



DIPLOMA IN ENGINEERING AND TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

Course Code : 1046

SEMESTER PATTERN

N – SCHEME

IMPLEMENTED FROM 2020 - 2021

CURRICULUM DEVELOPMENT CENTRE

**DIRECTORATE OF TECHNICAL EDUCATION
CHENNAI-600 025, TAMIL NADU**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING/TECHNOLOGY SYLLABUS (II / III YEAR)**

N Scheme

(Implemented from Academic Year 2020-21 onwards)

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Director, Directorate of Technical Education, Chennai-25

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DIPLOMA IN INFORMATION TECHNOLOGY (1046)

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DIPLOMA COURSES IN ENGINEERING/TECHNOLOGY
(SEMESTER SYSTEM)
(Implemented from 2020 - 2021)
N – SCHEME
REGULATIONS*

**Applicable to the Diploma Courses other than Diploma in Hotel Management & Catering Technology.*

1. Description of the Course:

a. Full Time (3 years)

The Course for the Full Time Diploma in Engineering shall extend over a period of three academic years, consisting of 6 semesters* and the First Year is common to all Engineering Branches.

b. Sandwich (3½ years)

The Course for the Sandwich Diploma in Engineering shall extend over a period of three and half academic years, consisting of 7 semesters* and the First Year is common to all Engineering Branches. The subjects of three years full time diploma course being regrouped for academic convenience.

During 4th and/or during 7th semester the students undergo industrial training for six months / one year. Industrial training examination will be conducted after completion of every 6 months of industrial training.

c. Part Time (4 years)

The course for the Part Time Diploma in Engineering shall extend over a period of 4 academic years containing of 8 semesters*, the subjects of 3 year full time diploma courses being regrouped for academic convenience.

*** Each Semester will have 16 weeks duration of study with 35 hrs. / Week for Regular Diploma Courses and 18 hrs. / Week for Part-Time Diploma Courses.**

The Curriculum for all the 6 Semesters of Diploma courses (Engineering & Special Diploma Courses viz. Textile Technology, Leather Technology, Printing Technology, Chemical Technology etc.) have been revised and revised curriculum is applicable for the candidates admitted from 2020 – 2021 academic year onwards.

2. Condition for Admission:

Condition for admission to the Diploma courses shall be required to have passed in The S.S.L.C Examination of the Board of Secondary Education, Tamil Nadu.

(Or)

The Anglo Indian High School Examination with eligibility for Higher Secondary Course in Tamil Nadu.

(Or)

The Matriculation Examination of Tamil Nadu.

(Or)

Any other Examinations recognized as equivalent to the above by the Board of Secondary Education, Tamil Nadu.

Note: In addition, at the time of admission the candidate will have to satisfy certain minimum requirements, which may be prescribed from time to time.

3. Admission to Second year (Lateral Entry):

A pass in HSC (academic) or (vocational) courses mentioned in the Higher Secondary Schools in Tamil Nadu affiliated to the Tamil Nadu Higher Secondary Board with eligibility for University Courses of study or equivalent examination & Should have studied the following subjects.

A pass in 2 Years ITI with appropriate Trade or Equivalent examination.

Sl. No	Courses	H.Sc Academic	H.Sc Vocational		Industrial Training Institutes Courses
		Subjects Studied	Subjects Studied		
			Related subjects	Vocational subjects	
1.	All the Regular and Sandwich Diploma Courses	Physics and Chemistry as compulsory along with Mathematics / Biology	Maths / Physics / Chemistry	Related Vocational Subjects Theory & Practical	2 years course to be passed with appropriate Trade
2.	Diploma Course in Commercial Practice	English & Accountancy English & Elements of Economics English & Elements of Commerce	English & Accountancy, English & Elements of Economics, English & Management Principles & Techniques, English & Typewriting	Accountancy & Auditing, Banking, Business Management, Co-operative Management, International Trade, Marketing & Salesmanship, Insurance & Material Management, Office Secretaryship.	-

- For the Diploma Courses related with Engineering/Technology, the related / equivalent subjects prescribed along with Practicals may also be taken for arriving the eligibility.
- Branch will be allotted according to merit through counseling by the respective Principal as per communal reservation.
- For admission to the Textile Technology, Leather Technology, Printing Technology, Chemical Technology and Commercial Practice Diploma courses the candidates studied the related subjects will be given first preference.
- *Candidates who have studied Commerce Subjects are not eligible for Engineering Diploma Courses.*

4. Age Limit: No Age limit.

5. Medium of Instruction: English

6. Eligibility for the Award of Diploma:

No candidate shall be eligible for the Diploma unless he/she has undergone the prescribed course of study for a period of not less than 3 academic years in any institution affiliated to the State Board of Technical Education and Training, Tamil Nadu, when joined in First Year and two years if joined under Lateral Entry scheme in the second year and passed the prescribed examination.

The minimum and maximum period for completion of Diploma Courses are as given below:

Diploma Course	Minimum Period	Maximum Period
Full Time	3 Years	6 Years
Full Time (Lateral Entry)	2 Years	5 Years
Sandwich	3½ Years	6½ Years
Part Time	4 Years	7 Years

This will come into effect from N Scheme onwards i.e. from the academic year 2020-2021.

7. Subjects of Study and Curriculum outline:

The subjects of study shall be in accordance with the syllabus prescribed from time to time, both in theory and practical subjects.

The curriculum outline is given in Annexure – I.

8. Examinations:

Board Examinations in all subjects of all the semesters under the scheme of examinations will be conducted at the end of each semester.

The internal assessment marks for all the subjects will be awarded on the basis of continuous internal assessment earned during the semester concerned. For each subject 25 marks are allotted for internal assessment. Board Examinations are conducted for 100 marks and reduced to 75.

The total marks for result are $75 + 25 = 100$ Marks.

9. Continuous Internal Assessment:

A. For Theory Subjects:

The Internal Assessment marks for a total of 25 marks, which are to be distributed as follows:

i) Subject Attendance

5 Marks

(Award of marks for subject attendance to each subject Theory/Practical will be as per the range given below)

80%	-	83%	1 Mark
84%	-	87%	2 Marks
88%	-	91%	3 Marks
92%	-	95%	4 Marks
96%	-	100%	5 Marks

ii) Test

10 Marks

2 Tests each of 2 hours duration for a total of 50 marks are to be conducted. Average of the these two test marks will be taken and the marks to be reduced to:

05 Marks

The Test – III is to be the Model Examination covering all the five units and the marks obtained will be reduced to :

05 Marks

TEST	UNITS	WHEN TO CONDUCT	MARKS	DURATION
Test I	Unit – I & II	End of 6 th week	50	2 Hrs
Test II	Unit – III & IV	End of 12 th week	50	2 Hrs
Test III	Model Examination: Covering all the 5 Units. (Board Examinations-question paper-pattern).	End of 16 th week	100	3 Hrs

-From the Academic Year 2020 – 2021 onwards.

Question Paper Pattern for the Test - I and Test – II is as follows. The tests should be

conducted by proper schedule. Retest marks should not be considered for internal assessment.

Without Choice:

Part A Type questions:	6 Questions × 1 mark	06 marks
Part B Type questions:	7 Questions × 2 marks	14 marks
Part C Type questions:	2 Questions × 15 marks	30 marks
	Total	50 marks

iii) Assignment

5 Marks

For each subject Three Assignments are to be given each for 20 marks and the average marks scored should be reduced for 5 marks.

iv) Seminar Presentation

5 Marks

The students have to select the topics either from their subjects or general subjects which will help to improve their grasping capacity as well as their capacity to express the subject in hand. The students will be allowed to prepare the material for the given topic using the library hour and they will be permitted to present seminar (For First and Second Year, the students will be permitted to present the seminar as a group not exceeding six members and each member of the group should participate in the presentation. For the Third Year, the students should present the seminar individually.)

The seminar presentation is mandatory for all theory subjects and carries 5 marks for each theory subject. The respective subject faculty may suggest topics to the students and will evaluate the submitted materials and seminar presentation. (2 ½ marks for the material submitted in writing and 2 ½ marks for the seminar presentation). For each subject minimum of two seminars are to be given and the average marks scored should be reduced to 5 marks.

All Test Papers, Assignment Papers / Notebooks and the seminar presentation written material after getting the signature with date from the students must be kept in safe custody in the department for verification and audit. It should be preserved for one

semester after publication of Board Exam results and produced to the flying squad and the inspection team at the time of inspection/verification.

B. For Practical Subjects:

The Internal Assessment mark for a total of 25 marks which are to be distributed as follows:-

a) Attendance	: 5 Marks
(Award of marks same as theory subjects)	
b) Procedure/ observation and tabulation/ Other Practical related Work	: 10 Marks
c) Record writing	: 10 Marks
TOTAL	: 25 Marks

- *All the Experiments/Exercises indicated in the syllabus should be completed and the same to be given for final Board examinations.*
- The observation note book / manual should be maintained for 10 marks. The observation note book / manual with sketches, circuits, programme, reading and calculation written by the students manually depends upon the practical subject during practical classes should be evaluated properly during the practical class hours with date.
- The Record work for every completed exercise should be submitted in the subsequent practical classes and marks should be awarded for 10 marks for each exercise as per the above allocation.
- At the end of the Semester, the average marks of all the exercises should be calculated for 20 marks (including Observation and Record writing) and the marks awarded for attendance is to be added to arrive at the internal assessment mark for Practical. (20+5=25 marks)
- Only regular students, appearing first time have to submit the duly signed bonafide record note book/file during the Practical Board Examinations.

All the marks awarded for Assignments, Tests, Seminar presentation and Attendance should be entered periodically in the Personal Theory Log Book of the staff, who is handling the theory subject.

The marks awarded for Observation, Record work and Attendance should be entered periodically in the Personal Practical Log Book of the staff, who is handling the practical subject.

10. Communication Skill Practical, Computer Application Practical and Physical Education:

The Communication Skill Practical and Computer Application Practical with more emphasis are being introduced in First Year. Much Stress is given to increase the Communication skill and ICT skill of students. As per the recommendation of MHRD and under Fit India scheme, the Physical education is introduced to encourage students to remain healthy and fit by including physical activities and sports.

11. Project Work and Internship:

The students of all the Diploma Courses have to do a Project Work as part of the Curriculum and in partial fulfillment for the award of Diploma by the State Board of Technical Education and Training, Tamil Nadu. In order to encourage students to do worthwhile and innovative projects, every year prizes are awarded for the best three projects i.e. institution wise, region wise and state wise. **The Project work must be reviewed twice in the same semester. The project work is approved during the V semester by the properly constituted committee with guidelines.**

a) Internal assessment mark for Project Work & Internship:

Project Review I	...	10 marks
Project Review II	...	10 marks
Attendance	...	05 marks (Award of marks same as theory subject pattern)
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Total	...	25 marks
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Proper record should be maintained for the two Project Reviews and preserved for one semester after the publication of Board Exams results. It should be produced to the flying squad and the inspection team at the time of inspection/verification.

b) Allocation of Marks for Project Work & Internship in Board Examinations:

Demonstration/Presentation	25 marks
Report	25 marks
Viva Voce	30 marks
Internship Report	20 marks

Total

100* marks

*Examination will be conducted for 100 marks and will be converted to 75 marks.

c) Internship Report:

The internship training for a period of two weeks shall be undergone by every candidate at the end of IV / V semester during vacation. The certificate shall be produced along with the internship report for evaluation. The evaluation of internship training shall be done along with final year "Project Work & Internship" for 20 marks. The internship shall be undertaken in any industry / Government or Private certified agencies which are in social sector / Govt. Skill Centres / Institutions / Schemes.

A neatly prepared PROJECT REPORT as per the format has to be submitted by individual student during the Project Work & Internship Board examination.

12. Scheme of Examinations:

The Scheme of examinations for subjects is given in Annexure - II.

13. Criteria for Pass:

1. No candidate shall be eligible for the award of Diploma unless he/she has undergone the prescribed course of study successfully in an institution approved by AICTE and

affiliated to the State Board of Technical Education & Training, Tamil Nadu and pass all the subjects prescribed in the curriculum.

2. A candidate shall be declared to have passed the examination in a subject if he/she secures not less than *40% in theory subjects* and *50% in practical subjects* out of the total prescribed maximum marks including both the Internal Assessment and the Board Examinations marks put together, subject to the condition that he/she secures at least a minimum of *40 marks out of 100 marks in the Board Theory Examinations* and a minimum of *50 marks out of 100 marks in the Board Practical Examinations*.

14. **Classification of successful candidates:**

Classification of candidates who will pass out the final examinations from April 2023 onwards (Joined first year in 2020 -2021) will be done as specified below.

First Class with Superlative Distinction:

A candidate will be declared to have passed in **First Class with Superlative Distinction** if he/she secures not less than 75% of the marks in all the subjects and passes all the semesters in the first appearance itself and passes all subjects within the stipulated period of study 2 / 3 / 3½ / 4 years [Full time(lateral entry)/Full Time/Sandwich/Part Time] without any break in study.

First Class with Distinction:

A candidate will be declared to have passed in **First Class with Distinction** if he/she secures not less than 75% of the aggregate marks in all the semesters put together and passes all the semesters except the I and II semester in the first appearance itself and passes all subjects within the stipulated period of study 2 / 3 / 3½ / 4 years [Full time(lateral entry)/Full Time/Sandwich/Part Time] without any break in study.

First Class:

A candidate will be declared to have passed in **First Class** if he/she secures not less than 60% of the aggregate marks in all the semesters put together and passes all the

subjects within the stipulated period of study 2 / 3 / 3½ / 4 years [Full time(lateral entry)/Full Time/Sandwich/Part Time] without any break in study.

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Second Class:

All other successful candidates will be declared to have passed in **Second Class**.

The above classifications are also applicable for the Sandwich / Part-Time students who pass out Final Examination from October 2023 /April 2024 onwards (both joined First Year in 2020 -2021)

15. Duration of a period in the Class Time Table:

The duration of each period of instruction is 1 hour and the total period of instruction hours excluding interval and lunch break in a day should be uniformly maintained as 7 hours corresponding to 7 periods of instruction (Theory & Practical).

ANNEXURE – I**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU****1052 : DIPLOMA IN INFORMATION TECHNOLOGY SYLLABUS****N-SCHEME****(To be implemented from the year 2020-21 onwards)****CURRICULUM OUTLINE****III SEMESTER**

COL NO.	SUBJECT CODE	SUBJECT	HOURS PER WEEK		
			THEORY	PRACTICAL	TOTAL
1	4052310	Basics of Electrical & Electronics Engineering	5	-	5
2	4046320	Operating System and Computer Architecture	5	-	5
3	4052330	C programming and Data structures	6		6
4	4052340	Electrical and Electronics Engineering Practical	-	4	4
5	4052350	Linux Practical		4	4
6	4052360	C programming and Data Structures Practical	-	4	4
7	4052370	E-Publishing Practical	-	4	4
			16	16	32
		Physical Education			2
		Library			1
	Total				35

IV SEMESTER

COL NO.	SUBJECT CODE	SUBJECT	HOURS PER WEEK		
			THEORY	PRACTICAL	TOTAL
	4046410	Computer Networks and Cyber Security	5	-	4
2	4052420	Web Design and Programming	5	-	5
3	4052430	Object Oriented Programming with Java	5	-	5
4	4052440	RDBMS	5	-	5
5	4052450	Web Design and Programming Practical	-	4	4
6	4052460	Java Programming Practical	-	4	5
7	4052470	RDBMS Practical	-	4	4
			20	12	32
		Physical Education	-		2
		Library	-		1
	TOTAL		20	12	35

V SEMESTER

COL NO.	SUBJECT CODE	SUBJECT	HOURS PER WEEK		
			THEORY	PRACTICAL	TOTAL
1	4046510	System Administration and Network Services	6	-	6
2	4052510	Python Programming	5	-	5
3		ELECTIVE – I - THEORY			
	4052531	Component Based Technology	5	-	5
	4052532	Artificial Intelligence and Data analytics			
	4046533	Mobile Application Development			
4	4046540	System Administration and Network Services Practical	-	4	4
5	4052540	Python Programming Practical	-	4	4
6		ELECTIVE – I - PRACTICAL			
	4052561	Component Based Technology Practical	-	4	4
	4052562	Data analytics using python Practical			
	4046563	Mobile Application Development Practical			
7	4052570	Entrepreneurship and Startup		4	4
			16	16	32
		Physical Education			2
		Library	-		1
	TOTAL		16	16	35

VI SEMESTER

COL NO.	SUBJECT CODE	SUBJECT	HOURS PER WEEK		
			THEORY	PRACTICAL	TOTAL
1	4052610	Computer Hardware and Servicing	6	-	6
2	4046620	Software Testing	5	-	5
3		ELECTIVE – II - THEORY			
	4046631	Social Networking and Ethical Hacking	5	-	5
	4052632	Multimedia Systems			
	4052633	Data science and Big Data			
4	4052640	Computer Hardware and Networking Practical	-	6	6
5		ELECTIVE – II - PRACTICAL			
	4046651	Social Networking and Ethical Hacking Practical	-	4	4
	4052652	Multimedia Systems Practical			
	4052653	Data science and Big Data Practical			
6	4052660	Project work and Internship		6	6
			16	16	32
		Physical Education			2
		Library	-		1
	TOTAL				35

ANNEXURE – II**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU****1046 : DIPLOMA IN INFORMATION TECHNOLOGY SYLLABUS****N-SCHEME****(To be implemented from the year 2020-21 onwards)****SCHEME OF EXAMINATION****III SEMESTER**

Col No	CODE	SUBJECT	Examination Marks			Minimum for Pass	Duration
			Internal	External *	Total		
1	4052310	Basics of Electrical and Electronics Engineering	25	100	100	40	3
2	4046320	Operating System and Computer Architecture	25	100	100	40	3
3	4052330	C Programming and Data structures	25	100	100	40	3
4	4052340	Electrical and Electronics Engineering Practical	25	100	100	50	3
5	4052350	Linux Practical	25	100	100	50	3
6	4052360	C Programming and Data Structures Practical	25	100	100	50	3
7	4052370	E Publishing Practical	25	100	100	50	3

IV SEMESTER

Col No	CODE	SUBJECT	Examination Marks			Minimum for Pass	Duration
			Internal	External *	Total		
1	4046410	Computer Networks and Cyber Security	25	100	100	40	3
2	4052420	Web design and Programming	25	100	100	40	3
3	4052430	Object Oriented Programming with Java	25	100	100	40	3
4	4052440	RDBMS	25	100	100	40	3
5	4052450	Web design and Programming Practical	25	100	100	50	3
6	4052460	Java Programming Practical	25	100	100	50	3
7	4052470	RDBMS Practical	25	100	100	50	3

VSEMESTER

Col No	CODE	SUBJECT	Examination Marks			Minimum for Pass	Duration
			Internal	External *	Total		
1	4046510	System Administration and Network Services	25	100	100	40	3
2	4052510	Python Programming	25	100	100	40	3
3		Elective Theory-I					
	4052531	Component Based Technology	25	100	100	40	3
	4052532	Artificial Intelligence and Data analytics	25	100	100	40	3
	4046533	Mobile Application Development Practical	25	100	100	40	3
4	4046540	System Administration and Network Services Practical	25	100	100	50	3
5	4052540	Python Programming Practical	25	100	100	50	3
6		Elective Practical-I					
	4052561	Component Based Technology Practical	25	100	100	50	3
	4052562	Data analytics using Python Practical	25	100	100	50	3
	4046563	Mobile Application Development Practical	25	100	100	50	3
7	4052570	Entrepreneurship and Startup	25	100	100	50	3

VI SEMESTER

Col No	SUBJECT CODE	SUBJECT	Examination Marks			Minimum For pass	Duration
			Internal	External *	Total		
1	4052610	Computer Hardware and Servicing	25	100	100	40	3
2	4046620	Software Testing	25	100	100	40	3
3		Elective Theory-II					
	4046631	Social Networking and Ethical Hacking	25	100	100	40	3
	4052632	Multimedia Systems	25	100	100	40	3
	4052633	Data science and Big Data	25	100	100	40	3
4	4052640	Computer Hardware and Networking Practical	25	100	100	50	3
5		Elective Practical - II					
	4046651	Social Networking and Ethical Hacking Practical	25	100	100	50	3
	4052652	Multimedia Systems Practical	25	100	100	50	3
	4052653	Data Science and Big Data Practical	25	100	100	50	3
6	4052660	Project work and Internship	25	100	100	50	3

* External Marks are conducted for 100 Marks and converted to 75 Marks

LIST OF EQUIVALENT PAPERS OF M SCHEME TO N-SCHEME

M-SCHEME		N-SCHEME	
III SEMESTER			
SUB CODE	SUBJECT	SUB CODE	SUBJECT
35231	Basics of Electrical & Electronics Engineering	4052310	Basics of Electrical & Electronics Engineering
35232	Operating systems	4046320	<i>Operating System and Computer Architecture</i>
35233	C Programming	4052330	C Programming and Data Structures
35234	Electrical and Electronics Practical	4052340	Electrical and Electronics Practical
35235	Linux Practical	4052350	Linux Practical
35236	C Programming Practical	4052360	C Programming and Data Structures Practical
35237	Computer Application practical	40002	Computer Application practical
IV SEMESTER			
34641	Management Information Systems	NO ALTERNATE	
34642	Information Security	NO ALTERNATE	
35243	Object Oriented Programming with Java	4052430	Object Oriented Programming with Java
35244	Data structures using C	4052330	C Programming and Data Structures
35245	Java Programming Practical	4052460	Java Programming Practical
35246	Data structures using C Practical	4052360	C Programming and Data Structures Practical
30002	Life and Employability Skill Practical	40001	Communication Skill Practical

EQUIVALENT PAPERS OF M-SCHEME

M-SCHEME		N-SCHEME	
V SEMESTER			
35251	Web Programming	4052420	Web Design and Programming
35252	Relational Database Management system	4052440	Relational Database Management system
35253	Component Based Technology	4052531	Component Based Technology
35271	Software Engineering	4052631	Software Engineering
35272	Cloud Computing	4052520	Cloud Computing and Internet of Things
35255	Web Programming practical	4052450	Web Design and Programming practical
35256	Relational Database Management system practical	4052470	Relational Database Management system practical
35257	Component Based Technology practical	4052561	Component Based Technology practical
VI SEMESTER			
34661	Advanced Java Programming		NO ALTERNATE
35262	Mobile Computing	4052533	Mobile Computing
35281	Multimedia Systems	4052632	Multimedia Systems
34682	Computer Hardware and Networks		NO ALTERNATE
34664	Advanced Java Programming Practical		NO ALTERNATE
35265	Mobile Computing Practical	4052563	Mobile Computing Practical
35283	Multimedia Systems Practical	4052652	Multimedia Systems Practical
34684	Computer Hardware and Networking Practical	4052640	Computer Hardware and Networking Practical
35267	Project work		NO ALTERNATE

SEMESTER – III



DIRECTORATE OF TECHNICAL EDUCATION
DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

III SEMESTER

2020 - 2021 onwards

**4052310 – BASICS OF ELECTRICAL AND
ELECTRONICS ENGINEERING**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS**

N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology.

Subject Code : 4052310

Semester : III

Subject Title : Basics of Electrical and Electronics Engineering

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
Basics of Electrical and Electronics Engineering	5	80	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	AC FUNDAMENTALS, BATTERIES AND UPS	13
II	TRANSFORMER AND SPECIAL MOTORS	12
III	SEMICONDUCTOR DEVICES	16
IV	BOOLEAN ALGEBRA, LOGIC GATES AND COMBINATIONAL SYSTEMS	16
V	SEQUENTIAL LOGIC SYSTEM	16
Test & Model Exam		7
TOTAL		80

RATIONALE:

Diploma Engineers from all branches of engineering are expected to have some basic knowledge of electrical and electronics engineering. Also the technicians working in different engineering fields have to deal with various types of electrical equipments. Various types of electronic circuits are used in different electrical equipments. Hence it is necessary to study electric circuits, different types of electrical machines and electronic devices their principles and working characteristics. The basic concepts studied in this subject will be very useful for understanding of higher level subjects in further study.

OBJECTIVES:

On completion of the following units of syllabus contents, the students must be able to

- Understand the AC fundamentals.
- Understand the working principle of UPS.
- Know about stepper motors and servomotors.
- Familiarize with semiconductor devices, rectifier circuits, transistors and its applications.
- Use Binary, Octal and Hexadecimal numbers.
- Define logic gates.
- Significance of Boolean algebra in digital circuits.
- Understand the working principles of sequential and combinational logic circuits.
- Define Flip-flops and describe behavior of various flip-flops.
- Know about Synchronous and Asynchronous counters.
- Know about the function of shift registers.

