CRITERION2–TEACHING–LEARNINGANDEVALUATION

StudentPerformanceandLearningOutcomes

ProgrammeOutcomes(POs)andCourseOutcomes(COs)forall Programmes offered by the institution

B.AENGLISH

COURSE OUTCOMES **(COs)**	COs	**ENGLISH-I** Courseoutcome Thiscoursehelpedthe learnerto; 1. Readandcomprehendbetter 2. CommunicateinEnglishorallyandinwriting 3. Participateinroleplaysandmini- talks. 4. Refertothedictionaryforsynonyms, expressionsandgrammar.
	COs	**POETRY** Courseoutcome Thiscoursehelpedthe learnerto; 1. Understand andappreciate apoem 2. Synthesizemulti-foldelementsofpoetryfor insightfulreading having understood prosody 3. Understandthenuancesofdifferentgenresandformsofpoetry 4. Understandthedifferent periodsinEnglishandAmericanpoetic tradition 5. Identifymultipleperspectivesinreading poetry 6. Compare great compositions in poetry Motivatehimself/herselftoattemptcreativewriting
	COs	**PROSE** Courseoutcome Thiscoursehelpedthe learnerto; 1. Understandandappreciate anexcellentpieceofprose 2. Developinsightfulreadingforunderstandingarticlesandclassic literaryprose 3. Understandthenuancesofdifferenttypesofprosewriting 4. Understandthedifferent periodsinEnglishliterarytraditionwith respect to prose 5. Identifymultipleperspectivesinreadingprose 6. Compare great compositions in journalistic styles Motivatehim/hertoattemptcompositionsinprosewriting.
	COs	**SOCIALHISTORY OFENGLAND** Courseoutcome Thiscoursehelpedthe learnerto; 1. Understandandappreciate anexcellentpieceofprose 2. Developinsightfulreadingforunderstandingarticlesandclassic literaryprose 3. Understandthenuancesofdifferenttypesofprosewriting

		4. Understandthedifferent periodsinEnglishliterarytraditionwith respect to prose 5. Identifymultipleperspectivesinreadingprose 6. Compare great compositions in journalistic styles Motivatehim/hertoattemptcompositionsinprosewriting.
	COs	**FOUNDATIONENGLISH-II** 1. Studentswilldevelopreading skillsandreading speed 2. Studentswillread universitytextsand expandtheirvocabulary 3. Studentswillreadforintensive informationretrievaland interpretation required by university studies 4. Studentswilldevelopabilitiesascriticalthinkers,readersand writers 5. Studentswillattainandenhancecompetence inthe fourmodes of literacy: writing, speaking, reading & listening 6. Students will write 3 summaries in which they will communicateappropriately,accuratelyandeffectivelywhat has been read
	COs	**PROSE** Courseoutcome Thiscoursehelpedthe learnerto; 1. Understandandappreciate anexcellentpieceofprose 2. Developinsightfulreadingforunderstandingarticlesandclassic literaryprose 3. Understandthenuancesofdifferenttypesofprosewriting. 4. Understandthedifferent periodsinEnglishliterarytraditionwith respect to prose. 5. Identifymultipleperspectivesinreadingprose
	COs	**INDIANWRITINGINENGLISH** 1. Studentswouldhavelearntthevaluesofspiritualrefinement in human life. 2. Studentswouldhaveunderstoodtheneedofwipingout social evils to dream of a healthy society. 3. StudentshaveunderstoodhowwelltheIndianculture isreflected in Literature. 4. Anunderstandingofthesocio-culturalaspect wouldhavebeen reached.

	COs	**HistoryOfEnglishLiterature** 1. Thecourseoffersextensive insight intothehistoryofEnglish literature, 2. Whilelayingspecialemphasisonvariousliterarymovements, genres and writers that are held to be the representatives of their times. 3. Ithelpsthestudentsto evaluatethewaysocio-culturaland historical 4. Phenomenainfluencetheliteraryproductionofaparticular period.
	COs	**FOUNDATIONENGLISH-III** 1. Studentswilldevelopreadingskillsandreading speed 2. Studentswillread universitytextsand expandtheirvocabulary 3. Studentswillreadforintensiveinformationretrievaland interpretation required by university studies 4. Studentswilldevelopabilitiesascriticalthinkers,readersand writers 5. Studentswillattainandenhancecompetence inthe fourmodes of literacy: writing, speaking, reading & listening
	COs	**DRAMA** 1. This coursetracesthe origin, growthofdrama inEngland SpecificallywrittenduringElizabethanAgeandRestoration Age. 2. Itintroducesdramaasa literarygenreaswellasdramatic genre with DueemphasisonShakespeareanAge. 3. Thecourseemphasisesonthechangingapproachesto theatre and thechangeindramaticworks.
	COs	**LITERARYFORMS AND TERMS** 1. Thepaperprovides animportantstudyofliterarytheoryas an Intellectualandcriticalactivity. 2. Tointroducethestudentstothenature,functionandrelevance of 3. Literarytheoryandcriticism. 4. Tohelpstudentsjudge literaryworksinanunbiasedand Dispassionate manner as taught bythe masters. 5. Strengthenanddevelopanalyticalandlogicalthinking.

	COs	**CREATIVEWRITING** 1. Understandandexplainprinciplesofcreativewriting, including form, technique, and style. 2. Deepenthatunderstandingbyinterpretingandevaluatingboth published works and the works of peer writers. 3. Applytheseprinciplestoproducepoems,stories,oressays. 4. Becomefamiliarwiththepublishingprocessintheliterarymarket and improve as a writer by submitting work to literary journals and participating in the writing community. 5. Applyprinciplesofcreativewritingtoimprovecommunicationina varietyofcontexts, including personal, academic, and public life.
	COs	**SOFTSKILLSFORCAREERCOMMUNICATION** 1. Effectivelycommunicatethroughverbal/oralcommunication and improve the listening Skills 2. Writeprecisebriefsorreportsandtechnicaldocuments 3. Activelyparticipateingroupdiscussion/meetings/interviews and prepare & deliver presentations. 4. Becomemoreeffectiveindividualthroughgoal/targetsetting, self motivation and Practicing creative thinking.
	COs	**FOUNDATIONENGLISH-IV** 1. Studentswilldevelopreading skillsandreading speed 2. Studentswillread universitytextsand expandtheirvocabulary 3. Studentswillreadforintensiveinformationretrievaland interpretation required by university studies 4. Studentswilldevelopabilitiesascriticalthinkers,readersand writers 5. Studentswillattainandenhancecompetence inthe fourmodes of literacy: writing, speaking, reading & listening
	COs	**FICTION** 1. Throughthenovelsand shortstoriesthestudentsareintroducedto Thelarge-scalecriticismandcondemnationofcontemporaryvalues. 2. Allformsofnovel-psychological,biographical,warnovels,and Novels ofhumour are included keeping the vast exposure inview.

	COs	**PHONETICSANDTRANSCRIPTION** 1. You will be familiar with the basic symbols of the InternationalPhoneticAlphabet,includingallthosesymbols needed to describe English 2. Youwillknowtheterminologyappropriatetothedescription of consonants and vowels, including the parameters of description on the IPA chart. 3. Youwillunderstandsomethingoftherelationshipbetweenthe sounds of speech and the abstract linguistic system that underlies them, as well as the relationship of phonetics and phonology to the wider linguistic system. 4. You will understand the basic structure of sound systems acrosslanguages,andthewaysinwhichthisisestablished analytically.
	COs	**PRESENTATIONSKILLS** **1.** Createandpresentorganizedandfocusedmessagesinpublic speaking settings. **2.** Analyzeaudiencedemographicandpsychographicinformation to create audience-centered messages. **3.** Employ verbal and nonverbal presentation skills for confidentlyandeffectivelydeliveringoralmessages. **4.** Evaluateargumentsandreasoning fromanaudience perspective. **5.** Employstrategiesandskillstomanagecommunication anxiety.
	COs	**PERSONALITYDEVELOPMENT** 1. Individualorin-groupclasspresentationspertainingtothe applications of concepts. 2. TheoriesorissuesinhumandevelopmentScoresobtained from essay and or objective tests. 3. Attendance,classroomparticipation,smallgroupinteractions. 4. Researchandwriteaboutrelevanttopics. 5. Designandcompletearesearchprojectthat cantaketheform of a developmental Interview, an observation or assessment through service learning.

	COs	**SHAKESPEARE** 1. Develop sufficient ability for reading and understanding ElizabethanEnglishtoallowforbettercomprehensionof Shakespeare's plays, poems, and sonnets. 2. AnalyzeverballyandinwritingShakespeare's literary development. A. Thestructuresandorganizationsofhisdramaticworks B. Thedevelopmentofhissonnets C. Thedevelopment ofhispoems. 3. Analyzeverballyand inwritingShakespeareasaproductof his society. 4. Analyzeverballyand inwritingtherelationshipof Shakespearean literature to society. 5. Analyzeverballyand inwritingtherelationshipofthe individual reader to Shakespearean literature.
	COs	**AMERICANLITERATURE** 1. Thecoursedealswiththecultureand literatureofAmerica from Colonial rule to the modern times. 2. ItexaminesthechangingAmericannarrativeanddistinctly “American” in their texts. 3. It explores the various perspectives of race, gender, socioeconomicclassandhistoricalbackgroundwhichplaya very important role in their works.
	COs	**FEMINISTWRITING** 1. Studentswouldhaveunderstoodgenderequalityand women’s rights. 2. Studentswouldhaveunderstoodtherevolutionarychanges occurred due to women empowerment. 3. Studentswould havebeenawareofthenegative impact of female feticide and woman exploitation in the society. 4. Studentswouldhavesharpenedtheirknowledge

		comprehendingtheroleofwomanforthebettermentofsociety
	COs	**LANGUAGEANDLINGUISTICS** **1.** Understandlanguagestructuresandfunctioningofthe language. **2.** Classifyancientandtraditionalperspectivesoflanguag e use in the society. **3.** AnalysetheGrammaticalTheoriesofWesterncountrie s as well as India. **4.** Evaluatetherelationshipbetweenlanguageandsociety . **5.** Understandtheapplicationoflinguisticsonotherrelat ed disciplines
	COs	**ENGLISHFORCOMPETITIVEEXAM** 1. Tomakestudentsawareofthe interdisciplinarynatureofthe contemporary approaches in literature. 2. Todevelopanaptitude for research. 3. Todevelopanin-depthknowledgeofdifferent literary genres, writing styles, ages of literature. 4. Todevelop acriticalperspectivethroughthestudyof various schools of literary theory. 5. Totrainthemtoappearandqualifydifferent competitive exams at state and national level.

	COs	**SOUTHASIANLITERATURE** 1. To achieve an excellent and broad-ranging foundational knowledgeoftheculture ofSouthAsia, givenbyscholarsat the forefront of their disciplines. 2. Tograsphoweachdisciplineapproaches itsobjectofstudy and organizes knowledge differently, by studying the same area fromthe standpoint ofdifferent intellectual traditions. 3. To prepare the student for either working in South Asian societiesorinacontext withSouthAsianconnections, suchas with South Asian Diaspora in the UK.
	COs	**ENGLISHLANGUAGETEACHING** 1. Attheendofthecoursethestudentswillbeableto Understand and do the contrastive analysis. 2. Acquireknowledgeofvariouslanguageskills. 3. Usevariouslanguageteachingmethodsforteaching a language. 4. Understandthebasicconceptoflanguage Testing and evaluation. 5. Identifythelanguageerrorsanditsclassifications.

	COs	**GRAMMARANDSEMANTICS** **1.** Haveinsightintobasicissuesoflinguisticsemantics,in cluding how linguistic expressionsrelate to entities int heworld,meaningrelationsbetweenlinguisticexpressi ons, and the relation between meaning and truth. **2.** Haveawarenessintobasicissuesinpragmatics, including how context and pragmatic principlesaffectinterpretation. **3.** Have visionintohowsemanticandpragmatics relatetoneighboring fieldssuchaslexicaltheory,morp hology and syntax. **4.** Understandhowandwhylanguagediffersfrom other communicationsystems, and how languageisemployedtocommunicatevarioustypesof meaning. **5.** Describeandanalyzehowpeoplehandleand exploit varioussemantic and pragmatic phenomena in everyday communication.
	COs	**ENGLISHLITERATUREFORCOMPETITIVE EXAMINATION** 1. To enable students to prepare for the competitive examsofvariouskindsespeciallymeantfortesting ability in English language. 2. To introduce students withthe common questiontypes askedincompetitiveexaminationsconcerningEnglish-grammar, vocabulary, comprehension, and other significant topics. 3. Toencouragestudentsto appearandprepareforthe competitive exams. 4. TohelpthestudentstoovercomethefearaboutEnglish as a compulsorysubject in various competitive exams.

	COs	**COMMUNICATIONSKILLS–PRACTICAL** Thisprojecthelpedthelearnerto; 1. Implementtheconceptsacquiredin Methodology/ Criticism courses. 2. Understandlibrarywork and datacollection. 3. Understanddataanalysis. 4. Understandpresentationoffactsmethodically. 5. Understandthe latest formatofpresentationsuchas MLA 8 Edition

COMMERCE

COURSE	**OUTCOMES** Aftercompletionofthesecoursesstudentsshouldbeableto
	SEMESTERI
PRINCIPLES OF ACCOUNTANCY	CO-I Preparingfinancialstatementsinaccordancewithappropriate standards. CO-II Prepareledgeraccountsusingdoubleentrybookkeepingand record journal entries accordingly CO-IIIInterpretingthebusinessimplicationsoffinancialstatement information CO-IVPreparingaccountinginformationforplanningandcontrol and for the evaluation of finance. CO-VPrepareBankreconciliationstatementfromincomplete statement
BUSINESS COMMUNICATION	CO–IDevelopcommunicationskillsanduseofelectronic media in business communication CO–IILearnthewaytoovercomecommunicationbarriers CO – III Practice modern forms ofcommunication CO–IVFormulatejobrelatedcommunicationandresume preparation CO-VAttend interviewandparticipate inGroupdiscussionwith confidence
BUSINESS ECONOMICS	CO-I.Employmarginalanalysis fordecisionmaking CO-II.Analyzeoperationsofmarketsundervaryingcompetitive conditions

	CO-III.EvaluatetheDemandandSupply,elasticityofdemandand Law of returns CO-IV.Possessthe knowledgeabouttheperfect competitionand price determination CO-V.Analyzecausesandconsequencesofunemployment, inflation and economic growth
SEMESTERII	
FINANCIAL ACCOUNTING	CO-I To familiarize the concept ofBranchaccount and itssystem CO- IITo understand the ScopeofdepartmentalaccountingCO– IIITofindoutthetechnicalexpertise inmaintainingthebooks ofaccounts. CO–IVEnablethestudentstounderstandpartnership accountfrom admissiontodissolution CO-VTo encouragethestudentsabout maintainingthebooksof accounts for further reference. 1.
BUSINESS MANAGEMENT	CO–I.Todevelopknowledgeaboutevolutionofmanagement thoughts CO– II.Tobetterunderstandingofplanninganddecisionmaking CO–III.Togiveanideaaboutorganizationstructureanddifferent types of organization CO–IV.Tomakethemfamiliarizewithrecruitment processand stages in selection CO–V.Toprovideideaaboutmotivation, importanceof communication and Principles of coordination.
INDIANECONOMY	DevelopideasofthebasiccharacteristicsofIndianeconomy, its potential on natural resources. CO -II. Understand the importance, causes and impact of populationgrowthand itsdistribution, translateandrelatethemwith economic development. CO –III. Grasp the importance of planning undertaken by the government of India, have knowledge on the various objectives, failuresandachievementsasthefoundationoftheongoingplanning and economic reforms taken by the government. CO -IV. Understandagriculturesthefoundationofeconomic growth and development, analyse the progress and changing nature ofagriculturalsectorand itscontributiontotheeconomyasawhole. CO - V. Not only be aware of the economy as a whole, they

	wouldunderstandthebasicfeaturesofMizoram'seconomy, sources of revenue, how the state government finance its programmes and projects.
ENVIRONMENTAL STUDIES	Understandkeyconceptsfromenvironment studies,political,and social analysis as they pertain to the design and evaluation of environmental policies and institutions. CO-II To understand appreciate concepts and methods from renewableandnonrenewablesourcesandtheir applicationin environmental problem solving. CO-IIIStudentscanacquireknowledgeonecosystem,FoodChains, and historicalcontext ofenvironmentalissues and the links between human and natural systems. CO-IVStudentsunderstandcriticallyonBio-diversity,threatsfor Bio-diversity and their roles and identities as citizens. CO-VStudentsunderstandconsumersandenvironmentalactorsina complex, interconnected world.
SEMESTER:III	
BUSINESSLAW	CO–IUnderstandthe lawandprocedureofthecontracts CO – II Analyse performance and the remedies CO–IIIGet clear ideaabouttheguaranteeofthepartiesunderthe contract CO–IVGetanideaaboutvariouskindsofagenciesand bailment and pledge CO–VSummarizesaleofgoodsandrightsanddutiesofbuyer and seller
CORPORATE ACCOUNTING–I	CO-IEnablingthestudentsto understandthe featuresofSharesand Debentures CO-IIDevelopanunderstandingaboutredemptionofSharesand Debenture and its types CO-IIITo giveanexposuretothecompanyfinalaccounts CO-IV To provide knowledge on Goodwill CO-VStudentscangetanideaaboutprofitpriortoincorporation.
BANKINGTHEROY LAW AND PRACTICE	CO–ITo helpto gatherknowledgeonbankingandfinancialsystem in India CO–IIToprovideknowledgeabout commercialbanksandits products CO-IIIToaimtofamiliarizebanking systeminIndia CO-IVToenablethemtounderstand bettercustomerrelationship

