# PERIYARUNIVERSITY

**PERIYARPALKALAINAGAR**

**SALEM-636011**

**DEGREEOFBACHELOROFSCIENCE**

***OUTCOMEBASEDEDUCATION***

***Syllabusfor***

# B.SC.ELECTRONICSANDCOMMUNICATION

**(SEMESTERPATTERN)**

**(For Candidates admitted in the Colleges affiliated toPeriyarUniversityfrom2021-2022onwards)**

## ProgrammeEducationalObjectives(PEOs):

Programme Educational Objectives (PEOs) are established through a consultation process.PEOsarebroadstatementsthatdescribethecareerandprofessionalaccomplishmentsthatthegraduatescan find opportunities inSales,Marketing,ServiceandR&DSectors.

TheB.Sc.Degreeprogrammegraduateswill…….

• **PEO 1** Practice the ethics of their profession consistent with a sense of social responsibilityand develop their engineering design, problem –solving skills and aptitude for innovations astheyworkindividuallyand inmulti-disciplinaryteams.

• **PEO2**Communicateeffectivelyandmanageresourcesskillfullyasmembersandleadersofthepr ofession.

• **PEO 3** Be receptive to new technologies and attain professional competence throughlifelong learning such as advanced degrees, professional registration, publications and otherprofessional activities.

## ProgrammeSpecificOutcomes:

OncompletionoftheBScDegreeinElectronicsandCommunication,graduateswillbeableto

• **PSO1** Apply the fundamental concepts of electronics and communication to design avarietyofcomponentsandsystemsforapplicationsincluding ..... communication, networking,embeddedsystems,PCB,Mobile,TVandetc.

• **PSO2** Select and apply cutting-edge hardware and software tools to solve complexElectronics andCommunicationproblems.

## ProgrammeOutcomes:

OncompletionoftheB.Sc.degreetheElectronicsandCommunicationgraduateswillbeableto

• **PO1**Utilizethebasicknowledgeinmathematics,scienceinElectronicsandCom munication areas.

• **PO2**Identifyformulateandsolvecomplexproblemstoachievedemonstratedconclusionsusing mathematicalprinciples.

• **PO3** Design system components that meet the requirement of public safety and offersolutions.

• **PO4** Apply research-based knowledge to design and conduct experiments, analyze,synthesizeandinterpretthedatapertainingtoElectronicsandarriveatvalidconclusion s.

• **PO5**Construct,chooseand applythetechniques,resourcesandmoderntoolsrequiredforElectronics applications.

• **PO6**ExaminetheimpactofElectronicssolutionsinglobalandenvironmentalcontextsandutilizet he knowledgeforsustaineddevelopment.

• **PO7**Developconsciousnessofprofessional,ethicalandsocialresponsibilitiesasexpertsinthefiel dofElectronics.

# REGULATIONS

## 1. ELIGIBILITY:

Candidatesseekingadmissiontothefirst yearoftheBachelorofScienceinElectronics&Communicationshould have passed the Higher Secondary Examination conducted by the Government ofTamil Nadu oran examination accepted as Equivalent there to by the Syndicate subject to such conditions as may beprescribed from to time are permitted to appear and qualify for the B.Sc., Electronics and CommunicationDegreeofthisuniversityafteracourseofstudyofthree AcademicYears.

## 2. DURATIONOFTHECOURSE:

The course for the degree of Bachelor of Electronics and Communication shall consist of three academicyearsdivided into sixsemesters.Each semesterwill beofof90 workingdays.

## 3. COURSEOFSTUDY:

The course of study shall comprise instruction in the following subjects under OBE (Outcome BasedEducation)patternaccordingto thesyllabusandbooks prescribedfrom timetotime.

**FOUNDATIONSUBJECTS:**

PARTI:Tamil/Hindi/Malayalam/French/GermanP

ARTII:English

**ALLIEDSUBJECTS:** INTHEFIRSTYEARONEMAJOR

Departmentoutofthefourmentionedbelow;tobechosenforthestudyof twoalliedpapers.Inthesecondyearanothermajordepartmentinthelisttobechosenforthestudyofanothertwoallied papers.

| SEMESTER | MAJORDE PARTMENT | ALLIEDSUBJECT |
|---|---|---|
| I/III | MATHS | ALGEBRA, CALCULUS &FOURIERSERIES |
| I/III | PHYSICS | ALLIEDPHYSICS -I |
| I/III | COMPUTERSCIENCE | PROGRAMMING INC |
| II/IV | MATHS | DIFFERENTIALEQUATIONSAND LAPLACETRANSFORMS |
| II/IV | PHYSICS | ALLIEDPHYSICS-II |
| II/IV | COMPUTERSCIENCE | PROGRAMMING INVISUALBASIC |
| II | | ALLIEDLAB-IFORALLIEDI&IIMATHS/PHYSICS /C&VB LAB |
| IV | | ALLIEDLAB-IIFORALLIEDIII& IVMATHS/PHYSICS/C&VBLAB |

## 5. SCHEMEOFEXAMINATIONS

The scheme of examinations under OBE (Outcome Based Education) for different semesters shall be asfollows.

**SEMESTERI**

| PART | SUBJECT | SUBJECTTITLE | TOTAL HOURS | | CRE-DITS | TOTAL | | |
|---|---|---|---|---|---|---|---|---|
| | | | L | T/P | | CIA | EA | MARKS |
| I | Language | Tamil-I@ | 6 | 2 | 3 | 25 | 75 | 100 |
| II | Language | English – I COMMUNICATIVEENGLISH | 6 | | 3 | 25 | 75 | 100 |
| III | Core-I | SemiconductorDevices | 4 | | 4 | 25 | 75 | 100 |
| III | CorePract.-I | BasicElectronics Lab | 1 | | | | | |
| III | AlliedI | | 4 | | 4 | 25 | 75 | 100 |
| III | AlliedLab-I | | 2 | | | | | |
| IV | SBEC-I | AppliedElectricCircuits | 2 | | 2 | 25 | 75 | 100 |
| IV | ValueEducation | Yoga | 1 | | 2 | 25 | 75 | 100 |
| IV | Add-on | ProffessionalEnglish-I | 2 | | 4 | 25 | 75 | 100 |

**SEMESTERII**

| PART | SUBJECT | SUBJECTTITLE | TOTAL HOURS | | CRE-DITS | TOTAL | | |
|---|---|---|---|---|---|---|---|---|
| | | | L | T/P | | CIA | EA | MARKS |
| I | Language | Tamil -II@ | 6 | | 3 | 25 | 75 | 100 |
| II | Language | English– II COMMUNICATIVEENGLISH | 4 | | 3 | 25 | 75 | 100 |
| II | NaanMuthalvan SkillDevelopmentCourse | Language Proficiency forEmployability-EffectiveEnglish | 2 | | 2 | 25 | 75 | 100 |
| III | Core- II | AppliedDigitalElectronics | 4 | | 4 | 25 | 75 | 100 |
| III | CorePract.-I | BasicElectronics Lab | 1 | 2 | 4 | 40 | 60 | 100 |
| III | Allied-II | | 4 | | 4 | 25 | 75 | 100 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| III | AlliedLab -I | | | 2 | 2 | 40 | 60 | 100 |
| IV | SBEC-II | PowerElectronics | 2 | | 2 | 25 | 75 | 100 |
| IVIV | EVS<br>Add-on course | EnvironmentalStudies<br>ProfessionalEnglish-II | 1<br>2 | | 2<br>4 | 25<br>25 | 75<br>75 | 100<br>100 |

**SEMESTERIII**

| PART | SUBJECT | SUBJECTTITLE | TOTAL | HOURS | CRE-DITS | TOTAL | | |
|---|---|---|---|---|---|---|---|---|
| | | | L | T/P | | CIA | EA | MARKS |
| I | Language | Tamil-III@ | 6 | | 3 | 25 | 75 | 100 |
| II | Language | English-III | 6 | | 3 | 25 | 75 | 100 |
| III | CoreIII | ElectronicCircuits | 4 | | 4 | 25 | 75 | 100 |
| III | CorePract.-II | ElectronicCircuitsPractical | 1 | 2 | | | | |
| III | CorePract.-III | 8085Microprocessor | 1 | 2 | | | | |
| III | Allied III | | 4 | | 4 | 25 | 75 | 100 |
| III | AlliedLab-II | | 2 | | | | | |
| IV | NMSDCI | Digital Skills for Employability-Microsoft Office Essentials | 2 | | 2 | 25 | 75 | 100 |

**SEMESTERIV**

| PART | SUBJECT | SUBJECTTITLE | TOTAL | HOURS | CRE-DITS | TOTAL | | |
|---|---|---|---|---|---|---|---|---|
| | | | L | T/P | | CIA | EA | MARKS |
| I | Language | Tamil- | 6 | | 3 | 25 | 75 | 100 |
| II | Language | IV@English- | 6 | | 3 | 25 | 75 | 100 |
| III | CoreIV | IV | 4 | | 4 | 25 | 75 | 100 |
| III | CorePract. II | 8085 Microprocessor andInterfacing | 1 | 2 | 4 | 40 | 60 | 100 |
| III | CorePract. III | ElectronicCircuits Lab | 1 | 2 | 4 | 40 | 60 | 100 |
| III | AlliedIV | 8085 Microprocessor andInterfacingLab | 4 | | 4 | 25 | 75 | 100 |
| III | Allied Lab - II | | | 2 | 2 | 40 | 60 | 100 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| IV | NaanMuthalvanSkillDevelopmentCourse | Employability Skills-Microsoft | 2 | - | 2 | 25 | 75 | 100 |
| IV | Add-oncourse | INTERNSHIP!* | Industry Oriented | Training 15days | | | | |