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	AC FUNDAMENTALS, BATTERIES AND UPS	
	1.1 AC FUNDAMENTALS: Difference between AC and DC - Advantages of AC over DC –Waveform of sinusoidal A.C. Cycle – Generation of single phase A.C. by elementary alternator - Definition of cycle, frequency, time period, amplitude, peak value, average value and RMS value – Define peak factor and form factor -Concept of phase, phase difference and phase angle — Single phase and 3 phase (Definition) - Meaning of lagging and leading sine wave – Advantages of three phase over single phase.	4
	1.2 Batteries: Classification of cells - Construction of Lead acid cell – Methods of charging – Care and Maintenance of Lead acid battery – Indications of a fully charge battery – Maintenance free batteries.	3
	1.3 UPS: Need for UPS - Online and Offline UPS – Definition – Block Diagram – Explanation of each block – Merits and demerits of online and offline UPS – Need of heat sink – Specification and ratings – Maintenance of UPS including batteries.	3
	1.4 Switches: Basics of switches used - Ratings of switches used for a system installation – Ratings and types of wires used – necessity of MCB, ELCB.	3
II	TRANSFORMER AND SPECIAL MOTORS 2.1 Single Phase transformer: Working Principle and Construction of transformer – Brief description of each part – Function and materials used - emf equation of transformer (No derivation) – Voltage and current ratio of a transformer — Efficiency - Losses in a transformer - Auto transformer - Applications – Step up and Step down transformer(Definition only)	5

	<p>2.2 Special Motors:</p> <p>Stepper Motor: Definition - Working principle - Types and applications — Servo motors: Definition - Working principle - Types and applications — Factors to be considered for selecting a motor for a particular application.</p> <p>2.3 Electrical Safety:</p> <p>Electric shock – need for earthing - types of earthing, fuses - need – types of fuses</p>	<p>5</p> <p>2</p>
III	<p>SEMI CONDUCTOR DEVICES</p> <p>3.1 Diodes:</p> <p>PN Junction diode – Barrier Voltage, Depletion Region – Forward biased and Reverse biased Junction – Working principle - forward / Reverse characteristics of P-N Junction diode - Applications of diode – Zener Diode: Construction - Characteristics (Forward and Reverse) – Avalanche and Zener break down - Applications of Zener diode. Light Emitting Diodes - operation, construction and characteristics. LDR — Principle of operation and Characteristics. Photo Diode – Principle of operation (concept only)</p> <p>3.2 Rectifiers:</p> <p>Definition – Need of Rectification – Circuit diagram, Operation, i/p and o/p Waveforms of Half wave - Full wave- Bridge rectifiers (without filters) - Uses of filters in rectifier circuit — Ripple factor, Efficiency and PIV (No derivation) – Comparison</p> <p>3.3 Bipolar Junction Transistor:</p> <p>Definition – Principle of NPN and PNP transistor - Symbol - Transistor terminals - Operating principle (NPN transistor only) - Configurations of transistor.</p>	<p>8</p> <p>4</p> <p>4</p>
IV	<p>BOOLEAN ALGEBRA, LOGIC GATES COMBINATIONAL SYSTEM</p> <p>4.1 Number representation:</p> <p>Decimal, Binary, Octal and Hexa decimal number systems –Conversion of number from one number system to another (without decimal point) - BCD CODE — ASCII Codes - Parity bit — Use of a parity bit —Odd parity and Even parity</p>	<p>4</p>

	<p>4.2 Logic gates: Positive and Negative logic System - Definition, Truth table, Symbol and Logical equations of AND – OR – NOT – EXOR – EXNOR (Only 2 - inputs) gates – Universal gates – NAND - NOR–Symbol and truth table.</p> <p>4.3 Boolean Algebra: Basic laws of Boolean algebra — Demorgan’s Theorem and proofs — Duality theorem - Simplification of logical equations using Boolean laws -De-Morgan’s theorem – Two and three variable Karnaugh map</p> <p>4.4 Arithmetic Circuits: Half Adder and full adder – Truth table, Circuit diagram – Half subtractor and Full subtractor – Truth table, Circuit diagram.</p> <p>4.5 Combinational logic circuits: Parity generator and checker - Multiplexer - De-multiplexer— Encoder-Decoder (Definition and Basic Circuits only)</p>	<p>4</p> <p>3</p> <p>3</p> <p>2</p>
<p>V</p>	<p>SEQUENTIAL LOGIC SYSTEM</p> <p>5.1 Flip flops: Basic principle of operation - S-R, D flip-flop – Operation and truth table – Race Condition – JK flip flop –T flip flop – Toggling –Edge Triggered Flip-flop – Level Triggered flip flop - J-K Master Slave flip flop.</p> <p>5.2 Counters: Need –Types of counters – 4 bit Asynchronous counter – Mod N counter – Decade Counter – 4 bit Synchronous counter –Distinguish between Synchronous and Asynchronous counter –Application of counters</p> <p>5.3 Registers: Shift register – Block diagram representation and wave form of serial –in Serial out, Serial — in Parallel — out, Parallel in -parallel out Applications of Shift Registers.</p>	<p>6</p> <p>5</p> <p>5</p>

TEXTBOOKS

S.No	Title	Author	Publisher	Year of Publishing/ Edition
1	Electrical Technology Vol I and II	B.L.Theraja	S.Chand & Co , NewDelhi	Mutiple Colour Revised FirstEdition,2012
2	Modern Digital Electronics	R.P.Jain	Tata Mc-Graw Hill, NewDelhi	ThirdReprint2010
3	Principles of Digital Electronics	K.Meena	PHI learning Private Ltd	2009

REFERENCE BOOKS

S.No	Title	Author	Publisher	Year of Publishing/ Edition
1.	Digital Electronics and Logic Design	Jaydeep Chakravarthy	University Press, Hyderabad	First Edition 2012
2.	Basic Electrical Engineering	V.N.Mittle	Tata Mc-Graw Hill, NewDelhi	First Edition
3.	Basic Electrical and Electronics Engineering	R,Muthu subramanian R.Salivajanan	Tata Mc-Graw Hill, NewDelhi	Seventh Reprint2011
4.	Principles of Electronics	V.K.Mehta	S.Chand &Co, New Delhi	Second Edition
5.	Digital Electronics	G.K.Kharate	Oxford University Press	2010



DIRECTORATE OF TECHNICAL EDUCATION
DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

III SEMESTER

2020 - 2021 onwards

**4046320 - OPERATING SYSTEM AND
COMPUTER ARCHITECTURE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS**

N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4046320

Semester : III

Subject Title : Operating System and Computer Architecture

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours/ Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
OPERATING SYSTEM AND COMPUTER ARCHITECTURE	5 Hrs	80 Hrs	25	100*	100	3 Hrs

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Introduction to Operating System	12
II	Process management	15
III	Memory Management, I/O and File Management	16
IV	Register Transfer Logic And CPU, Memory Module	16
V	Input – Output Module , Parallel Process	14
Test & Model Exam		7
Total		80

RATIONALE:

- Students have to be conversant with computer, its terminology and functioning. The heart of a computer is based around its Operating System. The processor deals with request coming from all directions asynchronously. The operating system has to deal with the problems of contention, resource management and both program and user data management, and provide a useful no-wait user interface. The course provides clear vision, understanding and working of Operating Systems.
- Computer Architecture describes the structure and behavior of the various functional modules of the computer and their interaction. This course provides the necessary understanding of the hardware architecture and operation of digital computers.

OBJECTIVES:

On completion of the following units of syllabus contents, the students must be able to

- Understand the purpose, goals, functions and evolution of Operating Systems.
- Understand the concept of process, process states and their scheduling.
- Classify different types of schedulers and scheduling algorithms.
- Identify the significance of inter-process communication and synchronization.
- Know about the usage of semaphore in inter-process communication.
- Understand the conditions for a deadlock, ways to prevent or recover from the deadlock.
- Know about memory protection against unauthorized access and sharing.
- Compare and contrast paging and segmentation techniques.
- Define virtual memory and its underlying concepts.
- Describe page replacement policies and disk scheduling techniques.
- Know the fundamental blocks of computer, different memory types and their operations.
- Realize the function of I/O in different operation modes and use of I/O processor.
- Study about Parallel processing and Pipe lining.

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	<p>INTRODUCTION TO OPERATING SYSTEMS</p> <p>1.1 Basics of Operating Systems: Definition – Types of Operating Systems - Mainframe, Desktop, Multiprocessor, Distributed, Clustered, Multiprogramming, Real time, Embedded and Time sharing, Mobile OS (Android, iOS)</p> <p>1.2 Operating System Components: Process Management component – Memory Management component - I/O Management component – File Management component - Protection System – Networking management component – Command interpreter.</p> <p>1.3 Operating System Services: Process Execution – I/O operations – File manipulations – Communications – Error detection and recovery – Resource allocation – Accounting – System Protection - System Calls – System call Execution.</p> <p>1.4 Operating System Structures: Simple structure, Layered, Monolithic, Microkernel Operating Systems – Concept of Virtual Machine – Booting.</p> <p>1.5 User Interface Command Line Interface(CLI)based OS–DOS, Unix–Graphic User Interface (GUI) based OS–Windows, Linux–Difference between CLI and GUI.</p>	<p>3</p> <p>3</p> <p>3</p> <p>2</p> <p>1</p>
II	<p>PROCESS MANAGEMT</p> <p>2.1 Processes: Definition – Process Relationship - Process states – Process State transitions - Process Control Block – Context switching – Threads – Concept of multithreads – Benefits of threads – Types of threads.</p> <p>2.2 Process Scheduling: Definition – Scheduling objectives – Types of Schedulers – Scheduling criteria – CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time (Definition only) – Scheduling algorithms – Pre emptive and Non – pre emptive - FCFS – SJF – RR - Multiprocessor scheduling – Types - Performance evaluation of the scheduling.</p>	<p>4</p> <p>5</p>

	<p>2.3 Inter-process Communication and Synchronization: Definition – Shared Memory System – Message passing – Critical section – Mutual Exclusion - Semaphores.</p> <p>2.4 Deadlocks: Definition – Deadlock characteristics – Deadlock Prevention – Deadlock Avoidance – Deadlock detection and Recovery.</p>	<p>3</p> <p>3</p>
III	<p>MEMORY MANAGEMENT, I/O AND FILE MANAGEMENT</p> <p>3.1 Basic Memory Management: Definition – Logical and Physical address map – Memory allocation – Contiguous Memory allocation – Fixed and variable partition – Internal and External fragmentation and Compaction – Paging – Principle of operation – Page allocation – Hardware support for paging – Protection and sharing.</p> <p>3.2 Virtual Memory: Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault , Working Set , Dirty page/Dirty bit – Demand paging (Concepts only) – Page Replacement policies – Optimal (OPT) , First In First Out (FIFO), Second Chance (SC), Not Recently Used (NRU) and Least Recently Used (LRU).</p> <p>3.3 Disk Management: Disk Structure – Physical, Logical – RAID structure of disk, RAID levels.</p> <p>3.4 File Management: File concept – File attributes – (definitions) Name, Identifier, Type, Location, Size, Time, Date, user identification – File Operations - File system structure – Directory Structure – Single level, Two level, Tree Structure.</p> <p>3.5 Access Methods: Sequential, Random access – Disk space allocation methods – Contiguous, Linked, Indexed.</p>	<p>4</p> <p>5</p> <p>2</p> <p>3</p> <p>2</p>
IV	<p>REGISTER TRANSFER LOGIC AND CPU, MEMORY MODULE</p> <p>4.1 Register transfer: Register Transfer Language – Inter Register transfer – Control function-Bus transfer-Memory transfer.</p>	<p>3</p>

	<p>4.2 Micro operations and ALU:</p> <p>Arithmetic micro operations- Binary adder, subtractor, incrementer, 4 bit arithmetic circuit, Logic micro operations- one stage of logic circuit-applications, shift micro operations- 4 bit combinational circuit shifter-one stage of ALU.</p> <p>4.3 Central processing unit:</p> <p>Components of CPU- General register organization, bus system-register set with common ALU-memory stack - stack limits, Instruction format (3,2,1,0 address instructions)</p> <p>4.4 Control unit:</p> <p>Structure of control unit- Fetch cycle, Indirect cycle, Execute cycle, Interrupt cycle, Instruction cycle.</p> <p>4.5 Memory types:</p> <p>CPU registers, Main Memory- ROM, RAM, Memory address map, memory connection to CPU, Secondary memory – Magnetic disk, Solid State Drive, Cache - Need for cache memory, operational principle of Cache.</p>	<p>4</p> <p>3</p> <p>2</p> <p>4</p>
V	<p>INPUT – OUTPUT MODULE, PARALLEL PROCESS</p> <p>5.1 Input Output Interface:</p> <p>Need for I/O interface, I/O bus and interface, I/O commands, Example of I/O interface.</p> <p>5.2 Asynchronous data transfer:</p> <p>Strobe control, Handshaking, Asynchronous serial transfer, Asynchronous communication interface.</p> <p>5.3 Modes of transfer and I/O Processor:</p> <p>Programmed I/O, Interrupt initiated I/O-vector interrupt, non-vector interrupt, Priority interrupt, Interrupt controller ,DMA –DMA controller, DMA transfer, CPU-IOP communication, Serial communication.</p> <p>5.4 Parallel processing and Pipe lining:</p> <p>Types of parallel processing systems - Parallel organizations – Pipe lining introduction - Instruction pipeline, pipelining in super scalar processors</p>	<p>2</p> <p>3</p> <p>5</p> <p>4</p>

Reference Books :

1. "Operating System Internal and Design Principles", William Stallings, Pearson Education, 7th Edition
2. "Operating System, Principals & Design", Pal Chaudhury, PHI Learning, First Edition
3. "Operating System", Rohit Khurana ITLESE, Vikas Publishing Ltd , First Edition 2011
4. "Operating System concepts", Abraham Siberschatz Galvin, Gagne, Wiley Publishers, 9th Edition
5. "Computer System Architecture", M.Morris Mano, Prentice –Hall of India Pvt Limited, Revised Third Edition
6. "Computer Organization And Architecture Designing For Performance", William Stallings, Pearson Publications, Eighth Edition
7. "Computer Organization and Design", David A. Patterson and John L.Hennessey, Morgan Kauffman / Elsevier, Fifth Edition
8. "Computer Architecture and Organization", John P. Hayes, Tata Mc Graw Hill, Third Edition



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

III SEMESTER

2020 - 2021 onwards

4052330 – C PROGRAMMING AND DATA STRUCTURES

CURRICULUM DEVELOPMENT CENTRE

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS**

N – SCHEME

(To be implemented to the Student admitted from the year 2021 – 2025 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4052330

Semester : III

Subject title : C Programming and Data Structures

TEACHING & SCHEME OF EXAMINATION

No. of weeks per Semester: 16 weeks.

Subject	Instructions		Examination			
	Hours/ Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
C PROGRAMMING AND DATA STRUCTURES	6 Hrs	96 Hrs	25	100*	100	3 Hrs

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics & Allocation of Hours

Unit	Topics	Hours
I	PROGRAM DEVELOPMENT & INTRODUCTION TO C	18
II	DECISION MAKING, ARRAYS , STRINGS, FUNCTIONS	18
III	STRUCTURES, UNIONS AND POINTERS	17
IV	INTRODUCTION TO DATA STRUCTURES, STACK,QUEUES	17
V	LINKED LIST, TREES, SORTING, SEARCHING	19
	TEST AND REVISION	7
	TOTAL	96

RATIONALE:

C' is the most widely used computer language, which is being taught as a core course. C is general purpose structural language that is powerful, efficient and compact, which

combines features of high level language and low-level language. It is closer to both Man and Machine. Due to this inherent flexibility and tolerance it is suitable for different development environments. Due to these powerful features, C has not lost its importance and popularity in recently developed and advanced software industry. C can also be used for system level programming and it is still considered as first priority programming language. This course covers the basic concepts of C. This course will act as “Programming concept developer” for students. It will also act as “Backbone” for subjects like OOPS, Visual Basic, Windows Programming, JAVA etc.

Data structures are the techniques of designing the basic algorithms for real-life projects. In the present era, it is very essential to develop programs and organize data in such a way that it solves a complex problem efficiently. Understanding of data structures is essential and this facilitates to acquire sound knowledge of the insight of hardware requirement to any problem base. The practice and assimilation of data structure techniques is essential for programming.

OBJECTIVES:

At the end of the Course, the Students will able to

- Define Program, Algorithm and flow chart
- Write down algorithm and flow chart for simple problems.
- Describe the concepts of Constants, Variables, Data types and operators.
- Develop programs using input and output operations.
- Use of command line arguments.
- Explain compiler controlled directives.
- Understand the structure and usage of different looping and branching statements.
- Define arrays and string handling functions.
- Explain user-defined functions, structures and union.
- Define pointers and using the concept of Pointers.
- Define Linear and non-linear data structures.
- List and discuss the different types of linear data structures.
- Define a tree and the different terms related with trees.
- Write the algorithm for different types of sorting and searching.

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours.
I	PROGRAM DEVELOPMENT & INTRODUCTION TO C	
	1.1 Program: Program Definition - Program development cycle – Algorithm – flow chart – symbols, importance & advantage of flow chart.	3
	1.2 Introduction to C: History of C - Features of C Language - Structure of a C program – Execution of C Program: Compiling, Link and Run a program – Diagrammatic representation of program execution process.	3
	1.3 Variables, Constants & Data types: C character set – Tokens – Constants - Keywords – identifiers and Variables - Data types and storage – Data type Qualifiers – Declaration of variables – Assigning values to variables – Escape sequences - Defining symbolic constants	5
	1.4 C operators: Arithmetic, Logical, Assignment, Relational, Increment and Decrement, Conditional, Bitwise, Special Operator precedence and Associativity. C expressions – Arithmetic expressions, Evaluation of expressions- Type cast operator..	5
1.5 I/O statements: Formatted input, formatted output, Unformatted I/O statements	2	
II	DECISION MAKING, ARRAYS , STRINGS, FUNCTIONS	
	2.1 Control Statements: Simple if statement – if-else, else-if-ladder statements, switch statement, Looping Statements – while, do _ while and for loop, go to, continue and break statements.	5
	2.2 Arrays: Definition – Array element and subscript - Declaration – Initialization of one dimension array elements - Two dimensional arrays – initialization of elements.	4
2.3 Strings: Introduction – Declaring and Initializing string variables, Reading strings ,	3	

	<p>Writing strings, String handling functions – strlen() , strcpy() , strcmp() , strcat() and strrev() function.</p> <p>2.4 Built in Functions:</p> <p>Declaration and definition of function. Math functions – Console I/O functions – Standard I/O functions – Character Oriented functions.</p> <p>2.5 User defined functions:</p> <p>Defining functions & Needs- Scope and Life time of Variables, Function call, return values, Recursion.</p>	<p>3</p> <p>3</p>
III	<p>STRUCTURES, UNIONS AND POINTERS</p> <p>3.1 Structures and Unions:</p> <p>Structure Definition – Variable declaration – initialization – Accessing and giving values to structures, Structures within structures, Arrays within structures. Unions: Declaration – initialization. Difference between Union and Structure.</p> <p>3.2 Pointers:</p> <p>Introduction – Advantages of pointers – Accessing the address of a variable – Declaring and Initializing pointers – Accessing a variable through its pointer – Pointer Expressions</p> <p>3.3 Dynamic memory allocation:</p> <p>Advantages – malloc(), calloc(), realloc() and free() functions</p> <p>3.4 Command line arguments :</p> <p>Introduction – argv and argc arguments</p>	<p>7</p> <p>4</p> <p>2</p> <p>4</p>
IV	<p>INTRODUCTION TO DATA STRUCTURES, STACK, QUEUES</p> <p>4.1 Introduction to Data Structures:</p> <p>Introduction - Data and Information - Elementary data structure organization - Types of data structures - Primitive and Non Primitive data structures, Operations on data structures: Traversing, Inserting, Deleting, Searching, Sorting, Merging, Different Approaches to designing an algorithm: Top-Down approach, Bottom-up approach (Definition and examples only)</p> <p>4.2 Definition of a Stack:</p> <p>Operations on Stack (PUSH & POP) –Implementation of stack through arrays – Polish notations – Conversion of infix to postfix expression.</p>	<p>8</p> <p>5</p>

	4.3 Queues: Definition – Representation of Queue using arrays – Circular Queue, Dequeue (Definition and Examples only)	4
V	LINKED LIST, TREES, SORTING, SEARCHING 5.1 Terminologies: Node, Address, Pointer, Information, Null Pointer, Empty list -. Type of lists : Singly linked list , Doubly linked list, Circular list - Representation of singly linked lists in Memory-Difference between Linked & sequential List – Advantages and Disadvantages of Linked list. (Concepts only, no implementations) 5.2 Trees: Terminologies: Degree of a node, degree of a tree, level of a node, leaf node, Depth / Height of a tree, In-degree & out-Degree, siblings. In order traversal, Preorder traversal, Post order traversal.(Concepts only, no implementations) 5.3 Sorting: Introduction, Types of sorting - Bubble sort, Quick Sort - Examples. 5.4 Searching: Definition – Algorithms and “C” programs for Linear search and Binary search.	7 6 3 3

TEXT BOOKS:

Sl.No	TITLE	AUTHOR	PUBLISHER
1.	Programming in ANSI C	Prof. E. Balagurusamy	Tata Mc-Graw Hill, New Delhi, 4 th Edition

REFERENCE BOOKS:

S.No	TITLE	AUTHOR	PUBLISHER
1.	A Text Book on C	E. Karthikeyan	PHI Private Limited, New Delhi
2.	Programming with C	Byron Gottfried.	Schaum Series -TMGH

3.	Programming and Problem solving using C	ISRD Group, Lucknow	Tata Mc-GrawHill, NewDelhi
4.	Let us C	Yashavent Kanethar	BPB Publication, 2005, New Delhi
5.	Introduction to Data structures with applications.	Trembley and Sorenson	Tata Mc-GrawHill, NewDelhi
6.	Fundamentals of Data structures in C	Horowitz , sahani Anderson- freed	University Press, Hyderabad
7.	Introduction to Data structures	Bhagat Singh	TMGH, New Delhi
8.	Data Structures and Algorithms	G.A. Vijayalakshmi Pai	TMGH, New Delhi



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

III SEMESTER

2020 - 2021 onwards

4052340 - ELECTRICAL AND ELECTRONICS ENGINEERING PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS**

N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4052340

Semester : III

Subject Title : Electrical and Electronics Engineering Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
ELECTRICAL AND ELECTRONICS ENGINEERING PRACTICAL	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

Diploma Engineers from all branches of engineering are expected to have some practical knowledge of electrical and electronics engineering. Also the technicians working in different engineering fields have to deal with various types of electrical equipments. Various types of electronic circuits are used in different electrical equipments. Hence it is necessary to have practice with electric circuits, different types of electronic devices to know the principles and working characteristics.

OBJECTIVES:

On completion of the following practical contents the students must be able to

- Verify power supply of SMPS
- Study the characteristics of PN junction diode and Zener Diode
- Function of Rectifier circuit
- Test the performance of Light devices
- Know about the function of a Transistor
- How to construct different logic functions using universal gates
- Realize the combinational circuits and sequential circuits

DETAILED SYLLABUS

contents: Practical

LAB EXERCISES

1	A	Checking of power supply in SMPS
	B	Construct the circuit and draw the graph for different stages of Bridge rectifier with filter using CRO.
2		Construct the circuit and draw the forward characteristics of PN junction Diode and find input resistance.
3		Construct the circuit and draw the reverse characteristics of Zener Diode and find breakdown voltage.
4		Construct the circuit and draw the VI characteristics of LED
5		Construct the circuit and draw the characteristics of LDR
6		Construct CE configuration circuit and draw the input characteristics and also find input resistance.
7		Construct CE configuration circuit and draw the output characteristics and also find output resistance.
8	A	Verify the truth tables of NAND, AND, NOR, OR, NOT, XOR using IC's
	B	Realization of basic gates using either NAND or NOR gate.
9		Construct and verify Half adder and Half Subtractor

10		Construct and verify the truth table of Full adder
11		Construct and verify the truth table of Full subtractor
12		Verify the truth tables of RS,D,T and JKFF
13		Construct and test the parity generator and checker function using IC74180
14		Construct and test the 4bit Ripple counter (IC7493)
15		Construct and test decade counter (IC7490)

BOARDEXAMINATION

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Writing any one Experiment (CIRCUIT DAIGRAM, TABULAR COLUMN, TRUTH TABLE / EQUATION / FORMULA)	45 Marks
Construction	40 Marks
Result	10 Marks
VIVA-VOCE	05 Marks
Total	100 Marks

EQUIPMENTS / COMPONENTS REQUIRED

EQUIPMENTS

S. No	Name of the Equipments	Range	Required Nos.
1	Ammeter	(0-50)Ma	6
2	Voltmeter	(0-20)V,(0-1v)	6
3	Power supply	0-30V	6
4	Digital Trainer Kit		6
5	Bread Board		6
6	Fixed dual power supply	0-15V	2
7	Signal generator	1MHz	2
8	CRO Dual Trace	30MHz	6

COMPONENTS

S.No	Name of the components	
1	Resistors	1150Ω,1KΩ, 2.2KΩ,10KΩ, 220Ω
2	Capacitor	10μF, 4.7μF
3	PN Diode	IN4007
4	Zener Diode	Z11.1
5	Transistor	SL100,CL100
6	IC7400, IC7402, IC7404, IC7408, IC7432, IC7486	
7	IC74180, IC74153, IC7476, IC7474	
8	IC7490, IC7493, IC7495	



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

III SEMESTER

2020 - 2021 onwards

4052350 - LINUX PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

N-SCHEME
(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4052350

Semester : III

Subject Title : Linux Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
LINUX PRACTICAL	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

- Linux is an open-source Operating System which offers a variety of functions, programs or applications and Linux software's to choose from, to the users, most of them are free. It has a good graphical user interface (GUI) and almost all the functionality that other proprietary OS offer.
- This practical enables to learn the commands used to perform various operations in a Linux system and write shell scripts for various functions. One of the top practical uses for Linux is web application development.

OBJECTIVES:

On completion of the following exercises, the students must be able to

- Login and logoff Procedures
- Use of General purpose commands
- Explain the use of simple filters and advanced filters.
- Know the details of process status
- Use Various communication Commands
- Search patterns
- Use of shell scripts
- Define the elements of the shell script
- Write shell script for various problems.

DETAILED SYLLABUS

Contents: Practical

Units	Topics	Hours
I	Basics of Linux OS: Entering and Exiting from a Linux system – User Accounts - General understanding of various application programs – Different shells	2
II	Linux Commands: Learn the syntax and usage of : Directory Management Commands - File Management Commands - General Purpose Commands - Simple Filters – Advanced Filters - Communication Commands - Check the Process Status - Process Management Commands - Search Patterns - Exercises.	28
III	Text Editor: File operations (New, Open, Close, Save, Save and Exit, Print) – Text Editing operations (Inserting, deleting, finding, replacing, copying and moving) .	2
IV	Shell Scripts: Use of shell scripts - Numerical operations - Looping – Swapping Technique - String operations –Using Command line arguments – Filters – Date Functions – Relational operations- Logical operations - Boolean operations - Basic arithmetic operations – Case statement – Search Directory or File - Exercises.	32

LAB EXERCISES

PART – A LINUX COMMANDS	
Write down the syntax and usage of the following exercise with all options. Check the commands with the system	
1	Usage of Directory Management commands: ls, cd, pwd, mkdir, rmdir
2	Usage of File Management commands: cat, chmod, cp, mv, rm, more
3	Use the General Purpose commands: wc, cal, date, who, tty, ln
4	Using the Simple filters: pr, head, tail, cut, paste, nl, sort
5	Advanced filters : Search for a pattern using grep, egrep, fgrep, uniq Communication Commands: write, wall
6	Check the details of process name, PID, status using ps command. Process Management commands: &, nohup, kill, nice
7	Device pattern using meta character to match each of the following situation: All three character filenames. All filenames that contains the characters 'a' or 'b' or 'c'. All filenames beginning with a particular string. All filenames beginning with 'ca' and ending with two digits. All filenames beginning with 's' and having 'a' at somewhere.
PART – B SHELL SCRIPTS	
1	Write a shell script that accepts a numerical value N. Then display the decrementing value of N till it reaches 0.
2	Write a shell script to search a string and display it.
3	Write a shell script that takes three command line arguments. The first argument is the name of the destination file and the other two arguments are names of files to be placed in the destination file.
4	Write a shell script to print contents of file from given line number to next given number of lines.
5	Write a shell script that print out date information in this order: time, day of The week, day number, year– that is like this.21:18:00 IST Mon16 Aug2021
6	Develop a Basic math Calculator using case statement
7	Write a shell script that presents a multiple choice question, gets the user's answer and report back whether the answer is right, wrong or not one of the

	choices.
8	Write a shell script that takes a command line argument and reports on Whether it is a directory, a file or something else.

BOARD EXAMINATION

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Correctness of Commands in Part-A	20 Marks
Execution of Commands in Part-A	20 Marks
Writing program in Part-B	20 Marks
Execution of program in Part-B	25 Marks
Printed Output (Part-A)	5 Marks
Printed Output (Part-B)	5 Marks
VIVA- VOCE	5 Marks
TOTAL	100 Marks

HARDWARE AND SOFTWARE REQUIREMENTS

Minimum Hardware Requirements:

Desktop Computers :30 Nos

Laser Printer :1No.

Minimum Software Requirements:

Operating System : Any Linux Based GUI Operating System



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

III SEMESTER

2020 - 2021 onwards

4052360 – C PROGRAMMING AND DATA STRUCTURES PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS**

N – SCHEME

(To be implemented to the Students admitted from the year 2021 – 2025 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4052360
 Semester : III
 Subject title : C Programming and Data Structures Practical

TEACHING & SCHEME OF EXAMINATION

No. of weeks per Semester: 15 weeks.

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
C Programming and Data Structure Practical	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

As 'C' is the most widely used computer language in software industry to provide the hands on experience on writing C programs and on implementation of linear and non-linear data structure, this course is introduced. The knowledge of 'C' language and data structures will be reinforced by practical exercises during the course of study. This course will help students to develop the capability of selecting a particular data structure.