	CO-VTo createawarenessaboutmodernbankingserviceslikee- banking, m-banking and internet banking.
BUSINESS STATISTICAL METHODS	CO-I Tofamiliarizestheconceptofstatistics CO-II To providepracticalexposureoncalculationofmeasuresof average CO-IIITo providepracticalexposureoncalculationofmeasuresof correlation and irrigation CO-IV To introduce the students about the concept of provability CO-VTo providepracticalexposureoncalculationoftrendanalysis.
CAPITALMARKET	CO–IUnderstandthestructureandclassificationofcapitalmarket and analyse about Indian securities market. CO–IIAnalyseabouttheIntermediariesinthe financialmarket, methods through which the capital fund has been raised. CO–IIIUnderstandthefunctionsofstockexchange,listingof securities and major stock exchanges. CO–IVAnalysethecommodityand financialderivativesand trading mechanisms. CO- VDiscussthe functionsofSEBI and measurestakenbySEBI to Protect investors.
MS – OFFICE PRACTICAL-I	CO–1RecognizeandusetheOfficePackagesoftware CO – 2 Identify and apply the menus in MS-Word CO–3Understandthemenus inExcel CO–4UnderstandthecomponentsofPowerpoint CO – 5Surf details through Internet
SEMESTER:IV	
COMPANYLAW	CO-I.Different kindofcorporateentitiesthat arepermittedtobeset up CO-II.Companyincorporationandrulesandproceduresforrunning a company CO-III. Manner ofraising fundsandrolesandresponsibilitiesof directors CO-IV.Rightsandobligationsofshareholdersandother stakeholders including employees and creditors CO-V.Windingupofacompanyandits procedures

CORPORATING ACCOUNTING–II	CO–IEnablethestudentsto understandaboutamalgamation, absorption and external reconstruction CO–IITomakethemawareabout accountsofbankingcompanies CO – III Keep themaware about accounts of insurance companies CO –IV Enable the students to gain an idea of liquidation of companies CO–VTointroduceanddevelopknowledgeofholdingcompanies accounts
PRINCIPLESOF MARKETING	CO–I.Demonstrateunderstandingofmarketingterminologyand concepts. CO–II.Identifywantsandenvironmentalfactorsthat shape marketing activities for certain target markets. CO–III.Demonstrateknowledgeofthe individualcomponentsofa marketing mix. CO–IV.Demonstrateknowledgeofkeybusinesscommunication strategies within the marketing field. CO–V. Identifytheorganizationalprocesses involved inthe planning, implementationandcontrolofmarketingactivities.
BUSINESS STATISTICAL DECISION TECHNIQUES	CO-I.Describeanddiscussthekeyterminology, conceptstoolsand techniques used in business statistical analysis CO-II.Criticallyevaluatetheunderlyingassumptionsofanalysis tools CO-III.Understandandcriticallydiscusstheissuessurrounding sampling and significance CO-IV.Discusscriticallytheusesand limitationsofstatistical analysis CO-V.Solvearangeofproblemsusing thetechniquescovered
PROJECT METHODOLOGY	CO–I.Understandproject characteristicsandvariousstagesofa project. CO–II.Understandtheconceptualclarityabout project organization and feasibility analyses – Market, Technical, Financial and Economic. CO–III.Analyzethelearningandunderstandtechniquesfor Project planning, scheduling and Execution Control. CO–IV.Applytherisk management planandanalysetheroleof stakeholders. CO–V.Understandthecontractmanagement,ProjectProcurement, Service level Agreements and productivity

TALLYPRACTICAL -II	CO –I Enter the accounting transactions in computerized format and find the financial result concern. CO-2 Acquire the skill of financial decision making in a systemized manner. CO –3 Interpret the financial statements as well as evaluation of stock at the end. CO – 4 After successfully qualifying practical examination, students will be awarded certificate to work with well-known accounting software i.e. Tally ERP.9 CO – 5 Students do possess required skill and can also be employed as Tally data entry operator.
SEMESTER:V	
COSTACCOUNTING	CO-IAimedtofamiliarizetheconcept ofcostaccounting CO–IIHelpsto gatherknowledgeonpreparationofcostsheet inits practical point of view CO–IIITo facilitatethe ideaand meaningofmaterialcontrolwith pricing methods CO–IVDeveloptheknowledgeaboutremunerationandincentives CO – V To introduce the concept ofoverhead cost
AUDITING	CO–I. Thestudentsshouldknowtheconceptsofauditing,typesand methods of auditing. CO–II.TheStudentsacquiredknowledgeabout vouchingofcash& credit transaction, verification of assets & liabilities. CO –III. From this subject, the students learned about preparation of different methods&auditors'responsibilityregardingdepreciation&reserves. CO–IV.Comprehendtheknowledgeaboutappointmentofdifferent types of auditor, their rights and duties. The Students gain the knowledge about audit in EDP environment. CO–V.Studentsacquireknowledgeaboutnontradingconcern auditing.
INCOMETAXLAW ANDPRACTICE– I	CO–ITointroducethebasicconceptofIncome Tax CO–IIInordertofamiliarizethedifferent know-howandheadsof incomewithitscomponentsCO –IIIIt helpsto buildan ideaabout income from house property as a concept CO–IVIt give moreideaaboutthe income frombusinessor profession

	CO–VMakethestudentsfamiliarizeswiththeconcept of depreciation and its provisions
INFORMATION TECHNOLOGYIN BUSINESS	CO– IUnderstandthecomponentsofcomputer CO–IIProvidetheknowledgeabout anoverviewofECommerce and E-business CO–IIIDescribetheconsumerorientedE-commerceapplications CO – IV Appraise the Electronic Data Interchange and its prerequisites CO- VAnalyzethedifferenttypesofE-marketingtechniques
SEMESTER:VI	
MANAGEMENT ACCOUNTING	CO–ITo enlightenthestudentsthought andknowledgeon management Accounting CO–IIHelpstogiveproperideaonfinancialstatement analysisin practical point of view CO–IIITointroducetheconceptoffund flowand cashflow statement CO–IVToprovideknowledgeabout budgetcontrolkeeping inmind the scope of the concept CO–VTo developtheknow-howandconceptofmarginalcosting with practical problems
ENTERPRENEURIAL DEVELOPMENT	CO–I.ToaimingtodevelopstudentsaboutEntrepreneurship development CO–II.TocreateanawarenessonvariousEntrepreneurship Development Programme CO–III.Toenablethemtounderstandprojectformulation CO – IV.To familiarize the students with EDP schemes CO–V.Togiveanintroductionabout MSME,EDIandothertraining institutes in Entrepreneurship

FUNDAMENTALS OF INSURANCE	CO–1Tounderstand theconceptofinsuranceand itsevolution CO – 2 To understand the business operations and market condition in Insurance Companies CO - 3 To understand the differentneeds ofcustomers on insurance products CO – 4 To understand the insurance terminologies. CO–5Ableto knowthevariousinsuranceproducts.

DEPARTMENTOFBIOCHEMISTRY

SEMESTER I

BIOORGANICCHEMISTRY

CO. NO	COURSEOUTCOMEDETAILS
CO1	Tounderstand basicdetailsofcarbohydratemoleculesanditsclassification
CO2	Describeaboutthenatureofamino acidsandtheirinteractions inthe formationof proteins.
CO3	Recallandunderstandtheclassification, chemistryandfunctionsoflipids
CO4	Characterizethestructureandpropertiesoflipids.
CO5	TounderstandbasicdetailsofNucleicAcidmoleculesanditsclassification

SEMESTER II

TOOLSOFBIOCHEMISTRY

CO. NO	COURSEOUTCOMEDETAILS
CO1	Describethebasicsofmeasurementsandvariousbiologicalbuffer systemsofblood
CO2	Demonstratetheprinciple,techniquesandapplicationsofchromatography
CO3	Explainthevariouselectrophoresisandcentrifugationtechniquesandtheir applications in Biochemistry
CO4	CategorizethecolorimetryandSpectroscopic techniques fortheassessmentof biologicalSamples
CO5	Classifytheradioactivetracertechniquesand applications ofradioisotopes

SEMESTERIII
ENZYMES

CO. NO	COURSEOUTCOMEDETAILS
CO1	Describethevarioussystems forclassifyingtheenzymes
CO2	Apply appropriate methods for determination of catalytic parameters and activity of enzymesandresolveproblemsconsideringkineticsandthermodynamicsofenzymatic reactions
CO3	Characterizethestructureandfunctionsofcoenzymes,andthe mechanismofenzyme catalysis
CO4	Explaintheregulatorymechanismsofenzymeactivitywhichinvolve inthe maintenance of body's homeostasis
CO5	Useappropriateenzymesforuseinindustriesforrecognizingtheir potential

SEMESTERIII

CELLBIOLOGY

Afterthesuccessfulcoursecompletion,learnerswilldevelopfollowingattributes:

CO. NO	COURSEOUTCOMEDETAILS
CO1	Explainthepurposesofbasiccomponentsofprokaryoticandeukaryoticcellsandtheir involvement in cell cycle
CO2	Recognizetheuseofcellularcomponentsingeneratingandutilizingenergyincells
CO3	Identifythecellularcomponentsthatareinvolvedinproteinsynthesis
CO4	Describethebasic mechanismsinvolved intransportofbiomoleculesthroughbiological membranes
CO5	Applytheir knowledge ofcancer biology to selected examples ofchanges or losses in cellfunctionespeciallyduringresponsestoenvironmentalorphysiologicalchanges, or alterations of cell function

SEMESTER IV

INTERMEDIARYMETABOLISM

Afterthesuccessfulcoursecompletion,learnerswilldevelopfollowingattributes:

CO.NO	COURSEOUTCOMEDETAILS
CO1	Understandthe basicprinciplesofmetabolicpathway
CO2	Correlatethe pathwaysofcarbohydratemetabolism.
CO3	Explainthesynthesisandutilizationoflipidsinliving organisms.
CO4	Appraisetheanabolicandcatabolicreactionsofaminoacids.
CO5	Discriminatethesynthesisanddegradationofthenucleicacids.

SEMESTER IV

PLANTBIOCHEMISTRY

Afterthesuccessfulcoursecompletion, learnerswilldevelopfollowingattributes:

CO.NO	COURSEOUTCOMEDETAILS
CO1	Understandtheplantcellphysiology
CO2	Comprehendprocessofphotosynthesisandphotorespiration
CO3	Demonstratenitrogenfixationinplants
CO4	Illustrateabouttheplantgrowththroughseedgerminationandseeddormancy
CO5	Explainhormonesand secondarymetabolitesofplants

SEMESTER V

CLINICALBIOCHEMISTRY

Afterthesuccessfulcoursecompletion, learnerswilldevelopfollowing attributes:

CO. NO	COURSEOUTCOMEDETAILS
CO1	Understandclinicalaspectsofbiochemistry
CO2	Describethecompositionandtheir functions,Anaemia:-classifications,erythrocyte indices. Bloodcoagulationsystem, Clotting time, Bleeding time, Prothrombintime, RBC count, WBC count,
CO3	Setup aclinicallaboratoryandexplainthedisordersofcarbohydratemetabolism
CO4	Infertheinbornerrorsofaminoacidandnucleicacidmetabolism
CO5	Elucidatethe disordersofkidneyandkidneyfunctiontests

SEMESTER V

MOLECULARBIOLOGY

Afterthesuccessfulcoursecompletion,learners willdevelopfollowing attributes:

CO. NO	COURSEOUTCOMEDETAILS
CO1	Todescribeandexplainchemicaland molecular processesofreplicationthatoccurs in cells
CO2	Demonstratethemechanismofreplicationprocess
CO3	Describethetranscriptionprocessandtheirinhibitors
CO4	Explainaboutthesynthesisofproteins andregulatorymechanism
CO5	Elucidatethemolecularbasisofmutationandrepairmechanism

SEMESTER V
HUMANPHYSIOLOGY

Afterthesuccessfulcoursecompletion,learners willdevelopfollowing attributes:

CO. NO	COURSEOUTCOMEDETAILS
CO1	SeekstounderstandtheprocessofDigestionand absorption.
CO2	Explainthephysiologyofrespiratorysystem
CO3	Understandmusclephysiologyandcardiovascularsystem
CO4	ElucidatetheFunctionalanatomyofthe humanreproductiveand renalsystem system
CO5	Inferorganizationofnervoussystem&thefunctioningofspecialsenses

SEMESTERV

NUTRITIONALBIOCHEMISTRY

Afterthesuccessfulcoursecompletion,learners willdevelop followingattributes:

CO. NO	COURSEOUTCOMEDETAILS
CO1	Classification,composition, foodsources,functionsofcarbohydrates,proteins,fats and oils
CO2	Conceptofnutrition,energymeasurements,BMR,SDA, RNIandRDA
CO3	Explainthe effectofproteinenergymalnutrition
CO4	Infertheclassification,dietarysourcesanddeficienciesofminerals
CO5	Elaborateontheeffectsofdrugonfoodandtheroleofdiet inpreventionand treatment of diseases

SEMESTERV

GENETIC ENGINEERING

Afterthesuccessfulcoursecompletion, learnerswilldevelopfollowingattributes:

CO. NO	COURSEOUTCOMEDETAILS
CO1	Get properknowledgeabouttheDNAmanipulativeenzymes:Restrictionenzymesand DNA ligases.
CO2	GainknowledgeaboutInvitro constructionofrecombinant DNAmolecules,passenger and vector DNA, and Transformation
CO3	Learnaboutscreeningandselectionofrecombinanthostcells,GeneLibraries,cloning techniques, Expression of cloned DNA
CO4	LearnaboutthebasicsofElectrophoresistechniques, Polymerasechainreaction(PCR), Site directed mutagenesis (SDM), Nucleic acid sequencing:Blotting techniques.
CO5	HaveknowledgeofApplicationofr-DNAtechnique inhumanhealth, Productionof Insulin, Production of recombinant vaccines

SEMESTERVI

IMMUNOLOGY

Afterthesuccessfulcoursecompletion, learnerswilldevelopfollowingattributes:

CO.NO	COURSEOUTCOMEDETAILS
CO1	UnderstandthetypesofImmunity.
CO2	Illustratethepropertiesandtypesofantigenand antibodies
CO3	Interpretthebasicsinantigenandantibodyreaction
CO4	Explainaboutthecomplementsystemandhypersensitivityreactions
CO5	Clarifyaboutthecomplementsystemand autoimmunity.

SEMESTER VI
ENDOCRINOLOGY

Afterthesuccessfulcoursecompletion, learnerswilldevelopfollowingattributes:

CO. NO	COURSEOUTCOMEDETAILS
CO1	Illustratethemechanismofactionofhormonesofhypothalamusandpituitarygland
CO2	Understandhypothalamicandpituitaryhormones.
CO3	Elucidatethechemistry,secretion&biologicalfunctionofthyroidandpancreatic hormones
CO4	Enumeratethechemistry&synthesisofG.I.tractand adrenalglandhormones
CO5	Detailtherole ofreproductive andlocalhormones

SEMESTERVI

PHARMACEUTICALBIOCHEMISTRY

Afterthesuccessfulcoursecompletion,learners willdevelop followingattributes:

O. NO	COURSEOUTCOMEDETAILS
CO1	Describethepharmacokineticsanddynamicsofdrugmolecule
CO2	Understandaboutbasicprinciplesinvolved inpharmacokinetics.
CO3	Understandaboutthedrugreceptorinteractionsandgainknowledgeonmetabolism.
CO4	Describethegenderprinciplesofadversedrugreactionsandacutepoisoning.
CO5	Advancetheknowledgeondrugdiscoveryprocess andethicalissues indrugdiscovery process and in preclinical toxicological studies .

SEMESTER

VIMICROBIALANDINDUSTIALBIOCHEMISTR

Y

Afterthesuccessfulcoursecompletion, learnerswilldevelopfollowingattributes:

O.NO	COURSEOUTCOMEDETAILS
CO1	Describe thestructuralorganizationofmicrobes
CO2	Explainthewaysbywhich microbesinvolveinenergyproduction
CO3	Illustratethemechanismsofmicrobialcarbohydratemetabolism
CO4	Demonstratethemethodsinvolvedinfermentation process
CO5	Depictthe processofindustrialproductionofenzymesandantibiotics

COURSE	**OUTCOMES** Aftercompletionofthesecoursesstudentsshouldbeableto
	SEMESTERI
CELL BIOLOGY	CO:1 Designthemodelofcell. CO:2Differentiatethestructureofprokaryoticandeukaryoticcell. CO:3ExplaintheorganizationofGenesandchromosomes, chromosome morphology and its aberrations CO:4Compareandcontrasttheeventsofcellcycleanditsregulation CO:5Explainthecommunicationsofcellswithothercellsandtothe environment.
	SEMESTERII
GENETICS	CO:1.Obtainacquaintanceonhistoricaloverviewofmicrobial genetics and genetic Materials CO:2Comprehend the concept of replication of genetic materials CO3.Understandabout regulationofgeneexpressionandmutation CO4. Demonstratethegeneticexchangemechanisminmicroorganisms CO5:GrasptheBasicofgeneticsandtheirrole

SEMESTERIII	
GENERAL MICROBIOLOGY	CO:1Rememberandrecallthehistoricaleventswhichpavedthe development of different types of microscopes. CO:2Understandanddifferentiatethedifferent typesofmicrobes. **CO: 3** Analyze the media composition and grow the desired microbe. CO:4 Apply the knowledge toenumerate themicroorganismsfrom naturalenvironment. CO:5Evaluatethe successofunderstanding theviruses
SEMESTER-IV	
MOLECULAR BIOLOGY	CO:1Learningstructurallevelsofnucleicacids- DNAandRNAand genome organization in prokaryotes and eukaryotes CO:2UnderstandingtheconceptofGeneand thegene architecture. `CO: 3 Overview ofthecentraldogma oflife and various molecular eventsLearning molecular events intheDNAreplicationandroleof different enzymes CO:4MolecularEventsTranslationleadingtoproteinsynthesisand Post translational modification. CO:5Understandingtheregulationofgeneexpressionin prokaryotes using operon concept andEukaryotes.