**SEMESTERV**

| PART | SUBJECT | SUBJECTTITLEs | TOTAL | HOURS | CRE-DITS | TOTAL | | |
|---|---|---|---|---|---|---|---|---|
| | | | L | T/P | | CIA | EA | MARKS |
| III | CoreV | Electronic CommunicationSystems | 5 | | 5 | 25 | 75 | 100 |
| III | CoreVI | Ic's&TheirApplications | 5 | | 5 | 25 | 75 | 100 |
| III | Elective I | FromGroupA | 5 | | 5 | 25 | 75 | 100 |
| III | ElectiveII | FromGroup B | 5 | | 4 | 25 | 75 | 100 |
| III | CorePract-IV | IC'S&Communication Lab | 1 | 2 | | | | |
| III | CorePract-V | FromGroupD | 1 | 2 | | | | |
| IV | SBEC III | ElectronicInstrumentation | 2 | | 2 | 25 | 75 | 100 |
| IV | NMSDC | Computational Intelligence for Employability-Drone Pilot Techniques | 2 | | 2 | 25 | 75 | 100 |

**SEMESTERVI**

| PART | SUBJECT | SUBJECTTITLE | TOTAL | HOURS | CRE-DITS | TOTAL | | |
|---|---|---|---|---|---|---|---|---|
| | | | L | T/P | | CIA | CIA | CIA |
| III | CoreVII | PC Hard Ware Networking&Troubleshooting | 5 | | 5 | 25 | 75 | 100 |
| III | CoreVIII | NetworkCommunication& Security | 5 | | 5 | 25 | 75 | 100 |
| III | ElectiveIII | FromGroupC | 5 | | 5 | 25 | 75 | 100 |
| III | Core Pract.IV | IC'S&Communication Lab | 1 | 2 | 4 | 40 | 60 | 100 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| III | Core Pract.V | FromGroupD | 1 | 2 | 4 | 40 | 60 | 100 |
| III | CoreIX | Biomedical Instruments(or)ProjectVivaVoce* | 5 | | 5 | 25 | 75 | 100 |
| **III** | **NMSDC** | **Advanced Data Analytics & Visualization** | **2** | **-** | **2** | **25** | **75** | **100** |
| IV | SBECVI | LifeDevelopmentSkills | 2 | | 2 | 25 | 75 | 100 |
| V | ExtensionActivities | (NCC/NSS/YRC/SportsEtc.) | | | 1 | | | |
| | | **TotalCredits&Marks** | | | **150** | | | **4100** |
| * | | **NoInternalMarkForProjectWork** | | | | | | |
| | | **ProjectReportEvaluation** | **80** | **Marks** | | | | |
| | | **VivaVoceEvaluation** | **20** | **Marks** | | | | |

**!* Internship**: To be carried out 4th semester vacation period ,The internshipcourse will notmeetas aregular class.

@AnyotherLanguagelikeHindi/Malayalam/French/etc.

#$ThosewhohavenotstudiedTamiluptoXIIstdandtakenaNonTamillanguageunderpart-IshalltakeTamilcomprisingoftwocourses(levelwillbeat6thstandard)insteadofNMEC

#$ThosewhohavestudiedTamiluptoXIIstdandtakenaNonTamillanguageunderpart-IshalltakeAdvancedTamilcomprisingoftwocoursesinsteadofNMEC.

**5.A. INTERNSHIPSOBJECTIVES**

Theinternship couldbe anew joboranew experiencewithinanexistingjob astheworkperformedin the internship should lead to new learning, discovery or growth for the student and contribute toward thestudent'sacademicprogram.

The student intern will either find a company to sponsor him or her or perform a specific project at anexistingjob.Theinternshipprogramis anagreementbetween thestudent,facultyadvisorandthecompanysupervisor.

Performjobrequirementsinaprofessionalmanner.

Maintain regular and prompt attendance, as agreed upon with supervisor. The submission of report iswritten at the end of the internship by the student to the institute which form part in the awarding of thedegree certificate.

**INTERNSHIPSOUTCOME**

Aninternshipprovidesthestudenttheopportunitytobuildupon,apply, andassessttheconceptsthataredeveloped through the College's curriculum and to further the student's professional growth through ameaningful"real-world" job experience.Internships.

**6. QUESTIONPAPERPATTERNFORALLUGCOURSES**

**MARKDISTRIBUTIONFORTHEORY(EXTERNAL)**

TIME: 3HOURS MAXIMUM MARKS : 75PASSINGMINIMUM :30MARKS

Part A

15x1=15(AnswerAllQuestions)

(ThreeQuestionsfromEachUnit)

Part B

5x2=10(Answer Any Two Questions)(OneQuestionsfromEachUnit)

Part C

5x10=50(AnswerAllQuestions)

(OneQuestionfromEachUnitwithInternalChoice)

**MarkDistributionforTheory(Internal)**

Max.Marks: 25 PassingMinimum:10Marks

| | | |
|---|---|---|
| SubjectLevelCycleTestandModelExam | : | 15 |
| SubjectLevelAssignment | : | 5 |
| SubjectLevelAttendance | : | 5 |
| **Total** | **:** | **25** |

**MARK DISTRIBUTION FOR PRACTICALS**

**(EXTERNAL)**TIME:3HOURS;MAXIMUMMARKS:60;PASSINGMINIMUM:24M

ARKSPRACTICALEXAM:50MARKS&RECORD:10MARKS

**Submission of Record Note Books for Practical Exams:** Candidates appearing for the Practical Examsmust submit Bonafide Record Note Book, otherwise the candidate will not be permitted to appear for thepracticalexam**.**

**MarkDistributionforPractical(Internal)**

Max.Marks:40 PassingMinimum:16Marks

| | | |
|---|---|---|
| YearThrough;LabPerformance | : | 10 |
| ModelPractical's | : | 20 |
| YearThrough;LabAttendance | : | 10 |
| **Total** | **:** | **40** |

**7. PROJECTWORKORONECOREPAPER:**

ACandidatecansubmit
**SOFTWAREorHARDWAREorHARDWAREcumSOFTWARE**basedproject and has to demonstrate the Project with Project Report in the University Project VivaVoceExaminationconductedattheendofthesixthsemester.

**MARKDISTRIBUTIONFORPROJECTREPORT:80MARKSM**

**ARKDISTRIBUTIONFORVIVAVOCE :20MARKS**

**InsteadofProjectWork;CorePaper–
IX"BIOMEDICALINSTRUMENTS"maybeofferedintheVIthSemester.**

**8. PASSINGMINIMUM:**

Acandidateshallbedeclaredtohavepassedtheexaminationonlyifthecandidatesecuresaminimumof40%intheUniversityexamination andwithanoveralltotalof40outof100.

**9. RESTRICTIONSTOAPPEARFORTHEEXAMINATIONS**

Candidates who fail in any of the course of Part I , II , III , IV & Part V of UG Degree examinationsshallcompletethecourseconcernedwithin5yearsfromthedateofadmissiontothesaidprogrammeandshouldtheyfailtodoso,theyshalltaketheexaminationintherevisedsyllabusprescribedfortheimmediatenextbatchofcandidates.

If there is no change in the syllabus they shall appear for the examination in that course with thesyllabus in vogue until there is a change in the syllabus. In the event of removal of that courseconsequenttochangeofregulationand/orcurriculumafter5-yearperiod,thecandidatesshallhavetotake up an equivalent course in the revised syllabus as suggested by the Chairman and fulfill therequirementsaspertheregulationcurriculumfortheawardofthedegree.

**10. IMPROVEMENTOFMARKSINTHESUBJECTSALREADYPASSED**

Candidates desirous of improving the marks awarded in a passed subject in their first attempt shallreappearoncewithinaperiodofsubsequenttwosemesters.Theimprovedmarksshallbeconsideredforclassificationbutnotforranking.Whenthereisnoimprovement,thereshallnotbeanychangeintheoriginalmarksalreadyawarded.

**11. CLASSIFICATIONOFSUCCESSFULCANDIDATES**

AcandidatewhopassesalltheexaminationsinPartItoPartVsecuringfollowingCGPAandGradesshallbedec

laredasfollowsforPartIorPartIIorPartIII.

| CGPA | GRADE | CLASSIFICATION OFFINALRESULT |
|---|---|---|
| 9.5 -10.0 | O+ | FirstClass-Exemplary |
| 9.0and abovebutbelow9.5 | O | |
| 8.5and abovebutbelow9.0 | D++ | FirstClasswithDistinction |
| 8.0and abovebutbelow8.5 | D+ | |
| 7.5and abovebutbelow8.0 | D | |
| 7.0and abovebutbelow7.5 | A++ | FirstClass |
| 6.5and abovebutbelow7.0 | A+ | |
| 6.0and abovebutbelow6.5 | A | |
| 5.5and abovebutbelow6.0 | B+ | SecondClass |
| 5.0and abovebutbelow5.5 | B | |
| 4.5and abovebutbelow5.0 | C+ | ThirdClass |
| 4.0and abovebutbelow4.5 | C | |

**12. RANKING**

Acandidatewho qualifiesfortheUGdegree coursepassingalltheexaminationsinthefirstattempt,withintheminimumperiodprescribedforthecourseof studyfromthedateofadmissiontothecourseandsecuresIorIIclassshallbeeligibleforrankingandsuchranki ngshallbeconfinedto

10% of the total number of candidates qualified in that particular branch of study; subject to amaximumof 10Ranks.Theimproved marksshall notbetaken intoconsideration for ranking.

