ACE

EngineeringCollege

Ankushapur(V),Ghatkesar(M),R.R.Dist-501301

(AnAutonomous Institution)

B.TECH. REGULAR COURSE (I-IV) YEARS

DEPARTMENTOFCOMPUTERSCIENCE&ENGINEERING(IoT)

COURSESTRUCTURE

IYear			II Semester				
S.No	Course Type	Course Code	Course Title	PeriodsPerWeek			Credits
				L	T	P	
1	BSC	MA201BS	Mathematics-II	3	1	0	4
2	BSC	CH202BS	Engineering Chemistry	3	1	0	4
3	ESC	EE203ES	BasicElectricalEngineering	3	0	0	3
4	ESC	ME205ES	EngineeringWorkshop	1	0	3	2.5
5	HSMC	EN205HS	English	2	0	0	2
6	ESC	CH206BS	EngineeringChemistryLab	0	0	3	1.5
7	HSMC	EN207HS	English Language and CommunicationSkillsLab	0	0	2	1
8	ESC	EE208ES	BasicElectricalEngineering Lab	0	0	2	1
9	MC	MC209	Python Programming	1	0	2	0
10	MC	MC210	Aptitude&Reasoning	3	0	0	0
Total				16	2	12	19

MA201BS:MATHEMATICS–II

(ADVANCEDCALCULUS&ELEMENTARYCOMBINATORICS)

B.Tech.IYearIISemester								
Course Code	**Category**	**Hours/Week**			**Credits**	**MaximumMarks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
MA201BS	**BSC**	3	1	-	4	30	70	100
ContactClasses:45	**TutorialClasses: 15**	**PracticalClasses: Nil**				**Total Classes:60**		

Prerequisite: MathematicalKnowledgeof12th /Intermediate level

CourseObjectives: Tolearn

- Methodsofsolvingthedifferentialequationsoffirstandhigherorder.
- Evaluationofmultipleintegralsandtheirapplications
- Thephysicalquantities involvedinengineeringfieldrelatedtovector valuedfunctions
- Thebasicpropertiesofvectorvaluedfunctionsandtheirapplicationstoline,surfaceand volumeintegrals
- ConceptofRecurrenceRelations andgeneratingfunctions

CourseOutcomes: Afterlearning thecontentsofthispaperthestudent must beableto

- Identifywhetherthegivendifferentialequationoffirstorderisexactornot
- Solvehigherdifferentialequationandapplytheconcept ofdifferential equationtorealworldproblems
- Evaluatethemultipleintegralsandapplytheconcepttofindareas,volumes,centreofmassand Gravity for cubes, sphere and rectangularparallelopiped
- Evaluatetheline,surface and volumeintegralsandconvertingthemfromonetoanother
- Applytheconceptsof advancedcountingtechniques

Unit:I FirstOrderODE

Exact, linear and Bernoulli's equations; Applications : Newton's law of cooling, Law of natural growth and decay; Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

Unit:II OrdinaryDifferentialEquationsofHigherOrder

Secondorderlineardifferentialequationswithconstantcoefficients:Non-Homogeneoustermsofthetype ^{ax}, sinx, cosx,polynomials in x, ^{ax}(x) and x(x); method of variation of parameters; Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Eulerequation.

Unit:III MultivariableCalculus(Integration)

Evaluation of Double Integrals (Cartesian and polar coordinates); change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals.

Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals),Centre of mass and Gravity (constant and variable densities) by double and triple integrals (applications involving cubes, sphere and rectangular parallelopiped).

Unit:IV Vectorcalculus

Gradient, Divergence, Curl, Line integral, conservative fields, Green's theorem, surface area of solids of revolution,surfacearea,surfaceintegral,TripleintegralsandGaussDivergencetheorem,Stokes'theorem (without proofs)

Unit:V	Counting(RecurrenceRelations&ElementaryCombinatorics)

Basiccounting,PigeonholeprincipleandCombinations,BinomialCoefficients,Application of Recurrence Relations, Solution of Recurrence Relations, Generating functions, Inclusion – Exclusion and applications

TextBooks:

1. B.S.Grewal,HigherEngineeringMathematics, KhannaPublishers,36th Edition,2010
2. KennethH.Rosen,DiscreteMathematicsandItsApplications,McGrawHill.

ReferenceBooks:

1. S.L.Ross,DifferentialEquations,3rdEd.,WileyIndia,1984.
2. G.B.ThomasandR.L.Finney,CalculusandAnalyticgeometry,9thEdition,Pearson, Reprint,2002.
3. HigherEngineeringMathematicsbyBVRamana,TataMcGraw-Hill
4. DiscreteMathematicsforComputerScientistsandMathematiciansbyJoeR.Mott, AbrahamKandel, Theodore P. Baker, Prentice-Hall of India Pvt.Ltd.