SEMESTERV	
PLANTBIOTECHNOLOGY	CO:1Understandscientificandtechnicalskillsonplants study CO:2Acquireknowledgeonlimitationsandchallenges in plant cell tissue culture. CO:3KnowtheapplicationsofPlant Biotechnology CO: 4 Learn the preservative methods of cells CO:5Evaluateanddiscusspublicandethicalconcerns over the use of plant Biotechnology
IMMUNOLOGY AND IMMUNOTECHNOLOGY	CO:1 DesignamodelofImmunoglobulin/Antibodies CO:2DescribewhichcellMtypesandorganspresent in the immune response CO:3Illustratevariousmechanismsthatregulateimmune responses and maintain Tolerance CO:4Exemplifytheadverseeffect ofimmunesystem including Allergy, hypersensitivityandautoimmunity CO:5Applybasictechniquesforidentifyingantigen antibody interactions

GENETICENGINEERING	CO:1Acquaintwiththevocabularyinvolvedinmolecular cloning strategies and techniques used to probe DNA for specific genes of interest CO:2ApprehendwiththetoolsandtechniquesinrDNA technology and types of Vectors CO:3Relatetheroleofrestrictionandmodifying enzymes in recombinant DNA Technology CO:4Explorethetechniquesinvolvedinconstructionof genomic DNA library and cDNA library CO: 5 Design the protocols for analyzing gene transfer methodsandtoexploreknowledgeonhybridizationbased markers

SEMESTERVI	
ANIMAL BIOTECHNOLOGY	CO:1.Inthesuccessfulcompletionofthecourse,studentswillbe able to: CO:2.To developanunderstandingonbasicpatternofanimalcell culture and controlling characters CO:3.Acquire knowledgeon handling animalcell culture and their applications CO:4. Understand the gene transfer technology, transgenic animal and stem cell technology CO:5.Emphasizetechniquesonfertilizationinanimalsandits development
PROTEOMICSAND GENOMICS	**CO1:**Tofamiliarizethestudentswithgenome databasesandmetagenomedatabaseandanalysis, markersforgeneticanalysisandgeneexpression profiling **CO2**:Togaininsightintodifferentsequencing methods,comparativeandfunctionalgenomicanalysis whichenables the students to understand about sequenceandstructurebasedapproachesforgene predictionandfunctiondetermination.

	CO 3: To have better understanding about proteomics and learn about protein profiling and analysis of data generated through mass spectrometry and to be aware of the bioinformatics tools available for analysis of proteomic data. **CO 4**: To have an enhanced theoretical knowledge on biological databases and sequence analsysis **CO 5**: To understand well about sequence alignment tools, gene prediction methods and homology modelling & drug targeting.
BIOPROCESSAND ENZYME TECHNOLOGY	CO:1Onsuccessfulcompletionofthecourse,student willbeable to: CO:2Narratethescopeandeconomicsof3.Microbial Biotechnology CO:3Understandtheneed ofmicrobialproductsforthemankind CO:4Examinethelearnedtechniquesinproductionof industrially important products CO:5Thinkabouttheinnovativenessintheproductionofnew beneficial metabolites

DEPARTMENTOFBOTANY

CourseOutcomes

SEMESTER– I	
Course	**Outcomes** Aftercompletionofthesecoursesstudentsshouldbe able to :
PLANTDIVERSITY-I(ALGAEAND BRYOPHYTES)	CO-1. Highlighting the occurrence, general characters and classification of Algae and Bryophytes. CO- 2 Explaining the structure, pigmentation, food reserves and methods of reproduction of Algae CO-3.Describingthestructure,reproductionand

	life cycles of Algae (*Oscillatoria, Anabaena, chlamydomonas,Volvox,OedogoniumCaulerpa, Chara, Cyclotella, Sargassum* and *Polysiphonia)* CO-4. Describing the structure, reproductionand lifecyclesof Bryophytes(*Marchantia,Porella, Anthoceros and Polytrichum*). CO-5.Pointingouttheeconomicimportanceof Algae and Bryophytes.
SEMESTER– II	
PLANTDIVERSITY-II(FUNGI, LICHENS, BACTREIA AND VIRUSES)	CO-1. Listing the general characteristics, mode of life, classification and economic importance of Fungi. CO-2. Explaining the occurrence, morphology, reproduction and life cycles of Fingi (*Albugo, Saccharomyces, Aspergillus, Neurospora, Peziza, Puccinia, Polyporus* and *Cercospora*). CO-3. Describing the General characteristics, Occurrence, Distribution, Classification and Reproduction and economic importance of Lichens. CO-4.Listing the general characters of PlantVirus and describing the reproduction of T4 phage. CO-5. Discussing the General characters, Occurrence, Distribution, Classification, Structure, Mode of nutrition, Reproduction and Economic importance of Bacteria.
SBEC-I-MUSHROOMCULTURE TECHNOLOGY	CO-1. Discussing the history, scope of edible mushroom cultivation and Types of edible mushrooms available in India. CO-2.Explainingthedetailstudyofthemushrooms, *Pleurotuscitrinopileatus, Agaricusbisporus*. CO-3. Determining the pure culture, nutritional value, cultivation unit, storage methods and preparation of mother spawn. CO-4. Understanding the importance andpreparation of value added products
SEMESTER-III	
ANATOMYANDEMBRYOLOGY OF ANGIOSPERMS ANATOMY	CO-1. Discussing the meristematic tissues (classification,distribution,structure,functionand

	meristemtheories). CO-2. Understanding the various tissue systems (simple, complex and vascular tissues). CO-3. Identifying the Primary and secondary structure of dicot, monocot stem, root, leaf and the normal and anomalous secondary growth in stem. CO-4. Explaining the structure and development of anther and types of ovule. CO-5. Describing the pollination, Fertilization, Double fertilization and Triple fusion, endosperm and development of dicot embryo.
SBEC-II-HORTICULTURE	CO-1. Outlining the Horticulture definition, branches, importance and scope. CO-2. Describing the Classification ofHorticultural Crops (fruits and vegetables). CO-3. Examining the techniques of gardening-Types, Methods & Tools. CO-4.Determiningtheplant propagationtechniques (Cutting, layering, Budding and grafting). CO-5.DemonstratingtheFloriculture-Cultivation of commercial flower crops.
SEMESTER– IV	
PLANTDIVERSITY-III (PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY)	CO-1. Explaining the general characteristics, classification and sporangial organization of Pteridophytes. CO-2. Describing the morphology, anatomy, reproduction and life cycle of Pteridophytes (*Lycopodium, Selaginella, Equisetum, Gleichenia* , *Adiantum* and *Marsilea*). CO-3. Discussing the general characteristics and classification of Gymnosperms. CO-4. Describing the morphology, anatomy and reproduction of *Cycas, Pinus* and *Gnetum*. CO-5. Understanding the Paleobotany – geological time scale, radiocarbon dating, fossilization process and types of fossils.
SBEC-III-PLANTTISSUE CULTURE	CO-1. Discussing the Plant Tissue culture – Introduction, Historical background and Principle. CO-2.Explainingthelaboratoryorganization,tools

	and techniques, methods of sterilization and media preparation. CO-3. Determining the types of culture - cell, tissue and organ culture, callus induction and suspension culture. CO-4. Describing the protoplast - isolation, culture and fusion, somatic hybridization and cybridization. Organogenesis – anther culture and Somatic embryogenesis. CO-5. Highlighting the application of tissuesand cellculture, productionofgeneticallyvariable plants and production of secondary metabolites.
SEMESTER– V	
MORPHOLOGYANDTAXONOMY OF ANGIOSPERMS	CO-1. Distinguishing the Plant body parts – Types and modification of Root, Stem and Leaf morphology, types, venation and phyllotaxy. CO-2. Illustrating the Inflorescence and their types and Flower morphology, floral types and their arrangements. CO-3. Understanding the types of classifications-artificial, naturalandphylogeneticsystemsandplant nomenclature. CO-4. Identifying of genus and species of locally available wild plants. CO-5. Describing the morphological and floral characters of locally available families of flowering plants. CO-6. Highlighting the economic products with special reference to the Botanical name, family, morphology of useful part and their uses. CO-7.Demonstratingtheherbariumtechnique.
CYTOLOGYANDGENETICS CYTOLOGY	CO-1.ExplainingtheHistory andDevelopmentof cell biology. CO-2. Illustrating the Ultra structure of a Plantcell and cell organelles. CO-3. Understanding the Mendelian genetics, principles and Mendel's laws. CO-4.Describingthegeneinteractionwithsuitable examples. CO-5.DiscussingtheSexdeterminationinplants, polyploidy and population genetics.

BIOINSTRUMENTATIONAND BIOSTATICTIS	CO-1. Describing the basic principles of various microscopes (Light, Compound, Phase contrast, ScanningandTransmissionElectronmicroscopes). CO-2Discussing the micro technique (microtomy, microtome's) and staining techniques. CO-3.Analyzingthebasicprinciplesofbiostatistics. CO-4. Describing the principles, mechanisms and applications of basic bio-instruments. CO-5. Understanding the fundamental concepts of biostatistics.
ELECTIVECOURES-I-PLANT BIOTECHNOLOGY	CO-1. Discussing the history, definition, scope and significance plant biotechnology. CO-2. Explaining the Recombinant DNA technology, Enzymes, Cloning vectors, Transposons and Applications of Genetic Engineering. CO-3. Describing the Gene transfer in plants-Aims, strategies for development of transgenic plants. CO-4.DiscussingtheEnvironmentalBiotechnology (Waste management, Solid waste and production of biogas, bioethanol) and food biotechnology.
SBEC -IV AGRICULTURALMICROBIOLOGY	CO-1. Discussing the General characterization–Soil microflora (Bacteria, fungi, Actinomycetes, Algae, Phosphate solubilizing bacteria). CO-2. Describing the nitrogen cycle, biological N_2fixation, symbiotic and non-symbiotic bacteria (*Rhizobium*, *Azospirillum* and *Azotobacter*). CO-3. Explaining the *Azolla* and *Anabaena azollae* association, nitrogen fixation, factors affecting growth. CO-4. Determining the Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution. CO-5. Formulating the Organic farm and organic fertilizers, recycling of biodegradable agricultural and industrial wastes and Biocompost making methods and field applications (Vermicomposting).
SBEC-V PLANTBREEDINGANDPLANT UTILIZATIONASFOODPLANT BREEDING	CO-1. Understanding the historical aspect, objectives of plant breeding. CO-2. Discussing the selectionofbreeding methods (pure line, clonal and mass). CO-3. Describing the types and procedureof hybridization and Somatic hybridization.

	CO-4. Explaining plantutilization as food, they are cereals,pulses,vegetables,sugarcrop,oilcropand fruit crops.
SEMESTER– VI	
PLANTPHYSIOLOGY	CO-1. Understanding the plant and its water relations. CO-2. Describing the photosynthesis-photosynthetic pigments and light reactions. CO-3. Explaining the Respiration – Aerobic and Anaerobic respiration. Glycolysis, Krebs cycle, Electron transport System. CO-4. Discussing the Nitrogen Metabolism:nitrogen fixation- nitrification, denitrification and Nitrate assimilation. CO-5. Determining the Plant Growth regulators (Auxins, Gibberellins. Cytokinins Abscisic acid, Ethylene.
PLANTECOLOGYANDPLANT GEOGRAPHY	CO-1.DiscussingtheApproachestothestudyof ecology and plant environment. CO-2. Describing the ecosystems and ecosystem concepts. CO-3.Explainingtheplantsuccession,typesand ecological group of plants. CO-4. Classifyingthe environmentalpollution, types and their control measures. CO-5. DefiningthephytogeographyDefinition, concept, Scope and significance. Co-6. Illustrating the Phytogeographicalzones of India and Vegetational types in Tamil Nadu.
PLANTPROTECTION	CO-1. Discussing the Damage to crops of India by Insects, Nematodes, Rodents, Fungi, Bacteria and viruses. CO-2. Describing the types of plant diseases, causative organisms and control measures. CO-3. Determining the symptoms, etiology and control measures of the various fungal diseases. CO-4.Determiningthesymptoms,etiology and controlmeasuresofthevariousbacterialdiseases. CO-5. Explaining the nature of plantvirus and Causalorganism, symptoms, controlmeasures of variousviraldiseases.
MAJORELECTIVECOURSE–II	CO-1.Explainingtheatomicstructureofelements

BIOCHEMISTRY	andstructureandpropertiesofwater. CO-2. Describing the structure and properties of carbohydrates. CO-3. Illustrating the Amino acids (structure, properties (physical and chemical); function) and proteins (primary, secondary, tertiary, quaternary structure, function of protein). CO-4.Discussingtheenzymesandlipids.
SBEC –VI **MEDICO-ETHNOBOTANY**	CO-1. Explaining the History, Scope andImportance of Medicinal Plants and Indigenous Medicinal Sciences (Ayurveda, Siddha. Unani). CO-2.DiscussingtheEthnobotany(definition,scope and objectives) and Role of ethnic groups in conservation of plant genetic resources. CO-3. Describing the role ofethnobotany in modern medicine and significance of ethnobotanical medicinal plants. CO-4. Highlighting the medicinal plants for formulation of drugs.

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COURSE :B.SCCHEMISTRY

Course	Outcomes Aftercompletionofthesecoursesstudentsshouldbeable to :
SEMESTER– I	
19UCH01 **GeneralChemistry-I**	CO-1. Know the method of handling of chemicals. CO-2. Understand the different models of atoms. CO-3. Studytheperiodicpropertiesanditsvariation. CO-4. Learn the electron displacement effect. CO-5. Understandthebehaviorofidealgasesandreal gases.
SEMESTER– II	
19UCH02 **GeneralChemistry -II**	CO-1. Understandthemodeofformationofionicbonds andcovalentbonds. CO-2.Writethereactionsofhydridesand carbides. CO-3. Compare the reaction, mechanism and stereochemistryofS_N1,$S_N2$and$S_Ni$reactions. CO-4. Knowthemechanismofaromaticelectrophilic substitutionreaction. CO-5.To studythechemicalconstitution.
19UCHS01 **Foodand Nutrition**	CO-1.Knowthesourceand constituentsoffood. CO-2.Definethetermslikenutrition,nutrientsetc. CO-3.Studythefood adulteration. CO-4. Understand the method ofpreservation and processingoffood. CO-5.Knowtheroleofvitaminsandminerals.
19UCHP01 **Volumetricestimationand Inorganic preparation.**	CO-1.Todotheacid–basetitration. CO-2.Calculatethestrengthofgivensolution. CO-3. Estimate the hardness of water. CO-4.Tolearnthetechniqueofvolumetricestimation. CO-5. Preparethe metalcomplexes and double salts.

SEMESTER– III	
17UCH03 General Chemistry–III	CO-1.Studythe methodofextractionofvarious metalslike Ti, Zr etc. CO-2.Understandthemechanismofnamereactions. CO-3. Write the reactions of carboxylic acids. CO-4. Define thesymmetryincrystalsystem. CO-5.Understandthefirstlawofthermodynamics.
SEMESTER– IV	
17UCH04 General Chemistry-IV	CO-1.Understandthenuclearreactions. CO-2. Writethereactionsofheterocyclic compounds. CO-3. Studythe chemistryofaniline and diazonium compounds. CO-4.Understandthesecondlawofthermodynamics. CO-5. Toevaluateabsolute entropy.
17UCHS02 Polymer Chemistry	CO-1. Writethepreparationofpolymers. CO-2. Studythe crystalline melting point and glass transition temperature. CO-3.Knowtheprocessing ofpolymers. CO-4. Learn the constitution of natural rubber. CO-5.Knowthevariousconstituentsofplastics.
17UCHP02 Inorganicqualitativeanalysis.	CO-1. Analyse the acid radicals and basic radicals systematically. CO-2.Eliminatetheinterferenceacidradicals. CO-3. Do the group separation. CO-4.Preparethesodiumcarbonate extract. CO-5.Carryout theconfirmatorytestforacidradicalsand basicradicals.
SEMESTER– V	
17UCH05 InorganicChemistry–I	CO-1.Defineacidsandbasesanditstypes. CO-2. Study the compounds of thorium and uranium. CO-3.LearntheWerner'stheoryandSidgwick'stheory. CO-4. Studythe crystal field theoryand its uses. CO-5.Writethe reactionsofmetalcomplexes.
17UCH06	CO-1. To understand the optical isomers and optical

Organic Chemistry-I	isomerism. CO-2.Toknowtheconformersandgeometricalisomers. CO-3. Study the chemistry of amino acids and proteins. CO-4. Learn the function of nucleic acids. CO-5.Toelucidatethestructureofalkaloidsandterpenes.
17UCH07 Physical Chemistry-I	CO-1.Studytheadsorptionanditstypes. CO-2. Derive the expression of rate constant of second order and third order reactions. CO-3. Studythe Collision theory, Lindemann theoryand ARRT. CO-4.Knowtheterminologies inelectrochemistryand applications of conductance measurement. CO-5.Understand theDHOtheoryandhydrolysisofsalts.
17UCHE01 AnalyticalChemistry-I	CO-1. Study the separation techniques and purification techniques. CO-2.Understandthetheoriesofprecipitation. CO-3.Knowthetypesofelectronictransitions. CO-4. Study the types of vibrations. CO-5.UnderstandRamanscatteringandRayleighscattering.
17UCHS03 AgriculturalChemistry	CO-1.Knowthenutrientsanditsfunctions. CO-2. Studythe manures and its types. CO-3. Understand the applications of pesticides and insecticides. CO-4.Learnthepreservationofseeds. CO-5. Study the properties of soil.
17UCHS04 Dyestuffsandtreatmentof effluents.	CO-1.Definethetermschromophoreandauxochrome. CO-2. Understand the various methods of dyeing. CO-3.Know the preparation of diphenylamine dyes and indigo dyes. CO-4. Writethe preparationand applications ofphthalein dyes and acridine dyes. CO-5.Studythe treatmentofeffluents.
SEMESTER– VI	
17UCH08 InorganicChemistry-II	CO-1.Studythechemistryofmetalcarbonylsand silicates. CO-2. Know the chemistryoforganometallic compounds.