**13. COMMENCEMENTOFTHISREGULATION:**

Theseregulationsshalltakeeffectfromtheacademicyear2021-2022,i.e.,forstudentswhoaretobeadmittedtothefirstyearofthecourseduringtheacademicyear2021-2022andthereafter.

**14. COURSEEQUIVALENCE:**

TheThreeYear Coursein theBachelor ofScienceinElectronics&Communication isEquivalent to:

- B.Sc.Electronics
- B.Sc.IndustrialElectronics
- B.E.S.(BachelorofElectronicScience)

**15. COURSEOBJECTIVES:**

The syllabus of B.Sc., Electronics and Communication is enriched and necessary changes have beenmade inthe course pattern andpapers. Thiswillenable the studentstoacquire the**Basic&FundamentalKnowledge In Both TheoryAndPractical's.**

**16. ACADEMICOPPORTUNITIES:**

After successful completion of this course ; students can pursuehigherdegree courses likeM.Sc.,(Electronics)/M.Sc.,(ElectronicScience)/M.Sc.,(AppliedElectronics)/M.Sc.,(Electronics& Instrumentation)/M.Sc.,(CyberForensics&InformationSecurity)M.Sc.,(Criminology & Criminal Justice Science)/M.Sc.,(ComputerScience)/MCA/ M.Sc.,(Nano Science and Technology) / M.Sc., HRD Psycholgy / M.Sc., ( Energy Science ) / M.Sc.,Environomental Science ) / M.Sc., Library & Information Science ) / M.Sc., YOGA / MBA / MA., (Defense&StrategicStudies/MA.,Yoga/MA.,PublicAdministration/MA.,PoliticalScienceetc

**17. JOBOPPORTUNITIES:**

The Students are eligible for placement in Army, Navy, Airforce, Civil AviationSectors, Space & Radio Astronomy Sectors, T.V. Broad Casting Stations, All IndiaRadio, BSNL , TNEB , ITES ( IT Enabled Software Services) , TelecommunicationSectors, Banking and Railway Services and as Computer Hardware & InstrumentService Professionals. A Wide variety of Self – Employment Opportunities are alsoavailable.

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTERI**

**COREI-SEMICONDUCTORDEVICES**

| L | T | P | C |
|---|---|---|---|
| 4 | 0 | 0 | 4 |

**COURSEOBJECTIVES:**

**T**hiscourseprovidestheimportantaspectofsemiconductorsanddeviceslikediodes,Transistor,JFETandMOSFET.

| **CourseOutcomes:**Aftercompletionofthiscourse,studentableto | |
|---|---|
| **CO1** | Understandthebanddiagram,typeofsemiconductorsandchargecarrierlife time. |
| **CO2** | Understandofcapacitorsandtypesofdiodesbreakdown |
| **CO3** | Demonstratethetransistorandtheirtypes |
| **CO4** | UnderstandthefundamentalsforconstructionofdifferenttypeofJFET. |
| **CO5** | TostudytheoperatingprinciplesofMOSFET. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programmespecificqualificationattributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Atom** | Structure of Atom - Atomic Number - ValenceElectrons - Bonding in Conductors - Insulators -Semiconductors-EnergyBandDiagramofConductors-Insulators-Semiconductors-IntrinsicSemiconductor-ExtrinsicSemiconductor - P Type Semiconductor - N typeSemiconductor -Carrier LifeTime. | 10 |
| **II** | **PN Junction Diode** | TheoryofPNJunctionDiode-EnergyBandStructure-DiodeCurrentEquation-DiodeResistance-DepletionCapacitance-DiffusionCapacitance-EffectofTemperature-PNJunctionDiodeasaRectifier- ZenerDiode- | 10 |

| | | | |
|---|---|---|---|
| | | AvalancheBreakDown-ZenerBreakDown-ZenerDiode asa VoltageRegulator. | |
| **III** | **Transistor** | OperationofPNP&NPNTransistor-CB,CE, CC Configuration and Characteristics - Transistoras anAmplifier. | 10 |
| **IV** | **JFET** | Construction-Operation-Output&TransferCharacteristics of P Channel & N Channel JFET -Characteristic Parameters of the JFET - BiasingtheFET-ComparisonofJFET&BJT-Comparison of P Channel & N Channel JFET - ApplicationsofJFET-JFETasaVoltageVariableResistor. | 10 |
| **V** | **MOSFET** | Construction,Operation,Output&TransferCharacteristicsofPChannel&NChannelDepletionMOSFET-Construction,Operation,Output & Transfer Characteristics P Channel & NChannelEnhancementMOSFET-BiasingtheMOSFET - Comparison of P Channel MOSFETwith N Channel MOSFET - Comparison of JFETwithMOSFET-HandlingPrecautionsfortheMOSFET. | 10 |

**REFERENCEBOOKS:**

1. ElectronicDevices&Circuits-Salivahanan-TMH-2ndEdition
2. ATextBookofAppliedElectronics-R.S.Sedha-S.Chand-Rs.395/-

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTR-I**

**SKILLED BASED ELECTIVE**

**COURSESBECI-**

**APPLIEDELECTRICCIRCUITS**

**(INDEPTHTHEORY&ANALYSIS NOTREQUIRED)**

| L | T | P | C |
|---|---|---|---|
| 2 | 0 | 0 | 2 |

**COURSEOBJECTIVES:**

- Tounderstandandacquireknowledgeaboutvariouscircuittheorem.
- Tomakestudentsstronginelectriccircuitdesigning.
- Tolearnthedifferentlawsandimplementincircuitsandalsocompareitsgain.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Examinethebasiccomponentsinseriesandparallelconnection. |
| **CO2** | Haveathoroughunderstandingofthedifferentcircuitlaws. |
| **CO3** | Understandvariouscircuittheorems. |
| **CO4** | AnalyseRMS&PowerparametersofACcircuits. |
| **CO5** | Acquiretheknowledgeof RLCanditsapplications. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| I | **Circuitcomponents** | Resistors,Capacitors&InductorsinSeriesandParallel -FactorsgoverningtheResistanceofaResistor,Capacitor & Inductor - Colour Coding of Resistors - EnergyStoredinaCapacitor-EnergyStoredinan Inductor–VariousOtherPassive&ActiveDevices- | 05 |

| | | | |
|---|---|---|---|
| | | SimpleProblems. | |
| II | **Circuitlaws** | OhmsLaw-Kirchoff'sVoltageLaw-Kirchoff'sCurrent Law - Current Division- Voltage Division-Star Connection - Delta Connection - Series Circuits - ParallelCircuits-Series&ParallelCircuits-Open Circuit-ShortCircuit-SimpleProblems. | 05 |
| III | **Theorems** | SuperPositionTheorem–Thevenin'sTheorem– Norton'sTheorem– Millman'sTheoremMaximumPowerTransferTheorem– Simple Problems | 05 |
| IV | **Ac circuitb asics** | SinusoidalandNonSinusoidalWaveforms–PeakValue – Peak to Peak Value – Average Value – RMSValue – Period and Frequency Measurement - PowerFactor-RealPower–ReactivePower–Simple Problems. | 05 |
| V | **Reactance,i mpedance &resonance** | CapacitiveReactance–InductiveReactance–Impedance – RL and RC in Series and Parallel– RLCinSeriesandParallel–SeriesResonance-Parallel Resonance-SimpleProblems | 05 |

BooksforReference

1. Circuits And Networks: Analysis And Synthesis - Sudhakar&ShyamMohan-TMH-IVEdition

2. BasicElectronics–BernardGrob–McgrawHill.

3. CircuitTheory–Salivahanan –S.Chand–Rs.395/-

| L | T | P | C |
|---|---|---|---|
| 4 | 0 | 0 | 4 |

**B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERII**

**COREII-APPLIEDDIGITALELECTRONICS**

**COURSEOBJECTIVES:**

- Toacquirethebasicknowledgeofdigitallogiclevelsandapplicationofknowledgetounderstanddigitalelectroniccircuits.
- Topreparestudentstoperformtheanalysisanddesignofvariousdigitalelectroniccircuits.
- To learnthe designprocessofregisters,countersandconversionofanalog todigitalconversionandvice-versa.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Examinethestructureofvariousnumbersystemsanditsapplicationindigital design. |
| **CO2** | Haveathoroughunderstandingofthefundamentalconceptsandminimizationtechniquesusedindigitalelectronics. |
| **CO3** | Understandvariouscombinationallogiccircuitsanditsapplications |
| **CO4** | Analyseanddesignvarioussequentiallogiccircuitsanditsapplications. |
| **CO5** | Analyzethelogiclevelsandapplythemforthedesignofanalogtodigital conversionandviceversa. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **Number systems** | BinarySignals–BinaryNumberSystem–DecimalNumber System - Octal Number System – HexadecimalNumberSystem– ConversionfromOneNumberSystemtoAnotherNumberSystem-BCD–Graycode –Excess –3 Code–ASCIIcode. | 10 |
| **II** | **Boolean algebra** | BinaryAddition,Subtraction,Multiplication&Division - 1's and 2's Complement Subtraction - 9's &10's Complement Subtraction - Basic laws of BooleanAlgebra - Duality Theorem – De Morgan's Theorem -SumofProducts–ProductofSum-TwoVariable, ThreeVariable&FourVariableKarnaughMaps. | 10 |
| **III** | **CombinationalElements** | LogicGates:AND,OR,NOT,EX-OR,EX-NOR, NAND&NOR-LogicGatesusingDiscreteComponents - NAND & NOR as Universal Gates - Half& Full Adder – Half & Full Subtractor - Encoder -Decoder-Multiplexer-Demultiplexer-Implementationusing74147,7442,74153&74155 IC's. | 10 |
| **IV** | **Sequential Elements** | Flip Flops: RS - Clocked RS - JK - Master Slave JK - D&TFlipFlops–ShiftRegisters:SIPO–SISO–PIPO – PISO – Shift Left – Shift Right- Ring counter – Twisted Ring Counter . Counters: Hexadecimal Up - Hexadecimal Down - Modulo Up - Modulo Down - UP/DOWNCounters-ImplementationUsing7476, 7495,7493&7490 IC's. | 10 |

| | | | |
|---|---|---|---|
| **V** | **A/DAND D/AConversion** | ParallelComparatorTypeofADC-CounterRampTypeofADC-SuccessiveApproximationTypeofADC - Dual Slope Type of ADC - ADC Accuracy andResolution - Binary weighted Resistor type of DAC -R-2RLadderTypeofDAC-DACAccuracyandResolution-ImplementationusingADC0809&DAC 0800 IC's. | 10 |

