

Model Curriculumfor B.Voc/ D.Voc in SoftwareDevelopment Batch 2025



**AllIndiaCouncil forTechnicalEducation Nelson
Mandela Marg, New Delhi**

1. Introduction

All India Council for Technical Education (AICTE) Ministry of HRD, Government of India has introduced Entrepreneurship oriented Skill development courses of B.Voc/D.Voc/Skill Diploma. These courses will be run by AICTE approved institutes by using available infrastructure and facilities. In these courses the institute will conduct general education content and sector specific skills will be imparted by Skill Knowledge Providers/Training Providers/ Industries.

Key Features:

Objectives

- To provide judicious mix of skills relating to a profession and appropriate content of General Education.
- To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme.
- To provide flexibility to the students by means of pre-defined entry and multiple exit points.
- To integrate NSQF within the Diploma, undergraduate level of higher education to enhance employability of the students and meet industry requirements. Such student apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
- To provide vertical mobility to students admitted in such vocational courses.
- The certification levels will lead to Diploma/Advanced Diploma/B. Voc. Degree in Software Development and will be offered by respective affiliating University/Board of Technical Education.
- Students may be awarded Level Certificate/Diploma/Advance Diploma/Degree as out-lined in the Table below:

Award	Duration after class X	Corresponding NSQF level
Level 3 Certificate	1 Year	3
Level 4 Certificate	2 Years	4
Diploma	3 Year	5
Advance Diploma	4 Years	6
B.Voc Degree	5 Years	7

2. Course Objectives

After successfully completing the vocational course, the student would have acquired relevant appropriate and adequate technical knowledge together with the professional skills and competencies in the field of Software Development so that he/she is properly equipped to take up gainful employment in this Vocation. Thus he/she should have acquired:-

A. Understanding of

- (a) The relevant basic concepts and principles in basic science subjects (Physics, Chemistry and Mathematics) so that he/she is able to understand the different vocational subjects.
- (b) The basic concepts in engineering drawing.
- (c) The concepts, principles of working of basic electronic devices and circuits.
- (d) The knowledge of testing procedure of components and circuits by making use of different test instruments.
- (e) The procedure of making P.C.B.
- (f) The concepts and principles used in Radio/Audio/Video Systems and Communication devices and its maintenance.

B. Adequate Professional Skills and Competencies in

- (a) Testing different software's.
- (b) Testing the performance of electronic circuits.
- (c) Locating the fault at component level and at the stage level.

C. A Healthy and Professional Attitude so that He/She has

- (a) An analytical approach while working on a job.
- (b) An open mind while locating/rectifying faults.
- (c) Respect for working with his/her own hands.
- (d) Respect for honesty, punctuality and truthfulness

D. NSQF compliant skills in Qualification developed by sector skill council in IT/ITeS sector

3. Course Structure

The course will consist of combination of practice, theory and hands on skills in the IT/ITeS sector.

Curriculum

The curriculum in each of the years of the programme would be a suitable mix of general education and skill components.

Skill Components:

- The focus of skill components shall be to equip students with appropriate knowledge, practice and attitude, to become work ready. The skill components will be relevant to the industry as per its requirements.
- The curriculum will necessarily embed within itself, National Occupational Standards (NOSs) of specific job roles within the industry. This would enable the students to meet the learning outcomes specified in the NOSs.
- The overall design of the skill development component along with the job roles selected will be such that it leads to a comprehensive specialization in few domains.
- The curriculum will focus on work-readiness skills in each of the years of training.
- Adequate attention will be given in curriculum design to practical work, on the job training, development of student portfolios and project work.

General Education Component:

- The general education component adhere to the normal senior secondary and university standards. It will emphasize and offer courses which provide holistic development. However, it will not exceed 40% of the total curriculum.
- Adequate emphasis is given to language and communications skills.

The curriculum is designed in a manner that at the end of each year after class Xth students can meet below mentioned level descriptors of NSQF:

Level	Process required	Professional Knowledge	Professional skill	Core skill	Responsibility
Level 3	Person may carry out a job which may require limited range of activities routine and predictable	Basic facts, process and principle applied in trade of employment	Recall and demonstrate practical skill, routine and repetitive in narrow range of application	Communication written and oral with minimum required clarity, skill of basic arithmetic and algebraic principles, personal banking, basic understanding of social and natural environment	Under close supervision some responsibility for own work with in defined limit
Level 4	Work in familiar, predictable, routine, situation of clear choice	Factual knowledge of field of knowledge or study	Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts	Language to communicate written or oral, with required clarity, skill to basic arithmetic and algebraic principles, basic understanding of social, political and natural environment	Responsibility for own work and learning
Level 5	Job that requires well developed skill, with clear choice of procedures in familiar context	Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools materials and information	Desired mathematical skill, understanding of social, political and some skill of collecting and organizing information, communication.	Responsibility for own work and learning and some responsibility for other's work and learning

Level 6	Demands wide range of specialized technical skill, clarity of knowledge and practice in broad range of activity involving standard/ non-standard practices	Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Reasonably good in mathematical calculation, understanding of social, political and reasonably good in data collecting, organizing information, and logical communication	Responsibility for own work and learning and full responsibility for other's works and learning
Level 7	Requires a command of wide ranging specialized theoretical and practical skill, involving variable routine and non-routine context	Wide ranging, factual and theoretical knowledge in broad contexts within a field of work or study	Wide range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Good logical and mathematical skill understanding of social, political and natural environment good in collecting and organizing information, communication and presentation skill	Full responsibility for output of group and development

CurriculumforSoftwareDevelopment

Level	Code	EducationalComponent	Credit	Marks
3 Semester I		Theory		
	3.GE.01	Language-I	3	50
	3.GE.02	Applied Chemistry	3	50
	3.GE.03	Applied Physics	3	50
	3.GE.04	Applied Maths-I	3	50
		Lab/Practical		
	3.GP.01	AppliedChemistryLab	1	25
	3.GP.02	AppliedPhysicsLab	1	25
	3.VP.01	IT-ToolsPractical	1	50
		On-Job-Training(OJT)/QualificationPacks		
		DomesticDataEntryOperator(SSC/Q2212)	(Anyone)	15
		DomesticIThelpdeskAttendant(SSC/Q0110)		
		CRMDomesticVoice(SSC/Q2210)		
3 Semester II		Theory		
	3.GV.01	GeneralFoundationCourse-I	3	50
	3.GV.02	BasicElectricity	3	50
	3.GV.03	BasicElectronics	3	50
	3.GV.04	AppliedMathematics-II	3	50
	EMC-101-25	Entrepreneurship Setup and Launch	2	50
		Lab/Practical		
	3.VP.02	BasicElectricityLab	1.5	50
	3.VP.03	BasicElectronicsLab	1.5	50
		On-Job-Training(OJT)/QualificationPacks		
		AnyoneoftheQP'scanbeoptedasofferedinSemesterI	(Anyone)	15
				200
4 Semester I		Theory		
	4.GV.01	GeneralFoundationCourse	3	50
	4.GV.02	ITTools	3	50
	4.GV.03	WebApplications	3	50
	4.GE.01	Language-II	3	50
		Lab/Practical		
	4.VP.01	IT-ToolsLab(Advanced)	1.5	50
	4.VP.02	WebApplicationsLab	1.5	50
	EMC-102-25	Entrepreneurship (Marketing Basics) **	2	50
		On-Job-Training(OJT)/QualificationPacks		
		MediaDeveloper(SSC/Q050)		

	JuniorSoftware Developer(SSC/Q0508)	(Anyone)	15	200
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Level	Code	EducationalComponent		Credit	Marks
	CRMDomesticNon-Voice(SSC/Q2211)				
4 Semester II	Theory				
	4.GV.04	DatabaseManagementSystems(795)		3	50
	4.GV.05	DigitalElectronics		3	50
	4.GV.06	ComputerNetworks		3	50
	4.GV.07	MaintenanceofComputerSystems		3	50
	Lab/Practical				
	4.VP.03	DatabaseManagementSystemLab		1.5	50
	4.VP.04	MaintenanceofComputerSystemsandComputerNetworkLab		1.5	50
	On-Job-Training(OJT)/QualificationPacks				
	AnyoneoftheQP’scanbe optedasofferedin SemesterI		(Anyone)	15	200
5 Semester I	Theory				
	5.GV.01	ITFoundationandProgrammingConcepts		3	50
	5.GV.02	WebDesigning		3	50
	5.GV.03	ProgramminginC		3	50
	5.GV.04	OperatingSystem(OS)		3	50
	Lab/Practical				
	5.VP.01	WebDesigningLab		1.5	50
	5.VP.02	CProgrammingLab		1.5	50
	On-Job-Training(OJT)/QualificationPacks				
	TechnicalWriter(SSC/Q0505)		(Anyone)	15	200
	InfrastructureEngineer(SSC/Q0801)				
	Associate–CRM(SSC/Q2202)				
5 Semester II	Theory				
	5.GV.05	DataStructures		3	50
	5.GV.06	ConceptsofData Mining		3	50
	5.GV.07	OOPswithJava		3	50
	5.GV.08	MultimediaTools&Applications		3	50
	Lab/Practical				
	5.VP.03	DataStructureLab		1.5	50
	5.VP.04	JavaLab		1.5	50
	On-Job-Training(OJT)/QualificationPacks				
	WebDeveloper(SSC/Q0503)		(Anyone)	15	200

Level	Code	EducationalComponent		Credit	Marks
	TestEngineer(SSC/Q1301)				
6 Semester I	Theory				
	6.GV.01	LinuxOperatingSystem–OperationsandManagement		3	50
	6.GV.02	SoftwareEngineering		3	50
	6.GV.03	WebDevelopmentusingPHP		3	50
	6.GV.04	WindowsDevelopmentFundamental		3	50
	Lab/Practical				
	6.VP.01	WebDevelopmentusingPHPLab		1.5	50
	6.VP.02	WindowDevelopmentFundamentalsLab		1.5	50
	On-Job-Training(OJT)/QualificationPacks				
	JuniorDataAssociate(SSC/Q0401)		(Anyone)	15	200
	IPExecutive(SSC/Q6201)				
	Security Analyst (SSC/Q0901)				
6 Semester II	Theory				
	6.GV.05	SoftwareTestingandProject Management		3	50
	6.GV.06	AndroidApplicationDevelopment		3	50
	6.GV.07	WindowConfigurationandServerAdministration		3	50
	6.GV.08	ManagementInformationSystems		3	50
	Lab/Practical				
	6.VP.03	AndroidApplicationDevelopmentLab		1.5	50
	6.VP.04	MISLab		1.5	50
	On-Job-Training(OJT)/QualificationPacks				
	QA Engineer(SSC/Q1302)		Anyone)	15	200
	SoftwareEngineer(SSC/Q4601)				
	7 Semester I	Theory			
7.GV.01		TechnologyTrendsInIT		3	50
7.GV.02		WindowMobileApplicationDevelopment		3	50
7.GV.03		IntroductiontoPythonProgramming		3	50
7.GV.04		IntroductiontoMicroprocessors		3	50
Lab/Practical					
7.VP.01		WindowMobileApplicationDevelopmentLab		1.5	50

Level	Code	EducationalComponent		Credit	Marks
	7.VP.01	PythonProgrammingLab		1.5	50
	On-Job-Training(OJT)/QualificationPacks				
	ManagementTrainee(SSC/Q6301)		(Anyone)	15	200
	Associate-Transactional F&A (SSC/Q2301)				
	ConsultantNetworkSecurity(SSC/Q0917)				
7 Semester II	Theory				
	7.GV.05	IntroductiontoAI		3	50
	7.GV.06	e-Commerce		3	50
	7.GV.07	ComputerNetworkSecurity		3	50
	7.GV.08	IntroductiontoBiometrics		3	50
	Lab/Practical				
	7.VP.03	AILab		1.5	50
	7.VP.04	ComputerNetworkSecurityLab		1.5	50
	On-Job-Training(OJT)/QualificationPacks				
	MasterTrainer forSoftwareDeveloper(SSC/Q0509)		(Anyone)	15	200
	HardwareEngineer(SSC/Q4701)				

DetailedCurriculum

Level3(SemesterI)

(3.GE.01)Language-I

Module1:Readingcomprehension(prescribedtexts)andfunctionalgrammar

A variety of genres – short stories, expository pieces, biographies, poems, plays, newspaper and magazine excerpts have been included. Teaching of grammar has been integrated with the reading texts. The emphasis is on functional grammar.

The following ten prose texts and five poems have been selected for development of different reading skills.

Prose texts(Prescribed)

1. A warmer or a colder earth (popular science) Arthur – C. Clark
2. The tiger in the tunnel (narrative) – Ruskin Bond.
3. First two or four pages from Sunny Days (autobiographical) – By Sunil Gavaskar
4. Case of suspension (narrative)
5. Big brother (narrative) Shekhar Joshi
6. Father, dear father (newspaper article from the Hindu)
7. Face to face (autobiographical) Ved Mehta
8. I must know the truth (narrative) Sigrun Srivastva
9. If I were you (play) Douglas James
10. India, her past and her future (speech) Jawahar Lal Nehru

Poems

1. Leisure – W. H. Davis
2. The road not taken – Robert Frost
3. Where the mind is without fear – Tagore
4. My grandmother's house – Kamla Das
5. The night of the scorpion – Nissi, Ezekiel

Nonprescribed

In this section learners will be exposed to newspaper, articles, tables, diagrams, advertisements etc. which they have to read carefully and interpret. In the examination similar pieces will be used.

Grammar and usage:

The following points of grammar and usage have been selected from the reading passages.