	CO-3.Studythenanomaterialsanditspplications. CO-4.Understandthechemistry ofpseudohalogensand interhalogen compounds. CO-5. Studythemagneticpropertiesofmolecules.
17UCHE02 Organic Chemistry-II	CO-1. Elucidate the structure of disaccharides and polysaccharides. CO-2.Knowtheimportanceofvitamins. CO-3. Write the mechanismofrearrangements. CO-4.Studytheimportantreagentsanditsuses. CO-5. Know the principle of green chemistry and green synthesis.
17UCH09 Physical Chemistry-II	CO-1.StudyNernst'sdistributionlawanditsapplications. CO-2. Draw the phase diagram of various systems. CO-3.Understandthereactionsinvolvedinthegalvaniccells. CO-4. Studythe working of storage cells and fuel cells. CO-5.Learnthekineticsofphotochemicalreactions.
17UCHE03 AnalyticalChemistry-II	CO-1.Studyvariouschromatographictechniques. CO-2.Understandthermogravimetricanalysisanddifferential thermalanalysis. CO-3.Learnthetechniqueofpolarography. CO-4.To interprettheprotonNMRspectrumofsimple organic compounds. CO-5. To interpret the mass spectrum of simple organic compounds.
17UCHS05 Pharmaceutical Chemistry	CO-1.Definevarioustermsinpharmaceuticalchemistry. CO-2. Understand the action of sulpha drugs. CO-3.Studytheactionofanalgesics. CO-4.Knowtheactionofantianaemicdrugs. CO-5. Have a knowledge on important medicinal plants like tulasi, kilanelli, mango etc.

17UCHS06 Industrial Chemistry	CO-1.Knowthepreparationofchemicalexplosives. CO-2. Understand the manufacture of leather. CO-3.Studytheproductionofchlorineandcaustic soda. CO-4. Study the formulation of paints. CO-5. Have a knowledge on manufacture ofcement and glass.
17UCHP03 Physical Chemistry Practical	CO-1.Todeterminetherateconstantof acidcatalysed hydrolysis of an ester. CO-2.Tofindoutthemolecularweightofsolutebyrast method. CO-3.Tostudythesimpleeutecticsystem. CO-4.Todeterminethetransitiontemperatureofhydrated salts. CO-5.Tofindoutthestrengthofanacidbyconductivity method and potentiometric method.
17UCHP04 Gravimetricestimationand Organic practical	CO-1. To estimatethe nickel bygravimetric analysis. CO-2.Toestimatethe lead bygravimetricestimation. CO-3. To learnthetechnique ofgravimetric analysis. CO-4.Tostudythegivenorganiccompoundqualitatively. CO-5. To determine the boiling point of liquids.

B.Sc.Mathematics-CourseOutcomes

SEMESTERI

CLASSICAL ALGEBRA	CO-1.UnderstandtheconceptsofBinomialseriesandtheoremfor a rational index, standard results for the Exponential and Logarithmic series. CO2Test forconsistencyoflinearequationsandCayley-Hamilton theorem. CO-3Examinetherelationbetweenrootsandcoefficientsofan equation and to understand the theory of equations. CO-4Learningofreciprocalequations,diminishingrootsand removal of term of an equation. CO-5UnderstandtheDescarte'sruleofsign,Horner'smethodof approximation and Newton's method ofevaluating a realroot
DIFFERENTIAL CALCULUS	CO-1.LearnPartialandhigherderivatives,totaldifferential coefficient and implicit functions. CO-2.UnderstandtheconceptsofJacobians,necessaryand sufficient condition and the Legrange's multipliers. CO-3.Knowthepolarcoordinates, lengthofperpendicularandthe concepts of Asymptotes CO-4.Learncurvatureandradiusofcurvatureofpedalcurves, polar tangential curves. CO-5.StudytheEnvelopesofoneandtwoparameters, chordof curvature, Evolute and their properties.

SEMESTERII

INTEGRAL CALCULUS	CO-1. Calculatethe lengthofanarcofacurvewhenwhose equations are given in parametric and polar forms. CO-2.Evaluatetheareaofsurfacesofrevolution. CO-3.Determinetheareaandvolumebyapplyingthetechniquesof double and triple integrals. CO-4.Obtainequationsforsurfacesandcurvesinthreedimensions. CO-5.Identify different types of differential equations and solve them.

VECTORANALYSIS	CO-1.Definevectorequationsforlinesand planes. CO-2.Analyzevectorfunctionstofindlimits,derivatives,tangent lines, integrals, arc length, curvature. CO-3.Computelimitsandderivativesoffunctionsoftwo andthree variables. CO-4.Differentiatevectorfields. CO-5.Determinegradientvectorfieldsandpotentialfunctions.
SEMESTERIII	
STATICS	• CO-1.Gainknowledgeaboutthe typesofforces • CO-2Gainknowledge aboutthecouples. • CO-3.Understandtheconceptsoffrictionandequilibriumofa particle. • CO-4.Developtheconceptofcentreofgravity. • CO-5.Gaintheknowledge aboutvirtualwork.

DIFFERENTIAL EQUATIONSAND LAPLACE TRANSFORMS	CO-1.Computeallthesolutionsofsecondand higherorderlinear differentialequationswithconstant coefficients, linear equations with variable coefficients CO-2.Compute allthe solutionsofsecond and higher orderlinear differentialequationswithVariablescoefficients, linearequations with variable coefficients. CO-3.Find the solutionofFirst orderpartialdifferentialequations for some standard types. CO-4.UnderstandtheLaplacetransformsofstandardfunctions CO-5.Apply Laplace transformto solve second order linear differentialequationandsimultaneous lineardifferentialequations.
SEMESTERIV	
DYNAMICS	CO-1.Togainknowledgeaboutvelocity. CO-2.Understandtheconceptsoftwofundamentalprinciples. CO-3.To develop the concept of Impulsive forces.

	CO-4.Gainknowledgeaboutsimpleharmonicmotion. CO-5.To develop the concept of central forces.
TRIGONOMETRY ANDANALYTICAL GEOMETRYOF 3D	CO-1.UnderstandtheExpansionsoftrigonometricratios. CO-2.Understandtheconcept ofInversehyperbolicfunctions. CO-3.Togainknowledgeaboutthesymmetricalformand coplanar lines. CO-4.Enhancethefundamentalconceptsofsphere andequation of circle on a sphere. CO-5.Todeveloptheconceptsofconeand general quadric cone.
SEMESTERV	
MODERNALGEBRA I	CO-1.UnderstandtheconceptsofGroupandSubgroupand its applications. CO-2.AcquireKnowledgeabouttheconceptsofhomomorphisms, isomorphisms. CO-3.GainknowledgeabouttheconceptsofAutomorphism. CO-4.Analysetheconcept ofRing.Fieldand EuclideanRing. CO-5.AnalyseanddemonstratetheEuclideanring andpropertiesof PolynomialRings.
REALANALYSISI	CO-1.UnderstandbasicconceptsofSequenceandSeries CO-2To gain knowledge about the bounded sequence. CO-3.AnalysetheconceptofConvergentanddivergentseries CO-4.Understand the concept of Metric Space. CO-5.TodeveloptheconceptofOpenand Closedset.
COMPLEX ANALYSISI	CO-1.KnowtheconceptofLimits,ContinuityandAnalytic function. CO-2.SolveComplexintegrals CO-3.GainknowledgeaboutCauchyintegralformulaand

	Liouville'stheorem. CO-4.Analysetheconcept ofLinear transformation CO-5.UnderstandvariouslineartransformationandConformal mappings.

OPERATIONS RESEARCH	CO-1.Formulatesimplereasonindandlearningoptimizationproblem. CO-2.Analyse a problem and can select a suitable strategy. CO-3Applyanappropriate methodtoobtainthesolutionto aproblem. CO-4.Understand the concept of Inventory model problem. CO-5.Understandtheconcept ofnetworkand criticalpath
DISCRETE MATHEMATICS	CO-1.RecallthevariousconceptsofMathematicalLogic CO-2.Understandtheconceptsofdifferenttypesofnormalforms CO-3.Classifythe varioustypesoffunctionsand makethemto usein practical applications related to computer science CO-4.GainknowledgeabouttheAlgebraic systems CO-5.UnderstandtheconceptsofBooleanAlgebraanditsapplications.

MODERNALGEBRA II	CO-1.FindtheLineardependentandindependent, bases and dimensions of spaces. CO-2.UnderstandaboutInnerproductspaceand Modules. CO-3.Know about the concept of linear transformation, Characteristics roots and Matrices. CO-4.Togainknowledgeabout canonicalformand nilpotent transformations. CO-5.ComputetheTraceandTransposeand Determinants.
REALANALYSISII	CO-1.Understand the Connected set and bounded sets. CO-2.GainknowledgeabouttheCompact metricspace CO-3.,UnderstandbasicconceptsofRiemannintegrationandsolving simple problem. CO-4.Solvingproblemsbyusing theoremsonderivatives CO-5.Todeveloptheconcept ofconvergenceanduniformconvergence.
COMPLEX ANALYSISII	CO-1.Understandthe concept ofvarioustypesofSeries CO-2.Gainknowledgeabout Uniformconvergenceofpowerseries. CO-3Find different Singularities and Residues. CO-4.EvaluatetheimproperintegralsandconceptofJordan'sLemma CO-5.Concept of Rouche's theorem.

GRAPHTHEORY	CO-1.Basicconceptofgraphtheory,degree,vertexandSubgraph. CO-2.Understand the connectedness and components. CO-3.UnderstandtheconceptofEulergraphand Hamiltongraph CO-4.Gain knowledge about trees and matrices in graph

	CO-5.KnowabouttheDiagraphandMatrices
NUMERICAL ANALYSIS	CO-1.SolvingproblembyNewton'smethodandMuller's method CO-2.GainknowledgeaboutNewton'sforwardandbackwarddifference CO-3.Study the concept of Numerical Differentiation and integration CO-4.Solving by solution of linear system CO-5.Solving bysolutionofordinarydifferentialequations

B.SC.MICROBIOLOGY

COURSE	**OUTCOMES** Aftercompletionofthesecoursesstudentsshouldbeableto
	SEMESTERI
FUNDAMENTALS OF MICROBIOLOGY	1. Learning the scientific methodsand the historyofscience is the embodiment of scientific knowledge 2. As an introductory part of Microbiology, students will get the basic ideas and practices from the contributionof several Microbiologists in the field of microbiology. 3. Theywillhaveto knowthediversityofmicrobialworld like algae, fungi, protozoa and their general characteristics and importances. 4. They will be understood various laboratory practices, biosafety and also know the applications of important instruments like biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter. 5. CritiquetherecentdevelopmentsinMicrobiology.
	SEMESTERII
MICROBIAL PHYSIOLOGY AND METABOLISM	2. UnderstandNutrientsuptakingandenvironmentalcondition ofMicroorganisms. 3. Metabolicmechanismofmicroorganisms. 4. Essential growth factorsandnutrientsupplementsof their growth of microbial population. 5. Classified the microbes based on that surviving environment and Overallphysiologyand anatomyof microorganisms to be learned

	6.Explainthephysiologicalchangesinmicrobesduring growth
MICROBIAL DIVERSITY	1. UnderstanddifferenttypesMicroorganismsandDiversityof microorganisms. 2. Well-known about the General Characteristics and Classification of Microorganisms 3. Identifythemorphologicalcharacteristics, importanceand classification of algae and protozoa. 4. Classified the microbes based on that surviving environment and Economic importance ofMicroorganisms. 5. Overallmicroorganismsdiversityto belearned

SEMESTERIII	
MICROBIALGENETICS	1. Through the course students will be acquainted withgenomeorganizationandmutations,different plasmids,mechanismsofgeneticexchange,phage genetics and transposable elements 2. MicrobialGenetics will allow students to know thegenetic material,structuresofDNAandRNA, centraldogmaoflifewhichincludesreplicationof DNA (prokaryotes and eukaryotes), translation (prokaryotes and eukaryotes, transcription in prokaryotes and eukaryotes, posttranscriptional processing. 3. Assessthecompetencyofmicrobesto uptake DNA 4. Comparedifferentmechanismsofgenetransfer. 5. Outlinethebiologyofphagesandtheirrole in gene transfer.
CONCEPTS OF BIOTECHNOLOGY	1. Understandthetoolsandtechniquesofgenetic engineering 2. UnderstandanddescribeDNA,fingerprintingand its application in forensic science 3. Understandthe methodsofproductionofhealth related compounds by biotechnology 4. Explainanddescribetheadvantages/disadvantages of genetic engineering for humans 5. Understandtheproductionandimportanceof genetically modified food
PRINCIPLES OF BIOINSTRUMENTATION	1. Discusstheapplicationsofbiophysicsand principle involved in bioinstruments 2. Describethemethodologyinvolvedin

	biotechniques 3. Describetheapplicationsofbioinstruments 4. Demonstrateknowledgeandpracticalskillsof usinginstrumentsinbiologyand medicalfield 5. Performtechniquesinvolvedinmolecularbiology and diagnosis of diseases
SEMESTERIV	
IMMUNOLOGY	1. Demonstrable detailed knowledge and understanding of immunologyand the wayit is appliedindiagnosticandtherapeutictechniques and research. 2. Demonstrate knowledge and practical skills in undertakingsimpleimmunologicalexperiments that mimic those under taken in diagnostic laboratories and research laboratories. 3. Demonstrateliteraturereviewskillsinundertaking a large survey of a complex field with in immunology, synthesis the information from primary medical literature. 4. Adheretosafeworkingpracticeinamixed microbiology/immunology laboratory 5. Explaintheconceptsandtrends indimensionsof health
BIOTECHNOLOGYFOR SOCIETY	1. Known that different types of cultivation techniquesofInsects,Microrganisms.Suchas Sericulture, Aquaculture and Vermiculture techniques. 2. Convertwastematerialtobeneficialone, likewise biofertilizer, biogas. 3. learnedthetechniquesofvaccineproductionand gene therapy 4. Theusingofbiologicaltechniquestomodifythe product nature for increase the market value of product. 5. Themechanismandmethodsofgenetically modifiedplantsandanimals.Characteristic featuresofthosethings.

SEMESTERV	
MEDICAL BACTERIOLOGY	1. Thiscourseprovideslearningopportunitiesinthe basic principles of medical microbiology and infectious disease. 2. It covers mechanisms of infectious disease transmission,principlesofasepticpractice,andthe role of the human body's normal microflora. 3. The course provides the conceptual basis for understandingpathogenicmicroorganismsandthe mechanisms by which they cause disease in the human body. 4. Italsoprovidesopportunitiestodevelopinformatics and diagnostic skills, including the use and interpretation of laboratory tests in the diagnosis of infectious diseases. 5. To understand the importance of pathogenic bacteria in humandisease withrespect to infections oftherespiratorytract, gastrointestinaltract,urinary tract,skinandsofttissue.
FOOD AND DAIRY MICROBIOLOGY	1. Bythestudyoffood&diarymicrobiologythe studentsareabletoknowtheprinciples and methods of foodpreservation, production of differentfermentedfoods,differentfoodborne diseases: 2.Theircausativeagents,foodsinvolved,symptoms andpreventivemeasures.Theywillhavetheknow foodsanitationandcontrol. 3.Thestudentswillknowabouttheculturalandrapid detection methods offood borne pathogens in foods and introduction to predictive microbiology 4.Designappropriatetechniquesfortherecoveryof fermentedproducts 5. Comparetheproductionprocessesofvarious fermented foods.
MEDICAL PARASITOLOGY AND ENTOMOLOGY	1. Identifythedifferenttypesofparasites 2. Classifyeachparasite 3. Describe the structureofeachparasite 4. Explaintheparasites'lifecycles 5. Discuss the relationship between each parasite and its host
MEDICAL MYCOLOGY	1. Student can classifythe medically important fungal organisms on the basis of reproduction, taxonomy, macroscopicandmicroscopicmorphologyand

	mycoses 2. Explainmechanismsof pathogenesis(Fungi)with clinical importance 3. Student candefine howantifungalagentscanbe used in treatment 4. Evaluatemodernlaboratorydiagnosticmethods. 5. Outline the significance of prophylaxis and therapeutic management
RECOMBINANT DNA TECHNOLOGY	1. Through completion the course the students will capable the acquire the knowledge about the genetic engineering,differentmethodsinmolecularcloning, DNA amplification, DNA sequencing, 2. Discuss the structure, properties and functions of nucleic acids 3. Assesstheconceptofgeneregulationinprokaryotes and eukaryotes 4. Explain the process of transcription in prokaryotes and eukaryotes 5. Construction and Screening ofGenomic and cDNA libraries and its applications
SEMESTERVI	
SOIL AND AGRICULTURAL MICROBIOLOGY	1. GainedknowledgeofAgriculturalMicrobiology 2. Anunderstandingofplantmicrobe-interactions. 3. A critical understanding about major plant diseases caused by fungi, bacteria and viruses, their control measures. 4. An clear view about production of biopesticides &biofertilizers 5. Compare the soil profiles and their perspectives of ecologicalzonation
ENVIRONMENTAL AND PHARMACEUTICAL MICROBIOLOGY	1. Know General bacteriology and microbial techniquesforisolationofpureculturesofmicrobes fromdifferentenvironmentalsources. 2.Acquire knowledge on air soil and water microbiology 3. Studentsacquiretheinformationaboutmicrobes 4. Knowaboutmicrobesanditsroleinairborne diseases. 5.Ableto knowaboutprinciplesandtechniquesin waste treatment.

