FACULTYOFENGINEERING
SchemeofInstruction&Examination
&
Syllabi

B.E. I Semester

Of

FourYearDegree Programme
In

Computer Science Engineering
Information Technology
Mechanical Engineering
Automobile Engineering
(Group-A)

(With effect from the Academic Year2018 – 2019)
(As approved in the Faculty Meeting held on 26th June 2018)

Issuedby
Dean,FacultyofEngineering
OsmaniaUniversity,Hyderabad
2018

SCHEMEOFINSTRUCTION& EXAMINATION
B.E. I-Semester

S. No.	CourseCode	CourseTitle	Scheme of Instructions				Scheme of Examination			Credits
			L	T	P/D	ContactHours/Week	CIE	SEE	Duration inHours	
TheoryCourse										
1	BS101MT	Mathematics-I	3	1	-	4	30	70	3	4
2	BS101PH	Physics	3	1	-	4	30	70	3	4
3	ES101EE	BasicElectrical Engineering	3	1	-	4	30	70	3	4
Practical /LaboratoryCourse										
4	BS151PH	PhysicsLab	-	-	3	3	25	50	3	1.5
5	ES152EE	BasicElectricalEngineeringLab	-	-	2	2	25	50	3	1
6	ES153CE	EngineeringGraphics& Design	1	-	4	5	50	50	3	3
Total			**10**	**03**	**09**	**22**	**190**	**360**		**17.5**

BS:BasicScience   **ES:**EngineeringScience
L:Lecture   **T**:Tutorial   **P**:Practical   **D**:Drawing
CIE: ContinuousInternal Evaluation   **SEE:**SemesterEndExamination(Univ.Exam)

Note: Eachcontacthourisa ClockHour.

CourseCode	CourseTitle						Core/Elective
BS101MT	Mathematics-I(CommontoAllBranches)						Core
Prerequisite	ContactHoursperWeek				CIE	SEE	Credits
	L	T	D	P			
-	3	1	-	-	30	70	4

CourseObjectives
➢ Tointroducetheconceptsofsequences,seriesand their properties
➢ Tointroducetheconceptsoffunctionsofseveralvariablesandmultipleintegrals
➢ Tostudyvectordifferentialandintegralcalculus

CourseOutcomes
Thestudents will be ableto
➢ find thenatureofsequencesandseries
➢ evaluatemultiple integrals
➢ applythisknowledgetosolvethecurriculumproblems

Unit-I
SequencesandSeries: Sequences,Series,Generalpropertiesofseries,Seriesofpositiveterms,Comparisontests,testsofConvergenceD'Alembert'sratiotest,Cauchy'snthroottest,Raabe'stest,Logarithmictest,Alternatingseries,Seriesofpositive andnegative terms,AbsoluteconvergenceandConditionalconvergence.

Unit-II:
Calculusofonevariable: Rolle'stheorem,Lagrange's,Cauchy'smeanvaluetheorems,Taylor'sseries, Curvature,Radiusofcurvature,Circleofcurvature,Envelopeofafamilyofcurves,   Evolutes   and Involutes.

Unit-III
MultivariableCalculus(Differentiation): Functionsoftwovariables,Limitsandcontinuity,Partialderivatives,Totaldifferentialanddifferentiability,Derivativesofcompositeandimplicitfunctions(Chainrule),Changeofvariables,Jacobian,Higherorderpartialderivatives,Taylor'sseriesoffunctionsoftwo variables,Maximumandminimumvaluesoffunctionsoftwovariables,Lagrange's methodofundeterminedmultipliers.

Unit-IV
MultivariableCalculus(Integration): Doubleintegrals,Changeoforderofintegration,ChangeofVariables fromCartesiantoplane polar coordinates,Tripleintegrals.

Unit-V
VectorCalculus: Scalarandvectorfields,Gradientof ascalarfield,Directionalderivative,DivergenceandCurlofavectorfield,Line,Surface andVolumeintegrals,Green'stheoreminaplane,Gauss'sdivergencetheorem,Stoke'stheorem(withoutproofs)andtheirverification.