Web References:

1) **SWAYAMOnlineCourses**https://storage.googleapis.com/uniquecourses/online.html
2) **DirectoryofOpenAccess Journals**https://doaj.org/
3) **SpringerOpen Journals**https://www.springeropen.com/journals
4) **UG/PGMOOCs**http://ugcmoocs.inflibnet.ac.in/ugcmoocs/moocs_courses.php

E-Text Books:

1) **NationalDigital Library:**https://ndl.iitkgp.ac.in/
2) **NCERTTextBooks**http://ncert.nic.in/textbook/textbook.htm
3) **DirectoryofOpenAccessBooks**https://www.doabooks.org/

CH202BS:ENGINEERINGCHEMISTRY

B.Tech.IYearIISemester								
CourseCode	**Category**	**Hours/Week**			**Credits**	**MaximumMarks**		
CH202BS	**BasicSciences**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	1	-	4	30	70	100
ContactClasses: 45	**TutorialClasses: 15**	**PracticalClasses: Nil**				**TotalClasses:60**		

Prerequisite: Nil

CourseObjectives:

- Tobringadaptabilitytotheconceptsofchemistryandtoacquiretherequiredskillsto become a perfect engineer.
- Toimpartthebasicknowledgeofatomic,molecularandelectronicmodificationswhich makesthe student to understand the technology based onthem.
- Toacquiretheknowledgeofelectrochemistry,corrosionandwater treatmentwhichare essentialfor the Engineers and inindustry.
- Toimparttheknowledgeofstereochemistryandsyntheticaspectsusefulforunderstanding reaction pathways.
- To acquire the knowledge of preparation, properties and applications of engineeringmaterials.

CourseOutcomes: Thebasicconceptsincludedinthiscoursewillhelpthestudenttogain:

- Theknowledgeofatomic,molecularandelectronicchanges,bandtheoryrelatedto conductivity.
- The required principles and concepts of electrochemistry, corrosion and in understanding theproblem of water and itstreatments.
- Theknowledgeofconfigurationalandconformationalanalysisofmoleculesandreaction mechanisms.
- Theknowledgeofpreparation,propertiesandapplicationsofengineeringmaterials.

Unit-1 MOLECULARSTRUCTUREANDTHEORIESOFBONDING

AtomicandMolecularorbitals,LinearCombinationofAtomicorbitals(LCAO),molecularorbitalsof diatomicmolecules,molecularorbitalenergyleveldiagramsofN_2,O_2andF_2molecules.Π-molecular orbitals of butadiene and benzene.
CrystalFieldTheory(CFT):SalientFeaturesofCFT–CrystalFieldSplittingoftransitionmetaliond-orbitalsinTetrahedral,Octahedralandsquareplanargeometries.Bandstructureofsolidsandeffectof doping on conductance.

Unit-2 WATERANDITSTREATMENT

Water and its treatment: Introduction – hardness of water – Causes of hardness - Types of hardness: temporary and permanent – expression and units of hardness – Estimation of hardness of water by complexometric method. Potable water and its specifications. Steps involved in treatment of water – Disinfection of water by chlorination and ozonization. Boiler feed water and its treatment – Calgon conditioning, Phosphate conditioning and Colloidal conditioning. External treatment of water – Ion exchange process. Desalination of water – Reverse osmosis.
Numericalproblems

Unit-3 ELECTROCHEMISTRYANDCORROSION

Electro Chemistry: Electro chemical cells–electrode potential, standard electrode potential, types of electrodes – calomel, Quinhydrone and glass electrode. Nernst equation Determination of pH of a solutionbyusingquinhydroneandglasselectrode.Electrochemicalseriesanditsapplications.Numerical problems.Potentiometrictitrations.Batteries–Primary(Lithiumcell)andsecondarybatteries(Lead–

acidstoragebattery andLithiumionbattery).

Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressedcurrent cathodicmethods.Surface coatings– metallic coatings– methodsofapplication.ElectrolessplatingofNickel.

Unit-4	STEREOCHEMISTRY,REACTIONMECHANISMANDSYNTHESISOF DRUGMOLECULES

Introductiontorepresentationof3-dimensionalstructures,Structuralandstereoisomers,configurations, symmetry and chirality. Enantiomers, diastereomers, optical activity and Absolute configuration. Conformation analysis ofn- butane. Substitution reactions: Nucleophilic substitution reactions: Mechanism of S_N1, $S_N2$reactions.

Electrophilic and nucleophilicaddition reactions:Addition ofHBrto propene.Markownikoffand Anti Markownikoff's additions. Grignard additions on carbonyl compounds. Elimination reactions: Dehydrohalogenationofalkylhalides.Saytzeffrule.OxidationReactions:Oxidationofalcoholsusing $KMnO_4$andchromicacid.Reductionreactions:ReductionofcarbonylcompoundsusingLiAlH_4,NaBH_4.Hydroborationof olefins. Structure, synthesis and pharmaceutical applications of Paracetamol and Aspirin.

Unit-5	MATERIALSCIENCE(POLYMERS,COMPOSITEMATERIALSCERAMICS AND COMPOSITE MATERIALS) & SPECTROSCOPY

POLYMERS: Introduction, classification, Types of polymerization, Thermoplastics and thermosetting polymers, synthesis and applications of poly vinyl chloride, Bakelite, nylon 6,6

COMPOSITE MATERIALS: Composites - Constitution, classification, Particle reinforced composites, Fiber-reinforced composites, Metal-matrix composites, Carbon-carbon composites Structural composites, Advantages and applications.

