Teaching and Examination Scheme:****Credits: 3**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
3	--	--	3	70	30	--	--	100

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Understand Software, types, evolution of Software and Software Engineering.
2. Identify Process models and learn to apply them for SDLC. In addition, students will learn various software engineering practices.
3. Understand the Web Engineering, System Engineering, along with responsibilities and work of different roles involved.
4. Understand & Implement different requirement engineering tasks.
5. Build various Analysis model based on requirement gathered.
6. Understand Project Management and roles involved in Project management.

Course Details:

UNIT	CONTENTS	HOURS	MARKS
I	1.1. Introduction to Software Engineering: Evolving Role of Software, Software, Changing Nature of Software, Legacy Software, Software Myths, How it all start 1.2 A Generic View of Process: Software Engineering – A layered Technology, process framework, Capability Maturity Model Integration (CMMI), Process patterns, Process Assessment, Personal and Team Process Models, Process Technology, Product and Process.	8	20
II	Process Models: Perspective Models, Waterfall Model, Incremental Process Models (Incremental and RAD), Evolutionary Process Models (Prototyping and Spiral), Specialized Process model (Component Based Model), Unified process. Agile software development. Software Engineering Practice: Software Engineering Practice, Communication Practices, Planning Practices, Modelling Practices, Construction Practice, Deployment.	6	15

III	System Engineering: Computer based systems, System Engineering Hierarchy, Business processing Engineering, Product engineering, System Modelling, Role of Systems analyst, software analyst, Business analyst. Web Engineering: Client/Server Software Engineering, Web Engineering.	6	15
IV	Requirement Engineering: A bridge to design and construction, Requirement Engineering tasks, Initiating requirement engineering process, Eliciting requirements, Developing use-cases, building the analysis model, negotiating requirements, Validating requirements.	8	15
V	Building Analysis Model: Requirement Analysis, Analysis Modelling Approaches, Data Modelling Concepts, Object-Oriented Analysis, Scenario-Based Modelling, Flow Oriented Modelling, Class Based Modelling, Creating a behavioural Model.	8	20
VI	Project Management: Management Spectrum, The People, The Product, The Process, The Project, The W5HH Principle, Critical Practices.	6	15

Learning Resources:

A) Books:

Sr. No	Author	Title	Publisher
1	Roger S. Pressman	Software Engineering: A Practitioner Approach, Seventh edition.	McGraw Hill.
2	Umakant Shirshetti, Asawari Shiposkar	Software Engineering	Nirali Prakashan

C) Web sites for reference:

<http://nptel.ac.in/course.php>

Semester: IV**Course: Data Structures and Algorithms****Course Code: DCE2204****Teaching and Examination Scheme:****Credits: 04**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
3	--	1	3	70	30	--	--	100

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Classify data structures based on data organization.
2. Develop algorithms for processing of an array.
3. Develop algorithms for processing of linked lists.
4. Develop algorithms for processing of hierarchical non-linear data structure such as BST.
5. Develop algorithms for processing of Graphs.
6. Develop algorithms for various searching and sorting operations.

Course Contents:

UNIT	CONTENTS	HOURS	MARKS
I	Basic concepts of data: Data structure definition, representation of information inside Computer, Data structure operations, Algorithms: Definition, complexity, time-space trade-off. Pattern matching algorithms.	7	16
II	Arrays: Representation of arrays in memory, traversing, inserting and deleting, sorting: bubble sort, searching: linear and binary. Multidimensional arrays, matrices, Sparse matrix.	7	16
III	Linked list: Representation of linked list in memory, traversing, inserting and deleting, memory allocation and garbage collection. Sequential versus linked storage allocation.	7	16
IV	Stack: Array representation of stack, insertion (push) and deletion (pop), arithmetic expressions: polish notations, Quick sort. Queue: Array representation of queue, insertion and deletion. Recursion.	7	18
V	Tree Structure: Binary tree, binary search trees, Traversal, insertion and deletion algorithm, heap and heap sort.	7	18
VI	Graphs: Terminology and representation, graph traversal (DFS, BFS), connected components and spanning tree, minimum spanning tree, shortest path algorithm.	7	16