**Booksforstudy**

1. *AnandKumar*.2008.**FundamentalsofDigitalCircuits.**[SecondEdition].PHI.
2. *Salivahanan.*2004.**DigitalCircuitsandDesign.**[FourthEdition].S.Chand.

**Books forReference**

1. *Donald,P.Leach, Albert Paul Malvino and GoutamSaha.* 2008. **Digital Principles andApplications.**[SixthEdition].Tata McGrawHill,NewDelhi.
2. *Virendra Kumar*.2009. **Digital Technology Principles and Practice.**[First Edition].NewAge InternationalPublications,NewDelhi.
3. *Jacob Millman and Christos Halkias.* 2011. **Integrated Electronics Analog and DigitalCircuitsandSystems.**[SecondEdition].TataMcGrawHillPublishingCompanyLimited,NewDelhi.
4. *Thomas, L.Floyd.* 2006. **Digital Fundamentals.** [Ninth Edition]. Pearson Education, NewDelhi.

**B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERII**

| L | T | P | C |
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**SKILLED BASED ELECTIVE COURSESBECII-**

**POWERELECTRONICS**

**(INDEPTHTHEORY &ANALYSISNOT REQUIRED)**

**COURSEOBJECTIVES:**

- Tounderstandandacquireknowledgeaboutvariouspowersemiconductordevices.
- Toprovidethestudentsadeepinsightintotheworkingofdifferentswitchingdeviceswithrespect totheircharacteristics.
- Tostudytheprincipleofoperation,designandsynthesisofdifferenttypesofpowersuppliesandtheirap plications.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | AbilitytoexpresscharacteristicsofSCR,TRIAC,DIACandUJT |
| **CO2** | AcquireknowledgeaboutfundamentalconceptsandmethodstoturnONand turnOFFthethyristor. |
| **CO3** | UnderstandthedesignprincipleoftriggeringcircuitofSCR |
| **CO4** | Explaintheswitchingprincipleandapplications |
| **CO5** | Remembertheworkingprincipleofvarioustypesofpowersupplies. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **ThyristorCharacteristics** | SimpleTheory&Characteristics ofSCR-DIAC, TRIAC-UJT.UJTasanOscillator. | 05 |

| | | | |
|---|---|---|---|
| **II** | **Methods ofTurn ON &Turn OFF** | AC gate Triggering- R Triggering- RC Triggering-DC gate Triggering - Pulse gate Triggering – NaturalCommutation - Force Commutation – Self - Impulse -Resonant-Complementary-External-Loadside-Line Side. | 05 |
| **III** | **Triggering SCR** | TriggeringofseriesconnectedSCR's-TriggeringofParallel Connected SCR's – Current & Voltage Protection-SnubberCircuit. | 05 |
| **IV** | **StaticSwitches** | SinglePhaseACSwitches- Three PhaseACSwitches-ThreePhaseReversingSwitches-ACSwitchesforBusTransfer -DC Switches -Solid StateRelays. | 05 |
| **V** | **PowerSupplies** | SwitchedmodeDCPowerSupplies-ResonantDCPowerSupplies-BidirectionalPowerSupplies-SwitchedmodeACPowerSupplies-ResonantAC PowerSupplies-BidirectionalACPowerSupplies. | 05 |

**Booksforstudy**

1. PowerElectronics-MuhammedH.Rashid-PHI-2ndEdition
2. PowerElectronics–Jaganathan–PHI–IIEdition.

**Books forReference**


1. *SinghMDandKhanchandaniKB,2007*,**Powerelectronics**[SecondEdition],TataMcgrawhill, Newdelhi.
2. *Mithal.G.K,2000*,**Industrialelectronicsandcontrol**[EighteenthEdition],TataMcgrawhill ,Newdelhi
3. *TherajaB.L,Theraja.A.K,2003*,**ElectricalTechnology** [FirstEdition],S.Chand,Newdelhi.

**B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERI &II**

| L | T | P | C |
|---|---|---|---|
| 2 | 2 | 2 | 4 |

## COREPRACTICALI-BASICELECTRONICSLAB

**(ANYHARDWAREBASED SIMULATIONTOOL MAYALSO BEUSED)**

**(Any22Experiments)**

**COURSEOBJECTIVES:**

Basic electronics laboratory is the gateway of the electronics & communicationengineering world. At the very beginning the students get familiarized with the variouselectronics instruments & components which basically equip them to construct complexcircuits in near future. In this lab students build up preliminary electronic circuits and verifytheresultswiththeoreticalconcepts.Labexperimentsaredesignedinsuchafashionthattheeng ineeringskillof the studentsstartsto enrich**.**

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | AbilitytoexpresscharacteristicsofDIODES,BJT,THYRISTORS |
| **CO2** | Tounderstandthebasictheoremsandto verifytheiroperation |
| **CO3** | Tounderstandthebasicdigitalcircuitsandtoverifytheiroperation |
| **CO4** | Learnthebasicsofgates&Constructbasiccombinationalcircuitsandverifytheirfunctionalities |
| **CO5** | LearnaboutShiftregisters&counters |

**Syllabus**

1. ColourCodingofResistors
2. PNJunctionDiodeCharacteristics.
3. ZenerDiodeCharacteristics.
4. CEInputCharacteristics.

5. CEOutputCharacteristics.

6. SCR/TRIACCharacteristics.

7. DCRegulatedPowerSupplyUsingZenerDiode.
8. VerificationofOhm'sLaw.
9. VerificationofKirchoff'sCurrentLaw.
10. VerificationofKirchoff'sVoltagelaw.
11. VerificationofThevenin'sTheorem/Norton'sTheorem.
12. VerificationofMillman'sTheorem
13. VerificationofMaximumPowerTransferTheorem
14. InductanceCalculationUsingSeriesorParallelResonance.
15. TransientResponseofanRCCircuit.
16. TruthTableVerificationofBasicGates(AnyTwo)
17. LogicGatesUsingDiscreteComponents(AnyOne).
18. +5VRegulatedPowerSupply.
19. NANDorNORasaUniversalGate(AnyOneGate).
20. VerificationofDeMorgan'sTheorem.
21. TruthTableVerificationofHalfAdder&FullAdder
22. TruthTableVerificationofHalfSubtractor&FullSubtractor.
23. EncoderUsing74147IC
24. DecoderUsing7442IC
25. MultiplexerUsing74153IC
26. DemultiplexerUsing74155IC
27. MSJKFlipFlopUsing7476IC
28. ParallelInParallelOutShiftRegisterUsing7495IC
29. UpCounterUsing7490ICor7493IC.
30. ClockGenerationUsingNANDorNORGate.

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTERIII**

**COREIII-ELECTRONICCIRCUITS**

| L | T | P | C |
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**COURSEOBJECTIVES:**

To analyze and describe the applied electronics principles used to develop circuitsand systems &To understand the fundamentals of the alternating current. To apply the basictools and testequipment used toconstruct, troubleshoot,and design standard electroniccircuits.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Understandthebasicsofelectricalenergyandpracticalimplementationofelectrical fundamentals. |
| **CO2** | solvedesignproblemsonrectifiers,filtersandpowersupplycircuits. |
| **CO3** | Understandvarioustypesofamplifier. |
| **CO4** | Examinethebasiccomponents offeedback&itstypes. |
| **CO5** | Acquiretheknowledgeaboutoscillators,MultivibratorsandWaveshapingcircuits. |