OBJECTIVES:

At the end of the Course, the Students will able to

- Analyze the given problem.
- Think the logic to solve the given problem.
- Describe the concepts of constants, variables, data types and operators.
- Develop programs using input and output operations.
- Write programs using command line arguments.
- Write programs using compiler control directives.
- Write programs using different looping and branching statements.
- Write programs based on arrays.
- Write Programs using string handling functions.
- Write programs using user-defined functions, Structures and Union.
- Write programs using the concept of Pointers.
- Understand the use of arrays
- Implement linear data structure algorithms using C language.
- Implement non - linear data structure algorithms using C language.
- Write programs for traversing a binary tree.
- Write programs for searching and sorting.

DETAILED SYLLABUS

Contents: Practical

PART – A

1. Write a simple C Program
 - a. Print your Name and Address
 - b. Find Simple interest and Compound interest.
2. Write a C program to swap two variable's using
 - (i) third variable and (ii) without using a third variable.
3. Write a program to find the largest number between given three numbers.
4. Write a program to print all prime numbers from 1 to N.
5. Write a program to prepare the total marks for N students by reading the Reg.No, Name, Mark1 to Mark6 by using array of structures.
6. Write a program using the function power (a,b) to calculate the value of a raised to b.
7. Write a program to find the length of the given string using pointers.
8. Write a program to find factorial of a number using recursion.

PART – B

9. Write a program in 'C' to create a singly linked list containing at least five elements. Make necessary assumptions.
10. Write a "C" program to perform operations in stack using array.
11. Write a "C" program to convert an infix expression into post fix expression.
12. Write a "C" program to perform operations in queue using array.
13. Write a "C" program to add two 3 x 3 matrices and display the result in Matrix form.
14. Write a "C" program to read 10 elements and sort the above numbers using bubble sort.
15. Write a "C" Program for binary searching.

BOARD EXAMINATION

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Writing any one program from PART – A	20 Marks
Writing any one program from PART – B	25 Marks
Executing program (PART – A)	20 Marks
Executing program (PART – B)	20 Marks
Result with printout (PART – A)	05 Marks
Result with printout (PART – B)	05 Marks
VIVA – VOCE	05 Marks
Total	100 Marks

HARDWARE REQUIREMENT

Desktop Computers	-	30 No's
Laser Printer	-	1 No's

SOFTWARE REQUIREMENT

C – Compiler with Editor.



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

III SEMESTER

2020 - 2021 onwards

4052370 – E-PUBLISHING PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

N-SCHEME

(To be implemented to the Students Admitted from the Year 2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4052370

Semester : III

Subject title : E PUBLISHING PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per Semester: 16 Weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
E PUBLISHING PRACTICAL	4	64	25	100*	100	3 Hrs.

***Board Examination Conducted for 100 Marks and Converted to 75 Marks**

RATIONALE:

This course will enable the students to familiarize with the features and use of application packages such as Corel Draw, Photoshop, Adobe Indesigner and Adobe illustrator. This subject will develop skills in handling the above packages to develop software for e-publishing. It makes the students exactly suitable for DTP industry.

OBJECTIVES:

On completion of the following exercises, the students must be able to

- Learn all tools and options in CorelDraw.
- Create designs like Bit Notice, Notebook Wrapper, Invitation and Calendar in CorelDraw.

- Learn all tools and options in Photoshop.
- Create designs using layers, tools, text effects and filters in Photoshop.
- Learn to use character styles, paragraph styles, text effects and text frame in Adobe Indesign.
- Create master page, multipage document and monthly calendar in Adobe Indesign.

DETAILED SYLLABUS

Contents: Practical

LAB EXERCISES

PART-A

1. Create a Bit Notice with specified height and width with various text styles.
2. Create a design using all basic tools and make changes using shape tool.
3. Create a notebook wrapper design using fountain filling and pattern filling tools.
4. Create an invitation using arrange menu commands like transformations, align and distribute, and order.
5. Create a calendar with the help of Grid Tool, Power clip and Import commands.
6. Create a simple logo using text tool, rectangle tool and ellipse tool.
7. Transform one object into another object using blend tool.

PART-B

8. Create a design by using the various Selection Tools, cutting and pasting the images.
9. Using multiple layers, create a design with the use of masking various images.
10. Create a design by the use of text tools and apply text effects.
11. Change the color of an image by the use of selective coloring method.
12. Create a design by applying the various filtering effects.
13. Create a simple layout and master page by using master page palette and character styles.

14. Create a multipage document by using character, paragraph, autoflow and text wrap commands.
15. Create a stylish monthly calendar sheet by using table and its formatting commands.

BOARD EXAMINATION

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION

Procedure Writing – One Question from PART - A	20 Marks
Procedure Writing – One Question from PART - B	25 Marks
Executing Exercise (PART – A)	20 Marks
Executing Exercise (PART – B)	20 Marks
Result(Part – A)	5 Marks
Result(Part – B)	5 Marks
VIVA - VOCE	5 Marks
TOTAL	100 Marks

HARDWARE REQUIREMENTS

Desktop Computers	30 Nos.
Laser printer	1 Nos.
Scanner	1 Nos.

SOFTWARE REQUIREMENTS

Any Open Source Software

- GIMP
- Scribus
- Inkscape
- Krita
- Pinta
- Shotwell or any equivalent open source software.

[or]

- Corel draw, Photoshop, Adobe indesign.(optional)

[Open source software usage is recommended than proprietary for doing lab exercises]

SEMESTER – IV



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

IV SEMESTER

2020 - 2021 onwards

**4046410 - COMPUTER NETWORKS AND CYBER
SECURITY**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4046410
 Semester : IV
 Subject Title : COMPUTER NETWORKS AND CYBER SECURITY

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
COMPUTER NETWORKS AND CYBER SECURITY	5 Hrs	80 Hrs	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	DATA COMMUNICATIONS	15
II	OSI MODEL AND LAN PROTOCOLS	16
III	TCP/IP PROTOCOLS	15
IV	NETWORK SECURITY	13
V	NETWORK SECURITY MECHANISMS AND CYBER SECURITY	14
Test & Model Exam		7
Total		80

RATIONALE:

The course aims to groom the students to gain concepts, knowledge and skills required to work on Computer Networking and Security industry. Course curriculum has

been designed to give overview and use cases of Data Communication, Layered Networks, Internetworking technology/protocols and Computer Security is covered and this will help to prepare the students to keep pace with computer networking and security industry trends.

OBJECTIVES:

- Understand the concept of data communication.
- Discuss the advantages and disadvantages of different network topologies.
- Know different network classification based on different category.
- Study about different networking devices and their practical usages.
- Understand the different layers of OSI and their functions.
- Compare different LAN protocols.
- Understanding of Synchronization in networks
- Study of different WAN networks and protocols
- Study of Broadband Next Gen (BNG)
- Identify the protocols used in TCP /IP and compare with OSI model.
- Know the IP addressing and TCP/ IP protocols briefly.
- QoS and Traffic Engineering in networks
- Overview of Operations, Administration and Maintenance (OAM) in networks
- Understand the basic concepts of network security.
- Identify the attacks and threats.
- Understand the basic concepts of RAID and digital Signatures.
- Study about Cryptography and different Cryptography Algorithms.
- Discuss about Network Security Applications.
- Know the applications of Network Security.
- Discuss about VPN and Firewalls.
- Identify the Wireless Security Issues.
- Network security mechanisms and cyber security

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	<p>DATA COMMUNICATIONS</p> <p>1.1 Data Communication: Components of a data communication – Data flow: Simplex - Half duplex – Full duplex; Networks – Network criteria – Types of Connections: Point to point – multipoint; Topologies: Star, Bus, Ring, Mesh, Hybrid – Advantages and Disadvantages of each topology.</p> <p>1.2 Types of Networks: Need for computer Networks - LAN – MAN – WAN – CAN – HAN – Internet – Intranet – Extranet , Client-Server, Peer to Peer, Mobile Networks, Data Centre Networks, Service Provider Networks</p> <p>1.3 Transmission Media: Characteristics of Transmission Media - Classification of transmission media - Guided – Twisted pair – Coaxial – Fiber optics – Unguided – Radio waves – Infrared – Low Orbit satellite (LOS) – VSAT – Cabling and Standards</p> <p>1.4 Network devices: Features and Concepts of Switches – Routers (Wired and Wireless) – Gateways.</p> <p>1.5 Synchronization in Networks: Concepts of Frequency and Time synchronization in Computer networks</p>	<p>2</p> <p>5</p> <p>3</p> <p>3</p> <p>2</p>
II	<p>OSI MODEL and LAN PROTOCOLS</p> <p>2.1 Network Models: Protocol definition - Standards - OSI Model – Layered architecture– Functions of all layers.</p> <p>2.2 802.X Protocols: Concepts and PDU format of CSMA/CD (802.3) – Token bus (802.4) – Token ring (802.5) – Ethernet – Types of Ethernet (Fast Ethernet, gigabit Ethernet, High speed Ethernet 10GE to 800GE) –Comparison between 802.3, 802.4 and 802.5 – Overview of Carrier Ethernet and use cases</p> <p>2.3 WAN Networks: Different layers in Service Provider Networks – Protocols Involved – High level design of Data Centre Networks</p>	<p>3</p> <p>4</p> <p>2</p>

	<p>2.4. Understanding Wireless Network protocols- 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac</p> <p>2.5 Switching: Definition – Circuit switching – Packet switching – Message switching – Optical Switching OTN– Multicasting</p> <p>2.6 BNG: BNG - Concepts – Services – Broadband NextGen</p>	<p>3</p> <p>2</p> <p>2</p>
III	<p>TCP/IP SUIT and PROTOCOLS</p> <p>3.1 Overview of TCP / IP: OSI & TCP/IP – Transport Layer Protocol– Connection Oriented and Connectionless Services – Sockets - TCP & UDP.</p> <p>3.2 Network Layers Protocol: IP – Interior Gateway Protocols (IGMP, ICMP, ARP, RARP, IGP, BGP Concept only).</p> <p>3.3 IP Addressing: Dotted Decimal Notation –Subnetting &Supernetting – VLSM Technique- IPv6 (concepts only)</p> <p>3.4 Application Layer Protocols: FTP– Telnet – SMTP– HTTP – DNS – POP</p> <p>3.5 QoS and Traffic Engineering: Overview of QoS and Traffic Engineering techniques and protocols</p> <p>3.6 OAM: Concepts of OAM in networks Protocols – Fault detection and isolation</p>	<p>3</p> <p>2</p> <p>3</p> <p>2</p> <p>3</p> <p>2</p>
IV	<p>NETWORK SECURITY</p> <p>4.1 Introduction to Network security: Definition – Need for security – Principles of Security – Attacks – Types of Attacks – Criminal attacks – Legal Attacks – Passive and Active attacks – Software Supply Chain attacks - Security Services – Security Mechanisms .</p> <p>4.2 Cryptography: Definition – Symmetric Encryption principles – Symmetric Block Encryption Algorithms – DES, AES – Stream ciphers – RC4 – Digest function – Public key Cryptography Principles– RSA- Diffe -Hellman algorithm– Digital Signature (Definition only)</p>	<p>3</p> <p>3</p>

	<p>4.3 Network Security Application: Authentication applications – Kerberos (concepts only) - Overview-Motivation –Encryption Techniques;</p> <p>4.4 Internet Security: Email security – PGP - S/MIME - IP security – Overview –IP Security Architecture - Web security - SSL, TLS ,SET (Concepts only) – Link Layer MACSEC security overview- Network Address Translation NAT - Distributed Denial of Service attacks– DDoS and its mitigation – Lawful intercept of traffic flow overview</p>	<p>2</p> <p>5</p>
V	<p>NETWORK SECURITY MECHANISMS AND CYBER SECURITY</p> <p>5.1 Introduction to network security: Definition and Basic concepts-Basic concepts of RAID levels (0, 1, 2, 3, 4, 5).</p> <p>5.2 Security Mechanism: Introduction – Types of Firewalls – Packet filters – Application gate ways – Limitations of firewalls.</p> <p>5.3 Wireless Security Issues: Definition and Types -Transmission Security, Authentication, WLAN Detection, Eaves Dropping, Active Attacks, WEP Definition and Features.</p> <p>5.4 Network Security Appliances: Overview of Network security appliances: IPSec, DDoS, NAT, IPS gateways.</p> <p>5.5 Cyber Security Cyber Space -Cyber Security domains - Countermeasures -<i>Critical infrastructure security</i> -Network security-Application security-Cloud security-Information security -Disaster recover - end user education - Concept of cyber security</p> <p>5.6 Common cyber threats Cybercrime - Cyber stalking -Forgery and Counterfeiting-Spamming - Cross Site Scripting - Cyber Squatting - Web Jacking - Salami Attack - Data Diddling - Cyber-attack - Cyber-terrorism - common methods - Malware - Ransomware - Phishing / social engineering -Insider threats - DDoS - Advanced persistent threats - man-in-middle attack- Cyber Security Techniques</p>	<p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>4</p>

Text Book:

1. "Behrouz A.Forouzen", "Data Communication and Networking", TataMcGraw-Hill,New Delhi, Fifth Edition.
2. "William Stallings", "Network Security Essentials", Pearson Publications, Fifth Edition.
3. "William Stallings", "Cryptography and Network Security", Pearson Publications, Sixth Edition.

Reference Books:

1. "Achyut.S.Godbole", "Computer Communication and Networks", TataMcGraw-Hill,New Delhi.
2. "Andrew S. Tanenbanum", "Computer Networks", Pearson Publications, Fifth Edition.
3. "Behrouz A.Forouzen", "Cryptography and Network Security", TataMcGraw-Hill,New Delhi, Third Edition.
4. " Dr. Jeetendra Pande", Introduction to Cyber Security, Uttarakhand Open University,2017



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

IV SEMESTER

2020 - 2021 onwards

4052420 – WEB DESIGN AND PROGRAMMING

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4052420

Semester : IV

Subject Title : Web Design and Programming

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
WEB DESIGN AND PROGRAMMING	5 Hrs	80 Hrs	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Internet, HTML and Advanced HTML	15
II	Frames, Forms and CSS	14
III	JavaScript	15
IV	PHP	15
V	PHP Programming and MySQL	14
Test & Model Exam		7
Total		80

RATIONALE:

The main objective of the of this subject is to introduce the students to the building blocks of Internet and Web Design & Programming using HTML, CSS, Java Script, PHP and MySQL. The subject will impart knowledge to design web pages, dynamic and interactive web sites with client-side and server-side scripting. After completion the students will be able to independently design and develop web sites.

OBJECTIVES:

On successful completion of the course, the students will be able to.

- To acquire knowledge on Internet and basics of networking concepts.
- To acquire basic knowledge on web development.
- Develop simple components in web pages using CSS.
- To acquire knowledge for validations and event handlers using JavaScript.
- To provide the basic knowledge about PHP and web services.
- To impart PHP scripting ideas and importance in web development.
- Write PHP Programs with MySQL database.

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	INTERNET, HTML AND ADVANCED HTML	
	1.1 Internet: History of the Internet - Basics of Networking Concepts – WAN, LAN, TCP/IP, UDP, FTP, Telnet, SMTP, Ports - World Wide Web – HTTP, SMTP, POP3, MIME, Understanding roles of Web Browsers – Concepts of Web Servers.	5
	1.2 HTML Introduction - Basic Tags of HTML - HTML Tag - TITLE Tag – BODY Tag - Formatting of Text: Headers - Formatting Tags: BOLD, ITALICS, UNDERLINE, PARAGRAPH, TT, STRIKETHROUGH, EM, BR and HR tags - PRE Tag - FONT Tag – Special Characters - Working with Images - META Tag.	5

	<p>1.3 Advanced HTML</p> <p>Difference between HTML & HTML5 - New elements in HTML5 - Links - Anchor tag – Lists - Unordered Lists - Ordered Lists – Definition Lists; Tables - TABLE, TR and TD Tags - Colspan and Rowspan.</p>	5
II	<p>FRAMES, FORMS AND CSS</p> <p>2.1 Frames</p> <p>Frameset – FRAME Tag – Frame inside other frames – NOFRAMES Tag.</p> <p>2.2 Forms</p> <p>FORM and INPUT Tag – Textbox - Radio Button – Checkbox – SELECT Tag and Pull Down Lists: Hidden - Submit and Reset; Some Special Tags: COLGROUP - THREAD, TBODY, TFOOT - _blank, _self, _parent, _top – IFRAME – LABEL - Attribute for <SELECT> - TEXTAREA..</p> <p>2.3 CSS</p> <p>Introduction – Features – Style Sheet basics - Working with CSS files – Syntax - Types of Style Sheets - Inline Styles - Embedded Styles - External or Linked Styles - What is CSS3? Animation – Borders – Backgrounds – Fonts –Multiple columns – Text effects.</p> <p>2.4 Formatting Text and Fonts</p> <p>Font Families Font Size Kerning, Leading and Indenting - Formatting Colors and Backgrounds: The Color Attribute - The Background Attribute - Background Colors and Images. Exploring CSS Class and ID Attributes: Defining the CSS Class Attribute – Defining the CSS ID Attribute - Dynamic effects with CSS - Lists- Tables – Forms - Simple Examples using above properties.</p>	<p>2</p> <p>3</p> <p>4</p> <p>5</p>
III	<p>JAVASCRIPT</p> <p>3.1 JavaScript Basics</p> <p>Need of scripting languages – Variables and Data Types: Declaring Variables – Life span of variables - Data Types - Operators: Assignment, comparison, computational and logical operators - Control Structures: Conditional Statements – Loop Statements: for, while, for in, break and continue statements.</p>	5

	<p>3.2 Object-Based Programming and Message boxes</p> <p>Functions - Executing Deferred Scripts - objects: Document object Model, Predefined objects, Array object, History object, Location object - Dialog Boxes - Alert Boxes - Confirm Boxes - Prompt Boxes.</p> <p>3.3 JavaScript with HTML</p> <p>Events - Event Handlers: onLoad and onUnload – onFocus and onBlur – onError - Forms: Forms Array – Form element properties - Introduction to jQuery – Features of jQuery - jQuery example.</p>	5
IV	<p>PHP</p> <p>4.1 Introduction</p> <p>A Brief Introduction to Apache, MySQL, PHP and Open Source - Server-Side Web Scripting.</p> <p>4.2 PHP</p> <p>PHP Structure and Syntax - Integrating HTML with PHP - Syntax and Variables - Constants and Variables - Passing Variables between Pages – if Statements - if and else – switch case - for loop – for each loop.</p> <p>4.3 Includes</p> <p>Includes and Functions for Efficient Code - Strings – Arrays and Array Functions - Sessions and Cookies – Sample Programs - Alternates to Incrementing/Decrementing Values..</p>	4
		5
		6
V	<p>PHP PRGRAMMING AND MYSQL</p> <p>5.1 PHP with MYSQL</p> <p>MySQL Syntax and Commands - Connecting to the MySQL Server – Data types - Functions - Querying the Database - SELECT, Logical Operators – MySQL Programs.</p> <p>5.2 Form Elements</p> <p>Processing the Form - FORM Element - Tables to Display Data – Edit, Update and Delete data.</p> <p>5.3 Hands on Experiments</p> <p>Creating a Simple Shopping - Cart Script – Mini Project.</p>	3
		3
		8

Reference Books

1. "Douglas E. Comer" "The Internet Book", Prentice Hall.
2. "Terry Felke-Morris" "Web Development and Design Foundations with HTML5", Pearson.
3. "Thomas A. Powell, Fritz Schneider" "HTML & CSS: The Complete Reference", Tata McGraw-Hill.
4. "Thomas Powell, Fritz Schneider" "Java Script: The Complete Reference", Tata McGraw-Hill.
5. "Timothy Boronczyk, Elizabeth Naramore, Jason Gerner, Yann Le Scouarnec, Jeremy Stolz, Michael K. Glass" "Beginning PHP6, Apache, MySQL, Web Development", Wrox Publications.



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

IV SEMESTER

2020 - 2021 onwards

4052430 – OBJECT ORIENTED PROGRAMMING WITH JAVA

CURRICULUM DEVELOPMENT CENTRE

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING,
TAMILNADU DIPLOMA IN ENGINEERING / TECHNOLOGY**

SYLLABUS

N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4052430

Semester : IV

Subject Title : Object Oriented Programming with Java

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16
weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
Object Oriented Programming with Java	5	80	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Fundamentals of OOPs & Java	15
II	Control Structures, Arrays, Vectors and Strings	13
III	Classes, Interfaces and Packages	15
IV	Exception Handling, Multithreading and Files	15
V	Applets, Graphics Programming and AWT Controls	15
Test & Model Exam		7
Total		80

RATIONALE:

This course explains the fundamental ideas behind the object oriented approach to programming. Knowledge of java helps to create the latest innovations in programming. Like the successful computer languages that came before, java is the blend of the best elements of its rich heritage combined with the innovative concepts required by its unique environment. This subject is designed to give you exposure to basic concepts of object oriented technology. This subject will help in learning to write programs in java.

OBJECTIVES:

On completion of the following units of syllabus contents, the students must be able to

- Understand the basic concepts and applications of Object Oriented Programming.
- Know the history & features Java.
- Use of control structures in Java Program.
- Use of Arrays and Vectors in Java Program.
- Demonstrate the use of string and String Buffers.
- Define Class with the attributes and methods.
- Know the types of inheritances.
- Define and Implement Interfaces.
- Create and access packages.
- Handle the errors using exceptions.
- Creating own exceptions
- Understand the concepts of multithreading.
- Develop multithreaded programs in Java.
- Develop File programs
- Develop simple Applets.
- Use of Graphics, Color & Font class
- List the types of AWT Components and types of event listeners.

*** DETAILED SYLLABUS**

Contents: Theory

Unit	Name of the Topics	Hours
I	<p>FUNDAMENTALS OF OOPS & JAVA</p> <p>1.1 Basics of OOPs: Introduction to Object Oriented Programming - Basic concepts of Object Oriented Programming –Objects and Classes – Data abstraction and Encapsulation, Inheritance, Polymorphism, Dynamic binding, Message communication – Application of OOPs.</p> <p>1.2 Introduction to Java: History of Java – Java features – Java Environment – JDK – API- Types of Java program – Creating and Executing a Java program – Java Tokens: Keywords, Character set, Identifiers, Literals, and Separator – Java Virtual Machine (JVM) – Comments in Java program.</p> <p>1.3 Elements: Constants – Variables – Data types – Type casting – Scope of variables – Operators - Types – Expressions – Evaluation of Expressions.</p>	<p>4</p> <p>6</p> <p>5</p>
II	<p>CONTROL STRUCTURES, ARRAYS, VECTORS AND STRINGS</p> <p>2.1 Decision making and Branching: Decision making: Simple if statement – if – else statement – Nesting if – else – else if Ladder – switch statement, Looping: While loop – do – While loop - for loop – break – labeled loop – continue Statement.</p> <p>2.2 Arrays & Vectors: Arrays: One Dimensional Array – Creating an array – Array processing – Multidimensional Array, Vectors: Definition- Creation - Methods</p> <p>2.3 Strings: String Class – Creation – Methods, String Buffer Class -- Creation - Methods– Difference between String and String Buffer.</p>	<p>5</p> <p>4</p> <p>4</p>
III	<p>CLASSES, INTERFACES AND PACKAGES</p> <p>3.1 Class and object: Defining a class – Creating objects – Accessing class members –</p>	<p>6</p>

	<p>Constructors – Method overloading – Static members – Nesting of Methods – this keyword – Command line argument.</p> <p>3.2 Inheritance:</p> <p>Definition –Types -- Single Inheritance – Multilevel Inheritance – Hierarchical Inheritance – Overriding methods – Final variables and methods – Final classes – Final methods - Abstract methods and classes – Visibility Control: Public , Private, friendly and protected. Interfaces: Multiple Inheritance -- Defining interface – Extending interface - Implementing Interface.</p> <p>3.3 Package:</p> <p>Java API Packages – System Packages – Naming Conventions – Creating & Accessing a Package – Adding Class to a Package – Hiding Classes.</p>	<p>6</p> <p>3</p>
<p>IV</p>	<p>EXCEPTION HANDLING, MULTITHREADING AND FILES</p> <p>4.1 Exception Handling:</p> <p>Types of Errors – Exception -- Advantages of Exception Handling – Basics of Exception Handling – try blocks – throwing an exception – catching an exception – finally statement – built in exceptions, creating own exception sub classes.</p> <p>4.2 Multithreading:</p> <p>Introduction – Life cycle of a Thread – Thread Methods – Creating Threads – Extending Thread class -- Implementing Runnable interface - Thread Priority – Thread Scheduling.</p> <p>4.3 FILES:</p> <p>File – Streams – Advantages – The stream classes – Byte stream classes –Character stream classes – Random Access files.</p>	<p>6</p> <p>4</p> <p>5</p>
<p>V</p>	<p>APPLETS, GRAPHICS PROGRAMMING AND AWT CONTROLS</p> <p>5.1 Applets:</p> <p>Introduction – Applet Life cycle – Creating & Executing an Applet – Applet tags in HTML – Parameter tag.</p> <p>5.2 Graphics programming:</p> <p>Graphics class –Lines -- Rectangles – Circles – Arcs -- Polygon –Filling objects – Color class - Selecting a color - Font class - Selecting a font -</p>	<p>5</p> <p>5</p>

	<p>Drawing Bar charts.</p> <p>5.3 AWT Components and Event Handlers</p> <p>Abstract window tool kit – AWT Controls – Labels – Text Field – Buttons - Checkboxes – Choice – Scrollbars – Event handling: Events, Event sources, Event Listeners, Input Events – Layout Managers – Menus.</p>	<p>5</p>
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Reference Books

1. “E. Balagurusamy “, “Programming with Java”, Tata Mc-Graw Hill, New Delhi.
2. “Herbert schildt “, “Java - The complete reference”, Tata Mc graw Hill, New Delhi.
3. “Java 2,J2SE1.4 Complete”, BPB Publications.



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

IV SEMESTER

2020 - 2021 onwards

4052440 – RELATIONAL DATABASE MANAGEMENT SYSTEMS

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4052440

Semester : IV

Subject Title : RELATIONAL DATABASE MANAGEMENT SYSTEMS

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
RELATIONAL DATABASE MANAGEMENT SYSTEMS	5 Hrs	80 Hrs	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Concepts of Databases and Data modeling	15
II	Relational Data model & MySQL Administration	15
III	Interactive MySQL	15
IV	MySQL Performance Tuning	14
V	Stored Program Concepts & Development	14
Test & Model Exam		7
Total		80

RATIONALE:

The Database Management system is a collection of programs that enables to store, modify and extract information from a database. The primary resource that fuels knowledge power is the database. Organizations are employing mechanisms to effectively manage and utilize the data stored in the databases. Relational Database Management System has been developed to harness the information stored in the database.

The major objectives of this subject are to provide a strong formal foundation in Database Concepts, technology and practice to the students to enhance them into well informed application developers. After learning this subject, the students will be able to understand the designing of RDBMS and can use any RDBMS package as a backend for database applications.

OBJECTIVES:

On learning of this subject, the students must be able to

- Describe data, database, database management systems and database models.
- To make the students to understand the concept of relational model and constraints.
- To make the students to understand the concept of Client/Server technology, Data warehousing, Data mining and Big Data.
- State CODD's rules.
- Understand Normalization and explain different types of normal form.
- To know DDL, DML, DCL and all related commands.
- Write logical and conditional statement for database query.
- Works with Procedures and functions.
- Create and use Cursors and Triggers.