1. agreement/concord: number – gender etc.
2. Tenses: simple past (negatives/interrogatives) present perfect, past perfect continuous, past perfect, expressing future time (will and going to)
3. Passive voice (perfect tenses and modals)
4. Modals (must, should, ought to, would)
5. Linking words (to like because although, instead of, if, as, since, who, which, that, when however, in spite of)
6. Reported speech, statements, questions (yes/no)

Module2:Functionalwritingandstudyskills

This module help the learner to write descriptive and narrative paragraph, letters, reports notices etc. and also practice skills of note making

1. Paragraphwriting
 - Describingobjects
 - Describingpeople
 - Narratingevents,stories
2. Letterwriting
 - Applicationfor leave
 - Applicationfor jobs
 - Asking forinformation formvarious agencies (e.g.Last date forgetting prospects; price of items before placing doers etc.)
3. Notemaking
4. Ending(punctuation,spelling, appropriatevocabulary,structures)

(3.GE.02)Applied Chemistry

1. StructureofAtom:

Rutherfordmodelofthestructureofatom,Bohr'stheoryofelectrons,quantumnumbersand their significance,de-Broglie equationanduncertainty principle, electronic configurationof 1 to 30 elements.

2. PeriodicPropertiesof Elements:

Periodiclaw,periodictable,periodicityinpropertieslikeatomicradiiandvolume,ionicradii, ionization energyand electronaffinity.Division of elements into s, p,d and f blocks.

3. ChemicalBonds:

Electrovalent,covalentandcoordinatebondandtheirproperties.Metallicbonding(electron cloud mode)and properties (liketexture,conductance,luster, ductilityand malleability).

4. FuelandtheirClassification:

Definition, characteristics, classificationinto solid, liquid and gaseous fuel. Petroleum and brief idea ofrefining into various factionsand their characteristics anduses. Calorific value of fuel, Gaseousfuels- preparation, properties,compositionand useof producer gas, water and oil gas.

5. Water:

Impurities in water, methods of their removal, hardness of water, its types, causes and removal, disadvantages of hard water in boilers, pH value and its determination by calorimetric method.

6. Corrosion:

Its meaning, theoryofcorrosion,preventionofcorrosionbyvariousmethodsusing metallic and non-metalliccoatings.

7. PlasticandPolymers:

Plastic-thermo-plasticandthermo-setting.IntroductionofPolythene.P.V.C.Nylon,synthetic rubber and phenol-formal-dehyde resin, their application in industry.

(3.GE.03)Applied Physics

1. **Units & Dimensions:**M.K.S. fundamentals & derived units, S.I. base units supplementary units and derived units, Dimensions of various physical quantities, uses of dimensional analysis.
2. **Surface Tension and Viscosity:** molecular forces, molecular theory of surface tension, surface energy, capillary action, concept of viscosity, coefficient of viscosity, principle and construction of viscometers.
3. **Vibrations:**Vibrations as simple spring mass system, elementary and qualitative concept of free and forced vibrations, resonance. Effects of vibrations on building bridges and machines members.
4. **Heat:**Temperature and its measurement, thermoelectric, platinum resistance thermometers and pyrometers. Conduction through compound media and laws of radiations.
5. **Ultrasonics:** Production of ultrasonic waves by magnetostriction and piezo-electric effect, application of ultrasonics in industry.
6. **Optics:** Nature of light, reflection and refraction of a wave from a plane surface. Overhead projector and Epidiascope.

(3.GE.04)Applied Mathematics-I

Sets, Relations and Functions

1. Sets
2. Relations and Functions-I
3. Trigonometric Functions-I
4. Trigonometric Functions-II
5. Relation between Sides and Angles of a Triangle

Sequences and Series

1. Sequences and Series
2. Some Special Sequences

Algebra-I

1. Complex Numbers
2. Quadratic Equations and Linear Inequalities
3. Principle of Mathematical Induction
4. Permutations and Combinations
5. Binomial Theorem

Co-ordinate Geometry

1. Cartesian System of Rectangular Co-ordinates
2. Straight Lines
3. Circles
4. Conic Sections

Statistics and Probability

- 1.MeasuresofDispersion
- 2.RandomExperimentsand Events
- 3.Probability

Couse Code: EMC-101-25

CourseName: **Entrepreneurship Setup and Launch**

Introduction:

This semester lays the foundation for the learner to understand what entrepreneurship is, beyond just starting a business. It introduces key ideas like problem-solving, value creation, and self-awareness. The learner will begin exploring basic business concepts while discovering their own interests and strengths.

Learners Objective:

1. Understand the core concepts of entrepreneurship through relatable, real-life examples.
2. Begin to see themselves as problem-solvers and creators.
3. Learn about business paths and choose one to try based on interest or local fit.
4. Launch a micro-hustle (online or offline) to earn their first income.
5. Build confidence and self-belief by doing.

Outcome: By the end of this semester, learners will start a simple business activity, earn their first income, and build belief in their ability to do business.

Guiding Principles/Approach:

This syllabus is built on principles of **experiential learning, growth mindset development, and identity-first learning**. Drawing from learning science and behavior design, the course shifts students from passive learning to *active doing*, where they try out small business activities in real contexts. The design helps students not just learn entrepreneurship but begin to see themselves as entrepreneurs. Emphasis is placed on *small wins, peer collaboration, and locally relevant opportunities* to ensure learning feels achievable and connected to their realities. The curriculum focuses on conceptual understanding without heavy theory, combining *practical action, reflection, and collaboration*. *By making progress visible and success feel possible, it plants the seeds of self-reliance, initiative, and long-term motivation.*

SemesterSyllabus:

Format:12weeks,4hours/week|2credits

RevenueTarget:₹10,000

Week	Learning Goal	MeasurableOutcome
1	Understandwhatentrepreneurshi p isand who can be an entrepreneur	Studentsdefineentrepreneurshipintheir ownwordsandlist 2entrepreneursfrom theirlocalareaor community
2	Connectpersonalidentity to entrepreneurship(strength s, interests, struggles)	Studentscreatea“value map”showinghow askill/interest/problemfromtheirlifecould become a business opportunity

3	Learn about 5 business paths: contentcreation,drop-shipping, cloudkitchen/foodbusiness,gig economyand localservices	Students explore 1–2 examples from each domainandshareonethey’re mostcurious to try and why
4	Chooseapathandgenerateabasic business idea	Studentswritedownaclearoffer(what,for whom, why) and one way to reach their customer
5	Takefirst realaction:message, post,pitch,orsell	Studentsreachouttoorservice1realpotential customerandrecordwhat happened
6	Reflectonfirstattempt andshare with peers	Studentssharetheirresult,achallenge faced, andoneideatoimprovenext time
7	Improveandtryagain:aimforfirst ₹100	Studentsapplyachange,tryagain,and aim tomaketheirfirst₹100orgetmeaningful response
8	Learn how to identify and understandyourtargetcustomer	Students talk to 2 potential customers or observethemandlist3insightsabouttheir needs
9	Learnhowtoserveyourtarget audience better	Students improve one part of their offer (product, delivery, messaging, or interaction)basedoncustomerfeedbackor need
10	Explorecoreentrepreneurial values(resilience,honesty, effort)	Studentsreflecton1valuethey’re building andshowitinabusinessaskorpeerstory
11	Focusonearningandstaying consistent	Studentscompleteasecondearningtaskand tracktheirconsistency(e.g.,sameproductor messagefor3 days)
12	Reflectonearnings,grit,andhow to keep going	Studentsrecordtotalearnings,oneresilience moment, and one support system or habit they’llcontinuewith

WeeklyComponent:

Component	Duration	Description
Learning Module	~1.5hrs	- Introduceskeyconceptsinasimpleandengagingway - Includes,examples,and1–2interactivediscussionsor quizzes
ActionLab	~2hrs	- Hands-ontaskontheweeklyconcept - Includesstep-by-stepguidance,templates,and worksheets - Endswithasubmission(e.g.,video,reflection,orproofof action)
Resources	Self-paced	-Supplementaryvideos,shortreadings,real-lifestories,and tools to deepen understanding at their own pace

EvaluationCriteria

Evaluation Component	Description	Weightage
Weekly Task Completion	Timely submission of weekly tasks including reflections, activities, quizzes etc.	40%
Target Completion	Performance-based evaluation on hitting revenue or profit targets (e.g., generating ₹10,000 revenue)	30%
Final Project	A comprehensive project based on the semester's theme	30%

Week1:WhatisEntrepreneurship?WhoCanBeanentrepreneur?

INTRODUCTION:CouldYouBeanentrepreneur?

When people hear “entrepreneur,” they often think it means having a company, investors, or an MBA. Some even believe it's only for toppers or those with high grades. But entrepreneurship is more about mindset than qualifications: it's about seeing a problem and

doingsomethingaboutit.Likesomeonewhostartssellingsnacksbecausetheirschoolcanteen isalwaysshut, or a friend who fixes brokenchargersforothers.Ifyou'veeverspottedaneedand thought, “I can solve this,” - you’ve already taken your first step.

Component1:LearningModule(~1.5hours)Unit1:

Whatis Entrepreneurship?

1. *Solvingproblemsorcreatingvalueinexchangeformoney.*
2. Entrepreneurshipisnotjustaboutstartingacompany:it’saboutinitiative, resourcefulness, and value creation.
3. Differenttypesofentrepreneurs:smallshopowners,streetvendors, YouTubers, local tailors, mechanics, and more.
4. Entrepreneursbuildopportunitiesinsteadofwaitingforthem.

SimpleSlide/VisualAidTip:

A circle that says "Problem", an arrow pointing to "Solution", then anarrowto "Earn". That’s entrepreneurship.

<Avideothatvisuallyshowshowentrepreneurshipstartswithspottingaproblem (e.g., long food lines), creating a solution (e.g., pre-order lunch service), andearning fromit:illustrating the simple flow: Problem →Solution → Earn>

MCQ1

Q:Whatbestdescribesentrepreneurship?

- A. Gettingajobinacompany
- B. Solvingproblemsforothersandearningfromit 
- C. Studyingbusinessincollege
- D. Buyingexpensivethings

Feedback:

1. *Correct!Entrepreneurssolveproblemsoroffervalueandgetpaidforit.*
2. *Notquite! Entrepreneurshipisaboutcreatingssomethinguseful,notjustgettingajob or studying.*

Unit2:WhoCanBeanentrepreneur?

Entrepreneurshipstartswithspottingaproblem,findingasolution,andcreatingvalue.Today,anyonewithaphoneandaninternetconnectioncanstartabusiness:moneyhelps,butmindsetandinitiative matter more at the start.

Youjust need:

1. Aproblemto solve
2. Asimpleskillorproduct
3. Thecouragetostartsmall

ExamplesCarousel(Swipeablecards)

1. **Pooja(India)**–SellshandmaderakhisonInstagram,learneddesigningonYouTube.
Problemshesaw:Expensiveorgenericrakhisinthemarket;nopersonal touch.
2. **Luis(Mexico)**–Repairsusedphonesinhisgarage,nowhasloyal customers.
Problemshesaw:Manypeoplecouldn'taffordnewphonesordidn'ttrustlocalrepair shops.
3. **Sana(Kolkata)**–Startedtiffindeliveryfromherhomekitchen,nowearns₹500/day.
Problemshesaw:Officeworkersstruggledtofindaffordable,homemade meals.
4. **Sal Khan (USA)** – Started Khan Academy with YouTube lessons to help his cousin.
Problemshesaw:Hiscousinneededhelpwithmath,butgoodlearningresourceswere hard to access.

MCQ

Q:Whichofthesecanbe aformofentrepreneurship?

- A. Makingreelsonskincaretipsandsellinghomemadefacepacks
- B. Buyingnewclothesfrommalls
- C. Studyingengineering
- D. Playinggameswithoutsharingorstreaming

Feedback:

1. *Correct!Sharingusefultips+sellingaproduct=solvinganeed!*
2. *Tryagain!Entrepreneurshipisaboutcreating valueandhelping others.*

ReflectionPrompt

1. Ifyouhadtoearn₹100thisweek,whatwouldyou do?

Component 2:Action Lab (~2 hours)

Task

Find&Learnfrom2EntrepreneursNe

arYou

Steps(Checklist):

1. Lookaroundyourneighborhoodoronline:find2peoplewhoearnthroughtheirownwork

2. Ask or observe:
 - a) What do they do?
 - b) How do they earn?

- c) Whatmakesthementrepreneurial?
3. Use the **EntrepreneurTrackerTemplate** (available in the resource tab)

Final Deliverable

Learners submit:

1. A short definition of entrepreneurship (in their words)
2. 2 entries from the EntrepreneurTracker (name, what they do, what learner learned)

→ Submitted in the submission tab.

Supplementary Resources (Optional)

1. [Danny O'Neill - Getting started | Entrepreneurship | Khan Academy](#)
2. [The Better India - Stories of local entrepreneurs](#)

Week2:CanIBeanentrepreneur?

INTRO–WhatMakesanentrepreneur?

You don't need a suit, a degree, or a lot of money to be an entrepreneur.

You need one thing: a mindset. Entrepreneurs notice problems around them: and do something about it. From the boy fixing bikes outside his house to the girl teaching dance on Instagram, they all started small. What matters most is not what you have: it's how you think and act.

Component1:LearningModule(~1.5

hours) Unit 1: What Makes an

entrepreneur?

KeyConcepts:

1. **Entrepreneurs are driven by curiosity:** they ask questions, explore possibilities, and seek better ways to do things.
2. **They take initiative:** they act, experiment, and create using limited resources with creativity and courage
3. **They learn by doing:** embracing mistakes as stepping stones to progress.
4. **They take full ownership:** one day they're the marketer, the delivery person, and the customer support, all in one.
5. **They are resilient:** they persist through challenges, adapt to change, and keep moving forward with purpose.

Real-LifeExamples:

1. Nithin & Nikhil Kamath (Zerodha) – Started India's largest stock brokerage without formal degrees or external funding, just deep curiosity about stock markets and a desire to simplify investing.
2. *Qualities: Took initiative early and stayed persistent through challenges.*
3. Prajakta Koli (Mostly Sane) – Started by making comedy sketches about everyday Indian life: family, school, relationships: and became one of India's top digital creators.
4. *Qualities: Stayed consistent, adapted over time, and built strong audience trust.*
5. Tilak Mehta (PapernParcels) – As a teenager, launched a courier startup using Mumbai's dabbawala network for delivery.
6. *Qualities: Thought creatively and acted with confidence at a young age.*

Unit 2: Start Small: Build Ideas from What You Know

In the last unit, you learned that entrepreneurs don't just have ideas; they act, solve problems, and use what they have.