CERAMICS: Different types of ceramic crystal structures, Clay products, Advanced ceramics, Ceramic ball bearings, Cements.

SPECTROSCOPY: Introductiontospectroscopy,IRspectraanditsapplications

TextBooks:

1. ATEXTBOOKOFENGINEERINGCHEMISTRYBYDRS.SDHARA& DR.K.MUKKANTI.(S.ChandPublications)
2. ATEXTBOOKOFENGINEERINGCHEMISTRYBYDRBHARATHIKUMARI YALAMANCHALI.(VGSTechnoSeries)

ReferenceBooks:

1. PhysicalChemistry,byP.W.Atkins
2. OrganicChemistry:StructureandFunctionbyK.P.C.VolhardtandN.E.Schore,5th Edition.
3. UniversityChemistry,byB.M.Mahan,PearsonIVEdition.

WebReferences:

1. EngineeringChemistry(NPTELWeb-book),byB.L.Tembe,KamaluddinandM.S.Krishnan.
2. EngineeringChemistrybyP.C.Jain&M.Jain;DhanpatRaiPublishingCompany(P)Ltd.,NewDelhi.

E-TextBooks:

1.[ebook]CentrallibraryIITIndore(www.library.iiti.ac.in)
2.[ebook]ChemistrybyRoyalSocietyofChemistry(https://www.rsc.org>ebooks)

EE203ES:BASICELECTRICALENGINEERING

B.Tech.IYearII Semester

Course Code	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
EE203ES	ESC	3	0	0	3	30	70	100

ContentClasses: 45	TutorialClasses: Nil	PracticalClasses: Nil	Total Classes:45

Prerequisite: FundamentalsofPhysics

CourseObjectives:

1. Tointroducetheconceptsofelectricalcircuitsanditscomponents
2. TounderstandACsinglephasecircuitsandconceptofpowerfactor.
3. TorealizetheoperationofTransformers.
4. TorecognizetheworkingofthreephaseInductionMotor.

CourseOutcomes:

Studentsare able

1. Toresolveelectricalcircuitsusingnetworklawsandtheorems.
2. ToableoperateresonanceinseriesRLCcircuits.
3. ToidentifylossesandcalculatetheefficiencyofTransformer.
4. TorealizeTorque-SpeedCharacteristicsofThreephaseInductionMotor.
5. ToanalyzeimportanceofEarthingandEnergyConsumption.

UNIT:I D.C.Circuits

Electrical circuit elements (R, L and C), voltage and current sources, KVL & KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Star-Delta Transformations.

UNIT:II A.C.Circuits

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance in series RL-C circuit. Three-phase balanced circuits, voltage and current relations in star and delta connections. (Elementary Treatment Only)

UNIT:III Transformers

Idealandpracticaltransformer,equivalentcircuit,lossesintransformers,regulationandefficiency.Auto-transformer and three-phase transformer connections. (Elementary Treatment Only)

UNIT:IV ElectricalMachines

D.C.Machines:Construction,PrincipleandTypesofD.CMachines.Speedcontrolofseparatelyexciteddcmotor.

Induction Motors: Generation of rotating magnetic fields, Construction and working ofa three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic

SynchronousGenerators:Constructionandworkingofsynchronousgenerators.(ElementaryTreatmentOnly)

UNIT:V ElectricalInstallations

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wiresand Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup. (Elementary Treatment Only)

TextBooks:

1. D.PKothariandI.JNagrath,BasicElectricalEngineering3rdEdition,TataMcGrawHill EducationPrivate Limitted,2009.
2. SahdevS.K,BasicElectricalEngineeringPearsonIndiaEducationServicePvt.Ltd,2015

ReferenceBooks:

1.D.P.Kothari&I.J.NagrathTheoryandProblemsofBasicElectricalEngineeringbyPHI.2009.

2. V.KMehta,PrinciplesofElectricalEngineering,S.ChandPublications.2008.

3. C.L.Wadhwa,BasicElectricalEngineering,NewAgeInternationalPvtLtdPublishers,2007

4. Abhijit Chakrabarti, Sudipta Debnath, Soumitra Kumar Mandal, Basic Electrical and Electronics Engineering-II, 2016

Web Reference:

1. https://swayam.gov.in/fundamentalsofelectricalengineering.
2. .https://www.sciencedirect.com/book/9780750646376/electrical-engineers-reference-book
3. https://www.pdfdrive.com/basic-electrical-engineering-books.html

ME205ES:ENGINEERINGWORKSHOP

B.Tech.IYearIISemester

CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
ME205ES	ESC	1	0	3	2.5	30	70	100
Contact Classes:15	TutorialClasses:0	PracticalClasses:45				TotalClasses:60		

Prerequisite: PracticalSkill

CourseObjectives:

- Tostudyofdifferenthandoperatedpowertools,usesandtheirdemonstration.
- Togainagoodbasicworkingknowledgerequiredfortheproduction ofvarious engineeringproducts.
- Toprovidehandsonexperienceaboutuseofdifferentengineeringmaterials, tools, equipment's and processes those are common in the engineeringfield.
- Todeveloparightattitude,teamworking,precisionandsafetyatworkplace.
- Itexplainstheconstruction,function,useandapplicationofdifferent workingtools, equipment and machines.
- Tostudycommonlyusedcarpentryjoints.
- Tohavepracticalexposuretovariousweldingandjoiningprocesses.
- Identifyandusemarkingouttools,handtools,measuringequipmentandto work to prescribedtolerances.