## Syllabus

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Power supply's** | Half Wave Rectifier - Full Wave Rectifier - BridgeRectifier-Averagevalue-RMSvalue-Formfactor-Peak factor - Ripple factor - Efficiency - TUF - PIV -Filters:C,L,LC,CLC,CRC–VoltageRegulators :SeriesRegulators-ShuntRegulators-ICVoltage | 10 |

| | | | |
|---|---|---|---|
| | | Regulators(78XX&79XX).. | |

| | | | |
|---|---|---|---|
| **II** | **Transistor biasing** | BiasStability-Thermalrunaway-MethodsoftransistorBiasing-Biascompensation-WaveShaping Circuits – RC & RL Circuits – Clipping &ClampingCircuits–VoltageDoubler–Tripler–Quadrupler. | 10 |
| **III** | **Types ofamplifiers** | Class A Amplifier - Class B Amplifier - Class ABAmplifier - Push Pull Amplifier - Complementarysymmetry Push Pull Amplifier - Class C Amplifier – MultistageAmplifiers:RCCoupledAmplifier-TransformerCoupledAmplifier-DirectCoupled Amplifier. | 10 |
| **IV** | **Feedback** | BasicsconceptsofFeedback-Effectsofnegativefeedback on gain, Bandwidth, Distortion, Noise, InputImpedance and Output Impedance - Types of NegativeFeedback-VoltageSeries-VoltageShunt-Current SeriesandCurrentShuntFeedback | 10 |
| **V** | **Oscillators** | Classification of Oscillators - Barkhausen Criterion - HartleyOscillator-ColpittOscillator-ClappOscillator -PhaseShiftOscillator-WeinBridge-CrystalOscillator-FrequencystabilityofOscillators-AstableMultivibrator-MonostableMultivibrator BistableMultivibrator-SchmittTrigger. | 10 |

**REFERENCEBOOKS:**

1. ElectronicDevices&Circuits-S.Salivahanan-TMH-IIEdition
2. ATextBookofElectronicDevices&Circuits–R.S.Sedha–S.ChandRs.325/-

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**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTE**

**RIII**

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|---|---|---|---|
| 2 | 0 | 0 | 2 |

**NONMAJOR ELECTIVE COURSE**

**IGROUP A - PAPER I -BASIC ELECTRONICS -**

**I(INDEPTHTHEORY &ANALYSIS NOTREQUIRED**

**COURSEOBJECTIVES:**

**T**hiscourseprovidestheimportantaspectofsemiconductorsanddeviceslikediodes, Transistor, JFET and MOSFET & to understand and acquire knowledge about variouscircuittheorem,makestudentsstronginelectriccircuitdesigning.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Understandthefundamentalsforconstruction&differenttypeofDiode,BJT. |
| **CO2** | Understandthefundamentalsforconstructionofdifferenttypeof JFET,MOS, etc |
| **CO3** | UnderstandvariouscircuitLaws. |
| **CO4** | Examinethebasiccomponentsinseriesandparallelconnection. |
| **CO5** | AnalyzeRMS&PowerparametersofACcircuits. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **Semiconductortheory** | Intrinsic Semiconductor – Extrinsic Semiconductor - TheoryofPNJunctionDiode-ZenerDiode-AvalancheBreakdown-ZenerBreakDown-Operation of PNP & NPN Transistor - CB, CE, CCConfigurationandCharacteristics-Transistorasan Amplifier. | 05 |

| | | | |
|---|---|---|---|
| | | | |
| **II** | **Electronic components** | SimpleTheory&Useof:Resistors,Capacitors,Inductors, Diodes, Zener diodes, Transistors, FET,MOSFET,UJT,SCR,DIAC,TRIAC,LED,Seven SegmentDisplay,BasicGateIC's,Transformers,LDR, Switches, Microphone, Loudspeaker, Buzzers,Fuse. | 05 |
| **III** | **Circuitlaws** | Ohm's Law - Kirchoff's Current Law - Kirchoff'sVoltageLaw-VoltageDivision-CurrentDivision -SeriesCircuits-ParallelCircuits-Series&Parallel Circuits-OpenCircuit-ShortCircuit. | 05 |
| **IV** | **Resistors,capacitors &inductors** | Resistor Resistors, Capacitors & Inductors in Seriesand Parallel-Factors governing the Resistance of a ,Capacitor & Inductor -ColourCoding of Resistors - EnergyStoredinaCapacitor-EnergyStoredinan Inductor | 05 |
| **V** | **Waveforms** | Sinusoidal Waveform - Non-Sinusoidal Waveforms - Peak Value - Peak to Peak Value - Average Value - RMSValue–Period&FrequencyMeasurement. | 05 |

**REFERENCEBOOKS:**

1. ElectronicDevices&Circuits-Salivahanan-TMH-2ndEdition
2. PrinciplesofElectronics-V.K.Mehta-S.Chand.
3. Circuits&Networks-Sudhakar-TMH-4thEdition.

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTERIII**

**NONMAJORELECTIVECOURSE I**

| L | T | P | C |
|---|---|---|---|
| 2 | 0 | 0 | 2 |

**GROUPA-PAPERII-BIOMEDICAL ELECTRONICS–I**

**(INDEPTHTHEORY&ANALYSIS NOTREQUIRED)**

**COURSEOBJECTIVES:**

- ToIllustrateoriginofbiopotentialsanditspropagations
- Tounderstandthedifferenttypesofelectrodesanditsplacementforvariousrecordings
- Tounderstandvariousphysiologicalrecordingsanditsmeasurements
- Tolearnthemedicalimagingequipmentandtechniquesforsurgeries.
- TosummarizetherapeuticequipmentandPatientmonitoringtechniquesforbiologicaloperations.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Differentiatedifferentbiopotentialsanditspropagations. |
| **CO2** | Illustratedifferentelectrodesanditsplacementforbiopotentialsrecordingsand measurements |
| **CO3** | Demonstratevariouselectrophysiologicalrecordingsandmeasurements |
| **CO4** | Explainmedicalimaging equipment'susinginsurgeries |
| **CO5** | Demonstratedifferenttherapeuticequipment'sandPatientmonitoringtechniques |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **Introduction** | IntroductiontoHumanPhysiology–Micro Electrodes –SkinSurfaceElectrodes–NeedleElectrodes–Reference Electrodes. | 05 |
| **II** | **Meters &recorders** | Digital Thermometer – Sphygmo Manometer - ElectronicSthethoscope–ECG-EEG–EMG | 05 |
| **III** | **CardioTocography** | Cardio Tocography - Electro Oculography - ElectroRetinography- PolySomnographyBloodFlowMeter-Doppler – Audiometer | 05 |
| **IV** | **Operationtheatreequipments** | UpperEndoscope-LowerEndoscope-ENTEndoscope | 05 |
| **V** | **Diathermy** | Diathermy - Surgical Diathermy- Micro WaveDiathermy- MultiparaPatientMonitor. | 05 |

**REFERENCEBOOKS:**


1. BiomedicalInstrumentation&Measurements–AnandaNatarajan–PHI-Rs.275/-
2. BiomedicalInstrumentationandMeasurements-LeslieCromwell-PHI-2ndEdition.
3. Bio-MedicalInstrumentation-Dr.M.Arumugam-AnuradhaAgencies-2ndEdition
4. HandbookofBiomedicalInstrumentation-R.S.Khandpur-TMH
5. MedicalInstrumentation,ApplicationAndDesign–JohnG.Webster–WEL-3rdEdition
6. ATextofBookofMedicalInstruments–Ananthi–NewAgeInternational–Rs.275/-
7. Internet :AdditionalReferenceForAllUnits.

**B.SC.ELECTRONICSANDCOMMUNICATION**

**SEMESTERIII**

**NON MAJOR ELECTIVE COURSE**

**IGROUPA-PAPERIII -CELLULARPHONES**

**(INDEPTHTHEORY &ANALYSIS NOTREQUIRED)**

| L | T | P | C |
|---|---|---|---|
| 2 | 0 | 0 | 2 |

**COURSEOBJECTIVES:**

TogetknowledgeaboutCellularRadio,ElementsofaCellularNetwork,CellularTelephony,Radio Propagation andits applications&themobileservicingandSoftwareRepairing.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Understandthefundamentalconceptsof Cellular. |
| **CO2** | Understandthedifferentaccessingtechnology. |
| **CO3** | Understandthehardware&softwareofmobile |
| **CO4** | Understandtheservicingofmobile |
| **CO5** | Understandtheothermobileservicetools |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Basics** | WorkingofaTelephone-LocalExchange-Initiatinga call - Calling a Number - Making a Connection - Answeringa Call-Conversation- Ending a Call - HookSwitch-Transmitter-Receiver-Ringer-Cellular Mobile Telephone System - Mobile PhoneServiceArea-MobileFraudCall. | 05 |

| | | | |
|---|---|---|---|
| **II** | **Accesstechnologies** | GSM-CDMA-GPRS-EDGE-WCDMA-UMTS-HSDPA-SatellitePhones-GPS-MobileBrowsers-WAP. | 05 |
| **III** | **Hardware/ Software** | Typesof:WirelessOptions,Batteries,MemoryCards,Messaging,RingTones,KeypadTypes,DisplayTypes.HandsetFormFactor-SMSAbbreviations-Mobile OS. | 05 |
| **IV** | **Hardware/ softwarerepairing** | Hardware/SoftwareRepairing-VariousLocks-Installation of : UFS Driver, UFS Suite & FlashingFiles-IMEINumberDetection-MobileGSMUtilityCodes(AnyFive of NokiaSet) | 05 |
| **V** | **Other mobile service tools** | UltrasonicCleaner-ComputerConnectors-SIMCard Reader - Memory Card Reader - Mobile Virus -Virus Prevention - Removing Virus - Health HazardswithMobiles-SAR. | 05 |

**REFERENCEBOOKS:**


1. ModernMobilePhoneIntroduction&Servicing-ManaharLotia-BPB-Rs.75/-(Unit-I)
2. ModernMobilePhoneRepairUsingComputerSoftware&Service Devices - ManaharLotia
   -BPB-120/-(Units I,IV&V)
3. ModernMobilePhoneUnlocking&UtilityCodesForGSM&CDMAPhones-ManaharLotia-BPB-Rs.99/-(Unit-IV).
4. Mobile Telephony - Digit Magazine - Supplement - Jan 2006 - Jasubhai DigitalMediaPublications.(UnitII&III)
5. BlueToothTechnology–CSRPrabhu&APrathapReddi–PHI-Rs.250/-