But the big question now is:

“What can I offer?”

That's where the Value Map comes in. It helps you take your first step toward thinking and acting like an entrepreneur: in your own way.

What is a Value Map?

A Value Map connects three simple things:

A. What people around you need

→ *Look around: is there something people often struggle with or something that could be better?*

B. What you enjoy or are willing to try

→ *You don't need to be an expert. Start with small things you like doing: talking to people, fixing, organizing, helping, designing, or learning something new.*

→ *Even if you're just curious about something: that's enough to begin.*

C. What solution you can create

→ *Use what you enjoy or are learning to try solving a real need around you: even in a small way*

Visuals:

3 overlapping circles:

1. “People Need”
2. “I Can”
3. “My Offer”

Examples:

1. People Need → Affordable meals

I Can → Cook + have access to home kitchen My Offer → ₹40 tiffin service

2. People Need → Study tips in Punjabi I Can → Speak clearly + love teaching

My Offer → 3-minute video tip on Instagram

MCQ

Q: What's the first step to being an entrepreneur?

- A. Waiting for the perfect idea
- B. Solving a problem with your skills 
- C. Buying a shop
- D. Studying for years

Feedback:

1. *Correct!Entrepreneursstartbysolvingsmallproblemsusing whattheyalreadyhave.*
2. *Tryagain!It'snotaboutwaiting:it'sabout starting.*

ReflectionPrompt

1. Ifsomeonegaveyou ₹500 andaskedyouto earnfromit, whatwould you do?

Component2:ActionLab(~2 hours)**Task:CreateYourPersonalValueMapSteps(checklistin app):**

1. Thinkof2–3problemspeoplefacearoundyou(hunger,phonerepair,boredom,etc.)
2. Listyourownskills,interests,orresources.
3. Matcheachproblemwithsomethingyoucouldoffer.
4. Usethe**ValueMapTemplateintheresources**toorganizeyourideas.

FinalDeliverable(SubmittedinApp):

1. Yourcompleted**ValueMap**(in3columns:Need,Skill,Offer)
2. Highlight**1idea**you'dliketoexploreforyourfuturehustle

SupplementaryResources(Optional)

1. "StartwithWhy"bySimonSinek
2. [10Characteristics of Successful Entrepreneurs|Business:Explained](#)

(3.GP.01)AppliedChemistry-Lab

1. Proximateanalysis ofsolidfuel.
2. ExperimentsbasedonBombCalorimeter.
3. Determinationofturbidityinagivensample.
4. Todeterminetheflashandfirepointofagivenlubricatingoil.
5. TodeterminetheviscosityofagivenlubricatingoilbyRedwoodviscometer.
6. Todeterminecloudandpourpointofagivenoil.

(3.GP.02)AppliedPhysics-Lab

1. Todeterminethesurfacetensionofaliquidbyriseincapillary.

2. To determine the viscosity of a given liquid.
3. To determine the frequency of tuning fork using sonometer.
4. To determine the frequency of AC main using sonometer.
5. Time period of a cantilever.

(3.VP.01)IT Tools-Lab

- Spreadsheets, Word, Presentation
- Multimedia Design
- Troubleshooting
- Project/Practical File
- Viva Voce

Level3(SemesterII)**(3.GV.01)GeneralFoundationCourse-I****A. BusinessManagementandEntrepreneurship****(a) EntrepreneurshipOrientation**

Importanceandrelevancereinreallife:Emphasisonself-employment.

(b) EntrepreneurshipValuesandAttitudes

Innovativeness,Independence,RiskTaking,Analyticalability.

(c) EntrepreneurialMotivation

AchievementPlanning,personalefficacy,entrepreneurialgoalsetting.

(d) LaunchingofaBusinessVenture

Identificationofproject,stepsin settingupabusiness,information about various institutionsproviding assistance, project formulation.

B. ComputationalSkills

(a) Percentage, ratio & proportion, profit& loss, discount, simple and compound interest,populationgrowthand depreciationofvalueofarticles usinglogarithm. Areaandvolume: rectangle,parallelogram, circle, cube, cone, cylinder&sphere.

(b)

C. EnvironmentalEducation

(a) Environmentandthesociety.

(b) Environment propertiesrisksin differenteconomicenterprises,in useof raw materials,in processing / manufacturing and designing.

(c) Povertyandenvironment.

D. RuralDevelopment

(a) Agriculture,thebackboneofIndianEconomy.

(b) Ruraldevelopmentprojectsin India including Integrated ruraldevelopment programme.

(c) Agrobasedruralindustries.

(d) Communityapproachtoruraldevelopment.

(3.GV.02)BasicElectricity**1. CurrentElectricity**

Definition of Resistance, Voltage, Current, Power, Energy and their units, Relation between electrical, mechanical and thermal units, Temperature variation of resistance, Difference between AC and DC voltage and current.

2. D.C.Circuits

Ohm'sLaw, Series-parallelresistancecircuits, calculationofequivalentresistance, Kirchhoff's Laws and their applications.

3. ElectricCells

Primary cell, wet cell, dry cell, battery, Li-ion battery, seriesand parallelconnectionsof cells, Secondarycells, LeadAcidCell, Dischargingandrechargingofcells, preparationofelectrolyte,

care and maintenance of secondary cells.

1. **Lighting Effects of Current**

Lighting effect of electric current, filaments used in lamps, and Tubelight, LED, their working and applications.

2. **Capacitors**

Capacitor and its capacity, Concept of charging and Discharging of capacitors, Types of Capacitors and their use in circuits, Series and parallel connection of capacitors, Energy stored in a capacitor.

3. **Electromagnetic Effects**

Permanent magnets and Electromagnets, their construction and use, Polarities of an electromagnet and rules for finding them.

Faraday's Laws of Electromagnetic Induction, Dynamically induced e.m.f., its magnitude and induction, inductance and its unit. Mutually induced e.m.f., its magnitude and direction, Energy stored in an inductance.

Force acting on a current carrying conductor in magnetic field, its magnitude and direction, Principles and construction of dynamo.

4. **A.C. Circuits**

Generation of A.C. voltage, its generation and wave shape. Cycle, frequency, peak value, R.M.S. value, form factor, crest factor, Phase difference, power and power factor, A.C. Series Circuits with (i) resistance and inductance (ii) resistance and capacitance and (iii) resistance inductance and capacitance, Q factor of R.L.C. series circuits.

(3.GV.03) Basic Electronics

i) Overview of Atom, Sub-Atomic Particles and CRO

- Brief History of Electronics.
- Atom and its elements,
- Electron, Force, Field intensity, Potential, Energy, current
- Electric field, Magnetic field, Motion of charged particles in electric and magnetic field.
- Overview of CRO, Electronic and Magnetic deflection in CRO, Applications.

ii) Voltage and Current

- Resistance, Ohm's law, V-I Characteristics, Resistors, Capacitors, Inductors.
- Voltage and Current sources, Symbols and Graphical representation
- Overview of AC, DC, Cells and Batteries, Energy and Power.

iii) Basics of Semiconductor

- Semiconductor materials, Metals and Semiconductors and Photo-electric emission.
- N-type and P-type semiconductor, Effects of temperature on Conductivity of semiconductor.
- PN junction diode, depletion layer, Forward & Reverse bias, V-I Characteristic, Effects of temperature, Zener diode, Photo diode, LED, Types and applications of diode.
- Diode as a rectifier, Half wave and full wave rectification, Zener diode Regulator.
- Introduction to Filters, Clippers, Clampers

iv) Bipolar Junction Transistor

- Operation of NPN and PNP transistors, Biasing of BJT.
- CB, CE and CC configuration
- Introduction to FET, JFET, MOSFET, CMOS and VMOS

v) **Transistor Amplifier and Applications**

- Introduction, Single and Multi-stage amplifiers
- Introduction to Oscillators
- Introduction to Thyristors, PNP diode, SCR, LASCR, DIAC, TRIAC

(3.GV.04) Applied Mathematics –II

Algebra-II

1. Matrices
2. Determinants
3. Inverse of a Matrix and its Applications

Relations and Functions

1. Relations and Functions-II
2. Inverse Trigonometric Functions

Calculus

1. Limits and Continuity
2. Differentiation
3. Differentiation of Trigonometric functions
4. Differentiation of Exponential and Logarithmic functions
5. Application of Derivatives
6. Integration
7. Definite Integrals
8. Differential Equations

Vectors and Three Dimensional Geometry

1. Introduction to Three Dimensional Geometry
2. Vectors
3. Plane
4. Straight Line

Linear Programming and Mathematical Reasoning

1. Linear Programming
2. Mathematical Reasoning

(3.VP.02) Basic Electricity Lab

1. Verify that resistance of conductor is directly proportional to resistivity and length and inversely proportional to cross-sectional area of the conductor.
2. Verification of Ohm's Law.
3. Verification of temperature coefficient of resistance:
 - (i) Positive for Tungsten and Nichrome and

- (ii) Negative for carbon.
4. Study of series resistive circuits.
5. Study of parallel resistive circuits.
6. Study of series and parallel connection of cells in circuits.
7. Preparation of Electrolyte for lead acid battery and its charging and measurement of Specific gravity with the help of hydrometer.
8. To find the efficiency of an electric kettle.
9. Charging and Discharging of a capacitor.
10. Verification of magnetic field of a Solenoid with:
 - (i) Iron core and
 - (ii) Air core.
11. Verification of Faraday's Law of electromagnetic induction.
12. Verification of Torque development in a current carrying coil in magnetic field.
13. Study of R.L. series circuit and measurement of power and power factor.
14. Study of R.C. series circuit and measurement of power and power factor.
15. Study of R.L.C. series circuit and measurement of power and power factor.
16. Study of R.L.C. series circuit for calculation of inductive reactance, capacitive reactance, impedance and Q- Factor.

Instruments Required

- Trainer kit for verifying Ohm's law,
- Trainer kit for measuring TCR
- Lead acid battery,
- Hydrometer,
- Electric kettle,
- Trainer kit for measuring power and power factor in RLC circuits

(3.VP.03) Basic Electronics-Lab

1. Study of current and voltage measurement using Ammeter and Voltmeter.
2. Study of current and voltage measurement using Galvanometer.
3. Study of current, voltage and resistance measurement using Multi-meter
4. Study of Power and Energy measurement using Wattmeter and Energymeter.
5. Study of working principle of Signal Generator and measurement of amplitude, time period and frequency of signal using Oscilloscope.
6. Study of V-I Characteristic of Diode.
7. Study of V-I Characteristic of Zener Diode. And use of Zener Diode as voltage regulator.
8. Study of Half wave rectifier with and without filter circuit.
9. Study of Full wave rectifier with and without filter circuit.
10. Study CE configuration for NPN and PNP transistors and measurement of voltage and current gain.
11. Study CB configuration for NPN and PNP transistors and measurement of voltage and current gain.
12. Study CC configuration for NPN and PNP transistors and measurement of voltage and current gain.

13. Study of working of single layer PCB manufacturing
14. Study of working of double layer PCB manufacturing.
15. Design of 7 segment display using LED and breadboard.

Instruments Required

- Ammeter
- Voltmeter,
- Multimeter,
- Galvanometer,
- Energy Meter,
- CRO,
- Diode Trainer kit
- Zener diode Trainer kit
- Rectifier trainer kit
- Transistor characteristic trainer kit,
- PCB manufacturing Lab
- Breadboard trainer kit to design 7 segment display.

Level4(SemesterI)**(4.GV.01)GeneralFoundationCourse-II****A. BusinessManagementandEntrepreneurship**

Management of Business, Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a) Basic Function (b) Marketing Management (c) Financial Management (d) Production Management (e) Personnel Management

B. ComputationalSkills

1. (a) Solution of linear equations and their application to problems of commercial mathematics.

(b) System of linear equations and in equation in two variables. Applications in information of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Mean, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers.

C. EnvironmentalEducation &RuralDevelopment

Environmental Education:

- a. Modernization of agriculture and environment, irrigation, water logging, use of fertilizers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.
- b. Rational utilization, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. RuralDevelopment

Principles and goals of rural development, major problems/constraints in rural development in India.

(4.GV.02)ITTools

- I. Computer Organization & OS: User perspective.
 - Understanding of Hardware.
 - Basics of Operating System.
- II. Networking and Internet.
 - Network Safety concerns.
 - Network Security tools and services.
 - Cyber Security.
 - Safe practices on Social networking.
- III. Office automation tools:
 - Spreadsheet.
 - Word processing.
 - Presentation.
- IV. MultiMedia Design: (Open Source Design Tools)

- InterfaceandDrawingToolsinGIMP.
 - ApplyingFilters.
 - Creatingandhandlingmultiplelayers.
 - UsingStampingandSmudgingtools.
 - Importingpictures.
- V. Troubleshooting:Hardware,Software and Networking.
- Commonlyencountered problems.
 - (Monitor: No display, KB/Mouse not responding, monitor giving beeps, printer not responding, check for virus, Delete temporary files if system is slow, adjust mouse speed).
- VI. WorkIntegratedLearningIT–ISM
- IdentificationofWorkAreas.
 - WorkExperience.

(4.GV.03)Web Applications

- I. **MovieEditingTools.**
- Familiarizationofinterfacecomponents.
 - Importingpictures.
 - ImportingAudioand VideoFiles.
 - SplittingandJoiningMovieClips.
 - AddingTitlesandpublishing.
- II. **CustomizingandEmbeddingMultimediacomponentsinWebPages.**
- CompatibleMultimediafileformatsforWebPages.
 - EmbeddingAudiofile.
 - EmbeddingVideofile.
 - EmbeddingFlashfile.
- III. **WebScripting–JavaScript.**
- JavaScriptreview.
 - Functions–userdefined.
 - StringObject.
 - MathObject.
 - ArrayObject.
 - Events.
 - CaseStudies.
- IV. **WorkIntegratedLearningIT–WA-II.**
- AdvancedFeaturesofWebDesign.
 - Codeview,Add-ins/SnippetsandPageTransitions.
 - DynamicWebtemplates.
 - SEO-SearchEngineOptimization.
 - Forms-Advanced.
 - Publishingwebpagesorwebsites-I.
 - Publishingwebpagesorwebsites-II.
 - Authoringtools.
 - CSStemplates.