MEDICALVIROLOGY	1. Students will be able to learn the nature, structure, general properties and their importance of different animal and plant viruses. 2. They will also know about Viral Transmission, Salient features of viral nucleic acids, Replication and also several disease caused by viruses and the way of preventation 3. Outline the general characteristics and pathogenesis ofviruses 4. Discuss the various replication strategies of viruses and the human diseases they cause. 5. Compile the different diagnostic procedures, and treatment strategies for viral infections
INDUSTRIAL MICROBIOLOGY	1. Studentswillbeabletodefinefermentation. 2. They will be able to describe process of industrial fermentation. 3. They will be able to understand the roleof bioreactor in fermentation. 4. They will be able to explain industrialprocesses for various products by flow sheet diagram. 5. Discuss the steps in downstream processing and assess the nature and utility of various fermented products

CLINICAL LAB TECHNOLOGY	1. Competency to performa fullrange oftesting in the contemporary medical laboratory encompassingpre-analytical and post-analytical components of laboratory services , including hematology , chemistry, microbiology, urinalysis, body fluids, molecular diagnostic, phlebotomy, and immune heamotology. 2. Professional conduct, respecting the feeling and needs ofothers, protecting the confidence ofpatient information,andnotallowingpersonalconcernsand biases to interfere with the welfare of patients. 3. Exhibits a sense of commitment to the ethical and human aspects of patients care. 4. Administrative skills consist with philosophies of quality assurance, continuous quality improvement, laboratory education and appropriate composure under stressful conditions. 5. Recognize the role of the clinical laboratory scientists in the assurance of quality health care.

Course:B.ScChemistry

SEMESTER– I	
Course	**Outcomes** Aftercompletionofthesecoursesstudentsshouldbe able to :
17UCH01 GeneralChemistry-I	CO-1. Know the method of handling ofchemicals. CO- 2.Understand the different models ofatoms. CO-3.Studytheperiodicpropertiesand itsvariation. CO-4. Learn the electron displacement effect. CO-5. Understand the behavior of ideal gases and real gases.

SEMESTER– II	
17UCH02 **GeneralChemistry -II**	CO-1. Understandthemodeofformationofionic bondsandcovalentbonds. CO-2.Writethereactionsofhydridesandcarbides. CO-3. Compare the reaction, mechanism and stereochemistryofS_N^1,S_N^2andS_N^ireactions. CO-4.Knowthemechanismofaromaticelectrophilic substitutionreaction. CO-5.Tostudythe chemicalconstitution.
17UCHS01 **Foodand Nutrition**	CO-1. Know the source and constituents of food. CO-2.Definethetermslikenutrition,nutrientsetc. CO-3. Study the food adulteration. CO-4.Understand themethod of preservation and processing of food. CO-5.Knowtheroleofvitaminsandminerals.
17UCHP01 **Volumetricestimationand Inorganic preparation.**	CO-1.Todotheacid–basetitration. CO-2.Calculatethestrengthofgivensolution. CO-3. Estimate the hardness of water. CO-4.Tolearnthetechniqueofvolumetricestimation. CO-5. Preparethe metalcomplexes and double salts.

SEMESTER– III	
17UCH03 **General** **Chemistry–III**	CO-1.Study themethod of extraction of variousmetals like Ti, Zr etc. CO-2.Understandthemechanismofnamereactions. CO-3. Write the reactions of carboxylic acids. CO-4. Define thesymmetryincrystalsystem. CO-5.Understandthefirstlawofthermodynamics.
SEMESTER– IV	
17UCH04 **General** **Chemistry-IV**	CO-1.Understandthenuclearreactions. CO-2.Writethereactionsofheterocycliccompounds. CO-3. Studythe chemistry of aniline and diazonium compounds.

	CO-4.Understandthesecondlawofthermodynamics. CO-5. To evaluate absolute entropy.
17UCHS02 Polymer Chemistry	CO-1. Writethepreparationofpolymers. CO-2.Study the crystallinemeltingpointandglass transition temperature. CO-3.Knowtheprocessing ofpolymers. CO-4. Learn the constitution of natural rubber. CO-5.Knowthevariousconstituentsofplastics.
17UCHP02 Inorganicqualitativeanalysis.	CO-1.Analysetheacidradicalsandbasicradicals systematically. CO-2.Eliminatetheinterferenceacidradicals. CO-3. Do the group separation. CO-4.Preparethesodiumcarbonate extract. CO-5.Carryouttheconfirmatorytestforacidradicals and basic radicals.
SEMESTER– V	
12UCH05 InorganicChemistry–I	CO-1.Defineacidsandbasesanditstypes. CO-2. Study the compounds of thorium and uranium. CO-3.LearntheWerner'stheoryandSidgwick'stheory. CO-4. Studythe crystal field theoryand its uses. CO-5.Writethe reactionsofmetalcomplexes.
12UCH06 Organic Chemistry-I	CO-1.To understandtheopticalisomersandoptical isomerism. CO-2.Toknowtheconformersandgeometricalisomers. CO-3. Study the chemistry of amino acids and proteins. CO-4. Learn the chemistry of heterocyclic compounds. CO-5. To elucidate the structureofalkaloids and terpenes.
12UCHE01 Physical Chemistry-I	CO-1.StudytheNernst'sdistributionlaw. CO-2.Understandtheadsorptionanditstypes. CO-3.Derivetheexpression of rateconstantof second order and third order reactions. CO-4.To studythetheoriesinchemicalkinetics. CO-5. To knowthekineticsofphotochemicalreactions.

12UCHE02 Spectroscopy	CO-1.Toknowthetypesofelectronictransitions. CO-2. Understand the types of vibrations. CO-3. Study the Raman scattering and Rayleigh scattering. CO-4.Tointerpret the proton NMR spectrum of simple organic compounds. CO-5. To interpret the mass spectrum of simple organic compounds.
12UCHS03 AgriculturalChemistry	CO-1.Knowthenutrientsanditsfunctions. CO-2. Studythe manures and its types. CO-3.Understandtheapplicationsof pesticidesand insecticides. CO-4.Learnthepreservationofseeds. CO-5. Study the properties of soil.
12UCHS04 Dyestuffsandtreatmentof effluents.	CO-1.Study thesynthesisandapplicationsof quinonid dyes. CO-2.Knowthesynthesisandusesof indigodyesand diphenyl methane dyes. CO-3.Understand the preparation and uses of phthalein dyes and xanthein dyes. CO-4.Studythepreparationofacridinedyes. CO-5. Study the treatment of effluents.
SEMESTER– VI	
12UCH07 InorganicChemistry-II	CO-1.Study thechemistry ofmetal carbonylsand silicates. CO-2. Know the chemistry of organometallic compounds. CO-3.Learntheimperfectionsinthecrystalsystem. CO-4. Understand the chemistryofpseudohalogens and inter halogen compounds. CO-5. Studythemagneticpropertiesofmolecules.
12UCH08 Organic Chemistry-II	CO-1.Elucidatethestructureofmonosaccharides. CO-2. To elucidate the structure of disaccharides. CO-3. Find out the structure of antibiotics. CO-4.To studythevariousrearrangements. CO-5. To studythe role of various reagents and its applications.

12UCHE03 Analytical Chemistry	CO-1.Have aknowledgeondataanalysis. CO-2. To understand the theories of precipitations. CO-3.Tostudyvariouschromatographictechniques. CO-4. Familiar with TGA and DTA techniques. CO-5.Learnthetechniquesofpolarography.
12UCHE04 Physical Chemistry	CO-1.Studythe phase diagramofvarious systems. CO-2.Toknowtheterminologiesinelectrochemistryand applications of conductance measurement. CO-3. To study the DHO theory and hydrolysis of salts. CO-4. Understand the reactions involved in the galvanic cell. CO-5.Toknowtheworkingofstoragecellsand fuel cells.
12UCHS05 Pharmaceutical Chemistry	CO-1.Definevarioustermsinpharmaceuticalchemistry. CO-2. Understand the action of sulpha drugs. CO-3.Studytheactionofanalgesics. CO-4.Knowtheactionofantianaemicdrugs. CO-5.Have a knowledge on importantmedicinal plants like tulasi, kilanelli, mango etc.
12UCHS06 Industrial Chemistry	CO-1.Knowthepreparationofchemicalexplosives. CO-2. Understand the manufacture of leather. CO-3.Studytheproductionofchlorineandcaustic soda. CO-4. Study the formulation of paints. CO-5. Have a knowledge on manufacture ofcementand glass.
12UCHP03 Physical Chemistry Practical	CO-1.Todeterminetherateconstantof acidcatalysed hydrolysis of an ester. CO-2.Tofindoutthemolecularweightof asoluteby Rast method. CO-3. To determine thetransition temperature of hydrated salts. CO-4. To find out the strengthofanacid byconductivity method and potentiometric method.

12UCHP04 Gravimetricestimationand Organic practical	CO-1.Toestimatetheleadbygravimetricestimation. CO-2. To learnthetechnique ofgravimetric analysis. CO-3. To study the given organic compound qualitatively. CO-4.To determinetheboilingpointofliquids.

CourseOutcomesBSc.ComputerScience **SEMESTER I**	
MICROPROCESSOR	CO1:recallandapplyabasicconceptof digital fundamentals to Microprocessor based personal computer system. CO2: identifyadetaileds/w&h/wstructureof the Microprocessor. CO3: illustrate how the different peripherals (8255, 8253 etc.) are interfaced with Microprocessor. CO4:distinguishandanalyzethe properties of Microprocessors &Microcontrollers. CO5: analyze the data transfer information through serial & parallel ports. CO6: train theirpracticalknowledgethroughlaboratory experiments.
ASSEMBLYLANGUAGE PROGRAMMING	CO1: Demonstrate ability to handle arithmetic operations using assembly languageprogramminginTASMandtraining boards CO2:Demonstrateabilitytohandlelogical operations using assembly language programming in TASM CO3:Demonstrateabilitytohandlestring instructions using assembly

	languageprogramminginTASM CO4:Demonstrateabilitytohandlesortingoperations and using assemblylanguage programming inTASM
SEMESTERII	
C-PROGRAMMING	CO1Explainaboutthebasicconceptsofprogram development statements and its syntax. CO2. Explain the various types ofarrays and its structure.CO3Discussaboutthevarioustypesof Functions and String handling mechanisms. CO4.ExplaintheConceptsofstructuresandUnions. CO5.Illustratesthevariousoperationsperformed on different types of files.
PROGRAMMINGINC LAB	CO1 Explanation ofdesign and algorithmic solution for agivenproblem. CO2. Constructionofflowchart forthe computer programs. CO3 Explains the program using ControlStatementsCO4.Explainsthe programusing Arrays and Functions. CO5.Explaintheprogramusing filehandlingwith structure.
SEMESTERIII	
OBJECT ORIENTED PROGRAMMINGWITH C++	CO1 Explain the top-down and bottom-up programmingapproachandapplybottomup approach to solve real world problems. CO2. Explain the difference between static and dynamicbinding.Applybothtechniquestosolve problems. CO3Describetheconceptofinheritanceandapplyreal worldproblems.CO4.Discussthegenericdatatypefor the datatype independent programming which relate it to reusability. CO5.Explaintodesignofhandling largedatasetusing File I/O.

PROGRAMMINGINC++ LAB	CO1 Explain the features of C++ using object orientedprogramming.CO2.Describetherelative merits ofC++ as anobject oriented programming language. CO3Describethemajorobject-orientedconceptsto implement object oriented programs in C++ Using encapsulation and inheritance. CO4.Describethemajorobject-orientedconceptsto implement object oriented programs in C++ Using polymorphism. CO5.Explain the advanced features of C++ specificallystreamI/O,templatesandoperator overloading.
DATASTRUCTURES ANDALGORITHMS	Co1:Remembertheconceptofalgorithms. Co2:Understandingtheconceptofarraysandstacks. Co3 : Apply Queue and linked list for other data structures. Co4 : Evaluate the tree and graphs. Co5:Analyzethesearchingandsortingmethods.
SEMESTER-IV	
RELATIONAL DATABASE MANAGEMENT SYSTEM	Co1 : Recognize the concept ofdatabase.Co2:ApplySQL Commands. Co3:UnderstandingtheAdvanceSQL Concept. Co4 : Understanding the concept of Normalization. Co5 : Analyze the transaction management.

RDBMS LAB	CO1:Designandimplement adatabaseschemaforagiven problemdomain CO2:Understandtheuseofquerylanguage(SQL)and its syntax. CO3:Populate and query a database using SQL DML/DDL commands. CO4:Perform programming in PL/SQL includingstoredprocedures,functionsand triggers.

SEMESTERV	
GUI PROGRAMMING	Co1 : Understanding the basic concepts ofvisual basic . Co2:Implementtheconceptofvariables,constantsand branching statements. Co 3:Usemenusandsubfunctionsto solvethegiven program. Co4 : Understanding the concept of arrays. Co5 : Access data using the concept of files.
OPERATING SYSTEM	CO1Describethebasiccomponentsofanoperatingsystem andtheirroleinimplementationsforgeneral purpose,real-timeandembeddedapplications.CO2.Define the concepts of processes, threads, asynchronous signals and competitive systemresource allocation. CO3 Explain what multi-tasking is and outline standardschedulingalgorithmsforMulti-tasking. CO4. Discuss mutual exclusion principles and their use in concurrentprogrammingincludingsemaphoreconstruction and resource allocation. CO5. Expose the details of major operating system concepts, overview of systemmemorymanagementandtheimplementationoffile systems.
COMPUTER NETWORK	CO1 Explain the local, metropolitan and wide area networks using the Standard OSI reference model. CO2.Discussionofvariousnetworkingtechnologies. CO3 Explain the concepts ofprotocols, network interfaces anddesignofperformance issuesin localarea networksand wide area networks. CO4. Describeabout wireless networking concepts,contemporary issues in networking technologies, network tools and network programming. CO5.Explaintheanalysisofdifferent typesofprotocoland the comparisonofnumberofdatalink,networkandtransport layer protocols.

PROBLEM SOLVING TECHNIQUES	CO1:Understand the fundamental conceptsofalgorithm,flowchart&problem solvingtechniques. CO2:Toanalysisthegivenproblems,useappropriate techniques and write efficient algorithm. CO3: Applythe basic knowledge ofmathematical factoring methodstomodelanalgorithmfor given problem. CO4:Implementtheconceptofarrayto solvea given problem. CO5:design an algorithm for merging,sorting and searching.
PROGRAMMINGIN VB LAB	CO1 Explain the simple programs using basic control statement.CO2.ExplaintheGUIbasedprogramusing Basic ActiveX Control. CO3 Explain the different advanced ActiveX control with example applicationprograms.

	CO4.Explainthevarioustypesofdatabase handlingwith MS-Access and Oracle CO5.Describetheconceptsofdatareportforanorganization.
SHELL PROGRAMMING LAB	CO1:Writeashellscripttoimplementthefilecommandsusing shell. CO2:Describe the concept of memory information. And CPU information. CO3:Design script for displaying date and time,list of file. CO4:Describe calcommand and palindrome checking. CO5:Todevelopthescript forcomparetofilesandtogiven set of numbers using linux commands.
SEMESTERVI	
JAVA PROGRAMMING	Co1:Remembertheconcepts ofoops. Co2:Understandthebasicterminologiesoflanguageand statements. Co3: Evaluate the arrays strings,victor and package. Co4:Unterstandingtheconceptof4ultithreadand applet programming. Co5:AnalyzetheI/ostreamsandgraphicsclasses.

SOFTWARE ENGINEERING	CO1 Explain the local, metropolitan and wide area networks using the Standard OSI reference model. CO2.Discussionofvariousnetworkingtechnologies. CO3 Explain the conceptsofprotocols, network interfaces anddesignofperformance issuesin localarea networksand wide area networks. CO4. Describe about wireless networking concepts, contemporary issues in networking technologies,networktoolsandnetworkprogramming. CO5.Explaintheanalysisofdifferent typesofprotocolandthe comparison ofnumberofdatalink,networkandtransportlayerprotocols.
DATAMININGAND WAREHOUSING	CO1Thefundamentalconceptsofdatawarehouse, delivery process, system process and process architecture. CO2.Explainthethesystemanddatawarehouse, process managers, capacity planning, tuning and testing. CO3Describethethebasicsofdatamining,datamining metrics and social implications of data mining CO4.Discussabouttheimplementationofdatawarehousing techniques CO5. Explain the association rules, basic algorithms, advanced association rulestechniquesandmeasuring thequalityofrules.
COMPUTER GRAPHICS	Co1:Rememberthebasicconceptsofgraphic system.Co2:Understandingscansystemsand I/O devices. Co3 : Apply 2D Transformation.Co4: Evaluate 3D Transformation. Co5:Implementvisiblesurfaceanddetectionmethods.