Learning Resources:**A) Books:**

Sr. No.	Author	Title	Publication
1	Seymour Lipschutz	Data Structures	McGraw Hill Schaum's series
2	Horowitz and Sahani	Data structures and algorithm	McGraw Hill

B) Websites:

<http://nptel.ac.in>

Semester: IV**Course: Programming in Java****Course Code: DCE2205****Teaching and Examination System:****Credits: 3**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
3	--	--	3	70	30	--	--	100

Examination with external examiner

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Develop simple Java programs using control structures
2. Develop Java programs using arrays and strings
3. Create user-defined packages
4. Create Java Applets
5. Implement inheritance mechanism in Java programs
6. Implement exception handling mechanism in Java programs

Course Contents:

UNIT	CONTENTS	HOURS	MARKS
I	1. FUNDAMENTALS OF OBJECT ORIENTED PROGRAMMING: Introduction, Object oriented paradigm, Basic concept of OOP, Benefits and applications of OOP. 2. JAVA EVOLUTION: Java History, Java Features, How java differs from c and c++, Java and Internet, Java and WWW, h/w and s/w requirements, Java environment. 3. OVERVIEW OF JAVA LANGUAGE: Java programs structure, Java Tokens, Java statements, JVM, Constant, variables, Data Types, Scope of variables.	7	16
II	1. OPERATORS AND EXPRESSIONS: Arithmetic, relational, logical, assignment, increment and decrement operators, Conditional operators, bitwise and special operators, Arithmetic expression, evaluation of expression, precedence of arithmetic operators, type of conversions in expression, operator's precedence and associativity. 2. DECISION MAKING, BRACHING AND LOOPING: Simple if, if-else, else if ladder. Switch statement, conditional operator, while statement, do..while, for, continue, break, labeled continue and labeled break statements.	7	16
III	1. ARRAY, STRINGS AND VECTORS: One-dimensional array, creating an array, two dimensional	7	18

	arrays, strings, vectors, wrapper classes. 2. JAVA APPLETs: Applet Basics: The Applet Class, Applet Architecture. An Applet Skeleton: Applet Initialization and termination. Simple Applet Display Methods: Requesting repainting, Using the status window, HTML APPLET tag, Passing parameters to applet, get Document Base(), and get Code Base(), show Document().		
IV	1. CLASSES, OBJECT AND METHODS: Defining a class , adding variables, adding methods, creating objects, accessing class members, constructor, method overloading, static members, overriding methods, final variables and methods, final class, finalize method, abstract method and classes, visibility control. 2. PACKAGES: PUTTING CLASSES TOGETHER: Introduction, Java API Packages, Using system packages, naming conventions, creating packages, accessing packages, using a package, adding a class to a package, hiding a packages.	7	18
V	INHERITANCE AND MULTIPLE INHERITANCES: Defining and subclass, subclass constructor, multilevel inheritance, hierarchical inheritance, defining interfaces, extending interfaces, implementing interfaces, accessing interface variables.	7	16
VI	EXCEPTION HANDLING: Fundamentals, Types, Why use Exception Handling, Hierarchy, Exception handling construct, Try-Catch-finally, Throw statement, Throw Clause, Creating your own clause.	7	16

Learning Resources:**A) Books:**

Sr. No.	Author	Title	Publication
1	E.Balguruswami	Programming with Java	Tata McGraw Hill
2	Deitel and Deitel	How to program java 2	Prentice Hall India
3	Herbert Schildt	Java2 Complete Reference	Tata McGraw Hill

B) Websites:

<http://nptel.ac.in>

Semester: IV**Course: Hardware and Networks Lab****Course code: DCE2206****Teaching and Examination System:****Credits: 4**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
-	4	-	-	-	-	50#	50	100