SuggestedReadings:

1. R.K.Jain&S.R.KIyengar,*AdvancedEngineeringMathematics*,NarosaPublications,2014.
2. ErwinKreyszig,*AdvancedEngineeringMathematics*, JohnWiley,9thEdition,2012.
3. B.S.Grewal,*HigherEngineeringMathematics*,KhannaPublications,43rdEdition,2014.
4. G.B.Thomas, MauriceWeirandJoelHass,*Thomas'Calculus*,Peterson,12thEdition,2010.

5. B.V.Ramana,*HigherEngineeringMathematics*,23rd reprint,2015.

CourseCode	CourseTitle						Core/Elective
BS101PH	Physics (Common to all Branches)						Core
Prerequisite	ContactHoursperWeek				CIE	SEE	Credits
	L	T	D	P			
-	3	1	-	-	30	70	4

CourseObjectives
  ➢ Aware oflimitsofclassicalfree electronfree theoryand toapplybandtheoryofsolids
  ➢ Acquireknowledgeonvariouspropertiesofsemiconductors.
  ➢ Grasptheintricaciesinsemiconductor – opticalinteraction

CourseOutcomes
  ➢ distinguish materialsbasedonband theoryofsolids
  ➢ classifysemiconductorsonthebasis of dopingand toestimateconductivityandlearntransportphenomenon in semiconductors
  ➢ Appreciateuseofopticalabsorptionbysemiconductors.

Unit–I
Crystallography: Introduction,Typesofcrystalsystems,Bravaislattices,   Latticeplanes andMillerIndices(Cubicsystem),Interplanarspacing(Cubicsystem),Bragg'slaw,Powderdiffractionmethod.
CrystalDefects: Classificationofpointdefects,ConcentrationofSchottkydefectsinmetalsandionic crystals,ConcentrationofFrankeldefects,Linedefects,ScrewandEdgedislocations,Burger's vector

Unit– II
BandTheoryofSolids&Semiconductors: Classicalfreeelectrontheory(qualitative),KronigPenneymodel(qualitativetreatment),Energybandformationinsolids,IntrinsicandExtrinsicsemiconductors,Conceptofahole,Carrierconcentrationandconductivityinintrinsicsemiconductors,Formation ofP-NjunctiondiodeanditsI–Vcharacteristics,Thermistor   and itscharacteristics,Halleffectanditsapplications.
DielectricMaterials: Dielectrics,Typesofpolarizations,Electronic,Ionic,OrientationalandSpace charge   polarizations. ExpressionforElectronicpolarizability,Frequencyandtemperaturedependenceofdielectricpolarizations,DeterminationofdielectricconstantbycapacitanceBridgemethod,   Ferroelectricity, Bariumtitanate,ApplicationsofFerroelectrics.

Unit– III
WaveMechanics: Matterwaves–de-Brogliewavelength,propertiesofwavefunction,Physicalsignificance,Schrodingertimedependent andtimein-dependentwaveequation.Particleina1-Dbox.
Electromagnetictheory: Basiclawsofelectricityandmagnetism,Maxwell'sequationsinintegralanddifferentialforms,Conductionanddisplacementcurrent,RelationbetweenD,EandP.**Electromagnetic waves:**Equationofplane waveinfreespace,Poyntingtheorem.

Unit–IV
MagneticMaterials: Classificationofmagneticmaterials:dia,para,ferro,antiferroandferromagnetic materials,Weissmolecularfieldtheoryofferromagnetism,Magneticdomains,Hysteresiscurve,soft

and hardmagneticmaterials,Ferrites: Applicationsofferrites.

Superconductivity: Introduction,Generalpropertiesofsuperconductors,Meissnereffect,TypeIandTypeIIsuperconductors,BCStheory(qualitative),IntroductiontoHigh$T_c$superconductors,Applicationsofsuperconductors.