PROGRAMMINGIN JAVA LAB	CO1 Explain the programming language design, syntax and semantics. CO2. Describe the critical thinking skills through solving programming problems. CO3Explainthestandardsyntaxforjava programs and other programming Tools. CO4.Describetheanimationandeventsbasedadvancedjava program concepts (Applet) CO5. Explain the java programs using object oriented class with parameters, constructors, utility, calculations, methods including inheritance, test classes andexceptionhandling.
PRACTICALIMAGE EDITING TOOL	CO1: Todesign greeting card and web page layout usingphotoshop.CO2:Applyvariousfiltereffectand stamp tool. CO3: Design Bunch of flower front page of college calendar. CO4: To perform plastic surgery and to createseethroughtotext.CO5:Toconvert balckand white image and describe fill a text.

PGDEPARTMENTOFCOMMERCEWITHCORPORATESECRETARYSHIP

ProgramOutcomes	PO-I The students will be ready for employment in functional areas like accounting, taxation, banking,insurance and corporate law, economics, finance, auditing and marketing. PO-II After completing two years for Master in Commerce (M.Com) program, students would gain a thorough grounding in the fundamentals ofCommerce and Finance. PO –III The commerce and finance focused curriculum offers a number of specializations and practical exposures which would equip the student to face the modern-day challenges in commerce and business. PO -IV The all-inclusive outlook of the course offer a number of values based andjob oriented courses ensures that students are trained into up-to-date. In advanced accounting courses beyond the introductory level, affective development will also progress to the valuing and organization levels. PO-VAftercompletingpostgraduation,studentscanget

	skills regarding various aspects like Marketing Manager, Selling Manager, over all Administration abilities of the Company. Capability of the students to make decisions at personal & professional level will increase after completion of this course.
ProgramSpecific Outcome	PSO-I Students also acquire skills to work astax consultant, audit assistant and other financial supporting services. Studentshavechoicesto pursueprofessionalcoursessuchas CA, M.COM, MBA, CMA, ICWA, CS, etc. PSO-II Students are able to play roles of businessmen, entrepreneur,managers,consultant,whichwillhelplearners to possessknowledge and other soft skills and to react aptly when confronted with critical decision making.
Semester –ICourse Outcomes **CORE-I General andCommercial Law**	CO-I Make the students understand about business and corporate law CO-II Develop knowledge on contractand various types of contracts CO-IIITo helpthestudentstounderstandtheconceptof sale of goods CO-IV Make the students understand about companies and its types CO-VToequipthe students with properknowledge about Foreign exchange
CORE-II&VICompanyLaw & Secretarial Practice I&II	CO-I To impart students with the knowledge of fundamentals of Company Law and provisions of the Companies Act of 2013. CO-II To apprise the students ofnew concepts involving in company law regime. Define memorandum of association and articles of association. CO-IIIDetermineprivateplacement andprospectusand misrepresentation in prospectus. CO-IVWritethemeaningandnatureof capitalshareand capital. CO-V Identify the differencebetween share anddebenture and owned capital and debt capital.
CORE-III Financial Market and Services	CO-I Student will able to understand the Australian banking system and describe the role of regulatory bodies in regulating how banks manage their capital. CO-II Student will able to describe the types of equity securities that companies can use to raise equity capitaland

	howthesesecuritiescanbelistedandtradedonthe Australian Stock Exchange. CO-IIIStudent willabletoapplydifferent company valuation techniques to determine share prices. CO -VI Studentwill able todescribe the characteristics of different types ofdebt securities and be able to price them. CO-V Studentwillabletodescribedifferenttheoriesofhow interest ratesaredeterminedandexplaintherelationship between the termto maturity, risk, and interest rates.
CORE-IVAdvancedCorporateAccounting	CO-I Learn about the journal entries of issue of shares and issue of debentures. CO-II To know about the meaning of companies and working style of companies. CO-IIIKnowaboutthe finalaccountsofthe companies. CO-IV Learn about the valuation method of shares and goodwill and measurement of performance of companies. Work with profit prior to incorporation and post incorporation profits in companies accounts. CO-V Learn about the concept of sources of redemption of debentures and redemption of preference shares.
ELECTIVE-I Economic Legislations	CO-I Apply intellectual property law principles (including copyright, patents, designs and trademarks) to real problems and analyse the social impact ofintellectual property law and policy. Work inteams, solve problemsand manage time CO-II Analyse ethicaland professional issues which arise in the intellectual property law context. Write reportson project work and critical reflect on your own learning.
Semester-II CORE-VIncomeTax	CO-IDefine the procedureofdirecttaxassessment. CO-II Able to file IT returns on individual basis.CO-III Able to compute total income and define tax complicacies and structure. CO-IV Able to understand amendments made from time to time in Finance Act. CO-V Differentiate between direct and indirect tax assessment.
ELECTIVE-II Applied Costing	CO-I Define the various components of total cost of a product i.e. direct & indirect cost and fixed & flexible cost. CO-IIDeterminevariouslevelsofmateriali.e.reorderlevel, minimum level,maximum level & EOQformanaging working capital. CO-IIIUsemethodsoftime-keeping&time-bookingand

	manage idle&overtime. CO-IVDefinethefeaturesof overheadorindirectcostof production and basis of allocation and apportionment. CO-V Use cost-sheetto compute unitcost of product. Determinebasisforcomputingtenderpriceofaproduct.
CORE-VIICorporateSocial Responsibility	CO-I Acquaint with the various concepts and aspects of corporate social responsibility. CO-II Understand about the concept of business ethics. CO-III Acquired knowledge about corporate social responsiveness and corporate citizenship. CO-IV Describe about different concepts in understanding corporate governance.
CORE-VIII Labourand Industrial Laws	CO-IStudents should able toelaborate the concept of IndustrialRelations. CO-II The students should able to illustratethe role oftrade union in the industrial setup. CO-III Students should able to outlinethe important causes& impact ofindustrial disputes. CO-IV Students should able toelaborate Industrial Dispute settlementprocedures. CO-V Student should be able to summarizetheimportantprovisionsof WageLegislations, in reference to Payment of Wages Act 1936, Minimum Wages Act 1948 & Payment of Bonus Act 1965
EDC-I Entrepreneurship Development	CO-I Student will able to understand the basic development of entrepreneurship as a profession. CO-II Student will have a basic knowledge of human resource management for small business. CO-III Student will able to identify and implement systems for collecting and analyzing information to monitor the performance of a new firm. CO-IV Student will able to understand the differences between an entrepreneurial venture and an ongoing business operation. CO-V Student will able to understand the critical roles of marketing research, competitive analysis, consumer-value proposition, and market-entrystrategyinthedevelopment of a business plan.
EDC-IIMarketing	CO-I Students can identify how consumer behaves differently. CO-IIAbletounderstandhowaproductpossessedfrom different stages. CO-IIIAbletounderstand thedifferencebetween trademark

	andbranding. CO-VIAbletodescribethecustomersegmentation,target marketing and positioning. CO-VUnderstanddifferentmethodsofsalepromotion.
NMEC-HumanRights	CO-I Identify and evaluate the historical, philosophical, politicalandculturaldevelopmentsestablishing humanrights as a set of global norms, agreements, and procedures. CO-II Explore global human rights institutions, law, and processes, and assess the impact of their interaction with national and local cultural practices and norms. CO-III Critically examine the impact of diverse geographic, culturaland theoreticalcontexts onthe socialacceptance and practical application of human rights norms. CO-IV Synthesize interdisciplinary approaches and contributions to topics such as gender, race,poverty, violence and post-colonialism within a human rights framework. CO-V Reflectively evaluate the effectiveness ofhumanrights practice on local, national or internationalhumanitarian efforts.
Semester–III **CORE-IXIndirect Taxes**	CO-I Student will able to Compute the assessable value of transactions related to goods and services for levy and determination of duty liability. CO-II Student will able to Identify and analyze the proceduralaspects under different applicable statutesrelated to indirect taxation. CO-III Student will able to Understand the basic principles underlying the Indirect Taxation Statutes (with reference to CentralExciseAct,CustomsAct,ServiceTax,ValueAdded Tax, and Central Sales Tax). CO-IV Student will able to understand Tax liability and taxable entities. Accounting treatment (simple and trilateral transactions) . CO-V Student will able to examine The method of tax credit. Inflows and outflows. Outflows: tax imposition, tax exemption, tax deduction. Student will able to understand Inflows and outflows related to VAT. Imposition of tax and tax base. Delivery of goods and services. Tax rates. Periodic tax returns. Place ofdeliveryof goodsandservicesanditsimpactonVAT.
CORE-XCorporateLaws	CO-IThestudentwillwellverseinbasicprovisions regarding legal frame work governing the business world. CO-II To know the students with the basic concepts, terms

	&provisionsofMercantile andBusinessLaws. CO-IIITodeveloptheawarenessamongthestudents regarding these laws affecting trade business, and commerce.
CORE-XII Management Accounting	CO-I Use business finance terms and concepts when communicating. CO-II Explain the financial concepts used in making accounting management decision. CO-III Use effective communication skills to promote respect and relationship for financial deals. CO-IV Utilize information by applying a varietyof business and industry software and hardware to major financial function. CO-V Demonstrate a basic understanding of accounting management.
CORE-XI Research Methodology	CO-I Acquiredknowledgeofresearchmethodologyfor decision making in business. CO-IIUnderstandingtheprocessofresearchthrough questionnaire. CO-IIIDescribeaboutsamplinganddatacollection. CO-IV Developmentin skills of hypothesis testing and interpretation of data.
ELECTIVE-IIIComputerApplication in Business	CO-I Understand the concept of input and output devices of Computers and how it works. CO-II Understand the concepts, structure, types and design of operating Systems. CO-III Understand the concept of Data Communication, its Modes, its Forms and Data Communication Channels. CO-IV Understand evolution of internet, its application and its basic services. Understand model, components of computer and how it works. CO-VUnderstandtheconceptofinputand outputdevicesof Computers in detail. Understand RAM, ROM and their types in detail.
Semester-IV **CORE-XIII Secretarial and Management Audit**	CO-I Student will understand the audit process from the engagement planning stage through completion of the audit, as well as the rendering of an audit opinion via the various report options. CO-IIStudent willunderstand auditors‟ legalliabilities, and be able to apply case law in making a judgment whether auditors might be liable to certain parties. CO-IIIStudent willunderstandtodescribethe variouslevels ofpersuasivenessofdifferenttypesofauditevidenceand

	explain the broad principles of audit sampling techniques. CO-IVStudentwill understandtodiscusstheneedforan independent or external audit and describe briefly the development ofthe role ofthe assurance provider in modern business society. CO-V Student will able describe the quality control procedures necessary to ensure that a competent assurance engagement is performed, and apply professional ethics including Code of Conduct to specific scenarios.Student willExplaintheinternalauditprocessincludingthe professional standardsapplicabletothe internal audit profession.
CORE-XIV Corporate Financial Management	CO-I Use business finance terms and concepts when communicating. CO-II Explain the financial concepts used in making financial management decision. CO-III Use effective communication skills to promote respect and relationship for financial deals. CO-IV Utilize information by applying a varietyof business and industry software and hardware to major financial function. CO-V Demonstrate a basic understanding of financial management.
ELECTIVE-IVSecurities MarketAnalysis	CO-ITocreateaninterestininvestmenthabitkeepingits widescope. CO –IITointroducetheconceptofCapitalMarket. CO–IIITofamiliarizetheconceptofleasefinancing venture CapitalandMutualFund Tohelp themtounderstand securityanalysis CO-IVTocreate anawarenessaboutriskandreturnof differentinvestments CO-V To enlighten the evolution of securities and derivatives.Tomakethemunderstandtheinvestment decisionsandportfolio performance.

M.Sc.,BIOTECHNOLOGY

COURSE	OUTCOMES Aftercompletionofthesecoursesstudentsshouldbeableto
SEMESTERI	
CELL AND MOLECULAR BIOLOGY	CO1:Understandingtheprokaryotic and Eukaryotic cell. CO2:Discussingindetailthecellmembraneandfunction. CO3:Understandingthestructuraland functional organization of cell organelles. CO4:Gainingknowledgeforcellto cell signaling. CO5:Examiningthecellularbasisofdifferentiation.
BIOLOGICAL CHEMISTRY	CO1: To make students have a strong foundation in chemical biology. CO2: Tointroduce them to metabolic pathwaysofthe major bio molecules and relevance to clinical conditions CO3:TocorrelateBiochemical processwith biotechnologyapplications. CO4**:**Todiscussthesignificanceofvarious metabolic processes occurring in biological system. CO5: To evaluate of both Hormones and Enzymologyandalsoitsmedicalimportancein thehumanlife.
MICROBIOLOGY	CO1: To understand the landmarks of microbiology, sterilization and principle and working of microscopes. CO2:Togetin depth knowledgeof microbialdiversity and growth curve of microbes.

	CO3:Toknowmicrobialdiseasesand hostpathogens interaction by microbes. CO4: To examine on epidemic and pandemic diseases. CO5:Tolearnagriculturalandenvironmentalmicrobiology.

SEMESTERII	
IMMUNOLOGY AND IMMUNOTECHNOLOGY	**CO 1:** To present an overview on types of immunity & immunological responses and to illustrate aboutdifferent cells and organs involved in immune system, properties and role of antigens and antibodiesinimmune system. **CO 2**: To demonstrate the principle of antigen and antibody interactions and its diagnostic applications **CO 3** : To display the role of MHC inantigen processing and presentation and the elaborate theprocess of T cell and B cell activation during the course of Cell mediated and Humoral immune responses respectively **CO 4**: To elucidate on the properties and functions of cytokines and complement components in immune response, hypersensitivity reactions and different types ofvaccines **CO 5**: To interpret the mechanism of immune response against the Infectious diseases, Immunodeficiency and Autoimmune diseases, Transplantations and Cancers.
GENETICENGINEERING	**CO 1:** To learn the theoretical knowledge in the genetic engineering enzymes and application. **CO 2:** Understanding the basic concept of gene cloning and the role of enzymes and vectors responsible for gene manipulation, transformation and genetic engineering. **CO3:**Studentsexpandedtheirknowledge about gene transfer methods and identifying suitable hosts for cloning and sequencing.

	CO 4: To learn the genomic library construction, hybridization and labeling techniques. **CO5:**DescribetheTransgenicmethods,chromosome jumpingandPCRand methods forgenetherapy.

SEMESTERIII	
PLANT BIOTECHNOLOGY	CO1:Acquiretheknowledgeaboutthetechniquesof PlantTissueCulture,Lab.organization&measures adoptedforasepticmanipulationandnutritional requirementsofcultured tissues. CO2:Learnthetechniquesofculturingtissues,single cells, protoplasts & anther culture, germplasm conservationandcryobiology CO3:Learnthelargescaleclonalpropagationof plantsthroughvariousmicropropagationtechniques, Productionofsecondarymetabolitesunderinvitro conditions CO4:Agoodunderstandingofr-DNAtechnology, methodsofgenetransfer,molecularmarkersand markerassistedselection C05:Developtransgenicsresistanttobiotic&abiotic stresses&qualitycharacteristicsandtheirroleincrop improvement
ANIMAL BIOTECHNOLOGY	**CO 1:**To know and be familiar with the organization ofanimalcells, scope&limitationsofanimalcell culture,typesand characteristics ofcellculture. **CO2**:To gain knowledge on the infrastructure requirementsforanimalcellculturelikelaboratory layout&design,equipments,substratesandmedia requirementsforanimalcellculture,propertiesof animalcellculturemediumandmaintenanceof asepticcondition. **CO3**:Tobecomeawareofthebasictechniques involvedinanimalcellcultureforestablishmentof cell line, cloning & selection, cell line characterization, quantification and scale up techniques. **CO4**:Tounderstandabouttheapplicationsofanimal

	cell culture in drug testing like viability and cytotoxicity assay, cryopreservation of cell lines and establishment of cell banks, bio-safety regulations and Bioethics in animal cell culture and specialized techniques preferred in animal cell culture. **CO 5**: To interpret about culture ofspecific cell types like hematopoietic cells and tumor cells, tissue engineering and stem cell technology and its applications, role of animal cell culture in IVF & test tube babies and gene therapy using embryonic stem cells.
BIOPROCESS TECHNOLOGY	**CO1**:Designingofbioreactorsandcontrolnecessary for maximizing production. **CO2**:Selectandoptimizemediaformaximum production of microbial metabolites. **CO 3**: Designing ofprotocols for strain improvement and separation of molecules after separation process **CO 4**: Describe and analyze the controlof*invitro* cellular growth process within the industrial –scale bioreactor environment **CO 5:** To understand the various techniques for isolation, recovery and purification of a protein and evaluate the outcome.