(4.GE.01) Language-II Module

- 3: Listening and speaking skills

In this module the learners will be exposed to a variety of listening activities recorded on audiotapes. These will be samples of good spoken English, which the learners can use as models. Worksheets will accompany the listening material.

This module will include the following:

1. Introducing yourself/friends in formal and informal situations.
2. Inviting people (over the phone and face to face) giving details of occasion, time place and date. Acceptance and refusal of invitation – formal and informal.
3. Seeking and supplying information (example opening an account in a bank, applying for loans etc.)
4. Talking and conveying messages (over the phone and face to face).
5. Giving directions/instruction.
6. Discussing contemporary issues related to environment, child labour, gender bias etc.
7. Listening to excerpts from television and radio.
8. Listening to poems/plays (prescribed).
9. Listening to speeches/talks.
10. Listening to songs like "We shall overcome".

Module-4 to 6 **(English for specific purposes) (opt anyone)**

There are modules being offered. A learner has to opt for anyone. The first is for academic purposes and the next two are for vocational purposes. The focus is not on the teaching of the subject matter like science and literature but on the way in which language is used in the different subjects.

Module 4: English for Science

This course will introduce learners to some interesting pieces of popular science

1. Health and hygiene
2. Conservation of (nearly extinct) animals.
3. Plant life.
4. Biogas/solar energy.

These pieces illustrate the use of English in scientific writing: giving information factually, logically and objectively.

Module 4: English for Receptionist

This module will introduce the learners to a variety of exercises, tasks and meaningful activities related to the receptionist's use of English. The printed course materials will be supported by tapes.

The following competencies be developed:

1. Receiving messages, making request etc.
2. Supplying information
3. Giving advice and making suggestions
4. Dealing with complaints

5. Making entries in an appointment book, register etc.

Module 4: English for Office Use

This course will help the learner to use English effectively and appropriately in the office environment. The competencies will be developed.

1. Using the telephone taking and passing messages.
2. Receiving messages
3. Making notes on files and circular.
4. Writing office notes, memos, notices, agendas for meetings.
5. Telegrams and fax messages.
6. Writing business letters, application enquires, complaints.
7. Filling in forms, cheques, pay slips etc.

(4.VP.01) IT Tools Lab (Advanced)

- Study of computer components, Booting of Computer and its shutdown
- Practicing some fundamental DOS Commands
- Simple Programs in BASIC to compute Mean, Variance, Correlation and Regression
- Creating database in MS-Access, structuring with different types of fields and use of query facility for accessing the information

(4.VP.02) Web Applications Lab

1. Programs/Practical Questions:
 - Movie Editing Tools
 - Customizing and Embedding Multimedia Components in Web Pages
 - Web Scripting- JavaScript
2. Project/Practical File
3. Viva Voce

EMC-102-25	Entrepreneurship (Marketing Basics)	0L:0T:4P	2 Credits
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Introduction

This semester helps learners understand marketing as a practical life skill - not just "advertising." It teaches them how to communicate value, attract the right customers, and grow something small into something sustainable. Learners explore the basics of customer psychology, messaging, content creation, and simple sales strategies. Through hands-on activities, they will practice real marketing techniques for their micro-hustle or a simulated business idea, learning how to get attention, build trust, and generate sales.

Learner's Objectives

1. Understand the core concepts of marketing using simple, relatable real-world examples.
2. Learn how customers think, choose, and buy - and how businesses influence decisions ethically.
3. Identify and define a target customer clearly instead of "selling to everyone."
4. Create clear messaging: what they sell, who it helps, and why it matters.
5. Use basic marketing channels (offline + online) to attract customers.
6. Run a simple marketing campaign and measure what worked.
7. Build confidence in selling, promoting, and talking about their product/service.

Outcome: By the end of this semester, learners will be able to market a product/service using basic strategies, attract real customers, and improve their results through feedback and experimentation.

Guiding Principles / Approach

This syllabus is built on action-based learning, clarity-first communication, and customer-first thinking. Learners don't just study marketing—they practice it in real situations through small experiments and repeated improvement. The course is designed to feel approachable and practical: learners create simple content, test messaging, talk to real people, and observe what influences decisions.

Instead of heavy theory, students build marketing skills through doing: customer discovery, storytelling, channel experiments, and reflection. The curriculum emphasizes confidence-building, ethical marketing, and communication as a leadership skill. By helping learners see results quickly (even small wins like one customer or one inquiry), the program builds motivation, creativity, and real-world business readiness.

Semester 2 Curriculum & Milestones

Format: 12 weeks, 4 hours/week | 2 credits

Recap Milestone: Recap and Introduction

Description: Revise what you learned in Semester 1 and plan what you will do in Semester 2

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
Recap	Recap and Introduction	Revise what you learned in semester 1 and plan what you will do in		Revise first 12 milestones of Semester 1	• Watch a video on 'Semester 1 summary' • Download 12 summary cards of Semester 1 milestones • Write 3 key learnings of Semester 1 • Write 3 things you will improve in semester 2 • Attempt Semester 1 Recap Quiz

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
		semester 2	2	Set your goals for Semester 2	• Learn how to 4X your revenue in Semester 02 using Marketing • Read how famous brands use marketing to increase revenue • Set your marketing goals • Attempt Semester 2 Readiness Quiz

Milestone 13: Marketing Fundamentals

Description: Marketing Fundamentals milestone focuses on helping students understand the basics of marketing and how they can use marketing to scale their businesses and generate revenue.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
13	Learn Marketing Fundamentals to scale your business	Learn how you can use multiple types of marketing to scale your business and grow revenue	1	Understand what is marketing	• Watch a video on marketing fundamentals
					• Read examples of famous marketing campaigns in India
					• Explain what you learned about marketing
					• Attempt task 01 quiz
			2	Learn different types of digital marketing	• Watch a video on what is digital marketing
					• Read a document on types of digital marketing
					• Write what kind of digital marketing works best for your business and why
					• Attempt task 02 quiz
			3	Write 3 marketing ideas for your business	• Read a document on how businesses like yours are using marketing to generate revenue
					• Write 3 marketing ideas to scale your business
					• Validate your ideas with 3-5 people
					• Shortlist the best idea and explain how it will generate revenue
					• Share your experience of doing this milestone
					• Attempt task 03 quiz

Milestone 14: WhatsApp Community Marketing

Description: WhatsApp Community Marketing milestone focuses on helping students learn how to build a WhatsApp community for their users and use it to generate trust, engagement, and sales.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
14	Build and activate	Build a WhatsApp	1	Create your WhatsApp community	• Watch a video on why you should build a WhatsApp Community

	your WhatsApp community	community for your users and use it to generate trust, engagement, and sales			• Read a document on how to create a WhatsApp community
					• Enter the name of your community
					• Upload your WhatsApp community link
					• Attempt task 01 quiz
			2	Invite people to join your WhatsApp community	• Read a few sample invite and welcome messages
					• Draft an invite message to invite 50 people to join your community
					• Draft a welcome message for your community members
					• Upload a screenshot of your welcome message
					• Attempt task 02 quiz
			3	Engage your community users and start building trust	• Learn 'how to engage people in your community'
					• Read top 10 community engagement ideas for your business
					• Write 5 types of content to post weekly in your community
					• Create and upload your weekly calendar
					• Attempt task 03 quiz
			4	Get 3 sales from your WhatsApp Community	• Learn how to do soft-selling on community
					• Create a community-only offer
					• Learn how to convert interested people into paid customers
					• Write a simple plan to generate 3 sales per month from the community
					• Share your experience of doing this milestone
					• Attempt task 04 quiz

Milestone 15: Generating Content for Marketing using AI

Description: AI-led Content creation and marketing milestone focuses on helping students learn how to use AI tools to generate creative ideas and create professional videos, posters, and blogs.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
15	Use AI to generate content for marketing	Learn how to use AI tools to generate creative ideas and create professional videos,	1	Learn what is content marketing	• Watch a video on 'what is content marketing' which content works for brand awareness or revenue generation
					• Write 3 types of content you believe your customers like
					• Attempt task 01 quiz
			2	Generate content ideas to attract	• Learn how to use AI to generate content marketing ideas for your

		posters, and blogs		customers	business
					• Generate 10 small content ideas to attract your customers
					• Discuss the ideas with your users and take feedback
					• Shortlist top 3 content ideas to attract customers
					• Attempt task 02 quiz
			3	Create your first brand video using AI	• Watch a video on 'How to use AI tools to create simple short videos'
					• Read this guide on how to ask AI to write a video script
					• Generate 5 ideas for your AI videos and write them here
					• Upload your AI generated video link
					• Attempt task 03 quiz
			4	Create a brand poster using AI	• Learn how to create a poster using AI
					• Write a prompt for the poster will you create using AI
					• Upload the AI poster you have created
					• Post this poster in your WhatsApp community
					• Attempt task 04 quiz
			5	Write a blog using AI	• Learn how to use prompt engineering to write content for your business
					• Read list of topics on which you can write a blog
					• Write the topic on which you will write a short blog
					• Write the first version of your blog
					• Share your blog with your friends and faculty
					• Share your experience of doing this milestone
					• Attempt task 05 quiz

Milestone 16: Social Media Marketing

Description: Social Media Marketing milestone focuses on helping students learn what social media marketing is and how to create a social media weekly plan that engages users and improves brand visibility.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
16	Plan your social media marketing strategy	Learn what is social media marketing and how can you execute it to scale your business	1	Learn what is social media marketing	• Watch a video on 'Introduction to Social media marketing'
					• Learn different types of social media marketing
					• Read a document on how to use social media marketing to generate revenue
					• Write your understanding of social media marketing
					• Write one social media marketing idea for your business
					• Attempt Task 01 Quiz
			2	Research your competitors	• Learn how to research your competitors
					• Find your competitors
					• Write top 3 things your competitors are posting

					• Find one unique gap that you can capture
					• Attempt task 02 quiz
			3	Finalize your content pillars	• Watch a video on 'what are content pillars'
					• Read examples of 'content pillars'
					• Write 5 content pillars for your social media strategy
					• Attempt task 03 quiz
			4	Create your weekly social media plan	• Watch a video on 'how to create a weekly social media plan'
					• Look at examples of 'social media calendar'
					• Create and upload your weekly calendar
					• Upload the link of your Instagram Channel
					• Share your experience of doing this milestone
					• Attempt task 04 quiz

Milestone 17: Trust-led Marketing

Description: Trust-led Marketing milestone focuses on helping students build trust through social media proofs, testimonials, or basic engagement and later converting them into leads and sales.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
17	Generate leads and turn them into sales	Use testimonials, conversations, and daily posts to generate leads and close sales.	1	Use social proof to build trust	• Identify 2 happy customers
					• Create a testimonial post with CTA
					• Post testimonial on social media
					• Post testimonial on the community
					• Attempt task 01 quiz
			2	Make people share their problems	• Learn how to ask open-ended questions
					• List 5 customer problems
					• Post these problems in community and social media
					• Evaluate top 2 problems customers face
					• Encourage people to share their problems
					• Attempt task 02 quiz
			3	Help your users with 3-5 days content sprint and generate leads	• Brainstorm or use AI to create a solution document for each problem
					• Post solution to 1 problem on a daily basis
					• DM people to check if your solution is helping them
					• Write how many leads did you generate
					• Attempt task 03 quiz
			4	Convert leads into sales	• Learn how to convert leads into sales
					• Soft sell your offering in community and social media
					• DM people how can your product help them better
					• Follow up after 24 to 48 hours
					• Write how many leads you converted into sales
					• Share your experience of doing this milestone
					• Attempt task 04 quiz

Milestone 18: Viral/Trend Marketing

Description: Viral Marketing milestone focuses on helping students learn how to launch viral campaigns for their businesses using the latest trends and make their brand go viral without spending any money.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
18	Make your brand go viral	Design viral marketing campaigns to reach 5X users without spending any money	1	Learn viral marketing	• Understand what is virality and how it works
					• Read about top 10 viral marketing campaigns in India
					• Write 3 reasons why people share content
					• Attempt task 01 quiz
			2	Design 2 viral campaigns for your business	• Learn 5 types of common viral marketing strategies
					• Read 10 viral marketing ideas for your business
					• Design 2 viral campaigns for your business
					• Take feedback from people and finalize one campaign
					• Set your campaign targets
					• Attempt task 02 quiz
			3	Launch one viral campaign to increase customer reach	• Create your campaign launch video or poster
					• Create your campaign launch message
					• Launch your campaign on your social media platform
					• Launch your campaign in your WhatsApp community
			4	Promote your campaign to make it viral	• Attempt task 03 quiz
					• Share your campaign in other groups and forums
					• Measure your campaign performance
					• Learn how to improve your campaign
					• Analyze your campaign and record final metrics
					• Enter the summary of your campaign
					• Share your experience of doing this milestone
					• Attempt task 04 quiz

Milestone 19: BTL/Offline Marketing

Description: BTL/Offline Marketing milestone focuses on helping users learn about BTL (below the line) or offline marketing and use it to reach out to local customers and generate revenue.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
19	Drive revenue through offline/BTL marketing	Use offline activities to reach local customers and generate sales	1	Understand offline or BTL marketing	• Watch a video on what is BTL marketing
					• Read about famous BTL marketing campaigns
					• Write how you can use BTL marketing for your business
					• Attempt task 01 quiz
			2	Pick your offline	• Learn about common offline tactics for your business

				marketing idea	• Write 1 offline marketing idea you can execute
					• Design your brand poster for offline marketing
					• Create your offline marketing offer or pitch
					• Practice your pitch with friends and take feedback
					• Attempt task 02 quiz
			3	Execute offline marketing in local market	• Identify people or locations in local for offline marketing
					• Pitch to at least 10 real customers
					• Collect contact details for WhatsApp Community invite
					• Close at least one sale
					• Write your offline marketing metrics
					• Share your experience of doing this milestone
					• Attempt task 03 quiz