Unit–V
Lasers: CharacteristicsofLasers,spontaneousandstimulatedemissionofradiation,Einstein'sCoefficients,populationinversion,RubyLaser,HeliumNeonLaser,SemiConductor   Laserand applicationsoflasers.
FiberOptics: Introduction,Propagationoflightthroughanopticalfiber,Acceptanceangle,Numericalaperture(NA),Types ofOpticalfibersandRefractiveindexprofiles,Fiberdrawingprocess(doubleCrucibleMethod),Lossesinopticalfibers,applicationsofopticalfibers.

SuggestedReading:

1. B.K.Pandeyand S. Chaturvedi, EngineeringPhysics, CengageLearning, 2012
2. A.K.Bhandhopadhya,NanoMaterials,NewAge International, 1ˢᵗEdition,2007
3. M.S.Avadhanuluand P.G.Kshira Sagar,Engg.Physics,S.Chand&Co.1ˢᵗEdition,1992.
4. C.M.Srivastava andC.Srinivasan – ScienceofEngg. Materials,New Age International.
5. R.KGaurandS.LGupta-Engineering Physics,Dhanpath RaiPublications,New edition.
6. SanjayDJain&GirishGSahasrabudhe-Engineering Physics,UniversityPress.

CourseCode	CourseTitle						Core/Elective
ES101EE	**BasicElectricalEngineering(CommontoAllBranches)**						**Core**
Prerequisite	ContactHoursperWeek				CIE	SEE	Credits
	L	T	D	P			
-	3	1	-	-	**30**	**70**	4

CourseObjectives
  ➢ ToprovideanunderstandingofbasicsinElectricalcircuits.
  ➢ Toexplainthe workingprinciplesof Electrical Machinesandsinglephasetransformers.

CourseOutcomes
  ➢ ToanalyzeElectricalcircuitstocomputeandmeasuretheparametersofElectricalEnergy.
  ➢ Tocomprehendthe workingprinciplesofElectricalDCMachines.
  ➢ ToIdentifyandtestvariousElectricalswitchgear, singlephasetransformersandassesstheratingsneededingivenapplication.
  ➢ Tocomprehendthe workingprinciplesofelectricalACmachines.

Unit-I
DCCircuits: Electricalcircuitelements(R,LandC),voltageandcurrentsources,Kirchoffcurrentandvoltagelaws,analysisofsimplecircuitswithdcexcitation.Superposition,TheveninandNortonTheorems.

Unit-II
ACCircuits: Representationofsinusoidalwaveforms,peakandrmsvalues,phasorrepresentation,realpower, reactivepower,apparentpower,powerfactor.Analysisofsingle-phaseaccircuitsconsistingofR,L,C,andRL,RC,RLCcombinations(seriesonly).Threephasebalancedcircuits,voltageandcurrentrelationsinstaranddeltaconnections.

Unit-III
Transformersand3-phInductionMotors:Transformers: Electromagneticinduction,Faradayslaws,staticallyinducedemf,Lenzlaw,BHcharacteristics,idealandpractical transformer,losses andefficiency,Auto-transformerandthree-phasetransformerconnections.
ThreePhaseInductionmotor: Generationofrotatingmagneticfields,Constructionandworkingofathree-phaseinductionmotor,squirrel cageIM,slip-ringIM,Applications.

Unit-IV
Single-phaseinductionmotor&DCMachines:Single-phaseinductionmotor: Constructionandprincipleof operation,Capacitorstart& capacitorrunmotor,applications
DCGenerators: Dynamicallyinducedemf,Flemming'sRighthandandLefthandrules,ConstructionandprincipleofoperationofDCgenerator,EMFequation,TypesofDCGenerators,OCCcharacteristics,applications
DCMotors:principleofoperationof DCMotor, TypesofDCmotors,applications.