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	<p>CONCEPTS OF DATABASES AND DATA MODELING</p> <p>1.1 Basic Concepts: Data, Databases, Database Management System – Components of Database – Data Dictionary – Architecture: Overall Architecture of DBMS - Three level architecture.</p> <p>1.2 Data Models: Types of Database models: Hierarchical Database Model, Network Database Model and Relational Database Model. E-R model: Entities - Attributes – Relationships – E-R diagram – Samples.</p> <p>1.3 Database Administrator: Server / Client and distributed concept – DBA tasks – DBA Tools/Utilities – Database Maintenance – Backup & Recovery.</p> <p>1.4 Advanced Concepts: Introduction to Data warehousing and Data mining – Applications – Data marts. Big Data: Definition – Characteristics – Various Technologies used – Applications – Overview of NoSQL: Difference between RDBMS and NoSQL – Tools used in Big Data, Scalability, and Understanding storage architecture.</p>	<p>4</p> <p>3</p> <p>3</p> <p>5</p>
II	<p>RELATIONAL DATA MODEL & MYSQL ADMINISTRATION</p> <p>2.1 Relational data model: CODD's rules – components of DBMS – Table Structure – Records, rows, tuples, attributes. Keys: Primary key, foreign key, composite key. Meta data – Data Dictionary – Data Integrity – Data constraints and validation – Types of constraints – Difference between SQL and MySQL.</p> <p>2.2 Normalization: Benefits – Normal forms: 1st Normal form, 2nd Normal form, 3rd Normal form.</p>	<p>5</p> <p>3</p>

	<p>2.3 MySQL Installation: Install, Configure and test the MySQL server on Microsoft Windows.</p> <p>2.4 Working with MySQL Admin: Creating (CREATE cmd), Selecting (USE cmd) and Describing database (DESC cmd) – SHOW cmd – backing up databases.</p>	<p>3</p> <p>4</p>
III	<p>INTERACTIVE MYSQL</p> <p>3.1 Introduction to MySQL: MySQL data types - Data Definition Commands – Data Manipulation Commands – Data retrieval commands.</p> <p>3.2 MySQL Operators and Expressions: Types of Operators – Arithmetic, Comparison and logical operators – Pattern matching – Import and Export of data.</p> <p>3.3 Built-in Functions: Single row functions – Aggregate functions – Conversion functions.</p> <p>3.4 Querying the table: Selecting rows using Where, Order by, group by & Having clauses. Sub-queries – correlated sub-queries.</p> <p>3.5 Flow control: IF(), IF NULL(), CASE, LOOP, LEAVE, ITERATE, REPEAT, WHILE</p>	<p>4</p> <p>2</p> <p>3</p> <p>3</p> <p>3</p>
IV	<p>MYSQL PERFORMANCE TUNING</p> <p>4.1 Indexes and sequences: Index types, Creating of an Index: Simple and Composite Index, Dropping Index. Sequences: creating, altering and dropping sequences.</p> <p>4.2 Views: Introduction – Advantages of views – Creating, Updating and Deleting views.</p> <p>4.3 Joins & Unions: Joins – definition - Types of Joins: natural join, inner join, self join, outer join. Unions: Types: Union, Union All, Union Distinct – order by and Limit handling.</p> <p>4.4 User and Transaction management: creating, deleting, renaming users grant & revoke commands –</p>	<p>3</p> <p>3</p> <p>4</p> <p>4</p>

	Transaction command: commit, rollback and save points.	
V	<p>STORED PROGRAM CONCEPTS & DEVELOPMENT</p> <p>5.1 MySQL Procedures & Functions: Creating – Executing and Deleting stored procedures – Creating – Executing and Deleting stored functions – Advantages.</p> <p>5.2 MySQL Trigger & Cursor: Use of Trigger – Creating Trigger – Types of Triggers – Cursor: Creation and Deletion</p> <p>5.3 MySQL and Web: Need for own MySQL programs – MySQL Application Programming Interfaces.</p> <p>5.4 MySQL with PHP: Database connections – Managing Database connections – Performing Queries – Closing Connections.</p>	<p>3</p> <p>3</p> <p>3</p> <p>5</p>

Reference Books:

1. “Abraham Silberschatz, Henry F.Forth, S.Sudarshan”, “Database System Concepts”, Mc Graw Hill Education. Seventh Edition.
2. “Joel Murach”, “Murach’s MySQL”, Mike Murach & Associates, Inc. 3rd Edition.
3. “Vikram Vaswami”, “The Complete Reference MySQL”.
4. “Paul DuBois”, “MySQL Developers library”, Addison Wesley (4th Edition).



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

IV SEMESTER

2020 - 2021 onwards

4052450 – WEB DESIGN AND PROGRAMMING PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4052450
 Semester : IV
 Subject Title : Web Design and Programming Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
WEB DESIGN AND PROGRAMMING PRACTICAL	4	64	25	75	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The main objective of the of this practical subject is to introduce the students to build a complete site, with the writing of a single web page in Web Design & Programming Practical using HTML, CSS, Java Script, PHP and MySQL. The subject will impart knowledge to design web pages, dynamic and interactive web sites with client-side and server-side scripting. After completion the students will be able to independently design and develop web sites and web applications.

OBJECTIVES:

By introducing the Web design and Programming Practical, it is intended to:

- Develop to build a complete website using HTML.
- Create web pages using Advanced HTML and CSS.
- Practice to include JavaScript for form validations.
- Develop and run sample programs using PHP script.
- Develop a simple web application using server side PHP script and MySQL.

DETAILED SYLLABUS

Contents: Practical

PART A	
1.	Design a HTML page describing your profile in one paragraph. Design in such a way that it has a heading, a horizontal rule, three links and your photo. Also, write three HTML documents for the links. Include facilities for forward, backward and HOME.
2.	Design a HTML page about computer languages. List the language. Each Language's name is a link. Prepare separate HTML documents for each language and call them in the appropriate link.
3.	Design a single page website for your polytechnic containing a description of the courses offered. It should also contain some general information about the college such as its history, the campus, and its unique features and so on. The site should be colored and each section should have a different color.
4.	Develop a web page using CSS to create a time table for the class using different border style.
5.	Write a Java script code that converts the entered text to uppercase.
6.	Write a Java script code to validate the username and password. The username and password are stored in variables.
7.	Write a Java Script code using frames and Events (When a cursor moves over an object it should display the specification of the object in another frame).
8.	Create a site containing banner advertisement at the top of the page. The ads are changed every 10 or 15 seconds.
9.	Write jQuery Program for Count the number of milliseconds between the two click events on a paragraph.
10.	Write jQuery Program for Disable/enable the form submit button & Blink the text.
PART B	
11.	Write a PHP program to implement at least 10 string functions with description.
12.	Write a PHP program to implement Date and Time Functions.
13.	Create a PHP script which display the capital and country name from the given array. Sort the list by the name of the country.

14.	Write a PHP script to display table with implementing Form Processing Controls of Insert and Delete data from data base.
15.	Create a simple shopping - cart script using PHP and MySQL.

BOARD EXAMINATION

NOTE:

Students should write one program from **PART A** and one program from **PART B**.

DETAILED ALLOCATION OF MARKS

Writing answer for any one program from PART – A	20 Marks
Writing answer for any one program from PART – B	25 Marks
Executing program – PART - A	20 Marks
Executing program – PART - B	20 Marks
Result with printout – PART - A	5 Marks
Result with printout – PART - B	5 Marks
VIVA – VOCE	5 Marks
TOTAL	100 Marks

LIST OF EQUIPMENTS

Hardware Requirement

1. Desktop Computers – 30 Nos.
2. Laser Printer - 1 No

Software Requirement

1. Notepad / Notepad++ / Dreamweaver
2. Apache XAMPP
3. Any Browser



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

IV SEMESTER

2020 - 2021 onwards

4052460 – JAVA PROGRAMMING PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING,
TAMILNADU DIPLOMA IN ENGINEERING / TECHNOLOGY
SYLLABUS
N-SCHEME**

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4052460

Semester : IV

Subject Title : Java Programming Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16
weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
Java Programming Practical	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

To understand various concepts of JAVA and to familiarize Java environment to create, debug and run Java programs.

OBJECTIVES:

- Develop programs using different operators and expressions.
- Develop programs using Iterative statements.
- Develop programs using arrays
- Develop applications using Vectors.
- Create classes and objects with constructors
- Solve problems using inheritance

- Handle exception arising in programs.
- Use multithreading in programs
- Develop programs using File
- Create Applet programs
- Develop programs using Graphics & Color classes
- Use GUI components to develop GUI applications

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DETAILED SYLLABUS

Contents: Practical

PART – A

1. Write a program to read the temperature in Celsius and convert into Fahrenheit.
2. Write a program to read 2 integers and find the largest number using conditional operator.
3. Write a program to read an integer and find the factorial of a number.
4. Write a program to implement Vector class and its methods.
5. Write a program to read a string and check whether it is palindrome or not.
6. Write a program to create a class with following data members
 1. Register number 2. Name
 3. Marks in 3 subjects and member functions
 1. parameterized constructor – to assign values to members
 2. method to find total mark
 3. method to display register number, name, total mark

Create 3 objects from the above class and use the members
7. Write a program that accepts radius of a circle from command line and display its area.

PART – B

8. Write a program to implement multilevel inheritance.
9. Write a program to create a own exception subclass that throws exception if the given number is not in a range of numbers.
10. Write a program that creates three threads. First thread displays “Good Morning” everyone second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.
11. Write a program to create a file using Byte stream or Character stream class.
12. Write a program to demonstrate Mouse events.
13. Write a program to display basic shapes using Graphics class and fill them using Color class
14. Write a program to create a simple calculator to perform addition, subtraction, multiplication and division using button, label and text field.

BOARD EXAMINATION

NOTE:

Students should write one program from **PART A** and one program from **PART B**.

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Writing answer for any one program from PART – A	20 Marks
Execution PART – A	20 Marks
Result and Print out PART – A	5 Marks
Writing answer for any one program from PART – B	25 Marks
Execution PART – B	20 Marks
Result and Print out PART – B	5 Marks
Viva voce	5 Marks
TOTAL	100 Marks

LIST OF EQUIPMENTS

HARDWARE

1. Desktop Computers – 30 Nos
2. Printer – 1 No

SOFTWARE

1. Any Text Editor
2. JDK 1.7 or above
3. Java enabled Browser



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

II YEAR

N – SCHEME

IV SEMESTER

2020 - 2021 onwards

**4052470 – RELATIONAL DATABASE
MANAGEMENT SYSTEM PRACTICAL**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 DIPLOMA IN INFORMATION TECHNOLOGY

Subject Code : 4052470

Semester : IV

Subject Title : RELATIONAL DATABASE MANAGEMENT SYSTEMS PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
Relational Database Management Systems Practical	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The main objective of this practical subject is to provide basic and advanced concepts of MySQL. MySQL is a relational database management system based on the Structured Query Language, which is the popular language for accessing and managing records in the database. MySQL is open-source and free software under the GNU license.

This practical includes all topics of MySQL database that provide for how to manage database and manipulate data with the help of various SQL queries.

OBJECTIVES:

On Completion of the following exercise, the students must be able to

- How to install, configure and connect to MySQL server and MySQL workbench in Windows.
- Understand basic concepts of how a database stores information via tables.
- Understand SQL syntax used with MySQL.
- Learn how to retrieve and manipulate data from one or more tables.
- Learn how to filter data based upon multiple conditions.
- Understand the advantages of stored functions and procedures.
- Learn way of connecting to MySQL through PHP, and how to create tables, enter data, select data, change data, and delete data. Connect to SQL server and other data sources.

DETAILED SYLLABUS

Contents: Practical

PART – A

1. Install, configure and connect to MySQL server and MySQL workbench in windows. Create a database, backup and restore the database.
2. To study Basic MySQL commands (create database, create table, use, drop, insert) and execute the following queries using these commands:
 - Create a database named 'employee'.
 - Use the database 'employee' and create a table 'emp' with attributes 'ename', 'ecity', 'salary', 'enumber', 'eaddress', 'deptname'.
 - Create another table 'Company' with attributes 'cname', 'ccity', 'empnumber' in the database 'employee'.
3. To study the viewing commands (select, update) and execute the following queries using these commands:
 - Find the names of all employees who live in Chennai.
 - Increase the salary of all employees by Rs.5,000.
 - Change the company city to Chennai where the company name is 'TCS'.

4. To study the commands that involve compound conditions (and, or, in, not in, between, not between, like, not like) and execute the following queries using these commands:

- Find the names of all employees who live in 'Chennai' and whose salary is between Rs.20,000 to Rs.30,000.
- Find the names of all employees whose names begin with either letter 'A' or 'B'.
- Find the company names where the company city is 'Chennai' and the number of employees is not between 5000 and 10,000.
- Find the names of all companies that do not end with letter 'A'

5. a) Create a database 'polytechnic_collee'. Create 2 users namely 'staff' and 'student'.

- Grant all privileges to the user 'staff' and grant only 'create' privilege to 'student' user and verify the same.
- Revoke all privileges to the 2 users and verify the same.

b) Implement the following transactions control statements.

i) Commit ii) Rollback iii) Save point

6. Create table 'author' with the following structure

author_id

author_name

address

mobile

book_title

pages

published_on

- i) Insert 4 books published by 3 authors each. (12 records)
- ii) Fetch all the rows and observe how the data duplicated.
- iii) Apply 1st and 2nd normal forms to fix it.

7. To study the commands for views and execute the following queries using these commands:

- Create a view having ename and ecity
- In the above view change the ecity to 'Chennai' where ename is 'John'.
- Create a view having attributes from both the tables.
- Update the above view and increase the salary of all employees of IT department by Rs.1000.

8. Create a library table with proper fields. Create another table called library1 and insert rows from library table.

Hint:

```
CREATE TABLE new_table LIKE original_table;  
INSERT INTO new_table SELECT * FROM original_table;
```

PART – B

9. Create a table to store the details of a customer in a Bank. Do some transactions like withdrawal, deposit. Find the Balance amount(Credit Limit). Based on customer's credit limit, write a program using **IF** or **CASE** flow control statements to find the customer levels namely SILVER, GOLD or PLATINUM.

If the Credit limit is

- greater than 50K, then the customer level is PLATINUM
- less than 50K and greater than 10K, then the customer level is GOLD
- less than 10K, then the customer level is SILVER

10. Create two tables with the following structure.

a) users - table name

user_id - UNSIGNED, INT, AUTO INCREMENT, PRIMARY KEY
username - VARCHAR (60)
password - VARCHAR (128)
email - VARCHAR (255)

b) users_profiles

user_id - FOREIGN KEY refers to user_id field of user table

first_name - VARCHAR(60)

last_name - VARCHAR(60)

mobile - VARCHAR(15)

- i) SELECT all the users along with their profile details. (Hint: Use INNER JOIN)
- ii) SELECT the users who do not have profiles (Hint: USE LEFT JOIN and exclude the rows generated with NULL values from joining table)

11. Create an employee database and create a stored procedure that accepts employee_id as input and returns complete details of employee as output.

12. Create two tables with the following structure

Authors

author_id - INT

name VARCHAR (60)

titles_count INT -- holds the total number numbers of titles authored.

Titles

author_id - INT

name VARCHAR (512) -- name of the title

- a. Create a trigger to update the titles count field of respective row in authors table each time a title gets inserted into titles table.
- b. Create **log table** with the following structure

author_id – INT

name VARCHAR (512) -- name of the title

status VARCHAR(25) --- ADDITION,DELETION,UPDATION

and insert an entry in that table each time the tile is added, deleted or updated.

Use a trigger to accomplish this.

13. Create a table containing phone number, user name, address of the phone user.
Write a function to search the address using phone number.

14. Create a table to store the salary details of the employees in a company. Declare the cursor id to contain employee number, employee name and net salary. Use cursor to update the employee.

15. Write a program to connect PHP with MySQL and create a database using PHP MySQL.

BOARD EXAMINATION

NOTE:

Students should write one program from **PART A** and one program from **PART B**.

DETAILED ALLOCATION OF MARKS

Writing answer for any one program from PART – A	20 Marks
Writing answer for any one program from PART – B	25 Marks
Executing program (PART – A)	20 Marks
Executing program (PART – B)	20 Marks
Result with printout (PART – A)	05 Marks
Result with printout (PART – B)	05 Marks
VIVA – VOCE	05 Marks
TOTAL	100 Marks

LIST OF EQUIPMENTS

HARDWARE REQUIREMENTS

1. Desktop Computers – 30 Nos
2. Printer – 1 Nos

SOFTWARE REQUIREMENTS

1. MySQL 5.5.20

SEMESTER – V



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

**4046510 – SYSTEM ADMINISTRATION AND
NETWORK SERVICES**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 INFORMATION TECHNOLOGY

Subject Code : 4046510

Semester : V

Subject Title : SYSTEM ADMINISTRATION AND NETWORK SERVICES

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
SYSTEM ADMINISTRATION AND NETWORK SERVICES	6 Hrs	96 Hrs	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	INTRODUCTION	19
II	FILE SYSTEM, ACCOUNT AND MEMORY MANAGEMENT	18
III	WINDOWS ADMINISTRATION	18
IV	LINUX/UNIX ADMINISTRATION	17
V	NETWORKING AND PERFORMANCE MONITORING	17
Test & Model Exam		7
Total		96

RATIONALE

The main objective of the subject is to enable the students to understand the concept of System Administration and importance of managing IT assets. This subject will impart basic knowledge about the two major operating systems used in the industry, preparing the PC hardware with operating systems from scratch with the newly available capabilities. It also helps the students to understand the concept of networking of computers, sharing of resources across the network and user management. This subject also prepares the student to get it certified in the industry to perform the role in System Administration related tasks.

OBJECTIVES:

On completion subject, the students must be able to

- Understand the importance of System Administration
- To know the role of workstation, servers, file system, disk administration in Windows, Linux
- Understand the Windows/Linux processes, schedulers
- Prepare the hardware to work with Windows Client, Server Operating Systems and Linux
- Understand the hardware virtualization and virtual machines
- To know about the Active Directory, Domain Controller and User management
- To know networking of computers and configuration of Exchange Server
- Understand the importance of Firewalls, Security Management
- To know about different tools in Windows/Linux for system administration
- Understand the performance monitoring

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	<p>INTRODUCTION</p> <p>1.1 Introduction: System Administration - Importance of System Administration Life Cycle – Role of System Administrator – Workstation – Server – Services – Data center</p> <p>1.2 Windows Operating Systems : History – Architecture -Client OS Flavours & Features – Server OS Flavours & Features</p> <p>1.3 Linux/Unix Operating Systems: Linux / Unix History – Architecture - Distributions – Kernel</p> <p>1.4 Virtualization: concept behind the Virtualization - Types of Virtualization: Hardware Virtualization - operating system Virtualization - Server Virtualization - Storage Virtualization. - Virtualization Benefits - Virtualization Security Hardware Virtualization Technology – Windows Hyper Visors (HyperV) - How to Use Hyper-V Virtualization Technology - Virtualization Tools</p>	<p>7</p> <p>3</p> <p>3</p> <p>6</p>
II	<p>FILE SYSTEM, ACCOUNT AND MEMORY MANAGEMENT</p> <p>2.1 File System: Windows File and Directory Layout – NTFS – FAT - Disk Partitions – Defragmentation – Registry - Linux File and Directory Layout – EXT4– FreeBSD – EXT3 – VFAT – Disk Partitions</p> <p>2.2 Account Management: User management in Windows- creating and managing local users and groups – User and group management in Linux - related commands - superuser - relevant files</p> <p>2.3 Memory: Windows Memory Architecture, memory management – Linux Memory Architecture, management</p>	<p>7</p> <p>5</p> <p>6</p>

<p>III</p>	<p>WINDOWS ADMINISTRATION</p> <p>3.1 Introduction: Windows boot process – computer management – disk management – system process – process identifier - user mode process – kernel mode process - managing start-up process</p> <p>3.2 Windows Services: Active Directory – Domain – Tree – Forests - Groups – Objects – Task Scheduler</p> <p>3.3 Windows Performance: Understanding Physical and Virtual memory – Paging File – Task Manager - Performance Monitor – Resource Monitor</p> <p>3.4 Windows Security: Windows Defender – Firewall – Firewall Inbound/Outbound rules – Group Policy – Windows Services</p> <p>3.5 Maintenance: WSUS (Windows Server Update Service) – Windows Backup & Recovery mechanisms – Windows Error Reporting (WER)</p>	<p>3</p> <p>4</p> <p>4</p> <p>3</p> <p>4</p>
<p>IV</p>	<p>LINUX/UNIX ADMINISTRATION</p> <p>4.1 Introduction: Boot process overview – Daemons – Boot Loaders GRUB – systemd – start-up scripts – process life cycle – process monitoring</p> <p>4.2:Access Control: Introduction – File system access control – process ownership – management of root account – user management - ACL- types</p> <p>4.3 Software Management: Package management tools – rpm – dpkg – apt - yum</p>	<p>6</p> <p>5</p> <p>6</p>
<p>V</p>	<p>NETWORK SERVICES</p> <p>5.1 Introduction: Network Service - common services - Domain Name System - Dynamic Host Configuration - Authentication servers -Directory services - e-Mail - File sharing - Instant messaging - Online game - Printing - File server - Voice over IP - Video on demand - Video telephony - World Wide Web -</p>	<p>8</p>

	<p>Simple Network Management - Time service - Wireless sensor network</p> <p>5.2 Protocols Used:</p> <p>TCP/IP, Ipv4, Ipv6 address format – MAC address – LAN - WAN- DHCP – ICMP – SMTP – POP3 – DNS -SNMP</p> <p>5.3 Networking requisites and tools:</p> <p>Pre-requisites to connect the computers to access the shared resources – exchange server configuration - network monitoring tools. (wireshark)</p>	<p>5</p> <p>4</p>
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Reference Books

1. "Thomas A. Limoncelli, Christina J.Hogan, Strata R.Chalup", "The practice of System and Network Administration", Addison Wesley (2ndEdition).
2. "Evi Nemeth, Garth Snyder, Trent R.Hein, Ben Whaley, Dan Mackin", "Unix and Linux System Administration Handbook", Addison Wesley Inc.
3. "Windows Server Administration Fundamentals" from Microsoft
4. www.microsoft.com
5. wikipedia



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

4052510 – PYTHON PROGRAMMING

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

N - SCHEME

(To be implemented to the Students admitted from the Year 2020-2021 on wards)

Course Name : **1046** Diploma in Information Technology

Subject Code : 4052510

Semester : V

Subject title : PYTHON PROGRAMMING

TEACHING & SCHEME OF EXAMINATION

No. of weeks per Semester: 16 Weeks

Subject	Instructions		Examination			Duration
	Hours/ Week	Hours / semester	Internal Assessment	Board Examination	Total	
PYTHON PROGRAMMING	5	80	25	100*	100	3

*Examination will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topic	Hours
I	INTRODUCTION	14
II	CONTROL STRUCTURE AND FUNCTIONS	15
III	STRINGS AND LISTS	14
IV	TUPLE, SET, DICTONARIES	15
V	FILES AND EXCEPTION HANDLING	15
TEST & MODEL EXAM		7
TOTAL		80

RATIONALE:

To introduce the student to the basic features of industry standard programming language and impart skills to develop industry standard solutions to the problems. The python language is one of the most accessible programming languages available because it has simplified syntax and not complicated, which gives more emphasis on natural language. Due to its ease of learning and usage, python codes can be easily written and executed much faster than other programming languages. Python has several modules to write programs to solve Artificial Intelligence, Machine Learning, Data Analysis problems. Python is a cross-platform language used by many leading organizations such as Google and NASA.

OBJECTIVES:

On completion of the following units of syllabus contents, the students must be able

- To read and write simple Python programs.
- To develop Python programs with conditionals and loops
- To define Strings in Python and operations on String.
- To define Python functions and call them.
- To Decompose a Python program into functions.
- To Represent compound data using Python lists, tuples, dictionaries.
- To use Python data structures -- lists, tuples, dictionaries.
- To do input/output with files in Python.
- To do exception handling in Python

DETAILED SYLLABUS

Content: Theory

Unit	Name of the Topics	Hours
I	INTRODUCTION TO PYTHON	4
	1.1 Features of Python: Installing and running Python - interpreter and Interactive mode - Identifiers - Reserved Keywords - Variables - Comments in Python	4
	1.2 Data Types: Numeric, String, List, Sets, Tuple, Dictionary, Boolean; Operators – Arithmetic, Relational, Assignment, Logical, Bitwise, Membership operator, identity operator.	5
II	DECISION MAKING, CONTROL STRUCTURE AND FUNCTIONS	5
	2.1 Decision Making: Simple if, if...else and if ... elif statement; Control Statement - for loop, range(), while, break , continue, pass	5
	2.2 Functions: Built in functions-Mathematical functions, Date and Time, dir(), help() Functions; User defined functions-Return values, parameters and arguments, function calls, local and global scope, function composition, recursion, anonymous functions.	5
III	STRINGS AND LISTS	5
	3.1 Strings in python: String functions and methods, string slicing, immutable property, string Traversal, Escape Characters, string formatting operators and functions.	5

	<p>3.2 Lists: Creation of List, values and accessing elements, mutable property, Traversing a List, copying the list, altering values, deleting elements from list.</p> <p>3.3 Built-in List operators and built-in methods: Illustrative Programs</p>	<p>5</p> <p>4</p>
IV	<p>TUPLES AND DICTIONARIES</p> <p>4.1 Tuples: creating, accessing values, immutable property, assignment of tuples, returning tuples, tuples as arguments - variable length arguments - basic tuple operations, Built-in tuple functions.</p> <p>4.2 Dictionaries: Creating a Dictionary, accessing values, updating dictionary, deleting elements from dictionary; dictionary keys - Properties, operations in Dictionary, Built-in dictionary methods.- Illustrative Programs</p>	<p>8</p> <p>7</p>
V	<p>FILES AND EXCEPTIONHANDLING</p> <p>5.1 File Handling: Text files, opening a file, closing a file, reading from a file and writing into a file, file opening modes, closing a file, File Object Attributes, File positions, renaming, deleting a file and files related methods.</p> <p>5.2 Directory methods: mkdir(), chdir(), getcwd(), rmdir().</p> <p>5.3 Exceptions in Python: Definition - Built-in exceptions, Handling Exceptions-try...except, except with No Exception, except with Multiple Exceptions, try...finally; User defined exceptions. - Illustrative programs</p>	<p>7</p> <p>2</p> <p>6</p>

REFERENCES

S.No	Title	Author	Publisher	Year of Publishing / Edition
1	Introduction to Computing and Problem Solving using Python	E.Balagurusamy	McGraw Hill Education(India) Pvt. Ltd.	1 st Edition / 2016
2.	Learning Python Programming	Jeffrey Elkner, Allan B. Downey, Chris Meyers	Samurai Media Limited.	2016
3.	Taming Python By Programming	Jeeva Jose	Khanna Book Publishing Co(P) Ltd	2017 Reprinted 2019
4.	Python Programming	Ashok Namdev Kamthane and Amit Ashok Kamthane	McGraw Hill Education(India) Pvt. Ltd.	2018
5.	Learn and Practice Python programming	Swapnil Saurav	Eka Publishers	2 nd Edition/ 2020
6.	Programming in Python	Dr.Pooja Sharma	BPB Publications	2017

Python Online Learning Resources:

<https://www.learnpython.org>

www.python.org ,

<https://www.tutorialspoint.com/python>



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

4052531 – ELECTIVE THEORY I COMPONENT BASED TECHNOLOGY

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology.

Subject Code : 4052531

Semester : V

Subject Title : **Elective Theory – I** COMPONENT BASED TECHNOLOGY

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16

weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
COMPONENT BASED TECHNOLOGY	5	80	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	INTRODUCTION TO .NET FRAMEWORK AND C#.NET	15
II	APPLICATION DEVELOPMENT USING C#.NET	15
III	APPLICATION DEVELOPMENT USING ADO.NET	15
IV	INTRODUCTION TO ASP.NET	14
V	XML	14
Test & Model Exam		7
Total		80

RATIONALE:

.NET Framework is changing the way developers write applications. .NET Framework provides a number of components to create many types of applications including those for consoles, Windows, mobile units and the web. Using .NET framework the data can be made available anytime, anywhere and on any device.