Milestone 20: Collaboration and Affiliate Marketing

Description: Collaboration and Affiliate Marketing milestone focuses on helping users learn about affiliate marketing and how to collaborate with individuals/businesses to reach more customers and generate revenue.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
20	Grow through collaboration and affiliation marketing	Use partners and affiliates to reach new audiences and generate sales	1	Understand affiliate marketing and collaboration	• Watch a video on what is affiliate marketing
					• Read about top collaboration or affiliate marketing campaigns
					• Learn 10 common types of collaboration or affiliate marketing for your business
					• Pick 3 types that can work for your business
					• Attempt task 01 quiz
			2	Design your affiliation model	• Learn how to start an affiliation program
					• Decide your commission structure
					• Write a pitch for partnership
					• Attempt task 02 quiz
			3	Finalize one person or business for collaboration	• Learn how to find a right partner for collaboration
					• Create a list of 5 to 10 people or businesses for collaboration
					• Send your partnership pitch to potential partners
					• Write the name of one final partner
					• Attempt task 03 quiz
			4	Execute the collaboration	• Explain how will the partner market your brand
					• Post the link or screenshot of successful collaboration
					• Respond to new leads within 24 hours
					• Close at least one sale
					• Attempt task 04 quiz
			5	Measure your	• Write number of leads generated
					• Write number of sales closed and

				collaboration	revenue generated
					• Write what worked and how to improve collaboration
					• Share your experience of doing this milestone
					• Attempt task 05 quiz

Milestone 21: Advertising Marketing (Meta)

Description: Advertising Marketing milestone focuses on helping users learn how to post a paid ad on Meta (Instagram and Facebook) promoting their business and reach to more users or generate revenue.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
21	Run your first ad on Instagram	Learn how to boost posts or run simple video ads to reach new viewers	1	Setup your Meta Business Suite	• Watch a video on why to run ads on Meta
					• Learn different types of ads
					• Read the guide on Meta Ad account setup
					• Setup your Meta Ad account
					• Attempt task 01 quiz
			2	Design your first paid ad	• Watch samples of good ad designs for your business
					• Finalize your ad objective
					• Upload the final draft of your ad with final copy and creatives
					• Attempt task 02 quiz
			3	Define your target audience and budget	• Watch a video on 'how to target the right people for ad'
					• Define your target audience
					• Learn how to decide the right budget for your ad
					• Decide your final budget
					• Attempt task 03 quiz
			4	Launch your ad	• Learn how to create and launch your ad
					• Create your ad and review ad preview
					• Upload the screenshot of launched ad
					• Attempt task 04 quiz
			5	Manage incoming leads from ad	• Draft a message for incoming leads
					• Send draft message to leads within 24 hours
					• Pitch your offer to leads and follow up
					• Close at least one sale
					• Attempt task 05 quiz
			6	Measure your ad performance	• Learn metrics to measure ad performance
					• Write money spent and leads or impressions
					• Mention CPL or CPM
					• Write revenue generated and number of sales closed
					• Write what worked and how to improve ads in future
					• Share your experience of doing this milestone
					• Attempt task 06 quiz

Milestone 22: Psychological Marketing

Description: Psychological Marketing milestone focuses on helping users identify psychological triggers like urgency, pricing, and offers, and use them to increase conversions and revenue.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
22	Use Psychological Triggers to	Learn how to use urgency, pricing, and	1	Understand the psychological triggers	• Learn why people buy products
					• Share a story of one product you purchased because of a trigger

	Increase Sales	offers to increase conversions and revenue			• Identify buying triggers for your business
					• Attempt task 01 quiz
			2	Execute FOMO or urgency marketing	• Learn how to create a FOMO or urgency marketing campaign
					• Write how will you create FOMO or urgency for your customers
					• Create one FOMO/urgency marketing campaign
					• Launch your campaign on social media and community
					• Attempt task 02 quiz
			3	Execute one offer or discount marketing campaign	• Learn how to create offer or discounting marketing campaigns
					• Write how will you create an offer/discount campaign
					• Create one offer/discount campaign for your customers
					• Launch your campaign on social media and community
					• Share your experience of doing this milestone
					• Attempt task 03 quiz

Milestone 23: Data-Driven Marketing

Description: Data-Driven Marketing milestone focuses on helping users analyze the data of the last 10 milestones and run specific campaigns or ideas that resulted in lead generation or revenue.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
23	Use Data-Driven Marketing to Grow Faster	Analyze data of the last 10 milestones to identify top campaigns or ideas and decide what to continue, improve, or stop.	1	Analyze your marketing data	• Learn how businesses make decisions using data
					• List 3 things that worked well and why
					• List 3 things that didn't work well and why
					• Attempt task 01 quiz
			2	Re-execute top performing campaign	• Re-execute top 1-2 campaigns for 1 week
					• Write how it helped generate leads or revenue
					• Attempt task 02 quiz
			3	Improve one low performing campaign and relaunch it	• Pick one low performing campaign and write how to improve it
					• Improve the campaign and relaunch it
					• Measure its performance and see if it was better
					• Share your experience of doing this milestone
					• Attempt task 03 quiz

Milestone 24: Closure and Next Step

Description: The final milestone focuses on helping users reflect on their learnings and also create an action plan for the next few months to continue to scale and grow their business.

Milestone #	Milestone name	Milestone Description	Task #	Task Title	Activities
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24	Plan your next growth phase	Document your 12 weeks of learning and create a 1 month plan to scale and grow your business	1	Review your progress	• List all the ideas you executed
					• Write which milestone helped you the most and how
					• Write which milestone helped you the least and why
					• Write your key learnings from this semester
					• Create a not-to-do list for your business
					• Attempt task 01 quiz
			2	Create your 1 month marketing plan	• Learn how to create a 1 month marketing plan
					• Set your marketing goal
					• Create and upload your 1 month plan to achieve this goal
					• Share your experience of doing this milestone
					• Attempt final semester quiz

Level4(SemesterII)**(4.GV.04)DatabaseManagementSystems**

- I. DatabaseConcepts–RDBMSTool.
 - BasicsofRDBMS.
 - SQL–Creating andOpeningDatabase.
 - Creatingandpopulatingtables.
 - Modifyingthecontentandstructureoftable.
 - OrderingandGrouping.
 - Operatingwithmultipletables.
- II. Operating WebBasedApplications.
 - OnlineReservationSystems.
 - E-Governance.
 - OnlineShoppingandBillpayments.
 - OnlineTutorialsandTests.
 - ProjectManagement–WebBasedApplicationdevelopment.
 - Projectessentialsandtips.
 - CaseStudy-OnlineGame.
 - CaseStudy-OnlineQuiz.
 - CaseStudy – OnlineBillCalculator.
- III. Fundamentals of Java programming,IntroductiontoJava,Object Oriented Programming,JavaLanguageElements,Operators, ControlFlow,Array,ClassDesign, ExceptionHandling, Assertions, Threads, Wrapper Classes,String Manipulation.
- IV. WorkIntegrated LearningIT–DMA.
 - IdentificationofWorkAreas.
 - WorkExperience.

(4.GV.05)Digital Electronics

1. **NumberSystemsandBooleanAlgebra**
 - BasicsofAnalogandDigital.
 - Booleanalgebra,De-morgan'slaw,Truthtables.
2. **Logical Circuits**
 - Logicgates:AND,OR, NOT,NOR, NAND,XOR,XNOR.
 - CombinationalCircuits:
 - (i) ArithmeticCircuits: Halfadders,Fulladders,Subtractors,
 - (ii) DataProcessingCircuits: Encoders,Decoders,Multiplexers, De-Multiplexers,
- 3.**LatchesandFlip-Flops**
 - ConceptofLatches,TypesofLatches,SRlatch.
 - SRFlipFlop,JKFlipFlop,DFlipflop,TFlipFlop,FlipFlop.
 - Introductiontocounters,TypesofcountersAsynchronousandSynchronous.
 - Introductiontoshift registers,typesofshift registers,

4. IntroductiontoDisplayDevices

- LED,LCD,7segmentdisplay

5. IntegratedCircuitsand Memories

- IntroductiontoIC's,Importanceandapplications,LinearandDigital IC's.
- IntroductiontoSSI,MSI,LSIandVLSI(Terminology&Definitions).
- MemoryOrganisationandOperations,RAM,ROM.

(4.GV.06)ComputerNetworks

UNIT-I

IntroductiontocomputerNetwork-Communication:AnEssential Partof OurLives,Communicating in a Network-Centric World, Network as a Platform, Architecture of the Internet, Trends in Networking

Communicating overthe Network -PlatformforCommunications, LANs, WANs, and Internetworks, Protocols, Using Layered Models,Network Addressing

UNIT-II

Application Layer Functionality and Protocols- Applications:The InterfaceBetween the Networks, MakingProvisionsforApplicationsandServices,ApplicationLayerProtocolsandServicesExamples

OSI Transport Layer - Roles of the Transport Layer, IPv4 Addresses, TCP: Communicating with Reliability, UDP: Communicating with Low Overhead

UNIT-III

OSI Network Layer - IPv4,Networks: Dividing Hosts into Groups, Routing, How Data Packets Are Handled, Routing Processes

Addressingthe Network-IPv4 Addresses for Different Purposes, AssigningAddresses, Calculating Addresses,Testing the Network Layer

OSIDataLinkLayer-DataLinkLayer,MACTechniques,MACAddressingandFramingData

(4.GV.07)MaintenanceofComputerSystems

UNIT-I

OSIPhysicalLayer-PhysicalLayer,CommunicationSignals,PhysicalSignalingandEncoding: RepresentingBits, PhysicalMedia: Connecting Communication

Ethernet - Overviewof Ethernet, Ethernet: Communication through the LAN, Ethernet Frame EthernetMAC, EthernetPhysicalLayer,Hubs and Switches,Address Resolution Protocol(ARP)

UNIT-II

Planning and CablingNetworks -LANs:Making the Physical Connection, DeviceInterconnections, developing an AddressingScheme, Calculating the Subnets, DeviceInterconnections

ConfiguringandTestingYourNetwork-ConfiguringDevices,applyingaBasicConfiguration, Verifying Connectivity, Monitoring and Documenting Networks

(4.GP.03)DatabaseManagementSystemsLab

1. Programs/PracticalQuestions
 - SQLQueries
 - JAVA Programs
 - Operating WebBasedApplication
2. Project/PracticalFile
3. VivaVoce

(4.GP.04)MaintenanceofComputerSystemsandComputer NetworkLab

- Identifyingexternalportsandinterfacing
- IdentifyingPCcardsandinterfacing
- Identifyingportsonthecardsandinterfacing
- PreventivemaintenanceofaPC
- UnderstandingCMOS
- PartitioningandformattingHarddisks.
- WorkingwithAntivirussoftware's

Level 5(SemesterI)

(5.GV.01)ITFoundations&ProgrammingConcepts

Computer characteristics: Speed, storage, accuracy, diligence; Digital signals, Binary System, ASCII; Historic Evolution of Computers; Classification of computers: Microcomputer, Minicomputer, mainframes, Supercomputers; Personal computers: Desktop, Laptops, Palmtop, Tablet; Hardware & Software; Von Neumann model.

Hardware: CPU, Memory, Input devices, output devices. Memory units: RAM (SDRAM, DDR RAM, RDRAM etc. feature wise comparison only); ROM-different types: Flash memory; Auxiliary storage: Magnetic devices, Optical Devices; Floppy, Hard disk, Memory stick, CD, DVD, CD/DVD-Writer; Input devices-keyboard, mouse, scanner, speech input devices, digital camera, Touchscreen Voice Input, Joystick, Optical readers, barcode reader; Output devices: Display device, size and resolution; CRT, LCD, LED; Printers: Dot-matrix, Inkjet, Laser; Plotters, Sound cards & speaker.

Software: System software, Application software; concepts of files and folders, Introduction to Operating systems, Different types of operating systems: single user, multitasking, time-sharing multi-user; Booting, POST; Basic features of two GUI operating systems: Windows & Linux (Basic desktop management); Programming Languages, Compiler, Interpreter, Databases; Application software: Generic Features of Word processors, Spread sheets and Presentation software; Generic Introduction to Latex for scientific typesetting; Utilities and their use; Computer Viruses & Protection, Free software, open source.

Computer Networks and Internet: Connecting computers, Requirements for a network: Server, Workstation, switch, router, network operating systems; Internet: brief history, World Wide Web, Websites, URL, browsers, search engines, search tips; Internet connections: ISP, Dial-up, cable modem, WLL, DSL, leased line Wireless and Wi-Fi connectivity ; email, email software features (send, receive, filter, attach, forward, copy, blind copy); characteristics of web-based systems, Web pages, Web Programming Languages.

Information Technology And Society: Indian IT Act, Intellectual Property Rights, issues. Application of information Technology in Railways, Airlines, Banking, Insurance, Inventory Control, Financial systems, Hotel management, Education, Video games, Telephone exchanges, Mobile phones, Information kiosks, special effects in Movies.

Programming Concepts & Techniques: Program Concept, Characteristics of Programme, Stages in Program Development, Tips for Program Designing, Programming Aids, Algorithms, Pseudo code, Notations, Design, Flowcharts, Symbols, Rules, compiler & Interpreter. Introduction to programming techniques, Top-down & Bottom-up approach, Unstructured, & Modular programming, Cohesion, Coupling, Debugging, Syntax & Logical Errors, Linking and Loading, Testing and Debugging, Documentation.

(5.GV.02)Web Designing

UNIT-I

Introduction to HTTP, HTML, Basic HTML Tags, Body Tags, Coding Style, Modifying & formatting Text, Lists – Unordered, Ordered, Definition, Insert Links -Linking to another Document, Internal Links, Email Links, Relative and Absolute Links, Insert Images - Referencing Images, Clickable Images, Image Placement and Alignment, Image Size, Image

Margins, Image Formats, Image Maps- Defining an Image Map, Advanced Coloring Body Content, Working with tables - Basic Tables, Table Attributes, Table Cell Attributes, Table RowAttributes,TablesInsideofTables,InvisibleSpacers,WorkingwithFrame-BasedPages- Creating Windows, Single Window Frames,CreatingColumn Frames,Creating Row Frames, Creating Complex Frames.