SEMESTERIV

RESEARCH METHODOLOGY AND BIOSTATISTICS	**CO1:**LearnaboutIntroduction,typesand methods of research **CO2:**Acquiringtheskillsofscientific reading, writing and presentations of research **CO3:**Describe various applicationareaofbiostatistics **CO4:**Distinguishdifferent typesofdataand sampling techniques. **CO5:**Learnthestatisticalanalysisof biologicaldata

M.Sc.(ComputerScience)

PGDepartmentof ComputerScience	Aftersuccessfulcompletionoftwo year degreeprograminM.Sc. Computer Science a student should be able to
CourseOutcomesM.Sc.(ComputerScience) I – Semester	
Course	**Outcomes**
17PCS01 Designand Analysisof Algorithms	1. Todesignefficientalgorithmsusingvariousalgorithm designing strategies 2. To analyze the problem and develop the algorithms related to these problems 3. Toclassifytheproblemandapplytheappropriatedesign strategy to develop algorithm 4. Todesignalgorithmincontextofspace 5. Tomaintaintimecomplexityand applyasymptoticnotation
17PCS02 Advanced Computer Architecture	1. Describebasicorganizationofcomputer andthearchitecture of 8086 microprocessor 2. Implementassemblylanguageprogramforgiventaskfor 8086 microprocessor 3. Demonstratecontrolunitoperationsandconceptualize instruction level parallelism 4. Categorize memoryorganizationand explainthe functionof each element of a memory hierarchy

	5.IdentifyandcomparedifferentmethodsforcomputerI/O mechanisms
17PCS03 AdvancedJava Programming	1. To learnthe graphicsand animationonthe webpages, using Java Applets 2. To learn Java Data Base Connectivity (JDBC) so as to retrieve and manipulate the information on any relational database through Java programs 3. TolearntheserversideprogrammingusingServletsandJSP and To learn Java Bean so as to make the reusable software components 4. To learn the invocation of the remote methods in an application using RMI 5. To learn the development of Enterprise based applications, using EJB based Stateful, Stateless and EntityBeans
17PCS04 Principlesof Programming Languages	1. To learn major programming paradigms and techniques involved in design and implementation of modern programming languages 2. Tolearnthestructureofa compilerandinterpretation 3. To different programming paradigm to improvingtheclarity, quality, and development time of a program (structured programming) 4. To learn Haskell (an advanced purely-functional programming style and lambda calculus (forvariable binding and substitution) 5. To learn To understand basic logic programming through Prolog
17PCS05 Advanced OperatingSystems	1. To design and understand the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems. 2. To evaluate, and compare OS components through instrumentation for performance analysis. 3. Toanalyzethevariousdeviceandresourcemanagement techniques for timesharing and distributed systems 4. To develop and analyzesimpleconcurrentprograms using transactional memory and message passing 5. Tounderstandthetrade-offsandimplementationdecisions
17PCSP01 Advanced Java ProgrammingLab	1. TolearntheInternetProgramming, usingJavaApplets 2. To create a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings 3. To learn to access database through Java programs, using Java Data Base Connectivity (JDBC)

	4. To create dynamic webpages, using Servletsand JSP and to invoke the remote methods in an application using Remote Method Invocation (RMI) 5. To understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB)
17PCSP02 Algorithmsusing C++ Lab	1. Identify theproblem given anddesign thealgorithm using various algorithm design techniques 2. Implementvariousalgorithmsinahighlevellanguage 3. Analyzetheperformanceofvariousalgorithms 4. Compare the performance of differentalgorithmsforsame problem 5. Toimplementmoreconceptofdesigningalgorithms

CourseOutcomesM.Sc.(ComputerScience) II – Semester

Course	Outcomes
17PCS06 .Net Programming	1. Understandthedevelopmentanddeploymentcyclesof enterprise applications 2. Utilizethe.NETframework tobuilddistributedenterprise applications 3. DevelopASP.NETWebServices,securewebservices,and .NETremotingapplications 4. To develop web applications using a combination of client-side and server-side technologies 5. Tounderstandandexperimentwiththedeploymentof enterprise applications
17PCS07 DiscreteStructures	1. Write an argumentusing logical notation and determine if the argument is or is not valid 2. Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examplesof each proof technique described 3. Understand the basic principles of sets and operations in set and to prove basic set equalities 4. Applycountingprinciplestodetermineprobabilities 5. Demonstrateanunderstandingofrelationsandfunctionsand be able to determine their properties
17PCS08 DataMining Techniques	1. Tointroduce thefundamental concepts of data miningand Recognize various types of data mining tasks 2. Tointroducemathematicalandstatisticalmodelsusedin data Classification 3. Todefine,understandandinterpretassociationrules

	4. Discuss the clustering algorithms to solve real-world problems 5. Tocreatesampledataofirisusingpreprocessingconcept using case study
17PCSE04 (Elective – I) E–Technologies	1. Understand the basic concepts and technologies used in the field of management information systems 2. Havetheknowledgeof thedifferenttypes of management information systems 3. Understandtheprocessesof developingandimplementing information systems 4. Beaware ofthe ethicalandsocial 5. Tosecurityissuesofinformationsystems
17PBAED2(EDC – I) Stress Management	1. This course provides understanding stress such as work related stress and individual stress 2. This course serves time management such as importance of planning the day and developing concentration 3. This course serves career plateau such as Identifying Career plateausandStructuralandContentPlateauingand Making a fresh start 4. Thiscourseprovidescontrollingcrisismanagement 5. Thiscourseprovidesselfdevelopment
17PCSP03 .NetProgramming Lab	1. To utilize the .NETframeworkto build distributed enterprise applications 2. To develop web applications using a combination of client-side and server-side technologies 3. To understand and experimentwith the deploymentof enterprise applications 4. Todevelopclientandserversideprogrammingusing database connectives 5. ToconnectSQLbased on.Netprogramming
17PCSP04 DataMiningLab	1. The data mining process and important issues around data cleaning, pre-processing and integration 2. The principle algorithms and techniques used indatamining, suchas clustering, association mining, classification and prediction 3. Synthesize the data mining fundamental concepts and techniques from multiple perspectives 4. Advancerelevantprogrammingskills 5. Gain experience and develop research skills by reading the data mining literature
17PHR01 HumanRights	1. Applyeffective writtenandoralcommunicationskillsto business and legal situations 2. Analyzetheglobalegalenvironment

	3. Students will graduate with the ability to analyze complex problems, find and deploy a variety of legal authorities, and communicate effectively in a variety of settings 4. Usecriticalthinkingskillsinbusinesssituations 5. Apply an ethical understanding and perspective to business situations
CourseOutcomesM.Sc.(ComputerScience) III – Semester	
17PCS09 OpenSource Computing	1. Describe the core syntax and semantics of Python programming language. 2. Discover the need for working with the strings and functions. 3. Illustrate the process ofstructuring the data using lists, dictionaries, tuples and sets. 4. Indicatethe useofregular expressionsand built-in functions to navigate the file system. 5. InfertheObject-orientedProgrammingconceptsin Python.
17PCS10 NetworkSecurity andCryptography	1. Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory. 2. Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication. 3. Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes. 4. Apply network security basics, analyze different attacks on networks and evaluate the performance of firewalls and securityprotocols like SSL, IPSec, and PGP. 5. Apply the knowledge of cryptographic utilities and authentication mechanisms to design secure applications.
17PCS11 MobileComputing	1. Tofamiliarizethestudentswiththebuzzwordsand technology of mobile communication 2. UnderstandtheGSMarchitecture 3. Understandthe issuesrelatingtoWirelessapplications 4. To developthe different applicationsthat mobile computing offers to people, employees, and businesses 5. To develop high levels oftechnical competencein the field of mobile technology.
17PCS12	1. Review the fundamentalconceptsofa digitalimage processing system. 2. Analyzeimagesinthefrequencydomainusingvarious

DigitalImage Processing	transforms. 3. Evaluate the techniquesforimage enhancementandimage restoration. 4. InterpretImagecompressionstandards. 5. Interpret imagesegmentationandrepresentationtechniques.
17PCSE06 (Elective – II) InternetofThings	1. ApplytheconceptsofIOT. 2. ApplyIOTtodifferentapplications. 3. AnalysisandevaluateprotocolsusedinIOT. 4. DesignanddevelopsmartcityinIOT. 5. Analysis and evaluate the data received through sensorsin IOT.
17PCSP05 Python ProgrammingLab	1. ImplementBasicPythonprogramsto solvesimpleproblems. 2. ImplementConditionalsandLoopsforPythonPrograms. 3. UsefunctionsandrepresentCompounddatausingLists, Tuples and Dictionaries. 4. Read and write data from & to files in Python and develop Application using Python. 5. Understand theprocessofdesigning and implementing Web applications using Python.
17PCS06 Mobile Application DevelopmentLab	1. Demonstrate the android features and create, develop using android. 2. Demonstrate and Understanding anatomy ofan Android application. 3. Applytheandroidgeolocationbasedservices. 4. DevelopvariousAndroidapplications related to layouts & rich uses interactive interfaces. 5. DevelopAndroidapplicationsrelatedtomobilerelated server-less database like SQLITE.
CourseOutcomesM.Sc.ComputerScience IV – Semester	
Course	**Outcomes**
17PCSE10 (Elective – III) CloudComputing	1. Define Cloud Computing and memorize the different Cloud service and deployment models. 2. Describeimportanceofvirtualizationalongwiththeir technologies. 3. UseandExaminedifferentcloudcomputingservices. 4. Analyzethecomponentsofopenstack&GoogleCloud platform and understand Mobile Cloud Computing. 5. Design&develop backup strategies for cloud data based on features
17PCSE14 (Elective – IV) WebTechnologies	1. DesignastaticwebpagebyapplyingHTMLelements. 2. ApplyCSS conceptsfordesigningHTMLwebpages. 3. DevelopDHTMLpagesbyusingJavaScript,JQuerywith

	DOMevents. 4. Implementawebpagewithdatabaseconnectivityusing Java. 5. CreaterichinternetapplicationusingXMLandAJAX.
17PCSPR1 ProjectWorkand Viva – voce	1. Knowledge of basic SWengineering methods and practices, and their appropriate application. 2. Knowledge and application of collaborative tools for SW development. 3. Successful implementation of teamwork behavior and policies in a large class project. 4. Students will demonstrate a breadth of knowledge in computer science, as exemplified in the areas of systems, theory and software development. 5. Students will demonstrate ability to conduct a research or applied Computer Science project, requiring writing and presentation skills which exemplify scholarly style in computer science.

M.Sc.APPLIEDMICROBIOLOGY

CourseOutcomes	Aftercompletionofthesecoursesstudentsshouldbeable to
SEMESTER– I	
GENERAL MICROBIOLOGY	1. Learning the scientific methods and the history of science is the embodiment ofscientific knowledge. 2. As an introductory part of Microbiology, students will get the basic ideas and practices from the contribution of several Microbiologists in the field of microbiology. 3. They will have to know the diversity of microbial world like algae, fungi, protozoa and their general characteristics and importances. 4. They will be understood various laboratory practices, and biosafety techniques 5. They will have to know about applications of importantinstrumentslikebiological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter.
IMMUNOLOGY AND IMMUNOTECHNOLOGY	1. Demonstrable detailed knowledge and understandingofimmunologyandthewayitis

	appliedindiagnosticandtherapeutictechniquesand research. 2. Demonstrate knowledge and practical skills in undertakingsimple immunologicalexperimentsthat mimic those under taken in diagnostic laboratories and research laboratories. 3. Demonstrate literature review skillsin undertaking a large survey of a complex field with in immunology 4. Adhere to safe working practice in a mixed microbiology/immunology laboratory 5. Outline the regulation of immune response and disorders of the immune system
CELLANDMOLECULAR BIOLOGY	1. To studying this course students get benefited by knowing the structure and function of various cell organelles of the eukaryotic cells. 2. They will also get the thorough knowledge about cell cycle, cell signaling pathways. 3. They will be able to get the practical knowledge of cell division, polyploidy by studying differentstages of Mitosis and meiosis. 4. Compare the mechanisms involved in translation between prokaryotes and eukaryotes 5. Assess the concept of gene regulation inprokaryotes and eukaryotes
BASICS OF PHYTOCHEMISTRY	1. Explain basic metabolic pathways of plants and formation of different secondary metabolites through various biosynthetic pathways in plants 2. Describe utilization of radioactive isotopes in the investigation of biosynthetic pathways 3. Explain source, chemistry, therapeutic uses of various secondary metabolites containing drugs. 4. Describe methods of extraction, analysis and commercial application of various secondary metabolites containing drugs. 5. Describe methods for industrial production, estimation and utilization of some therapeutically important phytoconstituents

SEMESTER– II	
MEDICAL BACTERIOLOGY AND MYCOLOGY	1. This course provides learning opportunities in the basic principles of medical microbiology and infectious disease. 2. It covers mechanisms of infectious disease transmission,principlesofasepticpractice,andthe role of the human body's normal microflora. 3. The course provides the conceptual basis for understanding pathogenic microorganisms and the mechanisms by which they cause disease in the human body. 4. It also provides opportunities to develop informaticsand diagnostic skills, including the use and interpretation of laboratory tests in the diagnosis of infectious diseases. 5. To understand the importance of pathogenic bacteria in human disease with respect toinfectionsof therespiratory tract,gastrointestinal tract,urinarytract,skinandsoft tissue..
INDUSTRIAL AND PHARMACEUTICAL MICROBIOLOGY	1. Get equipped with a theoretical and practical understanding of industrial microbiology 2. Know how to source for microorganisms of industrial importance from the environment 3. Know about design of bioreactors, factorsaffecting growth and production, heat transfer, oxygen transfer 4. Understandtherationale inmediumformulation& design for microbial fermentation, sterilization of medium and air 5. Appreciate the different types of fermentation processes
GENETIC ENGINEERING AND ADVANCES IN BIOTECHNOLOGY	1. Explain the physiological processes that occur during plant growthand development Describethe methodology involved in plant tissue culture and plant transgenics 2. Discuss issues related to plant nutrition, quality improvement, environmental adaptation,transgenic crops and their use in agriculture 3. Elucidate the significance of transgenic plants as bioreactors for the production of enzymes, plantibodies, edible vaccines and therapeutic proteins 4. Understand,conductandgainathorough

	knowledge to perform plant tissue culture experiments Explain the basics of animal biotechnology 5. Elucidate the molecular techniquesinvolvedin gene manipulation and rDNA technology
BIO INSTRUMENTATION AND BIOLOGICAL TECHNIQUES	1. Discuss the applications of biophysics and principle involved in bioinstruments 2. Describe the methodology involved in biotechniques 3. Describetheapplicationsofbioinstruments 4. Demonstrate knowledge and practical skillsof using instruments in biologyand medical field 5. Performtechniques involved in molecular biology and diagnosis of diseases
SEMESTER– III	
MEDICAL VIROLOGY AND PARASITOLOGY	1. Students will be able to learn the nature, structure, generalpropertiesandtheir importanceofdifferent animal and plant viruses. 2. They will also know about Viral Transmission, Salient features of viral nucleic acids, Replication and also several disease caused by viruses and the way of preventation. 3. Identifythedifferenttypesofparasites 4. Classifyeachparasite 5. Describe the structureofeachparasite
Food, Dairy and EnvironmentalMicrobiology	1. By the study of food & diary microbiology the students are able to know the principles and methods of food preservation, production of different fermented foods, different food borne diseases: their causative agents, foods involved, symptoms and preventive measures. 2. They will have the know food sanitation and control. 3. The students will know about the culturaland rapid detection methods of food bornepathogens in foods and introduction to predictive microbiology. 4. Studentswillbeabletoknowaboutwater potability, microbial bioremediation, waste management,biogeochemicalcyclingand

	differentmicrobialinteractions. 5.Apply principles of various facets of foodfermentation technology .
NANOTECHNOLOGY	1. Students learn the main manufacturing methods of Microelectronics and Nanoelectronics. 2. They understand the methods of Optical Lithography, Electron Beam lithography and Nanoimprint Lithography. 3. They learn the successive steps in building important electronic devices such astransistors and solar cells. 4. They learn the steps for making high-frequency transistors by self-aligning method, high-performance semi-transparent silicon solar cells, micro-bridges, micro-motors and biosensors. 5. Understand the nanoparticles applications in various field
SOIL,AGRICULTURAL MICROBIOLOGY AND BIO DEGRADATION	1. Attainment of course objectives will mean realization of the various beneficial effects of soil microorganisms on soil health, 2. Students learn about that some soil microbes are deleterious to agronomic crops. 3. Students will learn that some soil animalsand what they eat are of ecological importance; thus, planteating insects and mollusksmay add organic matter to the soil; insects, arachnids, and worms that consume dung and plant litter mix it with soil and speed up its decay; and, plant parasitic nematodes reduce soil's productivity. 4. The knowledge acquired inSoil Microbiologywill enhance the students' competency in the performance of their duties as future employees in the field of Soil Microbiology 5. Students will learn that the soil is an excellent habitat formultitudeofmicroorganisms balancingthesoil ecosystem

SEMESTER– IV	
RESEARCH METHODOLOGY, BIO STATISTICS AND BIO INFORMATICS	1. To develop aptitude for formulating research problem and experimental planning. 2. Tolearnaboutdatacollectionandstatistical analysis. 3. Tobetrainedinstatisticalbasisofbiologicalassay. 4. Tointroducevariousbiologicaldatabases(Primary, secondaryandcompositedatabases),biological information system(SRS, ENTREZ). 5.UnderstandSequencesimilaritytools(FASTA ,BLAST).Sequence information sources of nucleotide (GenBank, EMBL, EBI, DBJ ,UCSC)andproteinsequenceinformationsources (PIR, ExPASY, UniProt KB, SwissProt and TrEMBL)and Phylogenetic analysis.
HUMANANATOMYAND PHYSIOLOG	1. Use anatomical terminology to identify anddescribe locations of major organs of each system covered.. 2. Explain interrelationships among molecular, cellular, tissue and organ functions in each system. 3. Describe the interdependency and interactionsof the systems. 4. Explain contributions of organs and systems to the maintenance of homeostasis, 5. Identify causes and effects of homeostatic imbalances. Describe modern technology and tools used tostudyanatomyandphysiology

MasterofComputerApplications

CourseOutcomesMCA **III – Semester**	
Course	**Outcomes**
17PCA11 JavaProgramming	1. Identify classes, objects, members of a class and relationships among them needed for a specific problem 2. Write Java application programs using OOP principles and proper program structuring 3. Demonstratethe conceptsofpolymorphismandinheritance 4. Write Java programs to implement error handling techniques using exception handling

	5.WriteJavaprogramstoimplementfilehandlingtechniques
17PCA12 Visual Programming	1. Design,create,build, anddebugVisualBasicapplications 2. Explore Visual Basic's Integrated Development Environment (IDE) Implement syntax rules in Visual Basic programs and explain variables and data types used in programdevelopment 3. Apply arithmetic operations for displaying numeric output and write and apply decision structures for determining different operations 4. Writeandapplyloopstructurestoperformrepetitivetasks 5. Writeandapplyprocedures,sub-procedures,andfunctions to createmanageablecode.
17PCA13 DiscreteStructures	1. Write an argument using logical notation and determine if the argument is or is not valid 2. Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described 3. Understand the basic principles ofsets and operations in set and to prove basic set equalities 4. Applycountingprinciplestodetermineprobabilities 5. Demonstrate an understanding of relations andfunctions and be able to determine their properties
17PCA14 OperatingSystems	1. UnderstandstructureofOS,processmanagementand synchronization 2. AnalyzeanddesignMemoryManagement 3. Interpretthemechanismsadoptedforfilesharingin distributed Applications 4. Conceptualize the components and can do Shell Programming 5. KnowBasicLinuxSystemAdministrationandKernel Administration
17PCAE01 (Elective – I) ComputerGraphics	1. Develop lineandcirclegenerationalgorithms 2. Apply2D and3D transformations 3. Developclippingalgorithms forpoint,lineandpolygons 4. Learntheconceptsofprojections 5. Tolearnmoreviewingandgraphicspipeline

17PCAP06 JavaProgramming Lab	1. Implement Object Oriented programming concept using basic syntaxes ofcontrolStructures, strings and function for developing skills of logic building activity 2. Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem 3. Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved 4. Demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development 5. Identify and describe common abstract user interface components todesign GUIin Java using Applet & AWT along with response to events
17PCAP07 Visual ProgrammingLab	1. Design, create, build, and debug Visual Basic applications and to apply arithmetic operations for displaying numeric output 2. Apply decision structures for determining different operations and Write and apply loop structures to perform repetitive tasks 3. Write and apply procedures, sub-procedures, and functions to create manageable code 4. Create one and two dimensional arrays for sorting, calculating, and displaying of data 5. WriteVisualBasicprogramsusingobject-oriented programming techniques and Write Windows applications using forms, controls, and events.
17PCAP08 Python ProgrammingLab	1. Implement Basic Python programs to solve simple problems. 2. Write,TestandDebugPythonProgramsandImplement Conditionals and Loops for Python Programs. 3. UsefunctionsandrepresentCompounddatausingLists, Tuples and Dictionaries. 4. Read and write data from & to files in Python and develop Application using Python. 5. Understandtheprocessofdesigningand implementing Web applications using Python.