This subject introduces the basics of .NET Framework. Writing applications on C#.Net is covered in this course. Concepts of developing Window applications using C#.NET. Concepts of developing web applications using ASP.NET are discussed. This course helps to use ADO.NET to write the applications to connect with the back end database. The subject also enables the users to know the concepts of XML and the XML web services.

OBJECTIVES:

On completion of the following units of syllabus contents, the students must be able to

- List the major elements of the .NET Framework and describe some of the major enhancements to the new version of C#.
- Describe the basic structure of a C#.NET project and use the main features of the integrated development environment (IDE).
- Use the new language features and syntax in C# .NET.
- Explain the basic concepts and terminology of object-oriented design specifically for C#.NET.
- Use the basic concepts and terminology of object-oriented programming in C# .NET.
- Create applications by using Microsoft Windows Forms.
- Create applications that use ADO.NET.
- List down the features of ASP.NET.
- Create web controls using ASP.NET.
- Learn about server controls and events in ASP.NET.
- Set up and deploy various types of C# .NET-based applications.
- Develop Window applications using XML as back end database

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	INTRODUCTION TO .NET FRAMEWORK and C#.NET	
	1.1 Introduction to .NET framework: Features of .NET framework, Dot Net Architecture – Managed Code and the CLR – Intermediate Language, Metadata and JIT Compilation–Automatic Memory Management. – Assembly, .NET objects, .NET web services	3
	1.2 Visual Studio .NET: Features, Using the .NET Framework, Exploring the Visual Studio Integrated Development Environment – System requirements – Versions	3
	1.3 Introduction to C#.NET: Variables and constants – data types – declaration. Operators – types – precedence – Expressions – Program flow – Decision statements – if .. then, if..then..else, switch..case, Loop statements – while, do...while, for..next, for..each..next.	4
	1.4 Types: Value data types – Structures, Enumerations. Reference data types – Single dimensional– Multi-dimensional arrays–Jagged arrays– Dynamic arrays	3
1.5 Classes & objects: Creating and using your own classes – Data members and member methods – Instantiate an object	2	
II	APPLICATION DEVELOPMENT USING C#.NET	
	2.1 Windows programming: Creating windows Forms–Working with Toolbox Controls– Button, Check Box, Combo Box, Label, List Box, Radio Button, Text Box, Group Boxes, Picture Box	4
	2.2 Advanced Controls & Events: Timer , Progress Bar, Month Calendar , ToolTips, Tab Controls, Panels -Events–Click, Close, Deactivate, Load, MouseMove,	3

	<p>MouseDown, MouseUp, Keypress ,KeyDown, KeyUp.</p> <p>2.3: Multiple Document Interface (MDI) Forms: Creating MDI Applications – Creating MDI Child Windows – Arranging MDI Child Windows</p> <p>2.4 Menus and Dialog Boxes: Creating menus – Menu items – Creating Submenus , Menu Shortcuts, Context menu – Using dialog boxes – show Dialog() method.</p>	<p>4</p> <p>4</p>
III	<p>APPLICATION DEVELOPMENT USING ADO.NET</p> <p>3.1 Features of ADO.NET: Architecture of ADO.NET – ADO.NET providers – Connection – Command – Data Adapter – Dataset.</p> <p>3.2 Accessing Data with ADO.NET: Connecting to Data Source, Accessing Data with Data set and Data Reader – Modifying Table data using Command Objects – Understanding Data Set and working with Data Column and DataRow – Data Tables - Working with Data GridView</p> <p>3.3 Create an ADO.NET application: Using Stored Procedures</p>	<p>5</p> <p>5</p> <p>5</p>
IV	<p>INTRODUCTION TO ASP.NET</p> <p>4.1 ASP.NET Features: Change the Home Directory in IIS – Add a Virtual Directory in IIS Set a Default Document for IIS – Change Log File Properties for IIS – Stop, Start, or Pause a Web Site – Global. asax file</p> <p>4.2 Creating Web Controls: Web Controls – HTML Controls, Using Intrinsic Controls, Using Input Validation Controls, Selecting Controls for Applications – Adding web controls to a Page.</p> <p>4.3 Creating Web Forms: Server Controls – Types of Server Controls – Adding ASP.NET Code to a Page.</p> <p>4.4: .NET CORE WEB API : What's web API?, Web API features, Restful services, Method of REST</p>	<p>4</p> <p>4</p> <p>3</p> <p>3</p>

V	XML 5.1 Introduction: Advantages – HTML Vs XML – Browsing and parsing XML – Creating a XML file – Data island – Well formed XML document – XML components: elements – Entities – Comments – Processing instructions – Attributes	5
	5.2 DTD: Declarations in DTD: Element, Attribute, Entity and Notation – Construction of an XML document – XML Namespaces – Declaring namespaces – Default namespaces – XML schema – Need and use of Schema – Building blocks – Simple elements – Defining attributes – Complex elements	5
	5.3 XML with .NET: XML Serialization in the .NET Framework – SOAP Fundamentals- Using SOAP with the .NET Framework.	4

Reference Books

S.No	Author Name	Title	Publisher
1.	Douglas J. Reilly	Designing Microsoft ASP.NET Applications	Microsoft Press
2.	ISR D Group	Applicationsof.NET Technology	TMGH Education PvtLtd.,New Delhi
3.	E. Balagurusamy	Programming In C#, 3E	Tata McGraw-Hill Education,
3.	Rebecca M. Riordan	ADO NET 2 0 Step by Step	Microsoft Press
5.	David S. Platt	Introducing Microsoft .NET	Microsoft Press
6.	-	Introduction to Microsoft ASP.NET - Work Book	Microsoft Press



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

**4052532 – ELECTIVE THEORY I
ARTIFICIAL INTELLIGENCE AND DATA ANALYTICS**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

N - SCHEME

(to be implemented to the student Admitted from the Year 2020-2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4052532

Semester : V

Subject title : **Elective Theory I** Artificial Intelligence and Data Analytics

TEACHING & SCHEME OF EXAMINATION

No. of weeks per Semester 16 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
AI and Data Analytics	5	80	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit No.	Topic	No. of Hours
I	Artificial Intelligence	15
II	Introduction to Machine Learning	14
III	Data Analytics and NumPy Library	15
IV	Data Analysis with Pandas	15
V	Visualization with Matplotlib	14
Test and Revision		7
Total		80

RATIONALE:

This course provides the foundations for AI problem solving techniques and data analytics and articulates the different dimensions of these areas. The syllabus is designed to provide exposure to the theory as well as practical systems and software used in data analysis. This course explains fundamental data science techniques and the various Python programming packages required for data science.

OBJECTIVES:

After studying this subject students will be able

- To understand the fundamentals of Artificial Intelligence and its importance.
- To understand the techniques used in AI.
- To understand how the knowledge is represented, and the characteristics of intelligent agents.
- To Identify and formulate appropriate AI methods for solving a problem.
- To understand some of the search strategies and the constraint satisfaction problems.
- To understand the principles of Machine Learning.
- To explore some of the real-world applications of Machine learning techniques.
- To understand a range of topics and concepts related to data analytics.
- To familiarize with the Python NumPy library for array processing.
- To utilize the Pandas packages in Python for exploratory data analytics.
- To create informative visualizations with matplotlib to identify patterns.

DETAILED SYLLABUS

Content: Practical

Unit	Name of the Topics	Hours
I	<p>ARTIFICIAL INTELLIGENCE</p> <p>1.1 Artificial Intelligence: What is AI?-Types of AI-History of AI-Turing Test- Structure of AI-Goals of AI-Importance of AI-Techniques used in AI-Perception, Understanding and Action- Technological drivers of modern AI.</p> <p>1.2 Knowledge: Definition-Knowledge Representation-objectives and requirements-practical aspects of representation-Components Intelligent Agents: Agents and Environments-Properties of environments-characteristics of agents- classification of agents.</p> <p>1.3 Problem Solving: Problem Formulation-Goal Formulation-State Space Search-Search Problem-Basic search algorithm-Search Tree-Search strategies – Uninformed and informed search-Breadth First Search, Depth First Search, Best First Search- Constraint Satisfaction Problem (CSP)- Backtracking Search. Problem Definitions: N Queen Problem, 8 Puzzle Problem, Tic-Tac-Toe.</p>	4 4 7
II	<p>INTRODUCTION TO MACHINE LEARNING</p> <p>2.1 Learning: Strategies of Learning- Learning Model- Classes of Learning (Supervised, Unsupervised, Reinforcement)- Process of ML- Common types of ML algorithms.</p> <p>2.2 Neural Network: Biological and Artificial, Mathematical model of a neuron</p> <p>2.3 Machine Learning Applications: Learning Associations, Regression, Classification, Prediction- Natural Language Processing (NLP) - Automatic Speech Recognition (ASR) - Machine Vision-Robotics.</p>	5 3 6

<p>III</p>	<p>DATA ANALYTICS AND COMPUTING WITH NumPy</p> <p>3.1 Data Analytics: Data-Types of Data- Importance of Data- Data Analysis Vs Data Analytics-Types of Data Analytics- Elements of Analytics- Data Analysis Process- Qualitative and Quantitative analyses- Open-Source Data.</p> <p>3.2 Introduction to Python: Features of Python-Installing Python- Python IDEs- PyPI Python Package Index- Pip Python package manager- Importing Libraries and Functions- Python data structures (list, set, tuple, dict)- Functional programming (map, filter, reduce, lamda, list comprehension).</p> <p>3.3 NumPy Library: Introduction- Installation- Ndarray: creating an array, intrinsic creation of an array, Data types- basic operations- aggregate functions- Indexing, slicing, Iterating- Conditions and Boolean arrays- Array manipulation: Joining, splitting, shape changing, sorting- Structured arrays- Reading and Writing array data on a File.</p>	<p>4</p> <p>5</p> <p>6</p>
<p>IV</p>	<p>DATA ANALYSIS WITH PANDAS</p> <p>4.1 Introduction: Pandas data structures: Series - Declaration, selecting elements, assigning values, Filtering values, operations, mathematical functions, evaluating values, Handling missing data, creating series from dictionaries, adding two series.</p> <p>4.2 Data Frame: Defining, Selecting elements, assigning values, membership, deleting a column, filtering. Index Objects: Indexing, Re-indexing, Dropping- sorting and ranking- Descriptive Statistics</p> <p>4.3 Data Loading: Reading and Writing csv, xls, text data files- Data Cleaning and Preparation: Handling missing data, Removing duplicates,</p>	<p>5</p> <p>4</p> <p>6</p>

	replacing values- Vectorized String Methods- Hierarchical Indexing- Merging and Combining- Data aggregation and Grouping.	
V	<p>VISUALIZATION WITH MATPLOTLIB</p> <p>5.1 Data Visualization: Introduction to Matplotlib-PyPlot package- Figures and Subplots- showing plots and images</p> <p>5.2 Customizing Plots: Colors, Markers, Line Styles, Limits, Ticks, Labels, Legends, Grids - Annotating with text-Matplotlib configuration</p> <p>5.3 Chart types: Line, Bar, stacked bar, Box plots, pie chart - Histogram and Density plots- Scatter plot- Saving Plots to a file- Close and clear plots.</p>	<p>4</p> <p>4</p> <p>6</p>

Reference books

1. Tom Taulli - Artificial Intelligence Basics. A Non-Technical Introduction-Apress (2019)
2. Chowdhary K.R - Fundamentals of artificial intelligence-Springer (2020)
3. Stuart J.Russell,PeterNorvig- Artificial Intelligence A Modern Approach- (Prentice Hall- 2010, Edition 3)
6. NPTEL Web Content-Artificial Intelligence, Prof.P.Mitra, Prof.S.Sarkar, IIT Kharagpur(Link: <https://nptel.ac.in/courses/106/105/106105078/>)
7. Fabio Nelli, Python Data Analytics, APRESS, 2015
8. Wes McKinney, Python for Data Analysis: Data Wrangling with Pandas, NumPy,andIPython, O'REILLY 2018, Second Edition



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

4046533 – ELECTIVE THEORY I MOBILE APPLICATION DEVELOPMENT

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

N - SCHEME

(to be implemented to the student Admitted from the Year 2020-2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4046533

Semester : V

Subject title : **Elective Theory I** Mobile Application Development

TEACHING & SCHEME OF EXAMINATION

No. of weeks per Semester 16 Weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
Mobile Application Development	6	96	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit No.	Topic	No. of Hours
I	Introduction to Mobile Computing	17
II	Mobile and Smart TV OS	18
III	Android Development Environment	18
IV	Basic and Advanced Views	18
V	Location Based Services and SQLite	18
Test and Revision		7
Total		96

RATIONALE:

Mobile Application development is the very hot business domain. Majority of the corporate have a separate division for the development of mobile applications. It is imperative that students must know the way to apply advanced data communicating methods and networking protocols for wireless and mobile devices.

Students must utilize and employ application frameworks for developing mobile applications including under disconnected and weakly connected environment. They should be in a position to select components and networks for particular application , creatively analyze mobile and wireless networks and critically analyze security issues of mobile and wireless computing systems.

OBJECTIVES:

After studying this subject students will be able

- To understand the characteristics, basic concepts and systems issues in mobile Computing
- To understand architecture and protocols in Mobile computing and to identify the trends and latest development of the technologies in the area
- To understand the network protocols governing the mobile communication
- To know the different kinds of mobile OS prevailing in the market
- To know Android OS in detail
- To know Apple iOS and Smart TV OS
- To understand the components of a Mobile App.
- To have practical experience in the area through the development of Mobile apps
- To design successful mobile computing applications and services
- To evaluate critical design tradeoffs associated with different mobile technologies, architectures, interfaces and business models and how they impact the usability, security, privacy and commercial viability of mobile and pervasive computing services and applications
- To know the development of Mobile apps using SQLite database
- To know the cross platform application development tools

DETAILED SYLLABUS

Unit	Name of the Topics	Hours
I	<p>INTRODUCTION TO MOBILE COMPUTING</p> <p>1.1 Introduction to Mobile Computing :</p> <p>Evolution of Mobile Computing - Important terminologies</p> <p>1.2 Wireless LAN and Protocols:</p> <p>WI-FI and WI-MAX , Bluetooth ,RFID, Wi-Fi-Direct, Li-Fi, LTE, and 6LoWPAN , VoLTE</p> <p>1.3 Cellular Network Generations:</p> <p>Features of 1G,2G ,3G ,4G ,5G</p>	<p>5</p> <p>6</p> <p>6</p>
II	<p>MOBILE AND SMART TV OPERATING SYSTEM</p> <p>2.1 Mobile Operating Systems :</p> <p>Evaluation of Mobile Operating System-Handset Manufactures and their Mobile OS- Mobile OS and their features. Linux Kernel based Mobile OS</p> <p>2.2 Apple Mobile Operating Systems :</p> <p>History and features of Apple Operating Systems - iPadOS, tvOS, and watchOS</p> <p>2.3 Smart TV operating systems:</p> <p>Smart TV Operating System development History - versions and their features</p> <p>2.4 Android Operating System :</p> <p>Android Operating System development History - versions and its feature - The various Android devices on the market , The Android Market application store</p>	<p>5</p> <p>4</p> <p>4</p> <p>5</p>

<p>III</p>	<p>ANDROID DEVELOPMENT ENVIRONMENT</p> <p>3.1 Android Development Environment:</p> <p>System Requirements, Android SDK, Installing Java, and ADT bundle - Eclipse Integrated Development Environment (IDE), Creating Android Virtual Devices (AVDs) – Android Studio</p> <p>3.2 Android Architecture:</p> <p>Android Architecture - The Linux Kernel, Android Runtime - Dalvik Virtual Machine, Android Runtime – Core Libraries, Dalvik VM Specific Libraries, Java Interoperability Libraries, Android Libraries, Application Framework</p> <p>3.3 Creating a New Android Project:</p> <p>Defining the Project Name and SDK Settings, Project Configuration Settings, Configuring the Launcher Icon</p> <p>3.4 Activity:</p> <p>Creating an Activity, Running the Application in the AVD, Stopping a Running Application, Modifying the Example Application, Reviewing the Layout and Resource Files.</p>	<p>4</p> <p>4</p> <p>5</p> <p>5</p>
<p>IV</p>	<p>BASIC AND ADVANCED VIEWS</p> <p>4.1 Basic Views :</p> <p>Text View, Button, Image Button, EditText, CheckBox, ToggleButton, RadioButton and RadioGroup Views, ProgressBar View, Auto Complete Text View</p> <p>4.2 Advanced Views :</p> <p>Time Picker View and Date Picker View – List Views – Image View – Menus – Analog and Digital View – Dialog Boxes</p> <p>4.3 Displaying Pictures & Menus with Views:</p> <p>Image View – Gallery View – ImageSwitcher – GridView - Creating</p>	<p>5</p> <p>5</p> <p>5</p>

	<p>the Helper Methods – Options Menu – Context Menu</p> <p>4.4 SMS and Dialer :</p> <p>Sending SMS – Receiving SMS – Making phone call</p>	3
V	<p>LOCATION BASED SERVICES AND SQLITE</p> <p>5.1 Location Based Services :</p> <p>Obtaining the Maps API Key- Displaying the Map – Zoom Control – Navigating to a specific location – Adding Marker – Geo Coding and reverse Geo coding</p> <p>5.2 Content Provider and Storage:</p> <p>Sharing data – view contacts – Add contacts – Modify contacts – Delete Contacts - Store and Retire data's in Internal and External Storage – SQLite - Creating and using databases</p> <p>5.3 Android Service :</p> <p>Consuming Web service using HTTP , downloading binary Data – Downloading Text Content – Accessing Web Service</p> <p>5.4 Cross Platform App Development :</p> <p>Cross platform application development tools and their features</p>	5

REFERENCE BOOK:

1. J. F. DiMarzio (Author) -Beginning Android Programming with Android Studio, 4th Edition (2016) - Wiley
2. Wei-MengLee -Beginning Android 4 Application Development,2012 - Wiley India Edition
2. Asoke K Talukder,Hasan Ahmed, Roopa R Yavagal Mobile Computing,2005 - TMGH



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

4046540 – SYSTEM ADMINISTRATION AND NETWORK SERVICES PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4046540
 Semester : V
 Subject Title : System Administration and Network Services Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
SYSTEM ADMINISTRATION AND NETWORK SERVICES PRACTICAL	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The main objective of this practical course is to enable the students to prepare computer system from scratch with different operating systems (Windows and Linux). It also includes administration of computers in the domain controller and understands user management, security management and firewall policies in Windows operating system environment. It also covers preparation of computer systems using hardware virtualization technology with the help of virtualization tools.

This practical includes topics related to configuration of exchange server in Windows Server environment, backup and restore procedures, Microsoft Security, Windows Defender and Active Directory management.

OBJECTIVES:

On Completion of the following exercise, the students must be able to

- How to install operating system in the computer and connect to the server computer.
- Understand basic concepts of Active Directory Management
- Understand Firewall concepts and learn to write firewall rules.
- Learn how to configure the Exchange Server in the domain environment.
- Understand different virtualization software tools to prepare computer system using hardware virtualization technology.
- Understand the different backup and restore tools, Windows backup and restore.
- Learn how to use Windows Hyper-V and inter networking of virtualized computers and sharing of hardware resources.
- Learn how to use windows scheduler, write small system administration tasks.

DETAILED SYLLABUS

Contents: Practical

PART - A

1. Installation of Windows 10 in the Hyper Visor environment and configure the network adapter. Assign the static IP address for the computer.

Hint : Before installing the Windows 10 in the Hyper Visor environment, ensure that Hyper V feature enabled in the system where Hyper V is hosted and VTx feature is enabled in the BIOS.

2. Installation of Windows 10 in the Virtual Box environment and configure the network adapter and enable sharing the resources (folders, usb devices etc.,) between host computer and guest computer.

Hint : Before installing Virtual Box in the host computer, ensure that Hyper V feature is disabled in the system and VT x is enabled in the BIOS.

3. Installation of any Linux distribution in the Hyper Visor environment, configure the network adapter and assign the IP address. Enable the sharing of file folders from host machine.
4. Enable the local networking of two computers.
5. Install the Server Operating System and configure the AD, DNS and connect the client computer to the server computer.
6. Install the Server Operating System and configure the AD, DNS and connect the client computer to the server computer. Create specific user in the Server computer and login from the client computer.
7. Create firewall rule in windows to disable the specific port for incoming and outgoing traffic. (e.g., block the HTTP and HTTPS port)
8. Create FTP Server in the Windows 10 computer, and retrieve the contents from FTP server via FTP protocol.

PART - B

1. Install the Server Operating System and configure the DNS and connect the client computer to the server computer. Configure the static IP in the client computer and verify.
2. Install the Server Operating System and configure the DNS and connect the client computer to the server computer. Do not Configure the static IP in the client computer and verify the client computer is assigned with automatic IP.
3. Create automatic task in windows and demonstrate the task is executed in a timely manner. [Hint : Using Windows Task Scheduler]
4. Note down, physical memory and virtual memory of the running process in Windows / Linux along with priority of the process.
5. Configure sendmail / MailEnable (free Windows email software) in the Server system and create email id. Demonstrate the email messages are reached to specific recipient.

- Restoring the Windows Operating System to pre-defined known state after the installation of new software. [Hint: Using Windows System Restore point]

BOARD EXAMINATION

Note:

Students should write one program from **PART A** and one program from **PART B**.

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION		
1.	Procedure writing one from PART - A	20 Marks
2.	Executing Exercise PART - A	20 Marks
3.	Result with Print out PART - A	5 Marks
4.	Procedure writing one from PART - B	25 Marks
5.	Executing Exercise PART - B	20 Marks
6.	Result with Print out PART - B	5 Marks
7.	Viva voce	5 Marks
TOTAL		100 Marks

LIST OF EQUIPMENTS

HARDWARE:

- Desktop Computers - 30 Nos.
- Server - 1 No.
- Printer - 1 No.

SOFTWARE:

- Windows 10 Operating System
- Linux Operating System
- sendmail / MailEnable (free Windows email software)



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

4052540 – PYTHON PROGRAMMING PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N – SCHEME

(to be implemented to the student Admitted from the Year 2020-2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4052540
 Semester : V
 Subject : PYTHON PROGRAMMING PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16week

Subject	Instructions		Examination			Duration
	Hours/Week	Hours / semester	Internal Assessment	Board Examination	Total	
PYTHON PROGRAMMING PRACTICAL	4	64	25	100*	100	3 Hrs

* Examination will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

To write, debug and run programs in Python to understand the basic concepts of industry standard modern programming language.

OBJECTIVES:

- To write, test and debug simple Python programs
- To Implement Python Programs with conditionals and Loops
- To use functions for structuring Python Programs
- To implement string manipulation functions using Python Program
- To implement List and its built-in functions and methods
- To implement Tuples and passing tuple as arguments
- To create Python Dictionaries and updating Dictionaries
- To develop programs to read and write data from or to files in Python
- To Develop programs with Exception Handling

DETAILED SYLLABUS

Contents: Practical

PART – A

1.
 - i) Write a Python program to compute GCD of two numbers
 - ii) Write a Python Program to print prime numbers in the given range.
2.
 - i) Write a Python Program to check the given year is leap year or not.
 - ii) Write a Python Program to print Armstrong numbers between given range.
3.
 - i) Write a Python Program to do basic trim and slice operations on String.
 - ii) Write a Python Program to accept line of text and find the number of characters, vowels and blank spaces on it.
4.
 - i) Write a Python Program using function to display all such numbers which is divisible by 3 but are not multiple of 5 in a given range.
 - ii) Write a Python Program using recursion to print 'n' terms in Fibonacci series.
5. Write a Python Program to add 'ing' at the end of a given string if the string has 3 or more characters . If the given string is already ends with 'ing' then add 'ly' instead. If the string has less than 3 characters, leave it unchanged.
6. Write a Python program to find minimum and maximum of a list of numbers
7. Write a Python program to display a list in reverse order.
8. Write a Python Program to print the first half values of tuple in one line and last half values in next line.

PART – B

9. Write a Python Program to take a list of words and return the length of the longest one using string.
10. Write a Python Program to find an element in a given set of elements using Linear Search

11. Write a Python Program to sort a set of elements using Selection sort.
12. Write a Python Program to multiply two matrices.
13. Write a Python program to demonstrate different operations on Tuple.
14. Write a Python Program to demonstrate to use Dictionary and related functions.
15. Write a Python Program to copy file contents from one file to another and display number of words copied.

BOARD EXAMINATION

Note:

Students should write one program from **PART A** and one program from **PART B**.

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION		
1.	Any one program from PART - A	20 Marks
2.	Execution PART - A	20 Marks
3.	Result and Print out PART - A	5 Marks
4.	Any one program from PART - B	25 Marks
5.	Execution PART - B	20 Marks
6.	Result and Print out PART - B	5 Marks
7.	Viva voce	5 Marks
TOTAL		100 Marks

LIST OF EQUIPMENTS

HARDWARE:

1. Desktop Computers - 30 Nos.
2. Printer – 1 No

SOFTWARE:

1. Windows / Linux Operating System
2. Python (to run as interactive mode and IDLE mode)



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

**4052561 – ELECTIVE PRACTICAL - I
COMPONENT BASED TECHNOLOGY PRACTICAL**

CURRICULUM DEVELOPMENT CENTRE

**DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME**

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology.

Subject Code : 4052561

Semester : V

Subject Title : **ELECTIVE PRACTICAL I - COMPONENT BASED TECHNOLOGY PRACTICAL**

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
COMPONENT BASED TECHNOLOGY PRACTICAL	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

This subject imparts the key concepts of component .based technology, programming skill set and the knowledge and techniques of writing programs in widely used C#,NET , create web pages in ASP.NET and learn ADO.NET to access database.

OBJECTIVES:

On completion of the following exercises, the students must be able to

- Develop and execute simple programs using C#.NET
- Understand the concepts of event handlers.
- Know the usage of various C#.Net controls
- Create C#.NET applications using menus.
- Access SQL database by using ADO.NET
- Use Form controls.
- Create Window applications using C#.NET form controls

- Use web controls.
- Create web pages using ASP.NET
- Develop XML database handling methodologies

DETAILED SYLLABUS

Contents: Practical

PART- A

1. Accept a character from console and check the case of the character.
2. Write a program to accept any character from keyboard and display whether it is vowel or not.
3. Write a program to implement a calculator with memory and recall operations.
4. Develop a form in to pick a date from Calendar control and display the day, month, and year details in separate text boxes.
5. Develop a application using the File and Directory controls to implement a common dialog box
6. Develop a database application to store the details of students using ADO.NET
7. Create a simple ASP.NET page to Output Text with a form, two HTML text boxes, an HTML button, and an HTML element. Create an event procedure for the button.