UNIT-II

Cascading Style Sheet (CSS) – Introduction, creating style, using inline and external CSS, Creating Divs with ID style, Creating Tag& Class style, creating borders,Navigation links, creating effects with CSS.

JavaScript–Introduction,useofJavaScriptinwebpages.UnderstandJavaScripteventmodel, use some basic event and control webpage behavior.

UNIT-III

DESIGNINGWEBSITESWITHDREAMWEAVER/EXPRESSIONWeb/AMAYA/COFEECUP WYSIWYGHTMLEditor-IntroductiontoWYSIWYGHTMLeditor,advantagesofusingHTML editors, Creating a New Site, Creating a New Page, Adding Images with Alternate Text, Inserting & Formatting Text, Aligning Images, Creating an Email Link, Linking to Other Websites, Testing & Targeting Links, OrganizingFiles & Folders
CREATING & INSERTING IMAGES - OptimizingImages for the Web,Saving GIFs & PNGs in Photoshop, Inserting GIFs, Adjusting Transparency Settings, Saving JPGs for the Web

UNIT-IV

DESIGNING ACCESSIBLE TABLES-Understanding Tables& Accessibility,UsingTables for Tabular Data, styling a Table, Editing Table Layouts,Adding Style to aTable Using CSS
CREATINGWEBSITES WITHFRAMES -Introducing Frames,creating a Frameset, Opening Pages into Frames, Controlling Scrollbars & Borders, Targeting Links in Frames
CUSTOMIZINGTHEINTERFACE-OpeninganExistingSite,ReviewingMenuOptions& Preferences, Comparing the Macintosh &PC Interfaces, PreviewinginBrowsers & Device Central

Introduction toResponsive Web Designing– Introduction,advantages, creating and using responsive web pages.

UNIT-V

WebHosting-What isDomain?Introductionto DNS,howto registraDomain?Whatisweb hosting?Howtogetawebhosting?HostyourwebsiteonwebServer.FTP-FTPIntroduction, FTP Commands Viewing Files and Directories, FTP Commands Transferand Rename files, FTP with WS FTP/ CuteFTP, Filezillaon Windows.

(5.GV.03)ProgramminginC

Introductionto‘C’Language-Characterset,VariablesandIdentifiers, Built-inDataTypes, Variable Definition, Arithmeticoperators and Expressions,Constants and Literals,Simple assignment statement, Basic input/output statement, Simple‘C’ programs.

Conditional Statementsand Loops - Decision making within a program,Conditions, RelationalOperators,LogicalConnectives, ifstatement,if-else statement,Loops:whileloop, do while,for loop,Nestedloops,Infinite loops,Switch statement,structuredProgramming.

Arrays- One dimensional arrays:Arraymanipulation;Searching,Insertion, Deletionofan elementfromanarray;Findingthe largest/smallestelementin anarray;Twodimensional

arrays, Addition/Multiplication of two matrices, Transpose of a square matrix; Null terminated strings as array of characters, Standard library string functions

Functions-Top-down approach of problem solving, Modular programming and functions, Standard Library of C functions, Prototype of a function: Formal parameter list, Return Type, Function call, Block structure, Passing arguments to a function: call by reference, call by value, Recursive Functions, arrays as function arguments.

Storage Classes- Scope and extent, Storage Classes in a single source file: auto, extern and static, register, Storage Classes in a multiple source files: extern and static

Structures and Unions- Structure variables, initialization, structure assignment, nested structure, structures and functions, structures and arrays: arrays of structures, structures containing arrays, unions

Pointers - Address operators, pointer type declaration, pointer assignment, pointer initialization, pointer arithmetic, functions and pointers, Arrays and Pointers, pointer arrays, pointers and structures, dynamic memory allocation.

File Processing - Concept of Files, File opening in various modes and closing of a file, reading from a file, writing to a file

(5.GV.04) Operating System (OS)

- **System Software:** Operating System, Compiler, Interpreter and Assembler;
- **Operating System:** Need for Operating System, Functions of Operating System (Processor Management, Memory Management, File Management and Device Management), Types of Operating System-Interactive (GUI based), Time Sharing, Real Time and Distributed, commonly used Operating System: UNIX, LINUX, Windows, Solaris, BOSS (Bharat Operating System Solutions); Mobile OS – Android, Symbian, IOS.
- **Utility Software:** Anti-Virus, File Management tools, Compression tools and Disk Management tools (Disk Cleanup, Disk Defragmenter, Backup).

(5.VP.01) Web Designing Lab

- generic awareness about HyperText Markup Language (HTML).
- designing of websites.
- basics of HTML tags.
- Cascading Style Sheet (CSS).
- functional knowledge of web hosting

(5.VP.02) C Programming Lab

Programming Fundamentals

- **Data Types:** Concept of data types; Built-in data types-byte, short, int, long, float, double, char, string, boolean

- Variables:Needtousevariable, declaringvariables, variablenaming convention, assigning value to variables;
- Integerobjectmethod:parseInt
- Doubleobjectmethod:parseDouble, parseFloat
- ControlStructures:DecisionStructure – if, if-else, switch;LoopingStructure-while, do. . while, for;

ProgrammingGuidelines:

- GeneralConcepts;Modularapproach;
- StylisticGuidelines:Clarityandsimplicityofexpressionsandnames;Comments, Indentation;
- Runninganddebuggingprograms,SyntaxErrors,Run-Time Errors,LogicalErrors;
- ProblemSolving Methodology: Understanding of the problem, identifyingminimum numberofinputs requiredforoutput,breakingdownproblemintosimple logical steps.

Level 5(SemesterII)**(5.GV.05)DataStructure****UNIT-I**

An Overview of Computers and Programming - Simple program logic, The steps involved in the program development cycle, Pseudo code statements and flowchart symbols, Using a sentinel value to end a program, Programming and user environments, The evolution of programming models.

UNIT-II

The concept of data structure, Abstract data structure, Analysis of Algorithm, The concept of List Introduction to stack & primitive operation on stack, Stack as an abstract data type, Multiple Stack, Stacks application: Infix, post fix, Prefix and Recursion, Introduction to queues, Primitive Operations on the Queues, Queue as an abstract data type, Circular queue, Dequeue, Priority queue, Applications of queue

UNIT-III

Introduction to the Linked List of Stacks, Basic operations on linked list, Stacks and queues as a circular linked list, Header nodes, Doubly Linked List, Circular Linked List, Stacks & Queues as a Circular Linked List, Application of Linked List.

UNIT-IV

TREES - Basic Terminology, Binary Trees, Tree Representations as Array & Linked List, Basic operation on Binary tree, Traversal of binary trees: - In order, Preorder & post order, Application of Binary tree, threaded binary tree, B-tree & Height balanced tree, B+ & B* trees, 2-3 trees, Binary tree representation of trees, Counting binary trees

UNIT-V

Sequential Searching, Binary search, Insertion sort, Selection sort, Quicksort, Bubble sort, Heap sort, Comparison of sorting methods
Hash Table, Collision resolution Techniques, Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, Graph Traversal-Depth first & Breadth first search, Spanning Trees, minimum spanning Tree, Shortest path algorithm

(5.GV.06)Concepts of Data Mining**Unit-I**

Introduction to Data warehousing, needs for developing data Warehouse, Data warehouse systems and its Components, Design of Data Warehouse, Dimension and Measures, Data Marts: - Dependent Data Marts, Independent Data Marts & Distributed Data Marts, Conceptual Modeling of Data Warehouses: - Star Schema, Snowflake Schema, Fact Constellations, Multidimensional Data Model & Aggregates.

Unit-II

OLAP, Characteristics of OLAP System, Motivation for using OLAP, Multidimensional View and Data Cube, Data Cube Implementations, Data Cube Operations, Guidelines for OLAP Implementation, Difference between OLAP & OLTP, OLAP Servers: - ROLAP, MOLAP, HOLAP Queries.

UNIT-III

Introduction to Data Mining, Knowledge Discovery, Data Mining Functionalities, Data

MiningSystem categorization and its Issues. Data Processing:- Data Cleaning, Data Integration andTransformation. Data Reduction, Data Mining Statistics. Guidelines for Successful Data Mining.

Unit-IV

Association Rule Mining:-Introduction, Basic, The Task and a Naïve Algorithm, Apriori Algorithms, Improving the efficiency of the Apriori Algorithm, Apriori-Tid, Direct Hasing andPruning(DHP),Dynamic Item set Counting (DIC), Mining Frequent Patterns without CandidateGeneration(FP-Growth), Performance Evaluation of Algorithms,

Unit-V

Classification:-Introduction, Decision Tree, The Tree Induction Algorithm, Split Algorithms Basedon Information Theory, Split Algorithm Based on the Gini Index, Overfitting and Pruning,Decision Trees Rules, Naïve Bayes Method.

Cluster Analysis: - Introduction, Desired Features of Cluster Analysis, Types of Cluster AnalysisMethods:- Partitioned Methods, Hierarchical Methods, Density- Based Methods, DealingwithLarge Databases.Quality and Validity of Cluster Analysis Methods.

(5.GV.07)ObjectOrientedProgrammingwithJAVA

UNIT-I

C++vsJAVA,JAVAandInternetandWWW,JAVAsupportsystems,JAVAenvironment.

JAVA program structure, Tokens,Statements,JAVA virtualmachine,Constant & Variables, Data Types, Declaration of Variables,Scope of Variables,Symbolic Constants, Type Casting.

Operators:Arithmetic, Relational, LogicalAssignments,IncrementandDecrement,Conditional, Bitwise, Special, Expressions & its evaluation.

If statement, if...else... statement,Nesting of if...else... statements,else...if Ladder,Switch,? operators, Loops – While, Do, For, Jumps in Loops, Labelled Loops.

UNIT-II

Defininga Class,AddingVariablesandMethods,Creating Objects,Accessing Class Members, Constructors, Methods Overloading, StaticMembers, Nesting of Methods.

Inheritance:ExtendingaClass,OverridingMethods,FinalVariablesandMethods,Final Classes,FinalizeMethods,Abstractmethods and Classes,VisibilityControl.

UNIT-III

Arrays: One Dimensional & two Dimensional, strings, Vectors, wrapper Classes, Defining InterfaceExtending Interface,ImplementingInterface,Accessing InterfaceVariable,System Packages, Using System Package,Adding a Class to a Packages, Hiding Classes.

UNIT-IV

CreatingThreads,ExtendingtheThreadsClass,StoppingandBlocking aThread,LifeCycleof a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementingthe Runnable Interface.

UNIT-V

Localand Remote Applets Vs Applications, Writing Applets, Applets Life Cycle, Creating an Executable Applet,Designing aWebPage,AppletTag,Adding Appletto HTML File,Running the Applet, Passing Parameters to Applets, Aligning the Display, HTML Tags & Applets, Getting Input from the User.

(5.GV.08)MULTIMEDIA-TOOLS&APPLICATIONS

UNIT-I

IntroductionToMultimedia,NeedsandAreasofuse,IdentifyingMultimediaElements-Text, Images, Sound,Animation and Video,Making SimpleMultimedia With PowerPoint.

TEXT - Concepts of Plain & Formatted Text, RTF & HTML Texts, Using Common Text Preparation Tools, Conversion to and from of Various Text Formats, Creating text using standardsoftware.

UNIT-II

SOUND - Sound and its Attributes, Sound and Its Effects in Multimedia, Frequency, Sound Depth, Channels and its Effects on Quality and Storage, Size Estimationof Spaceof a Sound File, SoundCardStandard –FMSynthesisCards,WavesTableCards,MIDlandMP3Filesand Devices, 3D Sounds, Recordingand editing sound using sound editors likeAudacity, Sound forge etc.

UNIT-III

IMAGES-ImportanceofImagesGraphicsinMultimedia,VectorandRasterGraphics,Regular Graphics vs. Interlaced Graphics, Image Capturing Methods - Scanner, Digital Camera Etc. Colormodels-RGB,CYMK,Hue,Saturation,andBrightness,VariousAttributesofImagesSize, Color, Depth Etc, Various Image File Format BMP, DIB, CIF, PIC, and TIF Format Their FeaturesAndLimitations,Imageformatconversion,variouseffectsonimages.Createimages using Photoshop,CorelDrawandapplyvariouseffects,Using Layers,ChannelsandMasks in images.

UNIT-IV

VIDEO- Basic ofVideo, AnalogandDigital Video Type ofVideo, DigitizationofAnalogVideo, Video Standard – NTSC, Pal, HDTV, Video Capturing Media /Instruments Videodisk Camcorder Compression Techniques, File Formats AVI, MJPG, MPEG, Video Editing and Movie Making Tools, convertingformatsofvideos, recordingandediting videos usingvideo editing software likeadobe premiere or Sony Vegas.

UNIT-V

ANIMATION- Concepts of animation, 2D and 3D animation, tools for creating animation, character and text animation, creating simple animation using GIF animator and flash, Morphing and Applications.

Authoring tools for Multimedia – Introduction to various types of multimedia authoring tools, CD/DVD based and web based tools, features and limitations, creating multimedia package using all components.

(5.VP.03)Data Structure Lab

- Implementstack.Writefunctionslike push,pop,Initialize,EmptyorFull.
- Implementconceptof queues
- Implementqueuesinacirculararray.
- Implementqueuesasacircularlinkedlist
- Implementingdoublylinked list
- Binarysearchtreetosortanarray

(5.VP.04)JavaLab

ProgrammingproblemsbasedonallconceptscoveredintheorysuchasArrays, Classes, Threads, Methods, Applets etc.

Level 6(SemesterI)

(6.GV.01)LinuxOperatingSystem-Operations&Management

UNIT-I

Linux introduction and file system - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell.

Linux File system-Boot block,super block,Inode table, data blocks,How Linux access files, storage files, Linux standard directories, Commands forfilesand directoriescd, ls, cp,md, rm, mkdir,rmdir, more, less, creating and viewingfiles,using cat,file comparisons,Viewfiles, diskrelatedcommands, checking disk free spaces.

PartitioningtheHarddriveforLinux,InstallingtheLinuxsystem,Systemstartupandshut-down.