6. Mobile&PersonalCommunicationSystems&Services-RajPandya-PHI–Rs.250/-

7. INTERNET:ADDITIONALREFERENCEFORALLUNITS.

## B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERIV

## COREIV-8085MICROPROCESSOR&INTERFACING

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**COURSEOBJECTIVES:**

Tounderstandthefeaturesandapplicationsof8085microprocessor&exploittheabilities forthedesignand peripheral interfacingwith real timedomains

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Understandtheevolutionofprocessorand8085architectures. |
| **CO2** | LearntheinstructionandtocreatetheALP. |
| **CO3** | Investigatetheinstructionformatandmachinecyclefetch. |
| **CO4** | Computeanddesignfortimedelayandcounters. |
| **CO5** | Designanddevelopmentofinterfacingandapplications. |

## Syllabus

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **8085 Microprocessor** | Signalson8085–Architectureof8085–DemultiplexingtheBus-GeneratingControlSignals –Fetching,DecodingandExecutionofanInstruction–MemoryMappingfora8KMemoryChip -Study of EPROM (2764) & Study of RWM(6264). | 10 |

| | | | |
|---|---|---|---|
| **II** | **Instruction set** | Data Transfer – Arithmetic – Logical – Branching - MachineControlInstructions- Stack&StackOperations-SimplePrograms. | 10 |
| **III** | **Timing Diagram** | Addressing Modes - Instruction Format - MemoryRead Machine Cycle (MOV C,A& MVI A,32) -MemoryWriteMachineCycle(MVIM,48)- TimingDiagram of IN & OUT Instruction - Interrupt Systemof8085. | 10 |
| **IV** | **Peripherals** | TimeDelayProgram–Signalson8255–I/OMode –BSRMode- InterfacingWith:Switches&MatrixKeyboard. | 10 |
| **V** | **Interfacing** | Interfacing With: LED'S - Single & Multiple SevenSegment Displays - LCD - ADC 0809 - DAC 0800 –StepperMotor -TrafficLightControl System. | 10 |

**REFERENCEBOOKS:**


1. MicroprocessorArchitecture,ProgrammingandApplicationsWiththe8085/8080A– Ramesh.SGaonkar-NewAgeInternational–5thEdition.
2. IntroductiontoMicroprocessor-APMathur-TMH–3rdEdition
3. MicroprocessoranditsApplications –S.Malarvizhi–AnuradhaPublications
4. FundamentalsofMicroprocessorsandMicroControllers–B.Ram–DhanpatRai– IVthEdition

## B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERIII&IV

## COREPRACTICALII -ELECTRONICCIRCUITSLAB

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**(ANYHARDWAREBASEDSIMULATIONTOOLMAYALSOBEUSED)**

**(Any22Experiments)**

**CourseObjectives**

The objective of the course is to equip the students with in-depth basic conceptsand understanding of the principles of operation, construction, and characteristics of basicelectronic equipment, and their utilization in basic electronics building blocks (or modules)and their performances practically. The techniques of analysis and design of basic buildingblocksof moderntechnologyusingdevicewouldbe emphasized.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Todevelophands-onskillsandknowledgeabouttheelectronicdevicessuchas oscilloscopes,functiongenerators,multimeter,etc. |
| **CO2** | Toimplementdifferenttypesof electroniccircuitsusingthetechniques,skills. |
| **CO3** | Toanalyzecomplexnetworksofresistors,inductors,capacitorssubjecttoboth direct(non-time-varying)andalternatingvoltagesandcurrents. |

**Syllabus**

1. AmplitudeandFrequencyMeasurementUsingCRO
2. HalfWaveRectifierwithCapacitorFilter
3. FullWaveRectifierwithCapacitorFilter
4. BridgeRectifierwithCapacitorFilter
5. RegulatedDualPowerSupplyUsing78XX&79XX
6. Positive&NegativeClippingat0V
7. Positive&NegativeClampingat0V
8. VoltageDoubler/VoltageTripler/VoltageQuadrupler

9. BasicDifferentiator&BasicIntegrator
10. HartleyOscillatorUsingTransistor
11. Colpitt'sOscillatororClappOscillatorUsingTransistor.
12. PhaseShift/WeinBridgeOscillatorUsingTransistor.
13. CrystalOscillatorUsingTransistors.
14. UJTasanOscillator.
15. AstableMultivibratorUsingTransistors
16. MonostableMultivibratorUsingTransistors.
17. BistableMultivibratorUsingTransistors
18. SchmittTriggerUsingTransistors.
19. SingleStageRCCoupledAmplifier.
20. TwoStageRCCoupledAmplifier
21. EmitterFollower.
22. PushPullComplementarySymmetryEmitterFollower.
23. PowerAmplifierUsingLM380IC.
24. FiringAngleControlUsingSCR(HalfCycle/FullCycle).
25. LampDimmer
26. AutomaticStreetLightControl.
27. TransistorChopper.
28. BurglarAlarmorFireAlarm
29. PowerTransistorInverter(40W/20W)
30. CommutationTechniques(AnyTwo)

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTERIII&IV**

**COREPRACTICALIII**

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**(ANYEMBEDDEDBASEDSIMULATIONTOOLMAYALSOBEUSED)**

**(Any22Experiments)**

# 8085MICROPROCESSOR &INTERFACINGLAB

**CourseObjectives**

Toexposestudentstotheoperationoftypicalmicroprocessor(8085)**simulation tool/** trainer kit.solve different problems by developing different programs&todevelop thequalityof assessing and analyzingthe obtaineddata.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | IdentifyrelevantinformationtosupplementtotheMicroprocessor. |
| **CO2** | Setupprogrammingstrategiesandselectpropermnemonicsandruntheirprogramonthetraining boards/simulator. |
| **CO3** | **Practice**differenttypesofprogrammingkeepinginmindtechnicalissuesandevaluate possiblecausesofdiscrepancyinpracticalexperimentalobservationsincomparison. |
| **CO4** | Develop testing and experimentalprocedures on Microprocessor **analyze** theiroperationunder differentcases. |
| **CO5** | **Prepare**professionalqualitytextualandcomputationalresults,incorporatingaccepted dataanalysisandsynthesismethods,simulationsoftware,andword-processingtools. |

**Syllabus**

1. AdditionofTwo;8BitNumbers&SubtractionofTwo;8BitNumbers
2. MultiplicationofTwo;8BitNumbers
3. DivisionofTwo;8BitNumbers
4. BCDAddition

5. BCDSubtraction
6. FILL
7. BLOCKMOVE
8. 1's&2'sComplementofa16BitNumber.
9. Smallest/Largestof;NNumbers.
10. Ascending/DescendingOrderof;NNumbers.
11. SumofN;8BitNumbers.
12. MultiByteAddition.
13. 3DigitDecimaltoTwodigitHexadecimalConversion.
14. TwodigitHexadecimalto3digitDecimalConversion.
15. ADCInterface.
16. DACInterface.
17. WaveformGenerationUsingDAC.
18. StepperMotorInterface.
19. InterfacewithSwitches& InterfacewithLED's
20. HexKeyboardInterface.
21. InterfacewithSingleSevenSegmentDisplay.
22. InterfacingwithMultipleSevenSegmentDisplays.
23. InterfacewithLCD's.
24. InterfacingwithSolidStateRelay.
25. MovingDisplay.
26. BlinkingDisplay.
27. DigitalClock.
28. TrafficLightControl.

## B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERV

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## COREV -ELECTRONICCOMMUNICATIONSYSTEMS

**COURSEOBJECTIVES:**

LearnabouttheoreticalboundsontheratesofElectronicCommunicationSystemandrepresent a digital signal using several modulation methods. Draw signal space diagramscomputespectraofmodulatedsignals andapplyredundancyforreliablecommunication.

**COURSEOUTCOMES:**At theendofcourse,student willbeableto:

| | |
|---|---|
| **CO1** | Understandthebasicsof EM,spacediagram,spectrum,propagation. |
| **CO2** | Learnthegenerationanddetectionof Modulationandbasebandsystem. |
| **CO3** | Understandthegeneration,detection,TransmitterofFM. |
| **CO4** | Learnthe AM &FMReceiver |
| **CO5** | EvaluatetheperformanceofPCM,DPCMandDMinadigitalcommunication system |

## Syllabus

| Unit | UnitTitle | Intended learning Chapters(Programmespecificqualification attributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Propagation ofradiowaves** | IntroductiontoEM waves–Reflection andrefraction of radio waves at the surface of theearth – Ground wave propagation-Sky wavepropagation–Spacewavepropagation– StructureoftheAtmosphere–Criticalfrequency-Skipdistance–MaximumUsable frequency(MUF)– Virtualheight. | **10** |
| **II** | **Am generation&tr** | Needformodulation–Amplitudemodulation –FrequencySpectrumoftheAMWave-ModulationIndex–PowerrelationsintheAM | **10** |

| | | | |
|---|---|---|---|
| | **ansmission** | | |

| | | | |
|---|---|---|---|
| | | Wave – AM generation – AM Transmitter. - Forms of Amplitude Modulation – Evolutionof SSB – Balanced Modulator – Methods ofSSBGeneration–Vestigialsideband Transmission. | |
| **III** | **Fm generation&transmission** | Frequency Modulation - Frequency Spectrumof the FM Wave – Modulation Index – EffectofNoise–Adjacent&Co-ChannelInterference– WideBand&NarrowBandFM-FMGeneration– DirectandIndirect methods-FMTransmitter–Pre-Emphasis. | **10** |
| **IV** | **Am &fmreception** | AMReceiver–TRFReceiver– SuperHeterodyneReceiver– ImageFrequencyRejection– FrequencyChanging&Tracking – ChoiceofIF–AMDetection–AGC– SSBDetection.FMReceiver–AmplitudeLimiter – De-Emphasis–FMDetection–Balanced SlopeDetector–PhaseDiscriminator– RatioDetector. | **10** |
| **V** | **Pulsemodulation** | PAMModulation&Detection– PWMModulation & Detection - PPM Modulation &Detection - Sampling Theorem – Quantization& Quantization Error – PCM Modulation &Detection-Companding-ASK– FSK– BPSK– QPSK– DPSK | **10** |