Unit-V
ElectricalInstallations: ComponentsofLTSwitchgear:SwitchFuseUnit(SFU),MCB,ELCB,MCCB,TypesofWires andCables,Earthing.TypesofBatteries,ImportantCharacteristicsforBatteries.Elementarycalculationsforenergyconsumption,powerfactorimprovementandbatterybackup.

Suggested Reading:

1. N.K.De,"BasicElectricalEngineering",UniversitiesPress,2015.
2. J.B.Gupta,"FundamentalsofElectricalEngineeringandElectronics"S.K.Kataria&Sons Publications,2002.
3. J.B.Gupta,"UtilizationofElectricPowerandElectric Traction"S.K.Kataria&Sons Publications,2010
4. AbhijitChakrabarti,SudiptaNath,ChandanKumarChanda,"BasicElactricalEngineering" TataMcGrawHill,Publications,2009
5. Hughes,"ElectricalTechnology",VIIEdition,InternationalStudent-on,AddisonWelseyLongmanInc.,1995.

CourseCode	CourseTitle						Core/Elective
BS151PH	**PhysicsLab(Comm on to AllBranches)**						**Core**
Prerequisite	ContactHoursperWeek				CIE	SEE	Credits
	L	T	D	P			
-	-	-	-	3	**25**	**50**	1.5

CourseObjectives
 ➢ Makeprecisemeasurementsusingbasic physicalprinciplesand acquireskillstohandletheinstruments
 ➢ Relatesthetheoretical Knowledge tothebehaviorofPracticalPhysicalworld.
 ➢ Analyzeerrorsintheexperimentaldata.
 ➢ Plotgraphsbetweenvariousphysicalparameters.

CourseOutcomes
 ➢ Conductexperiments,takemeasurementsindependently.
 ➢ Writeappropriatelaboratoryreports.
 ➢ Computeand comparetheexperimentalresultsanddrawrelevantconclusions.
 ➢ Usethegraphicalrepresentationofdata and estimateresultsfromgraphs

ListofExperiments:

1. To determinethe DielectricconstantandPhase transition temperature ofLeadZirconiumTitanate(PZT).
2. TodrawtheI-VCharacteristicsofP-NJunctiondiode and toevaluatethe resistance.
3. TofindthevaluesofElectricalconductivityand energy gapofGecrystal.
4. DeterminationofrigidityofmodulusofTorsionpendulum.
5. Determinationofcarrierconcentration,MobilityandHallCoefficientofGecrystalusingHall EffectExperiment.
6. To determine theconstantsofA,Band α usingThermistorcharacteristics.
   i) Todrawthecurvebetweenthemagnetizingfield and theintensityofmagnetizationofthe specimen(softironrod)andtofindout i) Coercivityii)Retentivityandiii)Hysteresisloss.
7. TodrawtheI-V Characteristicsofa solarcellandtocalculate the
   i) FillfactorEfficiencyandii) Seriesresistance.
8. ToDeterminetheNumericalaperture(NA)ofOptical fiber.
9. Todetermine the wavelengthofthegivenLaser source.

Note: Minimumeightexperimentsshouldbeconductedinthesemester

Suggested Reading:

1. N.K.De, "BasicElectricalEngineering",UniversitiesPress,2015.
2. J.B.Gupta,"FundamentalsofElectricalEngineeringandElectronics"S.K.Kataria&Sons Publications,2002.
3. J.B.Gupta,"UtilizationofElectricPowerandElectric Traction"S.K.Kataria&Sons Publications,2010

CourseCode	CourseTitle						Core/Elective
ES152EE	**BasicElectricalEngineeringLab(CommontoAllBranches)**						**Core**
Prerequisite	ContactHoursperWeek				CIE	SEE	Credits
	L	T	D	P			
-	-	-	-	2	**25**	**50**	1

CourseObjectives
➢ Toimpartthepracticalknowledgeontesting ofDCandAC Machinesand theusageofcommonelectricalmeasuringinstruments

CourseOutcomes
➢ Getanexposuretocommonelectricalcomponentsandtheirratings.
➢ AnalyzetheperformanceofDCand ACMachines.
➢ Comprehendtheusageof commonelectricalmeasuringinstruments.
➢ Testthebasiccharacteristicsoftransformersandelectricalmachines.