UNIT-II

Essential Linux commands Understanding shells, Processes in Linux process fundamentals, connecting processes with pipes, redirecting input output, manual help, Background processing, managing multiple processes, changing process priority,scheduling ofprocesses at command,batch commands,kill,ps,who,sleep,Printingcommands, grape, fgrep,find,sort,Cal, banner,touch,file,file related commands-ws, sat, cut, grep, dd, etc.

Mathematicalcommands-bc,expr, factor,units.

vi, joe, vim editor

UNIT-III

Shell programming Basic of shell programming, Various types ofshell, shell programming in bash, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, shell keywords,Creating Shell programs forautomate system tasks and report printing, use of grep in shell, awk programming.

UNIT-IV

SystemadministrationCommonadministrativetasks, identifyingadministrative files-configuratinn andlogfiles,Roleofsystemadministrator,Managinguseraccounts-adding&deletingusers,changing permissionsandownerships,Creatingandmanaginggroups,modifyinggroupattributes,Temporary disable user's accounts, creating and mounting file system, checking and monitoring system performancefilesecurity&Permissions, becoming super user using su.Getting system information- host name, disk partitions & sizes, users, kernel.

Backup and restore files, linuxconf. utility in GUI, reconfiguration hardware with kudzu Configure desktop-X configurator, understandingXF86configfile, starting & using X desktop. KDE & Gnome graphical interfaces, changing X settings.

UNIT-V

BasicnetworkingadministrationSettingupaLANusingLinux,choosingpeertopeervsclient/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to internet, administration in a networked environment, common networking administrative tasks, the network file system, configuring Ethernet, initializing Ethernet Interface, ifconfig,netstatandnetconfigcommands aTCP/IPnetworks,DNSServices,routingusingLinux,SLIP & PPP services, UUCP.

Installation&Administrationofmailserver,ftpserverandApachewebsserver.

(6.GV.02)SoftwareEngineering

UNIT-I

SOFTWARE:SoftwareCharacteristics,Components&Applications,SoftwareEngineering-ALayered Technology, Software Process Models - Linear Sequential Model, Prototype & Rad Model., Evolutionary SoftwareProcess Model – Incremental Model and Spiral Model.

SOFTWAREPROJECTMANAGEMENT:ProjectManagementConcepts – PeopleProblem and Process
S/W process and Project Metrics : Metrics in The Process and Project Domains . Software
Measurement–SizeOriented, Function Oriented Metrics, Extended Function

UNIT-II

SOFTWAREPROJECTPLANNING: Objectives, Scope, Project Estimation, DecompositionTechniques,
Empirical Estimation Models.

ANALYSISCONCEPTANDPRINCIPLES:RequirementAnalysis,Communication Techniques,Analysis
Principles, Software Prototyping,Specifications.

ANALYSISMODELING:Elements of TheAnalysis Modeling, Data Modeling. FunctionalModelingand
Information Flow, Behavioral Modeling,Data Dictionary.

UNIT-III

DESIGNCONCEPTSAND PRINCIPLES: Design Process,Design Concepts, DesignPrinciples,Effective
Modular Design .

DESIGN METHODS : Architectural Design Process, Transform Mapping and Transaction Mapping,
InterfaceDesign,-InternalandExternalDesign, Human Computer InterfaceDesign, InterfaceDesign
Guidelines, Procedural Design.

UNIT-IV

S/W QualityAssurance:Quality Concepts, Matrix forSoftwareQuality,Quality Movement,S/W Q A,
S/WReview,FormalTechnicalReviews,FormalApproachestoSQA,S/WReliability,ISO9000quality
Standards

S/WTESTINGMODELS:S/WTesting Fundamentals,TestCase Design, Whiteand BlackBoxTesting,
Basic Path Testing, Control Structure

S/W TESTINGSTRATEGIES: Strategic ApproachToS/W Testing,Unit Testing,Integration Testing,
Validation Testing, System Testing, Debugging

UNIT-V

S/WREUSE : ReuseProcess,BuildingReuseComponents,ClassifiedAnd RetrievingComponents,
EconomicsOf S/W Reuse

COMPUTERAIDED S/WENGINEERING: IntroducingofCase,BuildingBlockForCase,TaxonomyOf
CaseTools,IntegratingCaseEnvironment,IntegratingArchitecture,CaseRepository.

(6.GV.03)WebDevelopmentusingPHP

UNITI

Introduction to PHP as a programming Language: - Advantages of PHP, the server side
architecture Decomposed, overview of PHP, history, object oriented support, benefits in
runningPHPasa serversidescript.Installingawebserver,Internetinformationserver,and IIS
installation, testing web server setup.

UNITII

The basics of PHP: - data types, variables, constants, operators, Arrays, Conditional
statements(ifstatement,ExecutingMultipleStatements,elseifclauseandswitchstatement),
Iterations (forloop, while loop, controlling an array using a while loop, do while statement,
for each loop and special loop key words)

UNITIII

Functions, user defined functions, functions with arguments, built in functions (print(),
includer(), header(), phpinfo()), PHP server Variables, working with date and time ,
performingmathematicaloperations,working with string functions.SystemVariable (GET,
POST,cookies& Session, Forums)

UNITIV

Workingwithforms,formelements(TextBox,TextArea,Password,Radio Button,Checkbox, The
ComboBox, Hidden Field and image), adding elements to a form, uploadingfilesto the

WebServerusingPHP, building a challenge and responsesubsystemandunderstandingthe functionality of the FORM attribute Method RegularExpressions:- Engine, types of Regular Expressions, symbols used in Regular Expressions. Error handling in PHP: - Displaying errors, warnings, types of errors, error levels in PHP, loggingErrors and Ignoring errors.

UNITV

Data base connectivity using PHP (MySQL, ODBC, ORACLE, SQL) Performing, executing Commands,differenttypesofDataBaseOperationslikeInsertion,deletion,updateandquery ondata

(6.GV.04)WindowDevelopmentFundamentals

- Programmingwebapplications
- Workingwithdataandservices
- Troubleshootinganddebuggingweb applications
- Workingwithclient-sidescripting
- Configuringanddeployingwebapplications
- Understandingcoreprogramming
- Understandingobject-orientedprogramming
- Understandinggeneralsoftwaredevelopment
- Understandingwebapplications
- Understandingdesktopapplications
- Understandingdatabases

(6.VP.01)WebDevelopmentusingPHPLab

PHPprogramminglanguageand2D,3D animationbasedonthetheorycoveredinclass.

(6.VP.02)WindowDevelopmentFundamentalsLab

- Client-side scriptingPrograms
- Deployingwebapplications
- Basicobject-orientedprograms
- Understandingdesktopapplications
- BasicSQLQueries

Level 6(SemesterII)

(6.GV.05)SoftwareTesting&ProjectManagement

UNIT-I

TestingbasicsandDevelopmentModels:Principalsandcontext oftestingin softwareproduction, UsabilityandAccessibilityTesting,PhasesofSoftwareProject,Processmodelstorepresentsdifferent phases,SoftwareQuality Control and its relation with testing, validating and verification,Software Development life cyclemodels,various development models.

White Box Testing: White Box Testing - Static Testing, Structural Testing-Unit code functional testing, Code coveragetesting,codecomplexity testing,

Black Box Testing- What? Why and when to do Black box testing, Requirements based testing, Positive and Negative Testing, Boundary value testing, Decision Tables, Equivalence Partitioning, State Based or Graph Based Testing, Compatibility Testing, User Documentation Testing, Domain Testing.

UNIT-II

IntegrationTesting:Introductionand types of integration testing, Scenario testing, defect bash.

SystemandAcceptanceTesting-Overview,functionalandnon-functionaltesting,Acceptance testing. Overviewofsome softwaretesting tools:WinRunner, LoadRunner, TestDirector. (Some practical should be conducted using these tools)

UNIT-III

PerformanceTesting-Introduction,factorsrelatedtoperformancetesting,methodologyfor performing testing, Regression Testing,

AdhocTesting- Overview, Buddy & pair testing, Exploratory testing, Interactive testing, Agile and extreme testing.

TestingofObjectOrientedTesting-Introduction,DifferencesinOOtesting.

UNIT-IV

Software Project Management: Overview, Software Project ManagementFramework,SoftwareDevelopment life cycle,

Organization Issues and ProjectManagement,ManagingProcesses, Project Execution,Problems in SoftwareProjects, ProjectManagement Myths and its clarifications.

SoftwareProjectScope:Needtoscopeassoftwareproject,scopemanagementprocess, communicationtechniques andtools,communicationmethodology

SoftwareRequirement GatheringandResource allocation:Requirementspecifications,SRS Documentpreparation,Resourcetypesforasoftwareprojects,requirementforresourcesallocation.

UNIT- V

Software ProjectEstimation: Work Breakdownstructure (WBS), steps in WBS, Measuringefforts for a project, techniques for estimation– SLOC, FP,COCOMO and Delphi methods.

ProjectScheduling:Scheduling anditsneed,scheduling basics,GanntChart,Networkscheduling techniques, Pert and CPM

UsingaProjectManagementTool:IntroductiontoMSProject2000,ManagingtasksinMSProject 2000,Tracingaprojectplan,creatinganddisplayingprojectinformationreports.

(6.GV.06)AndroidApplicationDevelopment

UNIT-I

Android Introduction,Smartphonesfuture,Preparing the Environment, Installing the SDK, Creating Android Emulator, Installing and Using Eclipse, Installing Android Development Tools, Choosing whichAndroid version to use

AndroidArchitecture,AndroidStack,Android applicationsstructure
 Creating a project, Workingwith the AndroidManifest.xml, Using the log system Activities
 IntroductiontoUI–Layouts,Fragments,Adapters,ActionBar,Dialogs,Notifications,UIbestpractices
 UIArchitecture, Application context, Intents, Activity lifecycle,Supporting multiple screen sizes

Unit-II

Designing User Interface Using Views – Basic Views- TextView, Button, ImageButton, CheckBox,ToggleButton, RadioButton etc., ProgressBar View and AutoCompleteTextView, TimePickerand DatePickerView, ListView, ImageView, ImageSwitcher and GridView, DigitalClock & AnalogClock Views
 Notificationand Toast,Parameters ,onIntents, Pending intents, Status barnotifications
 Toastnotifications

UNIT-III

Menus, Localization,Options menu, Context menu
 Dialogs-Alert dialog,Customdialog, Dialogas Activity
 OrientationandMovement-Pitch,rollandyaw,Naturaldeviceorientation,Referenceframe remapping
 SMS-Sendingand Receiving
 WorkingwithMedia–Playingaudioandvideo,Recordingaudioandvideo

UNIT-IV

LocationandMaps-Googlemaps,UsingGPStofindcurrentlocation
 Working with data storage- Sharedpreferences, Preferences activity,Files access, Using External storage, SQLite database
 Animation-Viewanimation,Drawableanimation
 Working with Sensors- Finding sensors, Accelerometers, Gyroscopes, Other types
 WorkingwithCamera –Controlling the camera,Previewand overlays,Takingpictures

UNIT-V

Contentproviders-Contentproviderintroduction,Queryproviders
 NetworkCommunication -WebServices,HTTPClient,XMLandJSON,Usinge-mails. Services - Service lifecycle,Foreground service, Creating own services
 PublishingandDistributingYourApp-Preparingforpublishing,GooglePlay requirements, Signingandpreparingthegraphics,PublishingtotheAndroidMarket,Monetization,Tipson becoming a top app, Google analytics

(6.GV.07)WindowsConfigurationandServer Administration

Understanding Windows Programming Basics: Identify Windows application types, Implement user interface design.

Creating Windows Forms Applications: Create and handleevents, Understand Windows Forms inheritance, understand how to create new controls and extend existing controls, Validate and implement user input, Debug a Windows-based application.

Creating Windows Services Applications: Create a Windows Services application, Install a Windows Services application.

AccessingDatainaWindowsFormsApplication:Understanddata accessmethodsfor a Windows Application, Understand data bound controls.

DeployingaWindowsApplication:Understandwindowsapplicationdeploymentmethods, integratingdata.

Network basics:Type of Networks, Topologies, Transmission media, Install UTP(Straight, Cross, Rollover Cables), IP Addressing,Subneting, OSI Model, TCP/IP Model, Wireless Network, Network Devices.

Installation: Installation Server, Drivers, Working with windows server Devices, Troubleshooting Devices & Drivers, Managing system updates.

WorkingWith DiskStorage:Typeof Disk Storage, Typeof volumes, Implementing faulttolerance, Usedisk managementtools, Disk Quota,Troubleshooting disk management,Shadow copy.

DomainController:InstallActiveDirectory,ManageActiveDirectoryComponent,WorkingwithOU Structure, Working with Domain User account, Working with Domain Groups, Troubleshooting ActiveDirectory.

DomainNameServices(DNS):DefineName resolution, Install DNS,Configure DNS Client, Manage and Troubleshoot DNS.

Dynamic Host Configuration Protocol: Configure DNS Server, Working With Super Scope, Configure DHCP Client, Manage and Troubleshoot DHCP Server.

BackupandRestore:RequirementforBackupandRecoveryAD,IssueforAD BackupandRecovery, Steps for Backupand Recovery AD.

(6.GV.08)ManagementInformationSystem

UnitI

An introduction to information systems, Information systems in organizations, Information TechnologyConcepts,The IS Revolution; Information requirementfor the different levels If management,transactionprocessingsystem, Managementinformation34system, Decisionsupport system. Strategic Roleof InformationSystems.Business Processes; Informationmanagement,and Decision Making. Computers and InformationProcessing;

UnitII

Transactionprocessingsystem; hardwareand softwarerequirements,toolsused, casestudies, merits and demerits of transaction processing system.

UnitIII

Managerial control,Informationand toolsrequired, differencebetweentransactional system and managersystem. Frequency oftaking outputs, Need for interconnected system, common database, Redundancycontrol,case studies.Decision support system, concept and tools, case studies, virtual organizations, strategic decisions-unstructured approach, cost and valuesof unstructured information.

UnitIV

Optimization techniques,differencebetween optimization tools and DSS tools expert system, differencebetweenexpert systemand managementinformationsystem. Roleofchief Information officer.