CourseOutcomesMCA IV – Semester	
Course	**Outcomes**
17PCA15 Software Engineering	1. Learnthephasesofsoftwaredevelopment 2. Developprocess modelsandprocesssystemmodels 3. Gather,understand,analyzeandspecifyrequirements 4. Developarchitecturaldiagram, and implement byfollowing coding principles 5. Applytestingstrategiesandhandlesoftwareproduct maintenance issues
17PCA16 MobileComputing	1. Tofamiliarizethestudentswiththebuzzwordsand technology of mobile communication 2. UnderstandtheGSMarchitecture 3. Understandthe issuesrelatingtoWirelessapplications 4. Todevelopthedifferent applicationsthat mobilecomputing offers to people, employees, and businesses 5. To develop high levels oftechnical competence in the field of mobile technology.
17PCA17 DataMining Techniques	1. To introduce the fundamental concepts of data mining and Recognize various types of data mining tasks 2. Tointroducemathematicalandstatisticalmodelsusedin data Classification 3. Todefine,understandandinterpretassociationrules 4. Discussthecluseringalgorithmstosolvereal-world problems 5. Tocreatesampledata ofirisusingpreprocessingconcept using case study
17PBAED2(EDC – I) StressManagement	1. This course provides understanding stress such as work related stress and individual stress 2. This course serves time management such as importance of planning the day and developing concentration 3. This course serves career plateau such as Identifying Career plateaus andStructural andContentPlateauingandMaking a fresh start 4. Thiscourseprovidescontrollingcrisismanagement 5. Thiscourseprovidesselfdevelopment
17PCAE06 (Elective – II) SoftComputing	1. List the facts and outline the different process carried out in fuzzy logic, ANN and Genetic Algorithms 2. Explaintheconceptsandmeta-cognitiveofsoftcomputing 3. Apply Soft computing techniques the solve character recognition, pattern classification, regression and similar problems 4. Outlinefactstoidentifyprocess/procedurestohandlereal

	world problems using soft computing and Evaluate various techniques of soft computing to defend the best working solutions 5. Design hybrid system to revise the principles of soft computing in various applications.
17PCAP09 MobileApplication Development Lab	1. Demonstrate the android features and create, develop using android and Demonstrate and Understanding anatomy of an Android application. 2. Apply the android geo location based services and Illustrate the android wifi features and advance android development Demonstrate the Linux security and implement ADL interface. 3. ApplyessentialAndroidProgramming concepts. 4. Develop various Android applications related to layouts & rich uses interactive interfaces. 5. Develop Android applications related to mobile related server-less database like SQLITE.
17PCAP10 DataMiningLab	1. The data mining process and important issues around data cleaning, pre-processing and integration 2. The principle algorithms and techniques used indata mining,suchasclustering,associationmining,classification and prediction 3. Synthesize the data mining fundamental concepts and techniques from multiple perspectives 4. Develop skills and apply data mining tools for solving practical problems and Advance relevant programmingskills 5. Gain experience and develop research skills by reading the data mining literature
17PHR01 HumanRights	1. Apply effective written and oral communication skills to business and legal situations 2. Analyzethegloballegalenvironment 3. Students will graduate with the ability to analyze complex problems, find and deploy a varietyof legal authorities, and communicate effectively in a variety of settings 4. Usecriticalthinkingskillsinbusinesssituations 5. Apply an ethical understanding and perspective to business situations
CourseOutcomesMCA V – Semester	
17PCA18 BigDataAnalytics	1. Explainthe motivation for big datasystemsand identifythe main sources of Big Data in the real world 2. DemonstrateanabilitytouseframeworkslikeHadoop,

	NOSQL toefficiently store retrieve and process Big Data for Analytics 3. Implement several Data Intensive tasks using the Map Reduce Paradigm and Apply several newer algorithms for Clustering Classifying and finding associations in Big Data 4. Design algorithms to analyze Big data like streams, Web Graphs and Social Media data 5. Designand implement successful Recommendationengines for enterprises
17PCA19 .Net Programming	1. Understand the developmentand deploymentcycles of enterprise applications 2. Utilize the .NETframework tobuild distributed enterprise applications 3. DevelopASP.NETWebServices,securewebservices,and .NETremotingapplications 4. To develop web applications using a combination ofclient-side and server-side technologies 5. To understand and experimentwith the deploymentof enterprise applications
17PCA20 OpenSource Technologies	1. TolearnfundamentalsofWebconceptinPHP 2. Introductionthe creationofstatic webpage usingHTML 3. DescribetheimportanceofCSSinwebdevelopment 4. To learn the function of JavaScript as a dynamic webpage creatingtoolandto learnPHP asaserver sideProgramming language 5. To learn the principles behind using MySQL as a backend DBMS with PHP
17PCAE09 (Elective – III) ImageProcessing	1. Reviewthe fundamentalconceptsofadigitalimage processing system. 2. Analyze images in the frequencydomain using various transforms. 3. Evaluate the techniquesfor image enhancementandimage restoration and Categorize various compression techniques. 4. InterpretImagecompressionstandards. 5. Interpret imagesegmentationandrepresentationtechniques.
17PCAE14 (Elective – IV) InternetofThings	1. Apply theconceptsof IOTandIdentifythedifferent technology. 2. ApplyIOTtodifferentapplications. 3. AnalysisandevaluateprotocolsusedinIOT. 4. DesignanddevelopsmartcityinIOT. 5. Analysis and evaluate the data received through sensors in IOT.
	1.

17PCAP11 BigDataAnalytics Lab	2. Demonstrate capability to use Big Data Frameworks like HadoopandPrograma pplicationsusingtoolslike Hive,pig, NO SQL and MongoDB for Big data Applications 3. Construct scalable algorithms for large Datasets using Map Reduce techniques 4. Implement algorithms for Clustering, Classifying and finding associations in Big Data 5. Design and implement algorithms to analyze Big data like streams, Web Graphs and Social Media data and construct recommendation systems 6. Applythe knowledge ofBig Data gained to fully develop a BDA application for real life applications.
17PCAP12 .NetProgramming Lab	1. To utilizethe .NETframeworkto builddistributed enterprise applications 2. To develop web applications using a combination ofclient-side and server-side technologies 3. To understand and experimentwith the deploymentof enterprise applications 4. Todevelopclientandserversideprogrammingusing database connectives 5. ToconnectSQLbased on.Netprogramming
17PCAP13 Software DevelopmentLab	1. Identify anddefinetheproblem statementandDefineand justify scope of the proposed problem 2. Gatherandanalyzesystemrequirements 3. Proposeanoptimizedsolutionamongtheexistingsolutions 4. Practicesoftwareanalysisanddesigntechniques 5. Developtechnicalreportwritingandoralpresentationskills
CourseOutcomesMCA VI – Semester	
Course	**Outcomes**
17PCAPR1 ProjectWorkand Viva – voce	1. Identify,defineandjustifyscopeoftheproposedproblem 2. Gatherandanalyzesystemrequirements 3. Proposeanoptimizedsolutionamongtheexistingsolutions 4. Practicesoftwareanalysisanddesigntechniques 5. Develop a functional application based on the software design 6. Apply coding,debuggingandtestingtoolstoenhancethe quality of the software 7. Construct newsoftwaresystembasedonthetheoryand practice gained through this exercise 8. Preparetheproperdocumentationofsoftwareprojects following the standard guidelines 9. Learntechnicalreportandoralpresentationskills

M.ScMATHEMATICS– COURSEOUTCOME

SEMESTERI	
LINEARALGEBRA	CO-1Describetheconceptofabasisforavectorspace. CO-2 Represent linear transformations by matrices.. CO-3Describetheconceptsofeigenvalue, eigenvectorand characteristc polynomial. CO-4 Investigate properties ofvector spaces and subspaces using bylinear transformations. CO-5Determinewhetheralineartransformationisdiagonalizable or not.
REALANALYSIS	CO-1Describethefundamentalpropertiesof therealnumbers that underpin the formal development of realanalysis; CO-2 Demonstrate an understanding of the theory of sequences and series, continuity, differentiation and integration; CO-3 Demonstrate skillsin constructing rigorous mathematical arguments; CO-4 Apply the theory in the course to solve a variety of problems at an appropriate level of difficulty; CO-5Demonstrateskillsincommunicatingmathematics.
MECHANICS	CO-1Understand the formationofdifferentialequationwhich will help to studyth dynamics of mechanical system. CO-2StudytheLagrange'sandHamilton'sequations. CO-3Learnthe Hamilton-jacobiantheoryand seperability. CO-4Know the canonicaltransformation,lagrange and poisson brackets
ORDINARY DIFFERENTIAL EQUATIONS	CO-1Solvethedifferentialequationsbyusingvariousmethods. CO-2Annihilatormethodtosolvenonhomogeneous equations. CO-3Studythewronskianand linear independence,reductionof the order of homogeneous equation.

	CO-4UnderstandtheBessel,Legendreequationandtheir properties. CO-5Findthesolutionoffirstorderdifferentialequation.
-NUMERICAL ANALYSIS	CO-1learntheprinciplesfordesigningnumericalschemesfor differential equations. CO-2analyzetheconsistency,stabilityandconvergenceofa numerical scheme. CO-3makeaconnectionbetweenthemathematicalequationsor properties and the corresponding physical meanings. CO-4useaprogramming languageormathematicalsoftwareto implement and test the numerical schemes.
SEMESTERII	
ALGEBRA	CO-1FindthenumberofSylow subgroups. CO-2Findthenumberofnon-isomorphicabeliangroups. CO-3Findthesplitting field,Galoisgroupofthegiven polynomial. CO-4Checkwhetherthegivenpolynomialissolvableby radicals or not. CO-5UnderstandtheWedderburn'stheoremondivision rings.
FLUIDDYNAMICS :	CO-1Recognize and find the valuesoffluid propertiesand relationship between them and understand the principlesofcontinuity, momentum,andenergyasapplied to fluid motions. CO-2Identifytheseprincipleswritteninformof mathematical equations. CO-3Apply dimensional analysis to predict physical parametersthatinfluencetheflowinfluidmechanics. CO-4Analyzetheproblemsrelatedtoelementaryfluid

	dynamicsespeciallyforincompressibleflowsusing Bernoulli equation in particular CO-5Analyzedifferentfluidflowmodelsusingfinite controlvolume and differential analysis approaches.
COMPLEX ANALYSIS	CO-1Familiarwiththemodelingassumptionsand derivations that lead to Complex Analysis CO-2 Recognize the major classification of analytic functions,harmonicfunctions,conformalmappingandthe qualitative difference between the complex integration & Real integration CO-3 Express the Cauchy's Derivative formulasCO-4DefinetheconceptoftheResidueTheorem. CO-5 Demonstrate understanding and appreciation of deeperaspectsofcomplexanalysissuchastheRiemann Mapping theorem.
DISCRETE MATHEMATICS	CO-1expressalogicsentenceintermsofpredicates, quantifiers and logical connectives. CO-2applytherulesofinferenceand methodsofproof including direct and indirect proof forms, proof by contradiction and mathematical induction. CO-3solvemathematicsproblemsthatinvolvecomputing permutations and combinations of a set, fundamental enumeration principles. CO-4evaluateBooleanfunctionsandsimplifyexpressions using the properties of Boolean algebra.
EDC:STATISTICAL METHODS:	CO-1Applyvarioustypesofsampling methodstodatacollection. CO-2Create and interpret frequency tables. CO-3Displaydatagraphicallyandinterpretgraphs:stemplots, histograms, and box plots. CO-4calculatethemeasuresofthecenterofdata:mean,median,

	and mode. CO-5Recognize,describe,andcalculatethemeasuresofthe spread ofdata: variance, standard deviation, and range
SEMESTERIII	
PARTIAL DIFFERENTIAL EQUATIONS	CO-1Familiarwiththemodelingassumptionsand derivations that lead to PDE's. CO-2RecognizethemajorclassificationofPDEsandthe qualitative difference between the classes of equations. CO-3becompetent insolvinglinearPDEsusingclassical methods.
TOPOLOGY	CO-1UnderstandvariousconceptsofTopology. CO-2 Demonstrate anunderstanding ofthe conceptsof metric spaces and topological spaces, and their role in mathematics. CO-3DemonstrateanunderstandingoftheconceptsofHilbert spaces and Banach spaces, and their role in mathematics. CO-4 knowledge of basic topology to formulate and solve problemsofatopologicalnatureinmathematicsandotherfields where topological issues arise. CO-5Learnabouttheconnectedandcompactspace.
MEASURETHEORY ANDINTEGRATION	CO-1 Knowledge of measure and outer measure,generalizationofintegralswithhelpofmeasures. CO-2 Understandandanalyze outer measure and measurable se ts. CO-3UnderstandandanalyzeLebesguemeasreand measure space. CO-4AnalyseandapplytheRiemannintegral. CO-5Applythedifferentiationandintegration.
CALCULUS OF VARIATIONS	CO-1Knowdifferenttypesof variationalproblemsand finding their extremals.

ANDINTEGRAL EQUATIONS :	CO-2Knowdifferent typesofvariationalproblemswith moving boundaries. CO-3Findthesolution of Fredholm& Voiterraintegral equations through different methods CO-4AnalyseHilbertSchmidttheory.
SEMESTERIV	
FUNCTIONAL ANALYSIS :	CO-1Understandtherelationshipbetweenmetricspace, normed space, inner product space, CO-2understandpropertiesofcontinuouslinear functionals on Banach space. CO-3understandvarioustypesofoperatorsonHilbert space. CO-4knowRegularelements,singularelements,spectrum of Banach algebra &its ideals.
PROBABILITY THEORY	CO-1 Understand the axiomatic formulation of modernProbability Theory and think of random variables as an intrinsic need for the analysis of random phenomena. CO-2 Characterize probability models and function of random variables based on single & multiples random variables. CO-3Evaluateandapplymoments&characteristicfunctionsand understand the concept of inequalities and probabilistic limits. CO-4 Understand the concept ofrandomprocesses and determine covariance and spectral density of stationary random processes. CO-5 Demonstrate the specific applications to Poisson and Gaussian processes and representation of low pass and band pass noise models.

GRAPH HEORY	CO-1identifythegraphsofconnectivityandtree. CO-2 find the Independent set and cycle graph. CO-3understand graphcoloring. CO-4Understandtheplanerandnonplaner graph.
PROGRAMMING WITH C++	CO-1 Learnthe fundamentalprogramming concepts and methodologies which are essentialto building good C++ programs. CO-2Practicethefundamentalprogrammingmethodologiesin the C/C++ programming language via laboratoryexperience. CO-3Code,document,test,andimplementawell-structured,robust computer programusing the C++ programming language. CO-4Writereusablemodules(collectionsoffunctions). CO-5 Introduction to the use of the C++ programming language asanaidtosolvingmathematicalandscientificproblems.students design, write,and implement programs .
C++ PROGRAMMING LAB	CO-1Implementtheconceptsofobjectorientedprogramming and apply string functions to performoperator overloading. CO-2Demonstratevirtualfunctionsandinheritanceandalso implement files and command line arguments. CO-3Developsolutionsforarangeofproblemsusingobjectsand classes. CO-4Programsto demonstratethe implementationof constructors, destructors and operator overloading. CO-5Applyfundamentalalgorithmicproblemsincludingtype casting, inheritance and polymorphism.