PART B

1. Develop a menu based application to implement a text editor with cut, copy, paste, save and close operations with accessing and shortcut keys.
2. Develop an application to perform timer based quiz of 5 questions.
3. Develop a database application using ADO.NET to insert, modify, update and delete operations.
4. Develop a application using Datagrid to add, edit and modify records.
5. Develop a web application to input data through a web form to a database and validate the data. Use the Required Field Validator and RangeValidator Controls.
6. Develop a Window application to read an XML document containing subject, mark scored, year of passing into a Dataset

7. Develop a Window application to read students records from Database using ADO.NET and generate XML document containing students records

BOARD EXAMINATION

Note:

One from PART-A and one from PART-B

DETAILED ALLOCATION OF MARKS

Writing answer for any one program from PART - A	20 Marks
Writing answer for any one program from PART - B	25 Marks
Executing program (PART – A)	20 Marks
Executing program (PART – B)	20 Marks
Result (PART – A)	5 Marks
Result (PART – B)	5 Marks
VIVA - VOCE	5 Marks
TOTAL	100 Marks

LIST OF EQUIPMENTS

HARDWARE REQUIREMENT

- 1.Desktop Computers – 30 Nos
2. Printer – 1 No

SOFTWARE REQUIREMENT

- 1.Visual Studio 2008/2012/2013/2015
- 2.Microsoft SQL Server 2005/2008 or above



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

**4052562 – ELECTIVE PRACTICAL I
DATA ANALYTICS USING PYTHON PRACTICAL**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 452562

Semester : V

Subject Title : **Elective Practical I - Data Analytics Using Python Practical**

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
Data Analytics Using Python Practical	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

This course provides the students the foundations for data analytics with python. The syllabus is designed to provide exposure to practical systems and software used in data analysis. The course explains data science techniques and the various Python programming packages required to prepare data for analysis, perform data analytics and create meaningful data visualization.

OBJECTIVES:

- To familiarize with the Python NumPy library for array processing.
- To utilize the Pandas packages in Python for exploratory data analytics.
- To explore some of the real world applications of Machine learning techniques.
- To create informative visualizations with matplotlib to identify patterns.

DETAILED SYLLABUS

Contents: Practical

Prerequisite:

- Python: Install Python IDE and important Python Libraries. Install Anaconda and find the features of Jupyter Notebook.

- Data Source:
<https://archive.ics.uci.edu/ml/machine-learning-databases/auto-mpg/>
<https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data>
<https://www.kaggle.com/arshid/iris-flower-dataset>
<https://www.kaggle.com/rohankayan/years-of-experience-and-salary-dataset>

PART A

Perform the exercises in PART A using NumPy

1. Basic data structures in NumPy

- a. Create a List, set, tuple and dictionary which stores the details of a student (rollno, name, dept, branch, percentage of mark) in Python and print the values.
- b. Convert the list and tuple as NumPy array.

2. Arrays in NumPy

- a. Create arrays using different intrinsic methods (ones, zeros, arange, linspace, indice) and print their values.
- b. Check the results of arithmetic operations like add(), subtract(), multiply() and divide() with arrays created using arange and ones intrinsic method.
- c. Check the results of mathematical operations like exp(), sqrt(), sin(), cos(), log(), dot() on an array created using arange intrinsic method.

3. Built-in functions in NumPy.

- a. Load your class Mark list data from a csv (comma separated value) file into an array. Perform the following operations to inspect your array. Len(), ndim, size, dtype, shape, info()
- b. Apply the aggregate functions on this data and print the results.

(Functions like min(), max(), cumsum(), mean(), median(), corrcoef(), std())

4. Handling Multiple Arrays

- a. Create two python NumPy arrays (boys, girls) each with the age of n students in the class.
- b. Get the common items between two python NumPy arrays.
- c. Get the positions where elements of two arrays match.
- d. Remove from one array those items that exist in another.
- e. Extract all numbers between a given range from a NumPy array.

5. Array Slicing in NumPy

- a. Load your class Marklist data into an array called “**marks**” to store students roll_num, subject marks and result.
- b. Split all rows and all columns except the last column into an array called “features”.
- c. Split the marks array into 3 equal-sized sub-arrays each for 3 different subject marks.
- d. Split the last column into an array “label”.
- e. Delete the roll_num column from the marks array and insert a new column student name in its place.

6. Indexing & Sorting in NumPy

- a. Load your class Marklist data from a csv file into an array.
- b. Access the mark of a student in a particular subject using indexing techniques.
- c. Sort the student details based on Total mark.
- d. Select a subset of 2D array using fancy indexing (indexing using integer arrays)
- e. Print student details whose total marks is greater than 250 using Boolean indexing.

7. Handling Two dimensional array in NumPy

- a. Import iris dataset with numbers and texts keeping the text intact into python NumPy.
- b. Convert the 1D iris to 2D array (iris2d) by omitting the species text field.
- c. Find the number and position of missing values in iris2d's sepal_length
- d. Insert np.nan values at 20 random positions in iris 2d dataset
- e. Filter the rows of iris2d that has petal_length > 1.5 and sepal_length < 5.0

PART-B

Perform the exercises in PART B using Pandas

8. Working with a Series

- a. Create a series using list and dictionary.
- b. Create a series using NumPy functions in Pandas.
- c. Print the index and values of series.
- d. Print the first and last few rows from the series.

9. Working with DataFrame Columns

- a. Create and print a DataFrame.
- b. Find the descriptive statistics for each column.
- c. Group the data by the values in a specified column, values in the index.
- d. Set Index and columns in a DataFrame.
- e. Rename columns and drop columns
- f. Select or filter rows based on values in columns.
- g. Select single and multiple columns with specific names

10. Working with DataFrame Rows

- a. Slicing DataFrame using *loc* and *iloc*.
- b. Filter multiple rows using *isin*.
- c. Select first n rows and last n rows
- d. Select rows randomly n rows and fractions of rows (use *df.sample* method)
- e. Count the number of rows with each unique value of variables
- f. Select *nlargest* and *nsmallest* values.
- g. Order/sort the rows

11. Handling missing data and duplicates

- a. Identify rows with missing data (*isnull()*, *notnull()*) and replace NA/Null data with a given value.
- b. Drop rows and columns with any missing data (*dropna()*, *dropna(1)*)
- c. Find duplicate values and drop duplicates.
- d. Fill the missing values using forward filling and backward filling.
- e. Replace the missing value with new value and write the dataframe to a CSV file in the local directory.

12. Merge and combine data

- a. Perform the *append*, *concat* and *combine_first* operations on DataFrames.
- b. Apply different types of merge on data.
- c. Use a *query* method to filter DataFrame with multiple conditions.

Perform the following exercises using Pandas matplotlib

13. Consider the Salary dataset, which contains 30 observations consisting of years of working experience and the annual wage (in dollars).
 - a. Create a linear plot to identify the relationship between years of working experience and the annual wages with suitable title , legend and labels.
 - b. Create a scatter plot to identify the relationship between years of working experience and the annual wages with title , legend and labels.
 - c. Also distinguish between observations that have more than 5 years of working experience and observations that have less than 5 years of working experience by using different colors in one single plot.
14. Consider the Iris dataset, where observations belong to either one of three iris flower classes.
 - a. Visualize the average value for each feature of the Setosa iris class using a bar chart.
 - b. Format the obtained bar graph by Changing the color of each bar, Change the Edge color, Line width and Line style.
15. Consider the Iris dataset, where observations belong to either one of three iris flower classes.
 - a. Visualize the Histogram for each feature (Sepal Length, Sepal Width, petal Length & petal Width) separately with suitable bin size and color.
 - b. Plot the histograms for all features using subplots to visualize all histograms in one single plot. Save the plot as JPEG file.
 - c. Plot the boxplots for all features next to each other in one single plot.

BOARD EXAMINATION

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Write any one program from PART-A	20 Marks
Write any one program from PART-B	25 Marks
Executing program (PART-A)	20 Marks
Executing program (PART-B)	20 Marks
Result with print out(PART-A)	5 Marks
Result with print out(PART-B)	5 Marks
VIVA-VOCE	5 Marks
TOTAL	100 Marks

LIST OF EQUIPMENTS

Hardware Requirements

Desktop Computers – 30 Nos

Printer - 1 No.

Software Requirement:

Python , Microsoft Excel



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

**4046563 – ELECTIVE PRACTICAL- I
MOBILE APPLICATION DEVELOPMENT PRACTICAL**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4046563
 Semester : V
 Subject Title : **ELECTIVE PRACTICAL 1** -Mobile Application Development Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
Mobile Application Development Practical	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALAE:

The primary intention of the Mobile Application development practical is to impart knowledge in data handling and service management, security and other aspects in mobile computing environments n user perspective.

OBJECTIVES:

On completion of the following exercises, the students must be able to

- acquire a solid foundation of skills to program and to create applications for Mobile Devices
- Install, configure and use Android development environment.
- To Learn about Basic Mobile Application Development tools
- To learn How to create interactive applications in android with multiple activities
- Create Mobile Application using SQLite Database

LIST OF EXPERIMENTS

PART-A

1.	Develop an App to demonstrate activity(Application Life Cycle) (example metric conversion - metre to Km, grams to Kg, litres to Kilo litre)
2.	Write an App to demonstrate different types of layouts
3.	Write an App to implement simple calculator using text view, edit view, option button and button
4.	Write an App to demonstrate list view (student particulars)
5.	Write a program to display Text in Text View using different Font Style
6.	Write a program to demonstrate Auto Complete Text View
7.	Write a program to demonstrate Image Button View
8.	Write a program to change the Background and Foreground Color of Text View

PART-B

1	Write a program to demonstrate Date picker and time picker
2.	Develop an simple application with context menu and option menu
3.	Develop an application to send SMS
4.	Write a program to view, edit contact
5.	Write a program to send e-mail
6.	Write a program to display map of given location / position using map view
7.	Write a program to demonstrate the application of intentclass
8.	Write a program to demonstrate SQLite (Create Database , Table , Insert ,Update, Delete and view records)

LIST OF EQUIPMENTS

HARDWARE REQUIREMENTS:

Desktop Computers - 30 Nos
Printer - 1 No

SOFTWARE REQUIREMENTS:

1. Android Studio / Net beans /Eclipse 2.Android ATD 3. Android SDK
4. JDK6.0or above

4046563 Mobile Application Development Practical

BOARD PRACTICAL EXAMINATION

Note:

1. The student should be given proper training in all the exercises. All the exercises should be completed before the examinations.
2. The student should maintain observation note book / manual and record notebook. The record note book should be submitted during the Board Practical Examinations. Common printout for the record note book should not be allowed. Individual student output for every exercise should be kept in the record note book.
3. All exercises should be given in the question paper and student is allowed to select any one by lot. All exercises with the hard copy of the template related to the exercise should be provided by the external examiner for the examination. Template can be varied for every batch.
4. The external examiner should verify the availability of the infrastructure for the batch strength before the commencement of Practical Examination.

DETAILED ALLOCATION OF MARKS	
User interface design diagram and XML in Part-A	05 Marks
Writing program in Part-A	15 Marks
Execution of program Part-A	20 Marks
Printed Output (Part –A)	5 Marks
User interface design diagram and XML in Part-B	05 Marks
Writing program in Part-B	20 Marks
Execution of program in Part-B	20 Marks
Printed Output (Part –B)	5 Marks
VIVA – VOCE	5 Marks
TOTAL	100 Marks



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

V SEMESTER

2020 - 2021 onwards

4052570 – ENTREPRENEURSHIP AND STARTUP

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic Year 2020-2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4052570
 Semester : V
 Subject Title : ENTREPRENERUSHIP AND STARTSUPS

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks per Semester: 16 Weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
Entrepreneurship and startups	4	64	25	75	100	3 Hrs.

Topics and Allocation of Hours

UNIT	Topic	Hours
1	Entrepreneurship – Introduction and Process	12
2	Business Idea and Banking	12
3	Start ups, E-cell and Success Stories	12
4	Pricing and Cost Analysis	12
5	Business Plan Preparation	12
Revision		4
Total		64

RATIONALE:

Development of a diploma curriculum is a dynamic process responsive to the society and reflecting the needs and aspiration of its learners. Fast changing society deserves changes in educational curriculum particularly to establish relevance to emerging socio-economic environments; to ensure equity of opportunity and participation and finally promoting concern for excellence. In this context the course on entrepreneurship and start ups aims at instilling and stimulating human urge for excellence by realizing individual potential for generating and putting to use the inputs, relevant to social prosperity and thereby ensure good means of living for every individual, provides jobs and develop Indian economy.

OBJECTIVES:

At the end of the study of 5th semester the students will be able to

- excite the students about entrepreneurship
- acquire Entrepreneurial spirit and resourcefulness
- Understand the concept and process of entrepreneurship
- Acquire entrepreneurial quality, competency and motivation
- Learn the process and skills of creation and management of entrepreneurial venture
- Familiarize with various uses of human resource for earning dignified means of living
- Know its contribution in and role in the growth and development of individual and the nation
- Understand the formation of E-cell
- Survey and analyze the market to understand customer needs
- Understand the importance of generation of ideas and product selection
- Learn the preparation of project feasibility report
- Understand the importance of sales and turnover
- be familiar with various financial and non financial schemes
- be aware of the concept of incubation and start ups

DETAILED SYLLABUS

Unit	Name of the Topics	Hours
1	<p>Entrepreneurship – Introduction and Process</p> <ul style="list-style-type: none"> ➤ Concept, Functions and Importance ➤ Myths about Entrepreneurship ➤ Pros and Cons of Entrepreneurship ➤ Process of Entrepreneurship ➤ Benefits of Entrepreneur ➤ Competencies and characteristics ➤ Ethical Entrepreneurship ➤ Entrepreneurial Values and Attitudes ➤ Motivation ➤ Creativity ➤ Innovation ➤ Entrepreneurs - as problem solvers ➤ Mindset of an employee and an entrepreneur ➤ Business Failure – causes and remedies ➤ Role of Networking in entrepreneurship 	12
2	<p>Business Idea and Banking</p> <ul style="list-style-type: none"> ➤ Types of Business: Manufacturing, Trading and Services. ➤ Stakeholders: sellers, vendors and consumers and Competitors ➤ E- commerce Business Models ➤ Types of Resources - Human, Capital and Entrepreneurial tools and resources ➤ Selection and utilization of human resources and professionals, etc. ➤ Goals of Business; Goal Setting ➤ Patent, copyright and <i>Intellectual property</i> rights ➤ Negotiations - Importance and methods ➤ Customer Relations and Vendor Management ➤ Size and capital based classification of business enterprises ➤ Various sources of Information 	12

	<ul style="list-style-type: none"> ➤ Role of financial institutions ➤ Role of Government policy ➤ Entrepreneurial support systems ➤ Incentive schemes for state government ➤ Incentive schemes for Central governments 	
3	<p>Start ups, E-cell and Success Stories</p> <ul style="list-style-type: none"> ➤ Concept of Incubation centre's ➤ Visit and report of DIC, financial institutions and other relevance institutions ➤ Success stories of Indian and global business legends ➤ Field Visit to MSME's ➤ Study visit to Incubation centers and start ups ➤ Learn to earn ➤ Startup and its stages ➤ Role of Technology – E-commerce and Social Media ➤ Role of E-Cell ➤ E-Cell to Entrepreneurship 	12
4	<p>Pricing and Cost Analysis</p> <ul style="list-style-type: none"> ➤ Unit of Sale, Unit Price and Unit Cost - for single product or service ➤ Types of Costs - Start up, Variable and Fixed ➤ Income Statement ➤ Cashflow Projections ➤ Break Even Analysis - for single product or service ➤ Taxes ➤ Financial Business Case Study ➤ Understand the meaning and concept of the term Cash Inflow and Cash Outflow ➤ Price ➤ Calculate Per Unit Cost of a single product ➤ Operational Costs ➤ Understand the importance and preparation of Income Statement ➤ Prepare a Cash Flow Projection 	12

	<ul style="list-style-type: none"> ➤ Projections ➤ Pricing and Factors affecting pricing. ➤ Launch Strategies after pricing and proof of concept 	
5	<p>Business Plan Preparation</p> <ul style="list-style-type: none"> ➤ Generation of Ideas. ➤ Business Ideas vs. Business Opportunities ➤ Opportunity Assessment – Factors, Micro and Macro Market Environment ➤ Selecting the Right Opportunity ➤ Product selection ➤ New product development and analysis ➤ Feasibility Study Report – Technical analysis, financial analysis and commercial analysis ➤ Market Research - Concept, Importance and Process ➤ Market Sensing and Testing ➤ Marketing and Sales strategy ➤ Digital marketing ➤ Branding - Business name, logo, tag line ➤ Promotion strategy ➤ Business Plan Preparation ➤ Social Entrepreneurship as Problem ➤ Solving - Concept and Importance ➤ Risk Taking-Concept ➤ Types of business risks ➤ Execution of Business Plan 	12

REFERENCEBOOKS:

1. Dr. G.K. Varshney, Fundamentals of Entrepreneurship, Sahitya Bhawan Publications, Agra - 282002
2. Dr. G.K. Varshney, Business Regulatory Framework , Sahitya Bhawan Publications, Agra - 282002
3. [Robert D. Hisrich](#), [Michael P. Peters](#), [Dean A. Shepherd](#), Entrepreneurship , McGraw Hill (India) Private Limited, Noida - 201301

4. M. [Scarborough, R. Cornwell](#), Essentials of Entrepreneurship and small business management, Pearson Education India, Noida - 201301
5. Charantimath Poornima M. Entrepreneurship Development and Small Business Enterprises, Pearson Education, Noida - 201301
6. [Trott](#), Innovation Management and New Product Development, Pearson Education, Noida - 201301
7. [M N Arora](#), A Textbook of Cost and Management Accounting, Vikas Publishing House Pvt. Ltd., New Delhi-110044
8. Prasanna Chandra, Financial Management, Tata McGraw Hill education private limited, New Delhi
9. [I. V. Trivedi](#), [Renu Jatana](#), Indian Banking System, RBSA Publishers, Rajasthan
10. Simon Daniel, HOW TO START A BUSINESS IN INDIA, BUUKS, Chennai - 600018
11. Ramani Sarada, The Business Plan Write-Up Simplified - A practitioners guide to writing the Business Plan, Notion Press Media Pvt. Ltd., Chennai 600095.

Board Examination – Evaluation Pattern

Internal Mark Allocation

Assignment (Theory portion)*	- 10
Seminar Presentation	- 10
Attendance	- 5
Total	- 25

Note: * Two assignments should be submitted. The same must be evaluated and converted to 10 marks.

Guidelines for assignment:

First assignment	– Unit I
Second assignment	– Unit II

Guidelines for Seminar Presentation – Unit III

Each assignment should have five three marks questions and two five marks questions.

BOARD EXAMINATION

Note

1. The students should be taught all units and proper exposure and field visit also arranged. All the portions should be completed before examinations.
2. The students should maintain theory assignment and seminar presentation. The assignment and seminar presentation should be submitted during the Board Practical Examinations.
3. The question paper consists of theory and practical portions. All students should write the answers for theory questions (40 Marks) and practical portions (60 Marks) should be completed for board examinations.
4. All exercises should be given in the question paper and students are allowed to select by lot. If required the dimensions of the exercises may be varied for every batch. No fixed time allotted for each portion and students have liberty to do the examination for 3Hrs.

5. For Written Examination theory question and answer: 45Marks

Ten questions will be asked for 3 marks each. Five questions from each unit 1 & 2. (10 X 3 = 30).

Three questions will be asked for 5 marks each. One question from each unit 1, 2 & 3. (3 X 5 = 15)

6. For Practical Examination: The business plan/Feasibility report or Report on Unit 4 & 5 should be submitted during the board practical examinations. The same have to be evaluated for the report submission (40 marks).

DETAILED ALLOCATION OF MARKS

Sl. No	Description	Marks
Part A	Written Examination - Theory Question and answer (10 questions x 3 marks:30 marks & (3 questions x 5 marks: 15 marks)	45
Part B	Practical Examination –Submission on Business Plan/Feasibility Report or Report on Unit 4 & 5	40
Part C	Viva voce	15
	Total	100

MODEL QUESTION PAPER

ENTREPRENEURSHIP AND START UPS

PART - A

Time: 1 hour

Max. Marks:45

I. Answer ten questions in brief (10x3=30)

1. Define entrepreneurship.
2. State the process of entrepreneurship
3. What are the benefits of being an entrepreneur?
4. How do entrepreneurs act as problem solvers?
5. Outline the role of networking in entrepreneurship.
6. List the various types of business
7. Outline the business model.
8. Suggest the various goals of business.
9. How selection of human resources is carried out?
10. Specify the role of government policy on entrepreneurship.

II. Answer three questions in details

(3x5=15)

11. Describe the importance of innovation on entrepreneurship.
12. Enumerate the various incentive schemes for the central government.
13. How technology will play a major role in E- commerce?

PART – B

Practical Examination – Submission on Business Plan / Feasibility Report or Report on Unit 4 & 5 **(40)**

PART- C

Viva Voce **(15)**

SEMESTER – VI



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

VI SEMESTER

2020 - 2021 onwards

**4052610 – COMPUTER HARDWARE AND
SERVICING**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4052610
 Semester : VI
 Subject title : COMPUTER HARDWARE AND SERVICING

TEACHING & SCHEME OF EXAMINATION

No. of weeks per Semester: 16 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
COMPUTER HARDWARE AND SERVICING	6 Hrs	96 Hrs	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topics	Time (Hours)
I	MOTHERBOARD COMPONENTS	18
II	MEMORY & I/O DEVICES	18
III	DISPLAY, POWER SUPPLY & BIOS	17
IV	DESKTOP, LAPTOP, MOBILE AND TABLET PC	18
V	FUTURE HARDWARE SYSTEMS	18
TEST AND REVISION		7
TOTAL		96

RATIONALE:

A Computer Engineer should be able to install and maintains Keyboard, Printer, Mouse, Monitor, etc. along with the computer system. Additionally (S)he should also be able to maintain and service mobile phones. The course provides the necessary knowledge and skills regarding working, construction and interfacing aspects of peripherals. The students will get to know how various peripherals communicate with central processing unit of the

computer system and pattern their respective operations. They should also know about the hardware and software installations in Laptop, Notebook, Tablet and Mobile phones. This subject provides the required background knowledge of installation, maintenance and testing of peripheral with Computers and Laptops. The student will also get to know about the future hardware systems like basics Non Volatile Memory (NVM), Remote Direct Memory Access (RDMA) and Embedding hardware.

OBJECTIVES:

On completion of the following units of syllabus contents, the students must be able to

- Know the evolution of Personal Computer from PC through Core i and Laptop.
- Know and explain the major components that make up the system unit.
- Know the data process and store them in meaningful information.
- Explain about the principle of operations of Keyboard, Mouse and Displays.
- Understand the components of media system.
- Know the Basics, working principle, specification and modern technology of different types of drives.
- Know the specification of I/O Ports of all I/O devices like Serial, Parallel, USB — Game port,
- Blue tooth and IP Connectors
- Know the operation, working principle and troubleshooting of devices like Dot matrix, Inkjet, Laser, Thermal, MFP Printers.
- Know the aspects related to Power Supply.
- Understand & troubleshoot the common problems in the computer system and the peripherals
- Know and explain the major components & troubleshooting of Laptop.
- Understand the basic components and tools used in servicing of Mobile phones.
- Know to install the software required for mobile phones and to maintain it.
- Understand the basics of Non Volatile Memory(NVM), Remote Direct Memory Access (RDMA) and Embedding hardware.

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	<p>MOTHERBOARD COMPONENTS</p> <p>1.1 Motherboard components: Processor sockets/slots - Memory sockets - Chipsets – Cache - BIOS - Clock generator - RTC - Super I/O Controller - Power connector - Battery - Keyboard/Mouse Connectors - Jumpers - Ports and Headers - Pin Connectors -Motherboard Form factor - Hardware, Software and Firmware.</p> <p>1.2 Computer Peripheral devices: Internal and External devices</p> <p>1.3 Processors: Introduction - Core2 Duo processor, Quad core processor, Core i3, i5, i7 series, AMD AIO series, Xeon Processor.</p> <p>1.4 Chipsets: Chipset basics - North / South Bridge architecture and Hub architecture.</p> <p>1.5 Bus Standards: Overview and features of PCI, AGP, USB, & Processor Bus.</p>	<p>6</p> <p>2</p> <p>5</p> <p>3</p> <p>2</p>
II	<p>MEMORY AND I/O DEVICES</p> <p>2.1 Primary and Secondary Memory: Introduction. Main Memory — Types – Organization, Access time, Cycle time, and Memory errors and Error detection Techniques. Hard Disk: Introduction — Construction — Working Principle — File Systems — Formatting and Troubleshooting.</p> <p>2.2 Removable Storage and Special Devices: DVD-ROM — Recordable DVD Rewritable DVD. Blu-ray: Introduction - Blu-ray Disc Parameters - Recording and Playback Principles. Special drives: External drives, Memory stick, USB flash drive, Solid state drive. Data Recovery tools - DOS, and Third party tools.</p> <p>2.3 Keyboard and Mouse: Keyboard: Interfacing and Signals (USB, Wireless), Types of keys,</p>	<p>4</p> <p>4</p> <p>3</p>

	<p>Keyboard Matrix, Key bouncing, Types of keyboard (Simple, Mechanical). Mouse: Optical mouse operation — Optical mouse cleaning — Troubleshooting flowchart for a mouse.</p> <p>2.4 Printers and Scanners:</p> <p>Printer: Introduction Types of printers — Dot Matrix, Inkjet, Laser, Thermal, MFP printer (Multi-Function Printer) - Operation and Troubleshooting. Scanner: Introduction, Scanner mechanism, Working principle — Types of Scanners (Barcode, Handheld, Flatbed) — Preventive maintenance, and Troubleshooting tools.</p> <p>2.5 Special I/O Devices:</p> <p>Trackball, Touch pad, Pointing stick, Joystick, Light pen, Graphic tablet, Camera, Bar-code reader, RFID reader</p>	<p>4</p> <p>3</p>
III	<p>DISPLAY, POWER SUPPLY and BIOS</p> <p>3.1 Displays and Graphic Cards:</p> <p>Displays: LCD Principles — Plasma Displays — TFT Displays - LED Displays. Graphic Cards: Video capture card - Troubleshoot display and graphics card problems</p> <p>3.2 SMPS:</p> <p>Block diagram Basic Principles and Operations O/P Voltage — Cable color code — Connectors and PowerGood — Common Failures (No circuit diagram to be discussed)</p> <p>3.3 BIOS:</p> <p>Bios functions — Cold and Warm booting — BIOS error codes — BIOS interrupts — BIOS advanced setup. Upgrading BIOS, Flash BIOS-setup. Identification of different BIOS (AMI, AWARD BIOS).</p> <p>3.4 POST:</p> <p>Error, Beep Codes, Error messages, Post — Faults related to Hardware.</p>	<p>5</p> <p>4</p> <p>5</p> <p>3</p>
IV	<p>DESKTOP, LAPTOP, MOBILE AND TABLET PC</p> <p>4.1 Upgrading of Systems:</p> <p>Hardware up-gradation. Updating of System & Application software: Device Driver - OS Update and Firewall Security — Control panel - Installed devices and properties — Install procedure, Rollback or Un-</p>	<p>4</p>

	<p>install procedure, Tests of various device driver software.</p> <p>4.2 Installation and Troubleshooting: Formatting, Partitioning and Installation of OS —Trouble Shooting Laptop and Desktop computer problems -.Antivirus and Application Software Installation – Backup and Restore procedure - Recovery software</p> <p>4.3 Laptop: Difference between laptop and desktop- Types of laptop — working principles—Configuring laptops and power settings - Upgrade RAM, Hard disk, Replacing battery - Configuration of camera, mic, WLAN, Bluetooth, touchpad Laptop and Keyboard.</p> <p>4.4 Mobile phone: Basics of mobile communication, Battery- antenna- ear piece- Microphone - Speaker- Buzzer -LCD- keyboard. Basic circuit board components – Names and functions of different ICs used in mobile phones. Installation & Troubleshooting: Mobile servicing kit, Assembling and disassembling of different types of mobile phones – Installation of OS - Fault finding & troubleshooting.</p> <p>4.5 Introduction to Tablet PC: Digitizers Versus Touch-Screen Displays, Merits and Demerits. Comparisons: Laptops, Desktops, Pocket PC, Other PDAs, Other Pen- Based Computers, Differences in Hardware. Windows XP Tablet PC Edition Configuration: Basic Interface Settings, Screen Settings, Display Properties, Other Settings and Options</p>	<p>4</p> <p>2</p> <p>4</p> <p>4</p>
<p>V</p>	<p>FUTURE HARDWARE SYSTEMS</p> <p>5.1 Moore’s law & NVM Technology: Calculating the Hardware Growth using Moore’s Law, Introduction to Non Volatile Memory Technology, - Architecture of NVM technology – Advantages and Scope of NVM Technology</p> <p>5.2 Emerging Non Volatile Memory Technologies: (Concepts only)- Magnetic Random Access Memory (MRAM), Spin Transfer Torque Random Access Memory (STT-RAM) - Ferroelectric Random Access Memory (FeRAM), Phase Change Memory (PCM) and</p>	<p>4</p> <p>5</p>

Resistive Random-Access Memory (RRAM).	4
5.3 Introduction to Advanced Network technologies: Remote Direct Memory Access (RDMA) - Working Principle of RDMA – Limitations and Challenges in RDMA technology	
5.4 Embedded Systems: Basic concepts - Embedded Board and the Von Neumann Model - Basic Electronics of Embedded devices - AC Circuits, DC Circuits and Active Devices - Power supply- Scope, Control and Probes - Advantages and Applications of Embedded devices.	5

REFERENCES:

S.No	Title	Author	Publisher	Year of Publishing / Edition
1	Computer Installation and Servicing	D.Balasubramanian	Tata Mc-Graw Hill, New Delhi	Second Edition 2010
2	Troubleshooting, Maintaining and Repairing PCs	Stephen J.Bigelow	TMH, New Delhi	Fifth Edition
3	PC Hardware in a nutshell	Robert Bruce Thompson.	O'Reilly Media	Third India Reprint 2008.
4	The Laptop Repair Workbook: An Introduction to Troubleshooting and Repairing Laptop Computers	Morris Rosenthal	Foner books	First Edition 2008
5	The Cell Phone Handbook	P.J. Stetz and Penelo e Stetz	FindTech Ltd	Second Edition
6	Advanced Mobile Repairing	Pandit Sanjib	BPB Publication, New Delhi	First Edition 2010
7	Absolute Beginner's Guide to Tablet PCs	Craig F. Mathews	ToolKits, Inc.	First Edition 2004
8	Embedded Hardware: Know It All	Ganssle J, Noergaard, Eady F, Edwards L Katz DJ, Gentile R, Arnold K, Hyder K, Perrin B	Newnes	1 st Edition (2007)



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

VI SEMESTER

2020 - 2021 onwards

4046620 – SOFTWARE TESTING

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : Diploma in Information Technology
 Subject Code : 4046620
 Semester : VI
 Subject title : SOFTWARE TESTING

TEACHING & SCHEME OF EXAMINATION

No. of weeks per Semester: 16 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
SOFTWARE TESTING	5 Hrs	80 Hrs	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topics	Time (Hours)
I	INTRODUCTION TO SOFTWARE TESTING	15
II	TEST PLAN AND LEVELS OF TESTING	15
III	TEST MANAGEMENT AND TESTCASE STRATEGIES	15
IV	AUTOMATION TESTING AND ITS TOOLS	15
V	SELENIUM SOFTWARE TESTING TOOL	13
TEST AND REVISION		7
TOTAL		80

RATIONALE:

Software Testing is the process of identifying the accuracy and quality of the software product and service under test. It is used to validate whether the product fulfills the prerequisites, needs, and desires of the client. At the end of the day, testing executes a framework or application with a specific end goal to point out bugs, errors or defects.