CourseOutcomes: Attheendofthecourse,thestudentwillbeableto:

- Studyandpracticeonmachinetoolsandtheiroperations
- Practiceonmanufacturingofcomponentsusingworkshoptradesincludingpluming,fitting, carpentry, foundry, house wiring andwelding.
- Identify and apply suitable tools for different trades of Engineeringprocessesincludingdrilling,materialremoving, measuring,chiseling.
- Applybasicelectricalengineeringknowledgeforhousewiringpractice.

1. TRADESFOREXERCISES:

Atleasttwoexercisesfromeachtrade:

1. Carpentry–(T-LapJoint,DovetailJoint,Mortise&TenonJoint)
2. Fitting–(V-Fit,DovetailFit&Semi-circularfit)
3. Tin-Smithy–(SquareTin,RectangularTray&ConicalFunnel)
4. Foundry–(PreparationofGreenSandMouldusingSinglePieceandSplitPattern)
5. WeldingPractice–(ArcWelding&GasWelding)
6. House-wiring–(Parallel&Series,Two-waySwitchandTubeLight)
7. BlackSmithy–(RoundtoSquare,FanHookandS-Hook)

2.TRADESFORDEMONSTRATION&EXPOSURE:

Plumbing,MachineShop,MetalCutting(WaterPlasma),PowertoolsinconstructionandWoodWorking

Text Books:

1. WorkshopPractice/B.L.Juneja/Cengage
2. WorkshopManual/K.Venugopal/Anuradha.

ReferenceBooks:1. WorkshopManual-P.Kannaiah/K.L.Narayana/SciTech

1. WorkshopManual/VenkatReddy/BSP

EN205HS:ENGLISH

B.Tech.IYearIISemester

CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
EN205HS	HSMC	2	0	0	2	30	70	100
ContactClasses:32	**TutorialClasses:-**	PracticalClasses:Nil				TotalClasses:32		

Prerequisite: KnowledgeoffunctionalEnglish,basicsingrammar,understandingofLSRWskills

CourseOverview:

In view of the growing importance of English as a tool for global communication and the consequent emphasisontrainingstudentstoacquirelanguageskills, thesyllabusofEnglish hasbeendesigned to developlinguistic,communicativeandcriticalthinkingcompetenciesofEngineeringstudents.

InEnglishclasses, the focusshouldbeontheskillsdevelopmentintheareasof vocabulary,grammar, reading and writing. For this, the teachers should use the prescribed text for detailed study. The students should be encouraged to read the texts leading to reading comprehension and different passages may be given for practice in the class. The time should be utilized for working out the exercises given after each excerpt, and also for supplementing the exercises with authentic materials of a similar kind, for example, newspaper articles, advertisements, promotional material etc. The focusinthissyllabusis onskilldevelopment,fosteringideasandpracticeoflanguageskillsin various contexts and cultures.

CourseObjectives:

Thecoursewillhelp to

- ImprovethelanguageproficiencyofstudentsinEnglishwithanemphasisonVocabulary, Grammar, Reading and Writing skills.
- Equipstudentstostudyacademicsubjectsmoreeffectivelyandcriticallyusingthetheoretical and practical components of English syllabus.
- Developstudyskillsandcommunicationskillsinformalandinformalsituations.

CourseOutcomes:

Studentsshouldbeableto

- UseEnglishLanguageeffectivelyinspokenandwrittenforms.
- Comprehendthegiventextsandrespondappropriately.
- Communicateconfidentlyinvariouscontextsanddifferentcultures.
- AcquirebasicproficiencyinEnglishincludingreadingand listeningcomprehension,writing and speaking skills

UNIT:I **TheRamanEffect**

VocabularyBuilding:TheConceptofWordFormation--TheUseofPrefixesandSuffixes.

Grammar:IdentifyingCommonErrorsinWritingwithReferencetoArticlesand Parts of Speech

Reading:ReadingandItsImportance-TechniquesforEffectiveReading.

Basic Writing Skills: Sentence Structures -Use of Phrases and Clauses in Sentences- Importance of Proper Punctuation- Techniques for writing precisely – Paragraph writing – Types,StructuresandFeaturesofaParagraph-CreatingCoherence-OrganizingPrinciplesof Paragraphs in Documents.

UNIT:II **AncientArchitectureinIndia**

Vocabulary:SynonymsandAntonyms.

Grammar:IdentifyingCommonErrorsinWritingwithReferencetoNoun-pronoun Agreement and Subject-verb Agreement.