**REFERENCEBOOKS:**


1. ElectronicCommunicationSystems-Kennedy-TMH–IVEd
2. ElectronicCommunicationSystems-Roddy&Collen–PHI–IVEd
3. ElectronicCommunications–SanjeevGupta–KhannaPublications.
4. PrinciplesofCommunicationEngineering–AnokhSingh–S.Chanda

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTERV**

**COREVI-IC'sANDTHEIRAPPLICATIONS**

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**COURSEOBJECTIVES:**

ThiscourseelaboratestheproductionmethodsofIC’sandvariousapplicationof themincludinglogic,OP-AMPs**.**

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | UnderstandthemethodofIC’sfabricationTechniques. |
| **CO2** | StudythevariouscircuitsofLogicoperationsusingICs. |
| **CO3** | GettheknowledgeofvariousOP-Ampcircuits |
| **CO4** | StudytheprincipleofFilter. |
| **CO5** | StudytheprincipleofTimer&Phaselockedloop circuits. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Icfabrication process** | Introduction - Basic Planar Process - Fabrication of aTypical Circuit - Active and Passive Components - Fabrication of FET,MOSFET&CMOS. | 10 |
| **II** | **Logic family's** | CharacteristicsofIC's-DiodeLogic-TransistorLogic-RTL-DCTL-IIL-DTL-HTL-TTL-CMOS–ECL-ComparisonofLogicFamilies. | 10 |

| | | | |
|---|---|---|---|
| **III** | **OP – AMP 'S** | Introduction - The ideal OP-AMP - OP-Amp Stages - OP-AmpParameters- Inverting&NonInvertingAmplifier - Adder - Subtractor - Multiplier - Divider -Integrator - Differentiator - V to I Converter - I to VConverter. | 10 |
| **IV** | **Filters** | LowPassFilter–HighPassFilter–BandPassFilter– BandRejectFilter-SolvingofSimultaneousEquations –SolvingofDifferentialEquations. | 10 |
| **V** | **555Timer& 565 PLL** | 555:FunctionalDiagram-AstableOperation-Monostable Operation - Linear Ramp Generator. PLL:Basic Principle – 565 PLL - Frequency Translation - FrequencyMultiplier-FrequencyDivider- AMDetection– FM Detection. | 10 |

**REFERENCEBOOKS:**

1) LinearIC's–RoyChoudhury–NAI–4thEdition.(UNITI)

2) ElectronicCircuits–Salivahanan–TMH-IIEdition(UNITII)

3) OP-Amps-Gayakwad-PHI-4thEdition-(UNITIII,IV&V)

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**ELECTIVEI -PAPERI-GroupA**
**8051MICROCONTROLLERANDINTERFACING**

**COURSEOBJECTIVES:**

To understand the basics of micro controller architecture and memory systems.learnthe assembly language programming instructions and writing programs &to exploit theabilities forthedesignandperipheral interfacing with real timedomains.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Understandtheevolutionofmicrocontroller8051architectures,pinfunctionsand bustiming. |
| **CO2** | Learntheinstructionformat,andtocreatetheassemblylanguageprogramwithloopingtechniques. |
| **CO3** | Investigatetheinterfacingtechniquesforkeyboardandopticaldevices. |
| **CO4** | Computeanddesignforconverterandrealtimeapplications. |
| **CO5** | Designanddevelopmentofmemories. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **8051 Microcontroller** | Features-Signals-Architecture-RAMStructure-SFR's-PowerSavingModes-Interruptlogic-Timer Logic-SerialLogic | 10 |

| | | | |
|---|---|---|---|
| **II** | **Instruction set** | Datatransfer-Arithmetic–Logical–Bitmanipulation–BranchingInstructions–Stack&StackOperations–Addressing Modes-Simple Programs. | 10 |
| **III** | **Interfacing withIO** | InterfacingWith:Switches&MatrixKeyboard-LED'S - Single & Multiple Seven Segment Displays –LCD. | 10 |
| **IV** | **Interfacing withApplication** | InterfacingWith:ADC0809IC–DAC0800IC-StepperMotor–DCMotor–TrafficLightControlSystem. | 10 |
| **V** | **Memories** | ROM – PROM – EPROM(2764) - EEPROM – NVRAM - Static RWM (6264)-Dynamic RWM(TC511000)-RWMRefreshing–PseudostaticRWM. | 10 |

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**REFERENCEBOOKS:**


1. The8051MicrocontrollerEmbeddedSystems–Mazidi&Mazidi-Pearson-2ndEdition.
2. IntroductiontoMicroprocessor-AP Mathur - TMH–3rdEdition (Unit-V)

**B.SC. ELECTRONICS AND**

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## ELECTIVE I - PAPER II-Group APIC16F877MICROCONTROLLERANDINTERFACING

**COURSEOBJECTIVES:**

1. Throughthiscourse,thestudentswillbeexposedtohardwaredetailsofPIC16F877MICROCONTROLLERwiththerelated signals and theirimplications.
2. Theywillalsolearnprogrammingandinterfacingof PIC16F877.
3. Theywillalsobeawareoftheinterfacingandits application.
4. Lastlythestudentswillhaveabasicideaonmemory.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | UnderstandthearchitectureofPIC16F877MICROCONTROLLER. |
| **CO2** | Impartthe knowledgeabouttheinstructionset. |
| **CO3** | InterfaceLCD,Keyboard,ADC,DAC,Sensors,Relays,DCmotorandStepper motorwithPIC16F877microcontroller. |
| **CO4** | UnderstandthebasicideaaboutMemoriesanditsapplications. |

## Syllabus

| Unit | UnitTitle | IntendedlearningChapters(Programmespecificqualificationattributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **PIC16f877 Microcontroller** | Features – Signals - Architecture – MemoryOrganization–WatchDogTimer– ResetTypes – Oscillator Types – Power Down Modes – I/OPorts–CCPModule– SSPModule.(USART, SPI,I2C&ICSP) | 10 |

| | | | |
|---|---|---|---|
| **II** | **Instructionset** | Byte Oriented – Bit Oriented - Literal & ControlInstructions–Stack&StackOperations-AddressingModes–SimplePrograms-Timer logic–interruptlogic–Serial Logic–ADC. | 10 |
| **III** | **Interfacing withIO** | Interfacing With: Switches & Matrix Keyboard - LED'S-Single&MultipleSevenSegmentDisplays – LCD. | 10 |
| **IV** | **Interfacing withApplication** | Interfacing With: ADC 0809 IC – DAC 0800 IC - StepperMotor–DCMotor– TrafficLightControlSystem. | 10 |
| **V** | **Memories** | ROM–PROM–EPROM(2764)-EEPROM– NVRAM - Static RWM (6264)-Dynamic RWM(TC511000)- RWM Refreshing – PseudostaticRWM. | 10 |

**REFERENCEBOOKS:**

1. PIC16F877DataBook–MICROCHIP.
2. FundamentalsofMicrocontrollersandApplicationsInEmbeddedSystems(WiththePIC18MicrocontrollerFamily)–RameshSGaonkar–PRI–RS.300/-
3. DesignWithPicMicrocontrollers–JohnB.peatman–Pearson
4. IntroductiontoMicroprocessors–APMathur–TMH–3rdEdition(UNIT-V).