Examination with external examiner

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Identify motherboard types and troubleshoot it.
2. Select processor and memory for the system, Partition Hard disk and make it dual boot.
3. Troubleshoot peripherals, networks and test power supplies
4. Prepare machines as client and server nodes in the network.
5. Make Ethernet cable using crimping tools and RJ45, and test it using LAN Tester
6. Understand Data Transmission in Optical Fibre cable

Skills to develop:**Intellectual Skills:**

- Demonstrate working as a leader.
- Follow ethical practices and develop attitude to behave in a team.
- Classify IP addresses.
- Detect and correct errors in networks.
- Create of Subnet in LAN.
- Use different protocols for communication

Motor Skills:

- Follow safety practices at the workspaces.
- Practice good housekeeping for clean workspaces.
- Maintain tools and equipment for every situation.
- Creating Ethernet cable using crimping tool.
- Skill to operate hubs/switches.
- Skill to connect computers using Ethernet cable and wi-fi access points

List of Experiments:

1. a. Identify desktop and server by its type and verify its specifications
b. Identify type of laptop and verify its Specification
2. a. Identify hardware components on motherboard
b. Troubleshoot common problems of motherboard.
3. Configure BIOS settings
4. Partition and manage hard disk: format hard drives with different file systems.
5. Partition and manage hard disk, format hard drives with different file systems.

6. Install Operating System – Windows family (such as Windows 7, Windows 10, Windows server)
7. Install Operating System – Unix family (such as Linux/Ubuntu/Centos)
8. Troubleshoot Hard disk problems.
9.
 - a. Install local printer (Software configuration settings on printer and troubleshooting)
 - b. Share Printer in Network (Software configuration settings on printer and troubleshooting)
10. Set keyboard, mouse, monitor, Speaker, Microphone and LCD Projector
11. Install SMPS, measure voltage levels in main connectors of SMPS connecting various subsystems.
12. Troubleshoot computer system by diagnosing the problem
13. Use diagnostic software for fault finding and viruses
14. Creating client Server Model in LAB using WEB Servers.
15. Making Crossover and Straight through Ethernet cable using RJ45
16. To understand working, architecture of Optical Fibre & Fibre Optic Switch.
17. Creating Subnetting architecture, Subnet ids for given Network ID.
18. Creating Remote Desktop connection in LAN in Windows, TeamViewer over Internet.
19. Understanding DNS.
20. Identifying Static IP, Private IP and Class of given ip over LAN and Internet using ipconfig command

Learning Resources:

A) Books:

SR. NO	AUTHOR	TITLE	PUBLISHER
1	Stephen Biglow	Bigelow's Troubleshooting Maintaining & Repairing PCs	Tata McGraw Hill
2	D.Balasubramanian	Computer Installation & Servicing	Tata McGraw Hill
3	Scott Muller	Upgrading and Repairing PC's	Pearson Education

B) Web References:

- 1) <http://nptel.ac.in/courses/106106092/3>

Semester: IV**Course: Microprocessor Lab****Course code: DCE 2207****Teaching and Examination System:****Credit: 02**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
-	2	-	-	-	-	25	25	50

Examination with external examiner

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Select proper instruction for arithmetic and logical operation.
2. Identify pins of 8086 chip.
3. Install 8086 emulator.
4. Use 8086 emulator and its tools like editor, assembler, linker and debugger.
5. Trace and observe various components of emulator like flag register, symbol table, memory, ALU.
6. Debug and Troubleshoot ALP.

Intellectual skills:-

- Use of programming language construct in programme implementation.
- To be able to apply different logics to solve given problems.
- Understand different types of errors as syntax, semantic, fatal, linker and logical.
- Understand debugging of programme.

Motor Skill:-

- Proper handling of computer system.
- Skill to draw flow chart.
- Skill to write the algorithm.
- Skill to run the programme.