Reading:ImprovingComprehensionSkills–TechniquesforGoodComprehension

Writing:FormatofaFormalLetter-WritingFormalLettersE.g..,LetterofComplaint,Letterof Requisition, Job Application with Resume.

UNIT:III	BlueJeans

Vocabulary:AcquaintancewithPrefixesandSuffixesfromForeignLanguagesinEnglishtoform Derivatives-Words from Foreign Languages and their Use in English.
Grammar:IdentifyingCommonErrorsinWritingwithReferencetoMisplacedModifiersandTenses.
Reading:Sub-skillsofReading-SkimmingandScanning
Writing:NatureandStyleofSensibleWriting-Defining-DescribingObjects,PlacesandEvents–Classifying-ProvidingExamplesorEvidence

UNIT:IV	WhatShouldYouBeEating

Vocabulary:StandardAbbreviationsinEnglish
Grammar:RedundanciesandClichésinOralandWrittenCommunication.
Reading:Comprehension-IntensiveReadingandExtensiveReading
Writing:WritingPractices--WritingIntroductionandConclusion-EssayWriting-PrécisWriting

UNIT:V	HowaChineseBillionaireBuiltHerFortune

Vocabulary:TechnicalVocabularyandtheirusage
Grammar:CommonErrorsinEnglish
Reading:ReadingComprehension-ExercisesforPractice
Writing:TechnicalReports-Introduction–CharacteristicsofaReport–CategoriesofReports Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

TextBook:

1.Sudarshana,N.P.andSavitha,C.(2018).EnglishforEngineers.CambridgeUniversityPress.

ReferenceBooks:

Swan,M.(2016).PracticalEnglishUsage.OxfordUniversityPress.
2. Kumar,SandLata,P.(2018).CommunicationSkills.OxfordUniversityPress.
3. Wood,F.T.(2007).RemedialEnglishGrammar.Macmillan.
4. Zinsser,William.(2001).OnWritingWell.HarperResourceBook.
5. Hamp-Lyons,L.(2006).StudyWriting.CambridgeUniversityPress.
6. ExercisesinSpokenEnglish.PartsI–III.CIEFL,Hyderabad.OxfordUniversityPress.

WebReferences:

1. **www.cambridgeenglishonline.org**
2. www.eslcafe.com
3. **bbc.co.uk/worldservice/learningenglish**

E-TextBooks:

1.Thesecrettoperfectingyourgrammar-BloomsburyInternational

CH206BS:ENGINEERINGCHEMISTRYLAB

B.Tech.IYearIISemester

Course Code	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
CH206BS	BASIC SCIENCE	-	-	3	1.5	30	70	100
ContactClasses:Nil	**TutorialClasses:Nil**	**PracticalClasses:45**				**Total Classes:45**		

Prerequisite: Nil

CourseObjectives: Thecourseconsistsofexperimentsrelatedtotheprinciplesofchemistryrequiredfor engineering student. The student will learn:

- Estimationofhardnessandchloridecontentinwatertocheckitssuitabilityfordrinking purpose.
- Todeterminetherateconstant ofreactionsfromconcentrations asanfunctionoftime.
- Themeasurementofphysical propertieslikeadsorption andviscosity.
- Tosynthesizethedrugmoleculesandcheckthepurityoforganicmoleculesbythinlayer chromatographic (TLC) technique.

ListofExperiments:

1. Determinationoftotalhardnessofwaterbycomplexometricmethodusing EDTA
2. Determinationofchloridecontentofwaterby Argentometry
3. EstimationofanHClbyConductometrictitrations
4. EstimationofAceticacidbyConductometrictitrations
5. EstimationofHClbyPotentiometrictitrations
6. Estimation of Fe^{2+} by Potentiometry using $KMnO_4$
7. SynthesisofAspirinand Paracetamol
8. Determinationofacidvalueofcoconutoil
9. Verificationoffreundlichadsorptionisotherm-adsorptionofaceticacidoncharcoal
10. Determinationofviscosityofgroundnutoilbyusing Ostwald'sviscometer.
11. Determinationofpartitioncoefficientofaceticacidbetweenn-butanolandwater.
12. Determinationofsurfacetensionofagiveliquidusingstalagmometer.
13. Thinlayerchromatographycalculationof R_f values.egorthoandparanitrophenols.
14. Determination of rate constant of acid catalysed hydrolysis of methylacetate

ListofEquipment/Software(withSpecifications orRange)Required:

1. CONDUCTIVITYMETER
2. POTENTIOMETER.
3. WATERDISTILLATIONSET
4. WATER BATH
5. TLCCHAMBER
6. UVCHAMBER
7. SHAKER BATH

EN207HS/EN107HS:ENGLISHLANGUAGEANDCOMMUNICATIONSKILLSLAB

B.TECHI YEARII SEMESTER								
COURSECODE	**CATEGORY**	**HOURS/WEEK**			**CREDITS**	**MAXIMUM MARKS**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**TOTAL**
EN207HS/EN107HS	**HSMC**	**0**	**0**	**2**	**1**	**30**	**70**	**100**
CONTACT CLASSES:NIL	**TUTORIAL CLASSES:Nil**	**PRACTICALCLASSES:32**				**TOTALCLASSES:32**		