OBJECTIVES:

On completion subject, the students must be able to

- understand Software Testing and its needs.
- Understand the difference between Software Verification and Validation
- Learn about Quality Assurance and Quality Control
- Understand Software Testing Life Cycle
- Understand Different types of Testing Methods
- Understand Manual Testing & Automation testing
- Understand Different types of Testing Levels
- Understand and prepare Test Plans
- Need for Maintaining a Software
- Define Test Case design techniques
- Create and Execute test cases and log results
- Define Test Reports
- Understand Defect and its life Cycle
- Define Automation testing
- Understand Automation Framework
- Choose right automation tool
- Understand various kind of testing tools
- Learn Selenium basics and selenium tool suite
- Understand the concept of Selenium IDE
- Understand the concept Selenium Web Driver basics

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	<p>INTRODUCTION TO SOFTWARE TESTING</p> <p>1.1 Basics of Software Testing: Introduction to testing - Importance of Testing - Benefits of Testing - Testing Strategies - Validation - Verification - Quality Assurance - Quality Control</p> <p>1.2 Software Testing Life Cycle: Phases - Requirement Analysis - Test Planning - Test case - Testing Environment Setup - Test Execution - Defect – Failure</p> <p>1.3 Testing Methods: Manual Testing vs Automation Testing - Benefits - Comparison - Types - White box Testing - Grey box Testing - Black box Testing - Test Automation</p> <p>1.4 Levels of Testing: Importance - Benefits - comparison of Functional vs Non-Functional testing - Types of Functional Testing - Types of Non Functional Testing - Regression Testing</p>	<p>3</p> <p>4</p> <p>4</p> <p>4</p>
II	<p>TEST PLAN AND LEVELS OF TESTING</p> <p>2.1 Test Planning: Prepare Test Plan - Deciding Test Approach - Setting Up Criteria for Testing - Identifying Responsibilities - Staffing - Resource Requirements - Test Deliverables - Testing Tasks</p> <p>2.2 Functional Testing: Importance - Benefits - Advantages of Functional Testing - Types of Functional Testing - Entry/Exit Criteria</p> <p>2.3 Non Functional Testing: Introduction - Purpose - Advantages - Non-Functional requirement - User/Technical Stories - Acceptance Criteria - Artifact - Non-Functional requirement Checklists - Types of Non-Functional Testing</p> <p>2.4 Software Verification: Purpose - Features - Types - Static Verification - Dynamic Verification -</p>	<p>3</p> <p>2</p> <p>3</p> <p>3</p>

	Approaches - Code Review - Walkthrough – Inspection 2.5 Maintenance: Overview - Types of maintenance - Cost of Maintenance - Maintenance Activities - Reverse Engineering - Program Restructure – Reusability	4
III	TEST MANAGEMENT AND STRATEGIES 3.1 Test Case Strategies: Objectives - Scope of the testing - Test case design techniques - Black-Box techniques - Boundary Value Analysis - Equivalence Partitioning - State Transition Diagrams - Use Case Testing - White-Box techniques - Statement Testing & Coverage - Test Adequacy Criteria - Coverage and Conditional flow 3.2 Test Execution: Implementation & Execution - Setting up environment - Prepare Test Data - Execute test suite - status - pass/fail - Log the results - Compare Actual results vs Expected Results 3.3 Test Reporting: Test Reports - Project Information - Test Cycle - Executive Overview - Summary of testing - Metrics - Defect Report - Defect description - Priority - Status - Types of Test Report 3.4 Defect Management: Defect Life Cycle - Discovery - Categorization - Resolution - Verification - Closure - Reporting - Defect Metrics - Defect Rejection Ratio - Defect Leakage ratio - Bug Report	4 4 3 4
IV	AUTOMATION TESTING AND ITS TOOLS 4.1 Automation Test: Introduction - Best Practices - Scope of Automation - Advantages - Challenges in Automation - Automation Testing Lifecycle 4.2 Automation Framework: Purpose - Benefits - Types of Automated Frameworks - Linear - Modular Based - Data-Driven - Keyword Driven - Hybrid - Library Architecture - Layered Architecture - Testcases Layer - Domain Layer - System under test Layer 4.3 Automation Testing Tool: Need of Tool - Types of Tool - Open Source - Commercial - Custom -	3 4 4

	<p>Selecting Right Tools - Different testing tools & Usage - Selenium - QTP - Junit - SoapUI - Watir – Appium</p> <p>4.4 Non Functional Testing Tool:</p> <p>Purpose - When to Use - Different Types of Tools & Usage - JMeter - LoadRunner - Loadster - Loadstorm - Forecast - Load Complete - Loadtracer - Neoload - vPerformer - WebLoad professional - WebServer Stress Tool</p>	4
V	<p>SELENIUM SOFTWARE TESTING TOOL</p> <p>5.1 Selenium Basics:</p> <p>Introduction - Features - Limitation - Selenium Tool Suite & Uses - Selenium IDE - WedDriver - Selenium Grid</p> <p>5.2 Selenium IDE Basics:</p> <p>Features - Commands - Actions - Accessors - Assertions - Writing Test cases - Test execution</p> <p>5.3 Selenium WebDriver Basics:</p> <p>Architecture - Features - Commands - Browser - Navigation - Web Element - Find Element - Checkbox Handling - Radio button Handling - DropDown Handling - Testcase creation - Execute with different browsers</p> <p>5.4 Selenium WebDriver Locators &Xpath:</p> <p>Locators - Inspect Elements using Web Inspect - Inspect Element in Chrome - Xpath, Firebugs &Firepath - Write effective Xpath</p>	<p>3</p> <p>3</p> <p>4</p> <p>3</p>

REFERENCES:

S. NO	TITLE	AUTHOR	PUBLISHER	YEAR OF PUBLISHING
1	Software Testing	K.Mustafa and R.A.Khan	Narosa Publishing House, New Delhi	Reprint 2009
2	Software Testing Principles and Practices	Srnivasan desikan, Gopalswamy Ramesh	Pearson	First Edition
4	Lessons Learned in Software Testing	CemKaner		2001



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

VI SEMESTER

2020 - 2021 onwards

**4046631 – ELECTIVE THEORY - II
SOCIAL NETWORKING AND ETHICAL HACKING**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4046631
 Semester : VI
 Subject Title : **ELECTIVE THEORY II** Social Networking and Ethical Hacking

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
Social Networking and Ethical Hacking Theory	5	80	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Networks- Concepts	16
II	SNA, Online Social Networks and Network Models	16
III	Introduction to Ethical Hacking, Buffer Overflows, SQL Injection	15
IV	Web Application Security and Technologies	15
V	Attacking Authentication	11
Test & Model Exam		7
Total		80

RATIONALE:

This course offers students, a theoretical Understanding of various social media networks. Working and using SNA in their infrastructure and critically evaluate the potential countermeasures to advanced hacking techniques. Analyze and evaluate techniques used to break into an insecure web application and identify relevant countermeasures.

OBJECTIVES:.

- to learn about structure and evolution of networks
- to build a framework of network analysis that covers measures such as density, centrality, clustering, centralization, and specialization
- to think like a hacker, providing students with a deep understanding of security issues and concerns.
- also provide the students with specialist knowledge and experience of advanced hacking techniques and their countermeasures.

DETAILED SYLLABUS

Contents: Theory

Unit	Topic	Hours
I	NETWORKS- CONCEPTS	
	1.1 Network Concepts Basics: Networks Concepts – Nodes, edges, adjacency matrix, one and two-mode networks, node degree	4
	1.2 Network centrality Concepts: Betweenness, closeness, eigenvector centrality (+ Page Rank), network centralization	4
	1.3 Community Concepts: Clustering, community structure, modularity, overlapping communities.	3
	1.4 Network models: Small world network models, optimization, strategic network formation and search Concepts	3
	1.5 Geographic Networks: Geographic networks, Decentralized search	2

<p>II</p>	<p>SNA, ONLINE SOCIAL NETWORKS AND NETWORK MODELS</p> <p>2.1 Erdos-Renyi and Barabasi-Albert- Concepts: Erdos-Renyi and Barabasi-Albert- Concepts - connected components, giant component, average shortest path, diameter, breadth-first search, preferential attachment.</p> <p>2.2 Watts-Strogatz Model: Watts-Strogatz Model – Network generation.</p> <p>2.3 Social Network services: Facebook, LinkedIn, Twitter, Couch Surfing using SNA to understand their users and improve their functionality.</p> <p>2.4 Network models: Simple contagion, threshold models, opinion formation, unusual applications of SNA.</p> <p>2.5 Strings: String – Declaration and initialization of strings, Reading and writing Strings, String handling functions – String manipulation programs.</p>	<p>4</p> <p>2</p> <p>4</p> <p>3</p> <p>3</p>
<p>III</p>	<p>INTRODUCTION TO ETHICAL HACKING, BUFFER OVERFLOWS, SQL INJECTION</p> <p>3.1 Introduction to Ethical Hacking: Introduction - Understanding the importance of security, Concept of ethical hacking</p> <p>3.2 Essential Terminologies: Threat, Attack, Vulnerabilities, Target of Evaluation, Exploit. Phases involved in hacking, Foot printing, Scanning, System Hacking, Session Hijacking.</p> <p>3.3 Buffer Overflows: Significance of Buffer Overflow Vulnerability, Reasons for Buffer Overflow Attacks, Methods of ensuring that buffer overflows are trapped.</p> <p>3.4 Sniffers: Active and passive sniffing, ARP poisoning and countermeasures, Man in the middle attacks, Spoofing and Sniffing attacks. Sniffing countermeasures.</p> <p>3.5 SQL Injection: SQL Injection - Attacking SQL Servers, Preventive Measures</p>	<p>2</p> <p>4</p> <p>3</p> <p>4</p> <p>2</p>
<p>IV</p>	<p>WEB APPLICATION SECURITY AND TECHNOLOGIES</p> <p>4.1 Web Application Security: Web Application Security - Core Defence Mechanisms. Handling User</p>	<p>3</p>

	<p>Access</p> <p>4.2 Web Application Authentication: Authentication, Session Management, Access Control.</p> <p>4.3 Web Application Technologies: Web Application Technologies - HTTP Protocol, Requests, Responses and Methods.</p> <p>4.4 Encoding Schemes: Encoding schemes, Server side functionality technologies (Java, ASP, and PHP).</p> <p>4.5 Web Application Threats and Hacking: Web Application Threats, Web Application Hacking.</p>	<p>3</p> <p>3</p> <p>4</p> <p>2</p>
V	<p>ATTACKING AUTHENTICATION</p> <p>5.1 Attacking Authentication: Attacking Authentication - Attacking Session Management, Design Flaws in Authentication Mechanisms</p> <p>5.2 Password functionality: Attacking Forgotten Password Functionality, Password change functions, Countermeasures to authentication attacks</p> <p>5.3 Attacking other users: Attacking other users - Reflected XSS Vulnerabilities, Stored XSS Vulnerabilities, DOM-Based XSS Vulnerabilities, HTTP Header Injection. Countermeasures to XSS.</p>	<p>3</p> <p>4</p> <p>4</p>

Reference Books:

1. Patrick Engebretson, The Basics of Hacking and Penetration Testing, Elsevier, 2013.
2. Network Security and Ethical Hacking, Rajat Khare, Luniver Press, 2006.
3. Network intrusion alert: an ethical hacking guide to intrusion detection, Ankit Fadia, Manu Zacharia, Thomson Course Technology PTR, 2007.
4. Patrick Doreian, Frans Stokman, Evolution of Social Networks, Routledge, 2013.
5. David Easley and Jon Kleinberg, Networks, Crowds, and Markets: Reasoning About a Highly Connected World, Cambridge University Press, 2010.



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

VI SEMESTER

2020 - 2021 onwards

4052632 – ELECTIVE THEORY - II MULTIMEDIA SYSTEMS

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4052632
 Semester : VI
 Subject Title : **ELECTIVE THEORY II** Multimedia Systems

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
Multimedia Systems	5 Hrs	80 Hrs	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topics	Time (Hrs)
I	Introduction to Multimedia	11
II	Defining Objects for Multimedia Systems	15
III	Multimedia Data and Standards, Database	16
IV	Multimedia Devices and Making Multimedia	15
V	Multimedia for Internet and Streaming	16
Test & Model Exam		7
Total		80

RATIONALE:

The exponential growth of Engineering and Technology particularly Information and Communications Engineering has benefited the day-today life of entire mankind in all respects. The research and developments are continually happening in this field to fine tune and improve the field particularly in multimedia which directly or indirectly has impact on every man's daily life. As such the introduction of current and future trends and technology of multimedia systems would strengthen the knowledge and skills of Engineering community in taking one-step further the prosperity of mankind.

OBJECTIVES:

On successful completion of the course, the students will be able to

- Understand the relevance and underlining infrastructure of Multimedia system.
- Apply contemporary theories of multimedia learning to the development of multimedia products.
- Analyze instructional and informational media (audio/ visual materials, web based materials, games and simulations etc) applied with multimedia techniques.
- Acquire knowledge about multimedia software tools.
- Understand the multimedia systems components and fundamental elements of any multimedia system.
- Acquire knowledge about compression / decompression and various media file formats.
- Understand the underlying principles of processing various multimedia data.
- Understand the working principles of various multimedia input–output devices.
- Gain knowledge about various multimedia related standards.
- Understand the design and development process of multimedia projects.
- Understand the technologies of multimedia used in Internet and its applications.
- Acquire knowledge about streaming, webcasting and many evolving technologies.

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	<p>INTRODUCTION TO MULTIMEDIA</p> <p>1.1 Introduction: Definition of Multimedia, Multimedia Basics, Multimedia Elements, Multimedia Applications, Delivering Multimedia.</p> <p>1.2 Multimedia Systems Architecture: Multimedia Workstation Architecture, High resolution Graphic displays, The IMA Architectural Framework, Network architecture for Multimedia systems.</p> <p>1.3 Evolving Technologies for Multimedia Systems: Hypermedia Documents, Hypertext, Hyper Speech, HDTV and UDTV, 3D Technologies and Holography.</p> <p>1.4 Defining Objects for Multimedia System: Text, Images, Audio and Voice, Full-Motion and Live Video, Multimedia Data Interface Standards, Video Processing Standards.</p> <p>1.5 Multimedia Software: Overview of Multimedia Software Tools, Open Source Replacements, Multimedia OS, VRML, OpenGL, Windows and Open Source API.</p>	<p>2</p> <p>3</p> <p>2</p> <p>2</p> <p>2</p>
II	<p>DEFINING OBJECTS FOR MULTIMEDIA SYSTEMS</p> <p>2.1 Text: About Fonts and Faces, Using Text in Multimedia, Hypermedia and Hypertext, Using Hypertext, Hypermedia Structures, Hypertext Tools.</p> <p>2.2 Images: Making Still Images, Bitmaps, 1 bit images, 8-bit gray level images, 8-bitcolor images, Dithering, 24 bit color images, Vector Drawing, 3-D Drawing and Rendering, Color, Understanding Natural Light and Color, Computerized Color, Color Palettes, Color Look-up table. Image</p>	<p>2</p> <p>4</p>

	<p>Processing, Image acquisition, Image enhancement. Color image processing.</p> <p>2.3 Sound: The Power of Sound, Digital Audio, Making Digital Audio Files, MIDI Audio, MIDI vs. Digital Audio, Multimedia System Sounds, Adding Sound to Your Multimedia Project , Audio Recording, Keeping Track of Your Sounds, Audio CDs, Sound for your Mobile, Sound for the Internet.</p> <p>2.4 Animation: The Power of Motion, Principles of Animation, Animation by Computer, Animation Techniques. Animation using OpenGL.</p> <p>2.5 Video: Using Video, How Video Works and Is Displayed, Analog Video, Digital Video, Displays, Digital Video Containers, Codec, Video Format Converters, Obtaining Video Clips, Shooting and Editing Video.</p>	<p>3</p> <p>3</p> <p>3</p>
<p>III</p>	<p>MULTIMEDIA DATA AND STANDARDS, DATABASE</p> <p>3.1 Data Compression: Need for Data compression, General Data compression Scheme, Compression standards, Non-lossy compression for images, Lossy compression for Photographs and Video, Hardware Vs Software Compression.</p> <p>3.2 Compression Schemes and standards: (Only Concepts of) Binary Image Compression, Color, Gray Scale and Still-Video Image Compression, JPEG, Video Image Compression, Multimedia Standards for Video, Requirements for Full-motion Video Compression, MPEG, Audio compression, Fractal compression, advantages / disadvantages.</p> <p>3.3 Data and File Format Standards: Popular File Formats, RTF, RIFF, GIF, PNG, TIFF, MIDI, JPEG, JFIF, AVI, WAV, BMP, WMF, MIX, MPEG standards. TWAIN.</p> <p>3.4 Database System: Data Types in Multimedia Databases, Storage and Retrieval, Database Management System, Database Organization and Transaction</p>	<p>3</p> <p>4</p> <p>3</p> <p>3</p>

	<p>Management for Multimedia System.</p> <p>3.5 Content Based Retrieval in Digital Libraries(C-BIRD)</p> <p>C-BIRD GUI – Color Histogram – Color Density – Color Layout – Texture layout- - Search by Illumination Invariance – Search by Object Model.</p>	3
IV	<p>MULTIMEDIA DEVICES AND MAKING MULTIMEDIA</p> <p>4.1 Multimedia Input/output Technologies:</p> <p>Limitations of Traditional input devices, Multimedia input / output devices, PEN input, Working of Electronic Pen, Digitizer, (only the concepts of) Video and Image display systems, Printer, Scanner. Digital voice and video: Voice Recognition system, Digital Camera, Video frame grabber, Video and still image processing, Full – motion video controller, Video Capture Board.</p> <p>4.2 Making Multimedia:</p> <p>The Stages of a Multimedia Project: Creativity, Organization, Communication, Hardware, Software: Text Editing and Word Processing Tools, OCR Software, Painting and Drawing Tools, 3-D Modeling and Animation Tools, Image-Editing Tools, Sound-Editing Tools, Animation, Video, and Digital Movie Tools, Authoring Systems, Making Instant Multimedia, Types of Authoring Tools.</p> <p>4.3 Multimedia Skills:</p> <p>The Team, Project Manager, Multimedia Designer, Interface Designer, Writer, Video Specialist, Audio Specialist, Multimedia Programmer, Producer of Multimedia for the Web.</p> <p>4.4 Designing and Producing:</p> <p>Designing, Designing the Structure, Designing the User Interface, Producing–Tracking, Copyrights.</p>	5
		4
		3
		3
V	<p>MULTIMEDIA FOR INTERNET AND STREAMING</p> <p>5.1 The Internet and Multimedia:</p> <p>The Bandwidth Bottleneck, Internet Services, MIME Types, Multimedia on the Web, Web Page Makers and Site Builders, Plug-ins and Delivery Vehicles.</p> <p>5.2 Designing for the World Wide Web:</p>	3

Developing for the Web, Small-Device Workspace, text and images for the Web, Clickable Buttons, Client-Side Image Maps, Sound for the Web, Animation for the Web, and Video for the Web, HTML5 Video - Plug-ins and Players.	3
5.3 Multimedia Communication: Study of Multimedia networking, Quality of data transmission, Media on demand, Multimedia Over Wireless and Mobile Networks – Media Entertainment, web-based applications, e-learning and education.	4
5.4 Streaming: Introduction - Applications of Streaming- The Streaming Architecture, Stream Serving: Webcasting – On-Demand Servicing – Voice and Video Conferencing - Internet Telephony - Virtual Reality.	6

Reference Books:

1. “Ze- Nian Li and M.S. Drew”, “Fundamental of Multimedia”, Pearson Education, Second Edition, 2014.
2. “Tay Vaughan”, “Multimedia: Making It Work”, Tata-McGrawHill.
3. “Prabhat, k.Andleigh, Kiran Thakra”, “Multimedia systems Design”, PHI
4. “Ralf Steinmetz, and Klara Nahrstedt”, “Multimedia Computing Communication and Applications”, Pearson Education.
5. “Ranjan Parekh”, “Principles of Multimedia”, TMGH, New Delhi.
6. “John F. Koegel Buford”, “ Multimedia Systems”, Pearson Education.
7. David Austerberry, The Technology of Video and Audio Streaming, Focal Press.



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

VI SEMESTER

2020 - 2021 onwards

**4052633 – ELECTIVE THEORY II
DATA SCIENCE AND BIG DATA**

CURRICULUM DEVELOPMENT CENTRE

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS**

N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 INFORMATION TECHNOLOGY

Subject Code : 4052633

Semester : VI

Subject Title : **ELECTIVE THEORY II DATA SCIENCE AND BIG DATA**

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
Elective – II DATA SCIENCE AND BIG DATA	5 Hrs	80 Hrs	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Introduction to Data Science	15
II	Fundamentals of Data Modelling	15
III	Fundamentals of Big Data	15
IV	Big Data Storage	14
V	Big Data Processing	14
Test & Model Exam		7
Total		80

RATIONALE:

This course provides a comprehensive understanding of data science and data modeling. The foundation on data science is laid to understand the core concepts and the techniques that underlie today's big data computing technologies. This course helps the students in identifying and applying appropriate techniques and tools to solve problems in managing huge quantities of data.

OBJECTIVES:

This subject has two major divisions. The objectives of these topics are given below.

Data Science

- After studying the first two units of this syllabus, students will be able
- To understand the fundamentals of data science, various data types, their sources, problems and issues, various formats of data and their processing steps.
- To apply the Python libraries and Microsoft Excel for Data analysis.
- To work with Microsoft Excel for data analysis and applying various functions for data analysis.
- To familiarize with the basic data representation methods.
- To understand the concepts of samples, attributes and their relationships.
- To develop and implement simple linear regression models.
- To understand the concept of model equation and of fit.
- To understand and differentiate the concepts of predictive models and the classification models.
- To familiarize with the concepts of Neural Networks, Decision Trees and Nearest neighbors techniques.

Big Data

- After studying the lessons from Units III to V, the students will be able to
- Get conceptual understanding of Big Data, Web data, classification of data, Big Data characteristics, types, classification and handling techniques.
- Get the conceptual understanding of the impact of ICT developments on Big Data Adoption.
- Understand the Big Data Analytics Life Cycle.
- Get the conceptual understandings of Big Data Storage systems and technologies.