Suggested ListofLaboratoryExperiments/Demonstrations:

Dem1.Basic safetyprecautions.Introductionanduse ofmeasuringinstruments–voltmeter,ammeter,multi-meter,oscilloscope.Real-liferesistors,capacitorsandinductors.

Exp1.VerificationofKVLandKCL,superpositiontheorem(withDCexcitation)

Exp2. VerficationofThevinensandNortonstheorems(withDCexcitation)

Exp3.SinusoidalsteadystateresponseofR-L, andR-Ccircuits– impedancecalculationandverification.Observationofphasedifferencesbetweencurrentandvoltage .Powerfactorcalculation

Exp4.Transformers: Observationoftheno-loadcurrentwaveformonanoscilloscope(nonsinusoidalwave-shapeduetoB-Hcurvenonlinearityshouldbeshownalongwithadiscussionaboutharmonics).

Exp5.Loadingofatransformer:measurementofprimaryandsecondaryvoltagesandcurrents,andpower.

Exp6.Three-phasetransformers: Star andDeltaconnections.Voltage andCurrentrelationships (line-linevoltage,phase-to-neutral voltage,lineandphasecurrents).

Exp7.Measurementofphasevoltage/current,linevoltage/currentandpowerinabalancedthree-phasecircuitconnectedinstar anddelta

Dem2.Demonstrationofcut-outsectionsofmachines:dcmachine(commutator-

brusharrangement),inductionmachine(squirrelcage

rotor),synchronousmachine(fieldwinging –slipringarrangement)andsingle-

phaseinductionmachine.

Exp8.OCCcharacteristicsofDCGenerator

Exp9.Synchronousspeedoftwoandfour-pole,three-

phaseinductionmotors.Directionreversalbychangeofphase –sequenceofconnections.

Exp10.PowerfactorimprovementofInductionMotorusingstaticcapacitorsExp11.

LoadTestofDC Motor

Note-1:

(i)   ListofExperimentsandDemonstrationssuggestedabovearealreadyavailableintheLaboratoryofthe electricaldepartment.Noneedtopurchaseany extraequipmentexceptDemonstration2equipment

(ii)   ProcurementofDemonstration2equipmentscanbedoneduringthecourseworkofthatsemester.Itcan beincludedinthe laboratory.

Note-2:

(i)   Experiments9,10andDemonstration3can beincorporatedintheLabsyllabusifthetopicsconcernedtotheabove experimentsareconsideredinnewBEEsyllabus.

Suggested Reading:

1. J.B.Gupta,"FundamentalsofElectricalEngineeringandElectronics"S.K.Kataria &Sons Publications,2002.

2. J.B.Gupta,"UtilizationofElectricPowerand ElectricTraction"S.K.Kataria&Sons Publications,2010

3. AbhijitChakrabarti,SudiptaNath,ChandanKumarChanda,"BasicElactricalEngineering" TataMcGrawHill,Publications,2009

4. Hughes,"ElectricalTechnology",VIIEdition,InternationalStudent-on,AddisonWelseyLongmanInc.,1995.

CourseCode	CourseTitle						Core/Elective
ES153CE	**EngineeringGraphics&Design(CommontoAllBranches)**						**Core**
Prerequisite	ContactHoursperWeek				CIE	SEE	Credits
	L	T	D	P			
-	1	-	4	-	**50**	**50**	3

CourseObjectives
➢ Toprepareyoutodesignasystem,component,orprocesstomeetdesiredneedswithinrealisticconstraintssuchaseconomic,environmental,social,political,ethical,healthandsafety,manufacturability,andsustainability
➢ Toprepareyoutocommunicateeffectively
➢ Toprepareyoutousethetechniques,skills,andmodernengineeringtoolsnecessaryforengineeringpractice.