PREREQUISITES: Knowledgeoffunctional English,basicsingrammar,understandingofLSRW skills

CourseObjectives:

- Tofacilitatecomputer-assistedmulti-mediainstructionenablingindividualizedand independent language learning
- TosensitizestudentstothenuancesofEnglishspeechsounds,wordaccent,intonationand rhythm
- Tobringaboutaconsistentaccentandintelligibilityinstudents'pronunciationofEnglishby providing an opportunity for practice in speaking
- Toimprovethefluencyofstudentsinspoken Englishandneutralizetheirmothertongue influence
- Totrainstudentstouselanguageappropriatelyforpublicspeakingandinterviews

COURSE OUTCOME:

Studentswillbeabletoattain

BetterunderstandingofnuancesofEnglishlanguagethroughaudio-visualexperienceandgroup activities

- Neutralizationofaccentforintelligibility
- Speakingskillswithclarityandconfidencewhichinturnenhancestheiremployabilityskills

SYLLABUS

EnglishLanguageandCommunicationSkillsLab(ELCS)shallhavetwoparts:

a. ComputerAssistedLanguageLearning(CALL)Lab

b. InteractiveCommunicationSkills(ICS)Lab

ListeningSkills

Objectives

1. Toenablestudentsdeveloptheirlisteningskillssothattheymay appreciateitsrolein the LSRW skills approach to language and improve their pronunciation

2. Toequipstudentswithnecessarytraininginlisteningsothattheycancomprehendthe speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language, to be able to recognizethemandfindthedistinctionbetweendifferentsounds,tobeabletomarkstressand recognize and use the right intonation in sentences.

• Listeningforgeneralcontent
• Listeningtofillupinformation
• Intensivelistening
• Listeningforspecificinformation

SpeakingSkills

Objectives

1. Toinvolvestudentsinspeakingactivitiesinvariouscontexts

2. Toenablestudentsexpressthemselvesfluentlyandappropriatelyinsocialand professional contexts

• Oralpractice:JustAMinute(JAM)Sessions
• Describingobjects/situations/people

- Roleplay–Individual/Groupactivities

Module:I	Exercise-I	

CALLLab:
Understand:ListeningSkill-Itsimportance–Purpose-Process-Types-BarriersofListening.
Practice: Introduction to Phonetics – Speech Sounds – Vowels and Consonants.
ICSLab:
Understand:CommunicationatWorkPlace-Spokenvs.Writtenlanguage.
Practice:Ice-BreakingActivityandJAMSession-SituationalDialogues–Greetings–TakingLeave–IntroducingOneselfandOthers.

Module:II	Exercise-II	

CALLLab:
Understand:StructureofSyllables–WordStressandRhythm–WeakFormsandStrongFormsin Context.
Practice:BasicRulesofWordAccent-StressShift-WeakFormsandStrongFormsinContext.
ICSLab:
Understand:FeaturesofGoodConversation–Non-verbalCommunication.
Practice:SituationalDialogues–Role-Play-ExpressionsinVariousSituations–Making Requests and Seeking Permissions - Telephone Etiquette.

Module:III	Exercise-III	

CALLLab:
Understand:Intonation-ErrorsinPronunciation-theInterferenceofMotherTongue(MTI).
Practice: Common Indian Variants in Pronunciation – Differences in British and American Pronunciation.
ICSLab:
Understand:HowtomakeFormalPresentations. Practice:
Formal Presentations.

Module:IV	Exercise-IV	

CALLLab:
Understand:ListeningforGeneralDetails.
Practice: Listening Comprehension Tests.
ICS Lab:
Understand:PublicSpeaking–ExposuretoStructuredTalks.
Practice:MakingaShortSpeech– Extempore.

Module:V	Exercise-V	

CALLLab:
Understand:ListeningforSpecificDetails.
Practice: Listening Comprehension Tests.
ICS Lab:
Understand:InterviewSkills.
Practice:MockInterviews.

ReferenceBooks:

1. Swan,M.(2016).PracticalEnglishUsage.OxfordUniversityPress.
2. Kumar,SandLata,P.(2018).CommunicationSkills.OxfordUniversityPress.
3. Wood,F.T.(2007).RemedialEnglishGrammar.Macmillan.
4. Zinsser,William.(2001).OnWritingWell.HarperResourceBook.
5. Hamp-Lyons,L.(2006).StudyWriting.CambridgeUniversityPress.
6. ExercisesinSpokenEnglish.PartsI–III.CIEFL,Hyderabad.OxfordUniversityPress.

WebReferences:

6. **elt.oup.com/learningresources**
7. **www.cambridgeenglishonline.org**
8. www.eslcafe.com
9. **bbc.co.uk/worldservice/learningenglish**
10. **www.manythings.org**

E-TextBooks:

2.Thesecrettoperfectingyourgrammar-Bloomsbury International

EE203ES:BASICELECTRICALENGINEERINGLAB

B.Tech.IYearIISemester

Course Code	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
EE203ES	ESC	0	0	2	1	30	70	100
ContactClasses:Nil	TutorialClasses:Nil	PracticalClasses:45				Total Classes:45		

Prerequisite:BASICELECTRICALENGINEERING

CourseObjectives:

1. Tointroducetheconceptsofelectricalcircuitsanditscomponents
2. TounderstandACsinglephasecircuitsandconceptofpowerfactor.
3. TorealizetheoperationofTransformers.
4. TorecognizetheworkingofthreephaseInductionMotor.