List of Experiments:

1. To understand 8086 microprocessor architecture & memory segmentation.
2. Study of 8086 Instruction set & identify the ALP tools like Assembler/linker/debugger/editor.
3. Edit, compile and execute an ALP to perform arithmetic operation
4. Edit, compile and execute an ALP to perform logical operation (AND/OR/NOT/Ex-OR)
5. Edit, compile and execute an ALP to perform data block transfer.
6. Edit, compile and execute an ALP to perform data block exchange.
7. Edit, compile and execute an ALP to find smallest/largest number from array of n numbers.
8. Edit, compile and execute an ALP to arrange numbers in array in ascending/ descending order.
9. Edit, compile and execute an ALP to find sum of series of numbers.
10. Edit, compile and execute an ALP to compare two strings.
11. Edit, compile and execute an ALP to perform string operations.
12. Edit, compile and execute an ALP to convert Hex to Decimal, Decimal to Hex.
13. Edit, compile and execute an ALP to count even and odd numbers.
14. Edit, compile and execute an ALP to count positive and negative numbers

Semester: IV**Course: Java Lab****Course code: DCE2208****Teaching and Examination System:****Credit: 02**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
-	2	-	-	-	-	25	25	50

Examination with external examiner

Course Outcomes: On successfully completion of this course, the students will be able to:

1. Develop simple Java programs using control structures
2. Develop Java programs using arrays and strings
3. Create user-defined packages
4. Create Java Applets
5. Implement inheritance mechanism in Java programs
6. Implement exception handling mechanism in Java programs

Skills to develop:**Intellectual Skills:**

- Make use of constructors and destructors for initialization and memory management
- Select proper control structure for decision making
- Implement inheritance mechanism
- Make use of exception handling mechanism

Motor skills:

- Operate the computer System
- Use and navigate integrated development environment

List of Experiments:

1. Edit, compile, execute and test a Java program that make use of arithmetic, relational, logical and special operators.
2. Edit, compile, execute and test a Java program that make use of branching and decision making statements.
3. Edit, compile, execute and test a Java program that make use of looping statements.
4. Edit, compile, execute and test a Java program to implement constructors.
5. Edit, compile, execute and test a java program that uses single and multidimensional arrays
6. Edit, compile, execute and test a Java program that uses strings
7. Edit, compile, execute and test a Java program that uses vectors
8. Edit, compile, execute and test Java applets
9. Edit, compile, execute and test user defined Java packages
10. Edit, compile, execute and test inheritance and interfaces in Java program
10. Edit, compile, execute and test exception-handling routines in Java program

Semester: IV**Course: Data Structures Lab****Course Code: DCE2209****Teaching and Examination Scheme:****Credits: 04**

Teaching Scheme			Examination Scheme					
TH	PR	TU	PAPER HOURS	ESE	MSE	PR/OR	TW	TOTAL
-	04	-	-	-	-	25#	25	50

Course Outcomes: The students will be able to:

1. Develop a program for operations on arrays
2. Develop e a program for operations on linked lists
3. Develop a program for operations on Stacks and Queues
4. Develop a program for operations on Binary Trees
5. Develop a program for operations on graphs
6. Develop programs on Sorting and Searching algorithms.

Skills to Develop:**Intellectual Skills:**

- Intellectual skills:
- Classify data structures.
- Select the appropriate data structure.
- Apply the different searching and sorting techniques.
- Apply different algorithms to solve the real world problem

Motor Skills:

- Operate the computer System
- Use and navigate integrated development environment

Suggested list of experiments:

1. Edit, compile, execute and test a Program to find largest number in an array
2. Edit, compile, execute and test a Program to find a pattern in a given text
3. Edit, compile, execute and test a Program to implement bubble sort algorithm
4. Edit, compile, execute and test a Program to implement linear search algorithm
5. Edit, compile, execute and test a Program to implement binary search algorithm
6. Edit, compile, execute and test a program to insert and delete an element in linked list
7. Edit, compile, execute and test a Program to implement quick sort algorithm
8. Edit, compile, execute and test a Program to find the product of two matrices
9. Edit, compile, execute and test a Program to insert an element into BST
10. Edit, compile, execute and test a Program to implement Warshall's algorithm to find the shortest path between all pair of nodes in a graph