CourseOutcomes
Thestudentswill be ableto
➢ Introduction toengineeringdesignanditsplaceinsociety
➢ Exposuretothe visual aspectsofengineeringdesign
➢ Exposuretoengineeringgraphicsstandards
➢ Exposuretosolidmodeling
➢ Exposuretocomputer-aidedgeometricdesign
➢ Exposuretocreatingworkingdrawings
➢ Exposuretoengineeringcommunication

Sheet No	Description of the Topic	ContactHours	
		Lecture	Drawing
1	PrinciplesofEngineeringGraphicsandtheirsignificance,usageof drawinginstruments.	1	
2	**Conic Sections–I** Construction ofellipse,parabolaandhyperbolagivenfocusandeccentricity.	1	2
3	**Conic Sections–II** Construction ofellipse(givenmajorandminoraxis), parabola(givenbaseandheight),rectangularhyperbola.		2
4	**Cycloids**(cycloid&epicycloid)	1	2
5	**Involutes**(involuteoftriangle,square&circle)		2
6	**Scales**(plain&diagonal scales)	1	2+2
7	**Introduction to AutoCAD** Basiccommandsandsimpledrawings.		2+2
8	**Orthographic Projection** Projectionsofpointssituatedindifferentquadrants.	1	2
9	**Projections of straight lines–I** Lineparalleltoboththereferenceplanes,lineperpendicularorinclinedtoonereferenceplane.	1	2
10	**Projections of straightlines–II** Lineinclinedtoboththereferenceplanes.	1	2

11	**Projections of planes–I** Perpendicularplanes	1	2
12	**Projections of planes–II** Obliqueplanes		2
13	**Projections of solids–I** Polyhedraandsolidsofrevolution,Projectionsofsolidsinsimpleposition.	1	2
14	**Projection of solids–II** Projectionsofsolidswhentheaxesinclinedtooneorboththereferenceplanes.	1	2+2
15	**Section of solids–I** Whenthesectionalplaneisparallelorperpendiculartoonereferenceplane.	1	2
16	**Section of solids–II** Whenthesectionalplaneisinclinedtoonereferenceplane.		2
17	**Developmentofsurfaces–I** PrismsandCylinders	1	2
18	**Developmentofsurfaces–II** PyramidsandCones		2
19	**Intersectionofsurfaces–I** Intersectionofcylinderandcylinder	1	2
20	**Intersectionofsurfaces–II** Intersectionofcylinderandcone		2
21	**Isometricprojection–I** Planesandsimplesolids	1	2
22	**Isometricprojection–II** Combinationof two orthreesolids		2
23	ConversionofIsometricViewstoOrthographicViews	1	2
24	**Floorplans**of2or3roomsincludingwindows,doors,andfixturessuchasWC,bath,sink,shower,etc.	1	2

SuggestedText:

1. BhattN.D.,PanchalV.M.&IngleP.R.,(2014),EngineeringDrawing,CharotarPublishingHouse
2. Shah,M.B.&RanaB.C.(2008),EngineeringDrawingandComputerGraphics,PearsonEducation
3. S.NLal,EngineeringDrawingwithIntroductiontoAutoCAD,CengageLearningIndiaPvtLid,NewDelhi,2018.
4. Agrawal B.&Agrawal C. M.(2012),EngineeringGraphics,TMHPublication
5. Narayana,K.L.&P Kannaiah(2008),Textbookon EngineeringDrawing,ScitechPublishers
6. (Corresponding setof)CADSoftwareTheoryandUserManuals

NOTE:
1. Atleast20sheetsmustbecovered.
2. Sheetnumber1to6(Graphsheets/drawingsheets)
3. Sheetnumber7to24(AutoCADdrawings