CourseOutcomes:

1. Toresolveelectricalcircuitsusingnetworklawsandtheorems.
2. ToableoperateresonanceinseriesRLC circuits.
3. Toidentifylossesandcalculatetheefficiencyof Transformer.
4. TorealizeTorque-SpeedCharacteristicsofThreephaseInductionMotor.
5. ToanalyzeimportanceofEarthingandEnergyConsumption.

List ofExperiments:

1. VerificationofOhmsLaw
2. VerificationofKVLandKCL
3. ResonanceinseriesRLC circuit
4. CalculationsandVerificationofImpedanceandCurrent ofRL,RCandRLCseriescircuits
5. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single Phase Transformer
6. LoadTestonSinglePhaseTransformertoCalculateEfficiency
7. LoadTestonSinglePhaseTransformertocalculateRegulation
8. MeasurementofActiveandReactivePowerinabalancedThree-phasecircuit
9. PerformanceCharacteristicsofaDCMotors
10. Torque-SpeedCharacteristics ofaDCMotors
11. PerformanceCharacteristicsofaThree-phaseInductionMotor
12. Torque-SpeedCharacteristics ofaThree-phaseInductionMotor

ListofEquipment/Software(withSpecificationsorRange)Required:

1. OhmsLawkit
2. KVLandKCL kit
3. ResonanceinseriesRLCcircuit kit
4. CalculationsandVerificationofImpedanceandCurrentofRL,RCandRLCseriescircuits panel
5. MeasurementofVoltage,CurrentandRealPowerinprimaryandSecondaryCircuitsofaSinglePhase Transformer panel
6. LoadTestonSinglePhaseTransformer(CalculateEfficiencyandRegulation)panel
7. ThreePhaseTransformer:VerificationofRelationshipbetweenVoltagesandCurrents(Star-Delta,Delta-Delta, Delta-star, Star-Star) panel
8. MeasurementofActiveandReactivePowerinabalancedThree-phasecircuitpanel
9. PerformanceCharacteristicsofaSeparately/SelfExcitedDCShunt/CompoundMotorpanel
10. Torque-SpeedCharacteristicsofaSeparately/SelfExcitedDCShunt/CompoundMotorpanel
11. PerformanceCharacteristicsofaThree-phaseInductionMotorpanel
12. Torque-SpeedCharacteristicsofa Three-phaseInductionMotorpanel
13. No-LoadCharacteristicsofaThree-phaseAlternatorpanel

MC209:PYTHONPROGRAMMING

B.TECHIYEARII SEMESTER								
COURSECODE	**CATEGORY**	**HOURS/WEEK**			**CREDITS**	**MAXIMUM MARKS**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**TOTAL**
MC209	**MC**	**2**	**0**	**1**	**0**	**30**	**70**	**100**
CONTACTCLASSES:30	**TUTORIAL CLASSES:Nil**	**PRACTICALCLASSES:15**				**TOTALCLASSES:45**		

PREREQUISITES: Acourseon"PythonProgramming".s

COURSEOBJECTIVE:

Attheendofthecoursestudents shouldbeableto:

1. Tolearnhowtouselists,tuples,anddictionariesinPython programs.
2. Tolearnhowtowriteloopsanddecision statementsin Python.
3. Tolearnhowtoreadandwritefilesin Python.
4. TolearnhowtouseexceptionhandlinginPythonapplicationsforerror handling.

COURSE OUTCOME:

Attheend ofthecoursestudentswillbeableto:

1. ExplainbasicprinciplesofPythonprogramminglanguage.
2. Create,run andmanipulatePython Programs usingcoredatastructures likeLists,Tuple,Set and
3. Dictionaries.
4. UnderstandandsummarizedifferentFilehandlingoperations.
5. Handleexceptions inprogramming.

Unit-1

Algorithms, building blocks of algorithms (statements, state, control flow), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies fordeveloping algorithms. Python Basics, Features of Python, Python Applications, Installing and running Python with Different IDEs,CommentsinPython,MemoryManagementinPython,GarbageCollectioninPython,PythonI/O: Printing to the Screen, Reading Keyboard Input.

Unit-2

Operators in Python: Arithmetic, Relational and Comparison Operators, Python Assignment Operators, LogicalOperatorsandBitwiseOperators,MembershipOperators,IdentityOperators,OperatorPrecedence and Associativity, Evaluating Expressions. Control Statements: A Word on Indentation, The if Statement, The if … else Statement, The if … elif … else Statement, The while Loop, The for Loop, Infinite Loops, Nested Loops, Loopmanipulation using pass, continue, break and else Statement.