(6.VP.03)Android ApplicationDevelopmentLab

1. WriteasimpleApplicationwhichwillprint"HelloWorld!"
2. WriteasimpleApplicationthatusesUILayoutandControl.
3. WriteasimpleApplicationthatmakesuseofStyle&Themes.
4. WriteasimpleApplicationthatusesEventHandling.
5. WriteasimpleApplicationthatusesAlarm,Notification.
6. Makealocationbasedapp.
7. Writeaprogramthatshowstheuseanimation.
8. WriteaprogramthatshowstheuseofImageEffects.
9. WriteaprogramthatshowstheuseImageSwitcher.
10. Writeaprogramthatshowstheuseofdatabase.

(6.VP.04)MISLab

Experimentstobecoveredbasedonthe theorycoveredinclass

Level 7(SemesterI)

(7.GV.01)TechnologyTrendsInIT

Unit-I

Internet of Things (IoT) – Definition of IoT, History of IoT, IoT vs. similar concepts, Application/Segmentoverview, Technology overview

Unit-II

Big Data Analytics: Concepts, examples of big data analytics, benefits of big data analytics, Technologies, and Applications, requirements for being successful withbig data analytics

Unit-III

Cloud Computing – Introduction, Why cloud services are popular, advantages, Characteristics, Service models,Deployment of cloud services, Potential privacy risks

Unit-IV

Cyber Security – Introduction,risks, Maliciouscode, Hacker, attacker or intruder,Cyber security Principles, InformationSecurity (IS) within Lifecycle Management, Risks & Vulnerabilities, Incident Response, Future Implications & EvolvingTechnologies

Unit-V

Wearable Technologies – Introduction, Applications of Wearable Technology, Challenges to Wearable Technology, various Wearable devices.

(7.GV.02)WindowsMobileApplicationDevelopment

Unit-I

INTRODUCTION TO WINDOWS 8 APPLICATION DEVELOPMENT - brief history of windows application development, History ofAPIs and Tools, Operating System Input Methods
TheWindowsCharmBar,StartButton,SearchButton,ShareButton,DevicesButton,Settings Button,
Windows Desktop, Switching between Desktop Programs

WINDOWS8ARCHITECTUREFROMADEVELOPER'SPOINTOFVIEW-Windows8Development
Architecture, Desktop Application Layers, UnderstandingWindowsRuntime:WindowsRuntime
ArchitectureOverview,Metadatain WindowsRuntime,„NETFramework 4.5:TheInstallation Model
of.NETFramework4.5, Window Runtime Integration,Pickingthe Appropriate Technology forYour
Project, Choosing a Programming Language

GETTING TO KNOW DEVELOPMENT ENVIRONMENT- Introducing the Toolset, Visual Studio IDE:
Creating a New Project,Lighting Up Your Applications withExpression Blend

UNIT-II

PRINCIPLESOFMODERNWINDOWSAPPLICATIONDEVELOPMENT-Windows8StyleApplication,
Windows8 Design Language, Introduction to Asynchronous Programming, Evolution of
Asynchronous, Programming on the .NET Platform

CREATINGWINDOWS8STYLEAPPLICATIONSWITHHTML5,CSS,ANDJAVASCRIPT-HTML5and
CSSontheWeb,HTML5Technologies,HTML5ApplicationsonWindowsRuntime,TheWindowsLibrary
for JavaScript (WinJS), Creating Windows8 Style Applications with JavaScript, Accessing the
Filesystem, Managing Data, Respectingthe User's Device

UNIT-III

USING XAML TO CREATE WINDOWS8 STYLE USER INTERFACES - Describing the User Interface UsingXAML,UsingNamespaces,UnderstandingtheLayoutManagementSystem,ReusableResources in XAML, Basic Controls in Windows 8 Style Applications: Controls with Simply Accessing the Internet: e Values, Content Controls, Workingwith Data: Data Binding Dependency Properties and Notifications, Binding Modes and Directions

WORKINGWITHXAMLCONTROLS-UsingAnimationsinApplication, Designing theVisual Lookof a Control,WorkingwithComplex Controls:Getting toKnow the ListViewBaseControls, Usingthe Grid View Control, Binding to Data, Grouping Data, Defining Visual Groups

BUILDINGWINDOWS8STYLEAPPLICATIONS-TheLifecycleof a Windows8 Application,Deploying Windows 8 Apps, Commanding Surfaces, Persisting Application Data, Applications and the Start Screen

UNIT-IV

CREATINGMULTI-PAGE APPLICATIONS -NavigationBasics,workingwithPages,UsingtheSplit Application and Grid Application Templates

BUILDING CONNECTED APPLICATIONS - Integrating with the Operating System and Other Apps: PickerUnifiedDesigntoAccessData,UnderstandingtheConceptofContracts,AccessingtheInternet: Detecting the Changes of Internet Connectivity, Using Feeds, Accessing WindowsLive
LEVERAGING TABLET FEATURES - Accommodating Tablet Devices, Building Location-Aware Applications, UsingSensors: Using Raw Sensor Data, Using Sensor FusionData

UNIT-V

ADVANCED PROGRAMMING CONCEPTS - Building Solutions with Multiple Languages: Hybrid Solutions, Background Tasks: Understanding Background Tasks, How Background Tasks Work, Cancelling BackgroundTasks, Implementing BackgroundTasks, creatinga Simple BackgroundTask, Managing Task Progress and Cancellation, Input Devices

TESTINGANDDEBUGGINGWINDOWS8APPLICATIONS-TheQualityofSoftware,BecomingFamiliar with Debugging, Controlling the Program Flow in Debug Mode, Monitoring and Editing Variables, ChangingtheCodeWhileDebugging,Windows8StyleApplication-SpecificScenarios,Introductionto SoftwareTesting, Introduction to Unit Testing, Unit Testing Windows8 Style Applications

INTRODUCING THE WINDOWS STORE - Getting to Knowthe Windows Store,How CustomersSeeanAppin the WindowsStore,ApplicationDetails,Making Moneywith Your App, The Developer Registration Process:Submitting the Application,The Application Certification Process, The Windows App Certification Kit.

(7.GV.03)IntroductiontoPython Programming

- Familiarizationwith the basics of Python programming:a simple "hello world" program,processofwritinga program,running it, andprintstatements; simpledata-types: integer, float, string
- Introducethenotion ofavariabe,andmethods tomanipulate it(conceptofL-valueand R-value even if not taught explicitly)
- Knowledgeofdata typesandoperators:acceptinginput from theconsole,assignment statement,expressions, operators and their precedence.

- Conditional statements: if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort numbers, and divisibility.
- Notion of iterative computation and control flow: for, while, flowcharts, decision trees and pseudo code; write a lot of programs: interest calculation, primarily testing, and factorials.
- Idea of debugging: errors and exceptions; debugging: pdb, breakpoints.
- Lists, tuples and dictionary: finding the maximum, minimum, mean; linear search on list/tuple of numbers, and counting the frequency of elements in a list using a dictionary. Introduce the notion of accessing elements in a collection using numbers and names.
- Sorting algorithm: bubble and insertion sort; count the number of operations while sorting.
- Strings: compare, concat, substring; notion of states and transitions using state transition diagrams.

(7.GV.04) Introduction to Microprocessors

Digital Design and VHDL

Introduction
 Combinational Logic
 Structural Modeling
 Sequential Logic
 Finite State Machines
 Parameterized Modules
 Testbenches

2. Arithmetic Logic Unit (ALU)

Introduction
 Arithmetic Circuits
 ALU
 Number Systems

3. Microprocessor I: Instruction Data Set. Machine Language

Introduction
 Assembly Language
 Machine Language
 Programming
 Addressing Modes
 Lights, Camera, Action: Compiling, Assembling, and Loading
 Odds and Ends

4. Microprocessor II: Control and Datapath Design. Single-Cycle Processor

Introduction
 Performance Analysis
 Single-Cycle Processor

5. Microprocessor III: Control and Datapath Design. Multi-cycle Processor

Introduction

PerformanceAnalysis
 MulticycleProcessor
 PipelinedProcessor

6. MemorysystemsandI/O.

Introduction
 Memory System
 Caches
 Virtual Memory
 Memory-MappedI/O
 Memory map
 I/ODevices
 Busesand organization

(7.VP.01)WindowsMobileApplicationDevelopmentLab

1. Workingwith J2MEFeatures
2. Threads&HighlevelUI
3. Developingnetworkedapplicationsusingthewireless toolkit
4. Authenticationwithawebserver
5. Study WindowsAPI's. Findout theirrelationshipwithMFC classes. Appreciate how they are helpful in finding complexities of windows programming.

(7.VP.02)PythonProgrammingLab

- Findthelargestandsmallestnumbersinalist.
- Findthethirdlargestnumberinalist.
- Testforprimarily.
- Findwhetherastringisapalindromeor not.
- Giventwointegerson x and n ,compute x^n .
- Computethegreatestcommondivisorandtheleastcommonmultipleoftwo integers.
- Test ifa number isequaltothe sum of the cubes of itsdigits.Find thesmallest and largest such numbers

Level 7(Semester**II)(7.GV.05)Introductionto****UNIT-I****AI**

Overview of AI: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success. Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem Heuristic search techniques : Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

UNIT-II

Knowledge Representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation. Using Predicate Logic : Representing Simple Facts in logic, Representing instances and is-a relationship, Computable function and predicate.

UNIT-III

Natural language processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing. Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning.

UNIT-IV

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells. Knowledge acquisition: General concepts in knowledge acquisition, early work in Machine Learning, examples of Inductive Learners, computer vision, Robotics, overview of LISP- AI language.

(7.GV.06)e-Commerce**Unit I**

Introduction E-Business: Origin and Need of E-Commerce, Factors affecting E -Commerce, Business dimension and technological dimension of E-Commerce, E-Commerce framework Electronic Commerce Models, Value Chains in Electronic Commerce.

Unit II

Internet and E-Business: Introduction to Internet and its application, Intranet and Extranets. World Wide Web, Internet Architectures, Internet Applications, Business Applications on Internet, E - Shopping, Electronic Data Interchange, Components of Electronic Data Interchange, Creating Web Pages using HTML.

Unit III

Technology for Online Business: Internet, IT Infrastructure, Middleware Contents, Text and Integrating E-Business Applications, Mechanism of Making Payment Through Internet, Online Payment Mechanism, Electronic Payment Systems, Payment Gateways, Visitors to Website, Tools for Promoting Website, Plastic Money, Debit Card, Credit Card, Laws Relating to Online Transactions.

Unit IV

ApplicationsinE-commerce:E-commerceApplicationsinManufacturing,Wholesale,Retail

andServiceSector.

(7.GV.07)ComputerNetworkSecurity

UNIT-I

Network Concept,Benefits ofNetwork, Networkclassification(PAN, LAN,MAN, WAN), Peer to Peer, Client Server architecture, Transmission media: Guided & Unguided, Network Topologies. Networking terms: DNS, URL, client server architecture, TCP/IP, FTP, HTTP, HTTPS,SMTP,TelnetOSI andTCP/IP Models:LayersandtheirbasicfunctionsandProtocols, Comparison of OSI and TCP/IP. Networking Devices: Hubs, Switches, Routers, Bridges, Repeaters, Gateways and Modems, ADSL.

UNIT-II

Ethernet Networking: Half and Full-Duplex Ethernet, Ethernet at the Data Link Layer, Ethernetatthe Physical Layer.SwitchingTechnologies: layer-2 switching, addresslearning in layer-2 switches, network loop problems in layer-2 switched networks, Spanning-Tree Protocol,LAN switch types and working with layer-2 switches, Wireless LAN

UNIT-III

InternetlayerProtocol:Internet Protocol,ICMP,ARP, RARP.IP Addressing:Differentclasses of IP addresses, Sub-netting foran internet work, Classless Addressing. Comparative study of IPv4 & IPv6. Introduction to Router Configuration.Introduction to Virtual LAN.

UNIT-IV

TransportLayer:Functionsoftransportlayer,DifferencebetweenworkingofTCP and UDP. Application Layer:DomainName System(DNS),Remotelogging,Telnet, FTP,HTTP, HTTPS. Introduction toNetwork Security.

(7.GV.08)IntroductiontoBiometrics

UnitI

Concepts-biometric recognition,biometrics,requirementsforbiometrics Biometric systems, their modes and architectures
Biometricssystemerrorsandevaluation

UnitII

Overview,comparisonandevaluationofvariousbiometrics
Unimodalbiometric systems,their advantages,disadvantagesandlimits
Multimodalbiometric systems,their modesofoperation,levelsoffusion

UnitIII

Biometric pattern recognition methods
Privacyprotectionandsocialacceptance
Biometric standardization, data formats
Designandimplementationofbiometricssystem,applicationsofbiometricssystem, biometric databases, security of biometricssystem

(7.VP.03)AllLab

1. StudyofPROLOG.
2. Writeaprogramtosolve8-queen's problem

3. Solve any problem using depth first search.
4. Solve any problem using best first search.
5. Solve 8-puzzle problem using best first search
6. Solve Robot (traversal) problem using means End Analysis
7. Solve traveling salesman problem.

(7.VP.04) Computer Network Security Lab

1. Identification of Connectors and Cables:
 - a. Connectors: BNC, RJ-45, I/O box
 - b. Cables: Co-axial, twisted pair, Optical fibre.
2. Identification of various network components
 - a. NIC (network interface card)
 - b. Hub, Switch, Router.
3. Execution of basic networking Commands: Netstat, IPConfig, IfConfig, Ping, Arp-a, Nbtstat- a, Netdiag, Nslookup, Traceroute, Pathping
4. Design Ethernet Cables: Cross Cable, Straight Cable, Rollover Cable.
5. Demonstration to connect two computers with/without connecting device.
6. Demonstration of File sharing & Printer sharing.
7. Study of various topologies using topology trainer
8. Detailed study of Network and Internet Settings on PC.
9. Troubleshooting of networks & Installation of network device drivers.
10. Study of Router Configuration.
11. Logging into a router, Editing and Help features and Saving Router configuration.
12. Setting the Hostname, Descriptions, IP Address, and Clock Rate on a Router.