	<p>among attributes</p> <p>2.2 Predictive models: Regression Models - Linear regression - Simple and Multiple Regression-Correlation-Mean squared Error-Testing goodness of fit-Model Equation</p> <p>2.3 Classification models: Two class- Multi class classification- Separability- Performance measures- Terminology- ConfusionMatrix-Types (Concepts only): Neural Network- Decision Trees- Nearest Neighbors.</p>	<p>5</p> <p>5</p>
III	<p>FUNDAMENTALS OF BIG DATA</p> <p>3.1 BigData Fundamentals: Data- Web Data- Classification of Data - Big Data - Characteristics - Volume, Velocity, Variety, Veracity, Value- Need for Big Data- Big Data Types and classifications - Sources of Big Data- Big Data handling techniques-Challenges.</p> <p>3.2: Impact of ICT developments on Big data Adoption: Data analytics and data science, digitization, affordable technology and commodity hardware, social media, hyper connected communities and devices, cloud computing and IoT.</p> <p>3.3 Big Data Analytics Life Cycle: Business Case Evaluation, Data Identification, Data Acquisition & Filtering, Data Extraction, Data Validation & Cleansing, Data Aggregation & Representation, Data Analysis, Data Visualization, Utilization of Analysis Results.</p>	<p>6</p> <p>4</p> <p>5</p>
IV	<p>BIG DATA STORAGE</p> <p>4.1 Storage Concepts: Clusters, File Systems, Distributed File System, NoSQL, Sharding, Replication, Master Slave, Peer to Peer, CAP Theorem.</p>	<p>4</p>

	<p>4.2 Big Data Storage Technologies: On-Disk Storage Devices-Distributed File system-RDBMS- NoSQL Databases- Characteristics of NoSQL- Types of NoSQL Storage devices. In-Memory storage devices -Data Grids-Databases</p> <p>4.3 Hadoop: Introduction - Hadoop and its Ecosystem: Hadoop core components - Features of Hadoop - Hadoop Ecosystem components - Hadoop streaming - Hadoop pipes - Hadoop distributed File system - HDFS data storage - Hadoop Ecosystem tools.</p>	5
V	<p>BIG DATA PROCESSING</p> <p>5.1 BigData Processing: Parallel data processing - Distributed data processing - Hadoop Framework - Processing workloads - cluster for processing - Batch processing with MapReduce - Map and Reduce Tasks - MapReduce algorithms - Processing in Realtime mode - Real time processing and MapReduce.</p> <p>5.2 Big Data Analysis Techniques: Quantitative analysis, Qualitative analysis, Data mining, Statistical analysis: Correlation, regression, Machine Learning: Classification, clustering, outlier detection, filtering. Semantic analysis: Natural language processing, Text Analytics, Sentiment analysis, Visual Analysis</p> <p>5.3 Big data Analytics Applications and case studies: Big data in Marketing and sales- Big data and Healthcare- Big data in Medicine- Big Data in Advertising.</p>	5 5 4

Reference books:

1. Field Cady, "The Data Science Handbook", Wiley, 2017.
2. Jake VanderPlas, "Python Data Science Handbook- Essential tools for working with data", O'REILLY, 2017
3. Davy Cielen, Arno D. B. Meysman, Mohamed Ali, "Introducing Data Science", manning publications, 2016
4. Thomas Erl, Wajid Khattak - Big Data Fundamentals Concepts, Drivers & Techniques-Prentice Hall (2016).
5. Raj kamal, Preeti Saxena, "Big Data Analytics-Introduction to Hadoop, Spark and Machine Learning", McGraw Hill Education(India) Pvt Ltd., 2019.
6. Michael Minelli, Michelle Chambers, and Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013.
7. Tom White, "Hadoop: The Definitive Guide", Third Edition, O'Reilley, 2012.
8. NPTEL MOOC courses on "Data Science" and "Big Data".



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

VI SEMESTER

2020 - 2021 onwards

4052640 – COMPUTER HARDWARE AND SERVICING PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 DIPLOMA IN INFORMATION TECHNOLOGY
 Subject Code : 4052640
 Semester : VI
 Subject Title : COMPUTER HARDWARE AND NETWORKING PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
COMPUTER HARDWARE AND SERVICING PRACTICAL	6	96	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The course aims at making the students familiar with various parts of computers and laptops and how to assemble them along with the different types of peripherals desired. In addition, the course will provide necessary knowledge and skills to the students in computer and laptop software installation and maintenance and also make them to diagnose the software faults. This subject also gives the knowledge and competency to diagnose the problems in computer computer hardware and peripherals and also gives the knowledge for trouble shooting for systematic repair and maintenance of computers and laptops.

OBJECTIVES

On completion of the following exercises, the students must be able to

- Know the various indicators, switches and connectors used in Computers.
- Familiarize the layout of SMPS, motherboard and various Disk Drives.
- Configure Bios set up options.
- Install various Secondary storage devices with memory partition and formatting.
- Know the various types of Printer installation and to handle the troubleshooting ability.
- Assemble PC system and checking the working condition.
- Installation of Dual OS in a system.
- Identify the problems in Computer systems, Software installation and rectification
- Assembling and disassembling of Laptop to identify the parts and to install OS and configure it.
- Enable to perform different cabling in a network.
- Configure Internet connection and use utilities to debug the network issues.
- Configure router for any topology
- Installation of sever operating system
- Configuring various services in server operating system
- Install various packet sniffing tools in linux

LAB EXERCISES

PART – A

Contents: Practical

1	<p>HARD DISK</p> <ul style="list-style-type: none">a) Install Hard Disk.b) Configure CMOS-Setup.c) Partition and Format Hard Disk.d) Identify Master /Slave / IDE Devices.e) Practice with Scan disk, Disk cleanup, Disk De-fragmentation, Virus Detecting and Rectifying Software.f) Creating System restore points in windows for system recovery.
2	<ul style="list-style-type: none">a) Install and Configure a DVD Writer & Blu-ray Disc Writer.b) Recording a Blank DVD & Blu-ray Disc.
3	<p>Printer Installation and Servicing</p> <ul style="list-style-type: none">a) Install and configure Dot matrix printer, Ink jet and Laser printer.b) Troubleshoot the above printers
4	Install and configure Scanner, Web cam, and Bio-metric device with system and trouble- shoot the problems
5	<p>Do the following cabling works in a network</p> <ul style="list-style-type: none">a) Cable Crimpingb) Standard Cablingc) Cross Cablingd) Testing the Crimped cable using a Cable tester
6	<ul style="list-style-type: none">a) Configure Host IP, Subnet Mask and Default Gateway in a system in LAN (TCP/IP Configuration).b) Configure Internet connection and use IPCONFIG, PING / Tracert and Netstat utilities to Debug the Network issues.
7	<ul style="list-style-type: none">a) Install and configure Network Devices: HUB, Switch and Routersb) Install and Configure Wired and Wireless NIC and transfer files between systems

8	<p>a) Transfer files between systems in LAN using FTP Configuration.</p> <p>b) Install a Printer in LAN and share it in the network.</p>
PART B	
1	Installation of Windows 2008 / 2013 Server
2	Installation and configuration of DHCP Server
3	Installation and configuration of Mail Server
4	Installation and configuration of Active directory Services. Create a user and permission using logon script and group permissions.
5	Installation and configuration of DNS Server
6	<p>a) Installation of Red Hat Linux using Graphical mode.</p> <p>b) Installation of Red Hat Linux using VMware.</p>
7	Installation of various open source packet sniffing tools and inspect packets in linux.

BOARD EXAMINATION

SCHEME OF VALUATION

Procedure Writing – One Question from PART – A	20 Marks
Procedure Writing – One Question from PART - B	25 Marks
Executing Exercise (PART – A)	20 Marks
Executing Exercise (PART – B)	20 Marks
Result(Part – A)	5 Marks
Result(Part – B)	5 Marks
VIVA - VOCE	5 Marks
Total	100 Marks

REQUIREMENTS

Hardware Requirements :	Quantity
Desktop Systems	30 Nos
Hard disk drive	06 Nos
DVD, Blu-ray Drive	06 Nos
Blank DVD , Blu-ray Disc	30 Nos
Head Cleaning CD	05 Nos
Dot matrix Printer	02 Nos
Laser Printer	02 Nos
Web Cam, Scanner, Biometric Fingerprint scanner	02 Nos Each
Network Requirements:	
Crimping Tool	06 Nos
Screwdriver set	06 Nos
Network Cables	50 Mtrs
Modem	02 Nos
Hub	01 No
Router	01 No
Switch	02 Nos
Software Requirements:	
Windows Server, Windows / Linux OS DVD and Blue-ray Burning S/W.	



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

VI SEMESTER

2020 - 2021 onwards

**4046651 – ELECTIVE PRACTICAL – II
SOCIAL NETWORKING AND ETHICAL HACKING
PRACTICAL**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME
(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4046651
 Semester : VI
 Subject Title : Elective Practical II Social Networking and Ethical Hacking Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
Social Networking and Ethical Hacking Practical	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The course is designed to enable the students to learn networking concepts and Ethical hacking techniques by using various software.

OBJECTIVES:

- To help students in conducting network scanning and analyzing
- To help students to monitor a system remotely and to extract hidden files.
- To help students to sniff a network analyze packets for any attack
- To develop programs using python
- To setup the networking and encounter hacking using various software.

DETAILED SYLLABUS

Contents: Practical

PART-A

Name of the Topics: Networking concepts - programs and tools

1. Write a Program to create networking nodes using python.
2. Write a program to create networking nodes degree using python.
3. Write a program to create edges using python.
4. Write a program to average birth first search using python.
5. Write a program to perform the port scanning using Nmap software
6. Write a program to monitoring TCP/IP connection using currports tools.
7. Write a program to create simple key logger using python.

PART-B

Name of the Topics: Ethical hacking and Encounter Techniques

8. Write a program to investigate a particular website details by using who.is software
9. Write a program to encrypt and decrypt password using crypt tool software
10. Write a program to perform the commands for the website analysis in command prompt ping, ifconfig, netstat
11. Write a program to capture network traffic and analysis using wireshark software
12. Write a program to perform SQL injection attack using the XAMPP software
13. Write a program to exploit to attack the host and add the exploit to victims PC using metasploit software
14. Write a program to tamper data add-on for website using firefox

BOARD EXAMINATION

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Write any one program from PART-A	20 Marks
Write any one program from PART-B	25 Marks
Executing program (PART-A)	20 Marks
Executing program (PART-B)	20 Marks
Result with print out(PART-A)	5 Marks
Result with print out(PART-B)	5 Marks
VIVA-VOCE	5 Marks
TOTAL	100 Marks

Board Examination-Question Paper Pattern

MODEL QUESTION PAPER

Answer the following

PART A

1. Write a program to perform the port scanning using Nmap software

PART B

2. Write a program to perform SQL injection attack using the XAMPP software

LIST OF EQUIPMENTS

Hardware Requirements

Desktop Computer - 30Nos.

Printer - 1 No.

Software Requirement:

Python

Crypt tool

Wireshark

XAMPP

Metasploit

Nmap

Firefox browser



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

VI SEMESTER

2020 - 2021 onwards

**4052652 – ELECTIVE PRACTICAL II
MULTIMEDIA SYSTEMS PRACTICAL**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology
 Subject Code : 4052652
 Semester : VI
 Subject Title : Elective Practical II Multimedia Systems Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
Multimedia Systems Practical	4 Hrs	64 Hrs	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The competencies which form the basis for this practical enable students to develop skills with interactive visual and auditory technology. This lab prepares students to use digital multimedia for communication, creativity, collaboration, critical thinking. This practical is to bring awareness to the students regarding the numerous resources available in the area of multimedia. Students will become a skilled and creative user of current multimedia technology with an increased understanding of multimedia concepts and techniques

OBJECTIVES:

After the completion of this lab students will be able to

- Create Audio / Video hardware & software applications.
- Record & edit digital audio using sound editing software.
- Learn about video editing.
- Apply various filters & Compression techniques in Multimedia Applications.
- Learn photo editing software.
- Learn about 2D, 3D and cloud animation.
- Learn about chroma key technique.

DETAILED SYLLABUS

Contents: Practical

1. Use a audio processing software and perform the audio editing tasks – Import audio, select and edit the sound, create fade-in and fade-out effects, label audio segments, use noise remove filter, mix multiple sound sources, change stereo to mono tracks, export audio to different format and save.
2. Use a video processing software to perform – Trim video clips, rotate video, merge video, split video, add titles, add special effects and edit video dimensions, bit rate, frame rate, sample rate, channel.
3. Create a movie from video clips to demonstrate – Audio-Video mixing, add music, video effects, video transition and titles.
4. Use suitable software and perform a) compress / decompress audio / video files. b) Convert audio/video to different format.
5. Use a scanner to create two or more partial scanned images of large poster/photo. Create a panoramic view of multiple photos by stitching together them using any panorama software.
6. Develop a web page which shows animation with sound effect using any professional HTML editor.
7. Convert the given image into pencil sketch using suitable photo editing software.
8. Design a certificate for sports day with different text effects using suitable software.

9. Import any two pictures, Morph, Merge and Overlap those two pictures.
10. Draw the raindrop that falls on the ground. Show the splash effect and sound effect using suitable software.
11. Create a moving cloud animation using any animation software.
12. Create a 2D animation using motion guide layer and masking.
13. Create a 2D animation of an aeroplane take off using suitable software.
14. Design a metallic text using 3D animation tool
15. Import an image with green screen background. Change the background of the imported image with required image using chroma key technique.

BOARD EXAMINATION

DETAILED ALLOCATION OF MARKS

Procedure / Program	45 Marks
Execution	40 Marks
Result with printout	10 Marks
VIVA – VOCE	5 Marks
TOTAL	100 Marks

LIST OF HARDWARE SUGGESTED

- I Desktop PCs with i3 or High end processor, 200 GB HDD, 4 MB RAM – 36 Nos
- II Laser Printer Monochrome, Color – 1 Each
- III Digital (Video) Camera - 2 No.
- IV Flat bed A4 size Scanner - 1 No.

LIST OF SOFTWARE SUGGESTED

Operating system: Windows 7, Windows 10, Linux

Software tools: Open Source Software or Commercial Software.

The following is the suggestive list of open source software and their commercial replacement. Experiments may be done using either open source software or commercial software.

3D Graphics and Animation

1. Art of Illusion Replaces: AutoDesk Maya

2. Blender Replaces: AutoDesk Maya

Audio Players

3. aTunes, Audacious, Clementine are Replaces: iTunes

4. CoolPlayer, MPH-HC Replaces: Windows Media Player

5. Zing Replaces: Windows Media Player

Audio Recorders and Editors

6. Audacity Replaces: Sonar X1, Sony ACID, Adobe Audition

7. Frinika Replaces: Sonar X1, Sony ACID

Audio Ripping and Conversion

8. fre:ac, BonkEnc Exact Audio Copy, Audio Converter Studio

9. CUEripper, CDex Exact Audio Copy

10. MMConvert Exact Audio Copy

Multimedia Players

11. VLC Media Player Replaces: Windows Media Player

12. Mplayer Replaces: Windows Media Player

13. KODI Replaces: Windows Media Player

14. MediaPortal Replaces: Windows Media Player

Video Editing

15. Cinelerra Replaces: Adobe Premiere

16. OpenShot Video Editor Replaces: Adobe Premiere Pro CS5

17. Avidemux Replaces: Adobe Premiere

18. Kdenlive Replaces: Adobe Premiere Pro CS5

19. CineFX Replaces: Adobe Premiere Pro CS5

Video File Conversion

- 20. DVDx Replaces: Movavi Video Converter, Zamzar
- 21. DVD Flick Replaces: Movavi Video Converter, Zamzar
- 22. FFDSHOW Replaces: Movavi Video Converter, Zamzar

Video Player

- 23. Miro Replaces: Windows Media Player

CD / DVD Burners

- 24 Infrared Recorder
- 25 CDRDAO

DVD Authoring

- 26. DVD Flick, DVDStyler, Bombono DVD



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

VI SEMESTER

2020 - 2021 onwards

4052653 – ELECTIVE PRACTICAL II DATA SCIENCE AND BIG DATA PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

N-SCHEME

(Implemented from the Academic year 2020 - 2021 onwards)

Course Name : 1046 Diploma in Information Technology

Subject Code : 4052653

Semester : VI

Subject Title : Elective Practical II Data Science and Big Data Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
Data Science and BigData Practical	4	64	25	75	100	3 Hrs.

RATIONALE:

The data science process is about analyzing, visualizing, extracting, managing and storing data. It enables companies to efficiently understand large volume of data from multiple sources and derive valuable insights to make smarter data-driven decisions. Data Science is widely used in various industry domains, including marketing, healthcare, finance, banking, policy work, and more. This practical subject helps students understand how they can use Python NumPy, Pandas and Matplotlib to critically examine a dataset with summary statistics and graphs, and extract meaningful insights. Also, the data analysis using Microsoft Excel has been included to familiarize some advanced features like data analysis. Microsoft Excel has been chosen as the software to start with in this subject because many of our students are already be familiar with Excel, so very little

further time will be required for them to learn to apply Excel for Data Processing. Processing unstructured data in the form of text files is also introduced. Basic statistics and data visualization techniques have been introduced as simple exercises.

OBJECTIVES:

On Completion of the exercises in this practical subject, the students will be able to

- Install the required packages to set up a data science coding environment
- Load different types of data into a Python Environment.
- Use basic operation with NumPy and Pandas libraries to prepare data
- Preprocess the data by handling missing data, duplicate values
- Aggregate the data
- Create data subsets
- Perform data cleaning operations
- Develop a single dataset by merging various datasets together
- Examine statistical summaries
- Use Matplotlib to create data visualizations
- Find the relationship between the data attributes
- Measure the basic statistical properties of the data
- Fit a regression model and understand the predictive capabilities of the models.
- Understand the basic text processing concepts.

LAB EXERCISES

Contents: Practical

1.	<p>Load the data about the exam fee paid by the students of all branches of your college. Perform the following operations on it using Excel.</p> <ol style="list-style-type: none">a. Arrange the data branch wise within the branch and arrange register numbers. Replace all names with CAPITAL.b. Count the number of students in each branch and semesterc. Calculate the total fee paid by students of each branch.d. Find the minimum and the maximum fee paid by the student.e. Find the sum, average, max, min of fee paid in each branch
2.	<p>Load the data collected from all students during online answer paper submission with the following details for each exam. Regno, name, course_code, subject_code, semester, number_of_pages(nop), mode_of_dispatch, email_id, mobile_number.</p> <p>Perform the following operations using Excel.</p> <ol style="list-style-type: none">a. Check the file for any missing data in the columns.b. Count the number of students appeared for the exam.c. Count the number of papers (subjects) submitted by each student (Using register number)d. Create a new column by concatenating register number and the subject code. Using this column, perform the vlookup function to find the number of pages (nop) written by the students in that subject, and the mode of dispatch.e. Count the number of students appeared (submitted) for each subject.f. Count the number of different (unique) subject_codes that have been submitted.
3.	<p>Read the dataset from the Auto-MPG repository and perform the descriptive statistics on the data using Excel-Data Analysis. Verify the same using the statistical functions of Excel.</p>
4.	<p>Read the dataset from the Auto-MPG repository and</p> <ol style="list-style-type: none">a. Identify the relationship between the variables using correlation.b. Identify the independent and the dependent variables.c. Perform the linear regression on the related variables and find the

	<p>regression equation.</p> <p>d. Estimate the performance of the regression model.</p>
5.	<p>Load any external csv data file and store it in a Pandas DataFrame.</p> <p>a. Check the shape and column types of the DataFrame (rows and columns). [Note: Use df.info () and df.shape()]</p> <p>b. Subset the data column by names, by index, by range.</p> <p>c. Subset data based on index label, row index, multiple rows.</p> <p>d. Subset based on rows and columns</p>
6.	<p>DESCRIPTIVE STATISTICS using Python-Pandas</p> <p>a. Write a Python script to find basic descriptive statistics on AUTO-MPG dataset.</p> <p>b. Find the values of the descriptive statistics.</p> <p>c. Determine the measures of a central location, such as mean, markers such as quartiles or percentiles, and measures of variability or spread, such as the standard deviation.</p>
7.	<p>READING AND WRITING DIFFERENT TYPES OF DATASETS</p> <p>a. Reading different types of data sets (.txt, .csv) from Web and disk and writing in file in specific disk location.</p> <p>b. Reading Excel data sheet using Pandas</p> <p>c. Export the values from the DataFrame to several other formats.</p>
8.	<p>DATA VISUALIZATION</p> <p>a. Load the Auto-MPG dataset from csv file into pandas.</p> <p>b. Analyze the Behavior of the Number of Cylinders and Horsepower Using a Boxplot</p> <p>c. Find the relationship between horsepower and weight using the scatter plot using the data from Auto-MPG:</p> <p>d. Find the outliers using plot.</p> <p>e. Plot the histogram, bar chart and pie chart on sample data.</p>
9.	<p>COVARIANCE and CORRELATION</p> <p>a. Find the correlation and covariance between two variables.</p> <p>b. Plot the correlation plot on the dataset and visualize giving an overview of relationships among data.</p>

	<p>c. Fit a simple linear regression model using libraries such as Numpy or Scikit-learn. (<code>importLinearRegression from sklearn.linear_model</code>)</p> <ul style="list-style-type: none"> • Import the packages and classes you need. • Provide data for independent and dependent variables. • Create a regression model and fit it with existing data. • Check the results of model fitting to know whether the model is satisfactory.
10.	<p>OUTLIER Detection</p> <p>When analyzing data collected as part of a science experiment it may be desirable to remove the most extreme values before performing other calculations. Write a function that takes a list of values and an non-negative integer, n, as its parameters.</p> <p>The function should create a new copy of the list with the n largest elements and the n smallest elements removed. Then it should return the new copy of the list as the function's only result. The order of the elements in the returned list does not have to match the order of the elements in the original list.</p>
11	<p>Text Processing</p> <ul style="list-style-type: none"> b. Open a text file and read all the lines of the file. c. Tokenise (separate the words) the text. d. Count the total number of lines, total number of words and unique words e. Sort the words alphabetically. f. Find the most frequent and least frequent words. g. List the words having certain suffixes. <p>Note: You can open a Tamil text file using 'UTF-16' encoding.</p>
12	<p>Text Processing-II</p> <p>Load a text file containing a list of words into aDataFrame. Apply the following functions and verify the results.</p> <p>Replace(), repeat(), count(pattern), startswith(pattern), endswith(pattern), find(pattern), findall(pattern).</p>
	<p>Mini Project: Develop any data science application using Python / Excel for processing your college data.</p>

BOARD EXAMINATION

DETAILED ALLOCATION OF MARKS

Writing answer for any one program from the list	45 Marks
Executing the program	35 Marks
Result with printout of the Program	10 Marks
Demonstration of Mini Project	5 Marks
VIVA – VOCE	5 Marks
TOTAL	100 Marks

Hardware Requirements:

Desktop Computers – 30 Nos

Laser printer - 1 No.

For the optimal student experience, we recommend the following hardware configuration:

- Processor: Intel Core i5 or equivalent
- Memory: 4 GB RAM
- Storage: 35 GB available space

Software Requirements:

You'll also need the following software installed

- OS: Windows 7 SP1 64-bit, Windows 8.1 64-bit or Windows 10 64-bit, Ubuntu Linux.
- Browser: Google Chrome/Mozilla Firefox Latest Version
- Notepad++ as IDE (this is optional, as you can practice everything using the Jupyter Notebook on your browser)
- Python 3.4+ (latest is Python 3.9) installed (from <https://python.org>)
- Python libraries as needed (NumPy, Pandas, Matplotlib and so on)
- Microsoft Excel

Install Anaconda by following the instructions at this link: <https://www.anaconda.com/distribution/>

Data Source: Students may use the following data sources from their department

Online examination answer paper uploaded details.

Data about the alumni of your college

Your college result details.

Data collected from students like students' profile, resume etc.

Some other online resources for testing

<https://archive.ics.uci.edu/ml/machine-learning-databases/auto-mpg/>

<https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data>

<https://www.kaggle.com/rohankayan/years-of-experience-and-salary-dataset>



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN INFORMATION TECHNOLOGY

III YEAR

N – SCHEME

VI SEMESTER

2020 - 2021 onwards

4052660 – PROJECT WORK AND INTERNSHIP

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.
DIPLOMA IN ENGINEERING/TECHNOLOGY SYLLABUS
N - SCHEME

(Implemented from the Academic year 2020-2021 onwards)

Course Name : 1046 Diploma in Computer Engineering
 Subject Code : 4052660
 Semester : VI
 Subject Title : Project Work and Internship

TEACHING & SCHEME OF EXAMINATION

No. of weeks per semester: 16Weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
Project Work and Internship	6	96	25	100*	100	3Hrs

*Examinations will be conducted for 100marks and it will be reduced to75 marks.

RATIONALE:

Project Work aims at developing innovative skills in the students whereby they apply the knowledge and skills gained through the course by undertaking a project. The individual students have different aptitudes and strengths. Project work, therefore, should match the strengths of students. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices, so as to participate and manage a large software engineering projects in future

OBJECTIVES:

- Implement the theoretical and practical knowledge gained through the curriculum into an application suitable for a real practical working environment preferably in an industrial environment.
- Develop software packages or applications to implement the actual needs of the community.

- Get exposure on industrial environment and its work ethics.
- Learn and understand the gap between the technological knowledge acquired through curriculum and the actual industrial need and to compensate it by acquiring additional knowledge as required
- Carry out cooperative learning through synchronous guided discussions within the class in key dates, asynchronous document sharing and discussions, as well as to prepare collaborative edition of the final project report.
- Expose students to the field of computing and to gain experience in software design.
- Understand and gain knowledge about disaster management.

GUIDELINES FOR PROJECT FORMULATION

The project work constitutes a major component in most of the professional programmers and it is to be carried out with due care and should be executed with seriousness by the candidates. Batch Size : Maximum 6 students per batch

TYPE OF PROJECT

As majority of the students are expected to work out a real life project in some industry / research and development laboratories / educational institutions / software companies, it is suggested that the project is to be chosen which should have some direct relevance in day-to-day activities of the candidates in his/her institution. Students are encouraged to work in the areas listed at the end. However, it is not mandatory for a student to work on a real life project. The student can formulate a project problem with the help of Guide.

PROJECT PROPOSAL (SYNOPSIS)

The students of all the Diploma Courses have to do a Project Work as part of the Curriculum and in partial fulfillment for the award of Diploma by the State Board of Technical Education and Training, Tamil Nadu. In order to encourage students to do worthwhile and innovative projects, every year prizes are awarded for the best three projects i.e. institution wise, region wise and state wise. **The Project work must be reviewed twice in the same semester. The project work is approved during the V semester by the properly constituted committee with guidelines.**

The project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken. The project work should compulsorily include the software development. The project proposal should contain complete details in the following form:

1. Title of the Project.
2. Introduction and Objectives of the Project.
3. Project Category (DBMS / OOPS /Networking / Multimedia / Artificial Intelligence / xpert Systems etc.).
4. Tools / Platform, Hardware and Software Requirement specifications.
5. Analysis (DFDs at least up to second level , ER Diagrams/ Class Diagrams / Database Design etc. as per the project requirements).
6. A complete structure which includes: Number of modules and their description to provide an estimation of the student's effort onVthe project. Data Structures as per the project requirements for all the modules.
 - Process logic of each module.
 - Testing process to be used.
 - Reports generation (Mention tentative content of report).
7. Are you doing this project for any Industry/Client? Mention Yes/No. If Yes, Mention the Name and Address of the Industry or Client.
8. Future scope and further enhancement of the project. Also mention limitation of the project.

SUGGESTIVE AREAS OF PROJECT WORK:

- Database Management Systems
- Software Engineering and Software Development
- Web page Designing
- Digital Image Processing
- Computer Graphics and Animation
- Multimedia Systems
- Computer Networks
- Artificial Intelligence
- Internet and e-commerce
- Computer Security and Cryptography
- Computer hardware and embedded systems

- Internet Of Things
- Cloud Computing
- Any other related area found worth.

Board Examination:

a) Internal assessment mark for Project Work & Internship:

Project Review I	...	10 marks
Project Review II	...	10 marks
Attendance	...	05 marks (Award of marks same as theory subject pattern)
Total	...	25 marks

Proper record should be maintained for the two Project Reviews and preserved for one semester after the publication of Board Exams results. It should be produced to the flying squad and the inspection team at the time of inspection/verification.

b) Allocation of Marks for Project Work & Internship in Board Examinations:

Demonstration/Presentation	25 marks
Report	25 marks
Viva Voce	30 marks
Internship Report	20 marks

Total	100* marks
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***Examination will be conducted for 100 marks and will be converted to 75 marks.**

c) Internship Report:

The internship training for a period of two weeks shall be undergone by every candidate at the end of IV / V semester during vacation. The certificate shall be produced along with the internship report for evaluation. The evaluation of internship training shall be done along with final year "Project Work & Internship" for 20 marks. The internship shall be undertaken in any industry / Government or Private certified agencies which are in social sector / Govt. Skill Centres / Institutions / Schemes.

A neatly prepared PROJECT REPORT as per the format has to be submitted by individual student during the Project Work & Internship Board examination.