Unit-3

Variables and Data Types in Python**:** How Python Sees Variables, Constants, Identifiers and Reserved words in Python, Naming Conventions in Python. Declaring and using Numeric data types: int, float, complexandboolean,Sequences:UsingStringdatatype,ListsandTuples,MethodsandUsefulBuilt-in Functions, Dictionaries and Set Types

Unit-4

Python Programming using functions, modules and packages: Organizing python codes using functions, FormalandActualArguments,PositionalArguments,KeywordArguments,DefaultArguments,Variable Length Arguments, Pass by Object Reference, Local and Global Variables, Scope and Lifetime of variables, Nested Functions, Recursive Functions, Powerful Lamda function.

Unit-5

PythonFileInput-Output:Openingandclosingfile,Varioustypesoffilemodes,readingandwritingto files. PythonExceptionHandling:Avoidingcodebreak usingexceptionhandling,Variouskeywordstohandle

exception,try..except.. else…finally,RaisingExceptions,Assertions, PythonCustom

TEXTBOOKS:

1. LearningwithPython3:HowtoThinkLikeaComputerScientist,3rdEdition–PeterWentworth, Jeffrey Elkner, Allen B. Downey and Chris Meyers
2. AllenB.Downey,``ThinkPython:HowtoThinkLikeaComputerScientist‘‘,Shroff/O‘Reilly Publishers.

REFERENCEBOOKS:

1. IntroductiontoPythonforComputationalScienceandEngineering(Abeginner's guide),HansFangohr.
2. ExploringPython,TimothyA.Budd,McGrawHill Education
3. JohnVGuttag,—IntroductiontoComputationandProgrammingUsingPython‘‘,Revisedandexpanded Edition, MIT Press
4. PYTHONPROGRAMMING,AshokKamthaneandAmitAshokkamthane

E TEXT BOOKS:

1. https://www.davekuhlman.org/python_book_01.pdf
2. https://www.pdfdrive.com/python-programming-for-the-absolute-beginner-d34494394.html
3. http://index-of.es/Python/Exploring%20Python.pdf

MC210:APTITUDEANDREASONING

B.Tech.IYearIISemester

Course Code	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
MC210	MC	3	-	-	0	30	70	100
ContactClasses:45	TutorialClasses:Nil	PracticalClasses: Nil				Total Classes:45		

Prerequisite: Nil

CourseObjectives:

This is a foundation course and aims at enhancing employability skills in students. Students will be introduced to higher order thinking skills and problem solving on the following areas - Arithmetic ability, Numerical ability and General reasoning. Students will be trained to work systematically with speed and accuracy while problem solving.

Themajorareascoveredinthiscourseinclude

1. ArithmeticAbility
2. NumericalAbility
3. QuantitativeAptitude
4. VerbalReasoning
5. Logicalreasoning
6. VisualReasoning

CourseOutcomes: Upon thecompletion ofthecourse,studentsareexpectedto

1. Solvequestionson theabovementionedareasusing shortcuts andsmartmethods
2. UnderstandthefundamentalsconceptsofAptitudeskills
3. PerformcalculationswithSpeed&Accuracy
4. ToimproveLogicalthinking.
5. ToimproveApplication Knowledge

Unit-1 ARITHMETICABILITYFOUNDATION

ARITHMETIC ABILITY FOUNDATION: Square root, Cube roots, Speed Maths using Vedic Maths, Surds & Indices, Logarithms

NumberSystems-Typesofnumbers,Divisibilitytests,LCMandHCF,Unitdigit,Numberofzeroes, Factorial, No. of factors, Remainder concepts, Successive Divisors

Unit-2 COMMERCIALARITHMETIC&ARITHMETICABILITYADVANCED

COMMERCIAL ARITHMETIC:Percentages, ProfitandLoss,Discount,SimpleInterest &Compound Interest

ARITHMETIC ABILITY ADVANCED: Time, Speed & Distance- Basics, Average Speed, Problemson Trains, Relative Speed, Boats & Streams, Races & Games, Circular Motion

Timeandwork,Work&Wages,Chain Rule,Pipesand Cisterns

Unit-3 BIODIVERSITYANDBIOTIC RESOURCES

ALGEBRA:LinearEquations,QuadraticEquationsandIn-equations,Averages,Ratio,Proportion& Variations, Ages, Partnership

LOGICALREASONING: Statements&Conclusions,Statements&CourseofActions,Statements& Assumptions, Cause & Effect, Coded Inequalities, Syllogism, Input Output

Unit-4 MODERNAPTITUDE

MODERNAPTITUDE -I:Permutations&Combinations,CircularPermutation,Probability,Areaand Volumes.

MODERNAPTITUDE -II:DataSufficiency,Data Interpretation –Line graph,PieCharts,Bar graph

Unit-5 VERBALREASONING&VISUALREASONING

VERBALREASONING:Bloodrelations,Directions,Coding&Decoding,NumberRanking,Venn Diagrams, Alphanumeric Symbol Test, Mathematical operations.

Series,Analogy,Classification,AnalyticalReasoning-InformationOrdering –Arrangements

VISUALREASONING: Series,Analogy,Classification, Mirror&WaterImages,Spottingoutthe