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**ELECTIVE I - PAPER III -Group APROGRAMMABLELOGICCONTROLLERS**

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**COURSEOBJECTIVES:**

To provide knowledge levels needed for PLC programming and operating, PLCfunctions, Data Handling processes &make the students how devices to which PLC inputand outputmodulesare connected.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | AbilitytogainknowledgeonProgrammableLogicController. |
| **CO2** | Createladderdiagramsfromprocesscontrolfunction |
| **CO3** | UnderstandtheknowledgeaboutvariestypeofPLCregisters |
| **CO4** | DevelopthePLCapplicationprogram |
| **CO5** | DesignthedifferenttypeofPLCfunctions,DataHandlingFunction. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programmespecificqualificationattributes K1, K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **PLCBasics** | AdvantagesandDisadvantages–OverallPLCSystem – Input & Output Modules – Printing PLCInformation– CPU–Memory–Processor–I/OModules– PowerSupplies–ProgrammingEquipment– ProgrammingFormats– ConstructionofPLCLadderDiagram– ProcessorsScanningConsiderations– PLCOperationalFaults– InputON/OFFSwitchingDevices– | 10 |

| | | | |
|---|---|---|---|
| | | InputAnalogDevices–<br>OutputON/OFFDevices–OutputAnalogDevices. | |

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| **II** | **PLC Programming** | InputInstructions–Outputs:Coils,Indicators&Others – Operational Procedures – Contact and CoilI/O Programming Examples (Any 3) – Digital LogicGates–BooleanAlgebraPLCProgramming– ConversionExamples(Any3)– LadderDiagramsandSequenceListings– LargeProcessDiagram Construction. | 10 |
| **III** | **PLC Functions** | GeneralCharacteristicsofRegisters– ModuleAddressing – Holding Registers – Input Registers:SingleandGroup– OutputRegisters:SingleandGroup – PLC Timer Functions – Examples of TimerFunctionIndustrialApplications(Any3)– PLCCounters–ExamplesofCounterFunctionIndustrial Applications(Any3). | 10 |
| **IV** | **Intermediate functions** | PLCAdditionandSubtraction–PLCRepetitiveClock – PLC Multiplication, Division, Square Root,Trignometric and Log Functions – Other ArithmeticFunctions–BasicComparisonFunctions– Basic ComparisonFunctionApplications(Any3). | 10 |
| **V** | **Data handlingfunctions** | SkipFunctionandApplications– MASTERCONTROLRELAYFunctionandApplications–Jump with Non Return– Jump with Return – MOVEFunction & Applications – Moving Large Blocks ofPLC Data – PLC Table and Register Moves – PLCFIFOFunction–FAL–ONS–CLRAndSWEEP Functions – Bit Patterns in a Register – Changing aRegister Bit Status– Shift Register Functions andApplications. PLCNetworking. | 10 |

**TEXTBOOK**

Programmable LogicControllers–John W.Webb &Ronald A.Reis–PHI–V Edition – Rs.295/-

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**ELECTIVEII -PAPERI-Group**B

**MODERN TELEVISION SYSTEMS**

**COURSEOBJECTIVES:**

Tointroducethebasicsofpicturetransmissionandreception,analysisandsynthesis of compositevideosignal,receiverandpicturetubesandtelevisioncameratubesalsostudyvarious colourtelevisionsystems.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Understandthefundamentalconceptsof televisionstandards. |
| **CO2** | Acquiretheknowledgeinbasicprincipleofreceivercircuits. |
| **CO3** | Distinguishtheprincipleofverticalandhorizontalsyncseparation. |
| **CO4** | Understand different colour television systems used worldwide and its compatibility. |
| **CO5** | Evaluatethedetailedoperationofcameraandpicturetubeofmonochromeand colourtelevision. |

## Syllabus

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **Television Standards** | Aspect Ratio - Scanning – Number of Scanning Lines - InterlacedScanning-VerticalResolutionandHorizontalResolution–Horizontal&VerticalSyncDetails-CompositeVideoSignal-ChannelBandwidth–VestigialSideBandTransmission&Reception–Complete Channel Bandwidth – FM Channel | 10 |

| | | | |
|---|---|---|---|
| | | Bandwidth–AllocationofFrequencyBandsForTV Transmission-PositiveandNegativeModulation–CCIR–BStandards. | |
| **II** | **Receiver Circuits** | RF Tuner –Tuner Types - Various Sections of a VHFTuner – UHF Tuner – Electronic Tuning – Video IFSection – IF Amplifier – VSB Correction - Video IFAmp using IC CA 3068 - Video Detector Operation &Requirements– VideoAmplifierOperation&Requirements– CouplingMethods–VideoAmpUsing IC TBA 890. | 10 |
| **III** | **SyncSeparator** | BlockDiagram–Vertical&HorizontalSyncSeparation-VerticalO/PStage&Requirements– VerticalO/PStageIC's–EHTgeneration-SCorrection– Line O/PStageUsingTransistors& ICCA 920 – AGC – Types of AGC - Sound Section –Sound Take Off Circuit – Inter Carrier Sound IF Amp –AMLimiting– FMDetection–AnyOneFMDetector -Sound Section ICCA3065. | 10 |
| **IV** | **ColourTelevision** | Compatibility–Naturallight–Colourperception– Threecolourtheory–Chromaticitydiagram–Luminance, Hue and Saturation – Luminance &Colourdifferencesignals-Frequencyinterleaving– BandwidthforColourSignalTransmission-ModulationofColourDifferenceSignals-ColourTV Standards. | 10 |

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|---|---|---|---|
| **V** | **TelevisionTransmission &Reception** | MonochromeTVCameraTubes(AnyOne)–MonochromePictureTube-BlockdiagramofMonochromeTVTransmitterandReceiver–ColourTV Camera – Colour Picture Tubes (Any One) – PAL-D Coder – PAL Decoder – Merits & Demerits - LowVoltagePowerSupply–HighVoltagePowerSupply–SMPS-Merits&Demerits. | 10 |

**REFERENCEBOOKS:**

1. MonochromeAndColourTelevision-Gulathi–Nai–IiEdition
2. ColourTelevisionPrinciplesAndPractice-Gulathi-Nai
3. ModernTelevisionPractice-Gulathi-Nai-IIIEdition

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**ELECTIVEII-PAPERII-Group**B

**RADARANDNAVIGATIONALSYSTEMSC**

**OURSEOBJECTIVES:**

Tointroducethefundamentalconcepts ofRADARandnavigationalaids. Exposethestudentstodifferenttypesof RADARsystemsandNavigation,getfamiliarizewith recenttechnologiesinmethodsofnavigation.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Gainknowledgeinthe fundamentalprincipleofRADAR. |
| **CO2** | Becomefamiliarwithfundamentalsofdifferenttypesof RADAR. |
| **CO3** | Gainin-depthknowledgeaboutthedifferenttypesofRADARtransmitterand receiverandtheiroperations. |
| **CO4** | UnderstandthesignaldetectioninRADARandvariousdetectiontechniques. |
| **CO5** | Understandthenavigationalaidsandmodernnavigationmethods. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Introduction to Radar** | Basic Radar –The simple form of the Radar Equation - RadarBlockDiagram-RadarFrequencies– ApplicationsofRadar–TheRadarEquation- TransmitterPower-PulseRepetitionFrequency– AntennaParameters-OtherRadarEquation Considerations. | 10 |

| | | | |
|---|---|---|---|
| **II** | **MTI andPulse DopplerRadar** | DopplerandMTIRadar-MovingTargetDetector-MTIfromaMovingPlatform-PulseDopplerRadar– | 10 |

| | | | |
|---|---|---|---|
| | | OtherDopplerRadarTopics-TrackingwithRadar– AutomaticTrackingwith SurveillanceRadars. | |
| **III** | **RADAR Transmitter andReceiver** | LinearBeamPowerTubes-SolidStateRFPowerSources - Magnetron - Crossed Field Amplifiers - OtherRFPowerSources- OtheraspectsofRadarTransmitter -TheRadarReceiver-SuperheterodyneReceiver- DuplexersandReceiverProtectors-RadarDisplays.- Propagation Radar Waves - Atmospheric Refraction – Standardpropagation-NonstandardPropagation-The RadarAntenna-ReflectorAntennas. | 10 |
| **IV** | **RADIODIRECTION FINDING& RANGES :** | An Aural Null Direction Finder – The Goniometer - Automatic Direction Finders - The Commutated AerialDirectionFinder- TheLF/MFFourcourseRadioRange- VHFOmniDirectionalRange-VORReceivingEquipment- Loran-AEquipment-TheDeccaNavigationSystem- DeccaReceivers-The OmegaSystem. | 10 |
| **V** | **Methods ofNavigation** | OperationofDME-TACANEquipment.- InstrumentLandingSystem- GroundControlledApproachSystem –MicrowaveLandingSystem-NavigationOverthe Earth-ComponentsofanInertialNavigationSystem. | 10 |

**REFERENCEBOOKS:**

1. IntroductionToRadarSystems-Skolnik–Tmh–IiiEdition2003
2. RadarPrinciples-PeytonZPeebles-JohnWiley–2004
3. PrinciplesOfRadar-JcToomay-PhiIiEdition-2004

4. Microwave&RadarEngineering–Kulkarni–UmeshPublications

5. RadarSystem&RadarAidsToNavigation–Sen&Battachariya–KhannaPublications.

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTERV**

**ELECTIVEII- PAPERIII Group**B

**SATELLITE,CABLEANDDTH SYSTEMS**

**COURSEOBJECTIVES:**

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- Tointroducethebasicsconceptsof Satellitesandcablenetworks.
- Tomakethestudentsassembleandtroubleshoot DTHthereself.
- Createsentrepreneurshipopportunity.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Gainknowledgeabouthistoryandbasicsofsatellites |
| **CO2** | AcquireknowledgeaboutcableTVnetworktransmissiontechniques |
| **CO3** | AcquireknowledgeaboutdigitalsatelliteTVnetworktransmissiontechniques |
| **CO4** | IntroductionofDTHComponents |
| **CO5** | InstallingtheDTH&supporting peripherals |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|
| I | **Satellite systems** | Geo-StationarySatellite– SatelliteCommunicationSystem–SatelliteElectronics– InternationalandRegionalDirectBroadcastingSatellites– Indian DomesticSatellites–DomesticBroadcastingSystems. | 10 |

| | | | |
|---|---|---|---|
| II | **Cable tvsystems** | CableSignalSources–CableSignalProcessing–CableSignalDistribution–BidirectionalNetworks–ScramblingofTVSignals–CableSignalConvertors. | 10 |
| III | **Digitalsatellitetv** | Digital Satellite Transmission – Digital SatelliteReceptionandDecoding–DTHTV–DigitalTV Receiver–MeritsofDigitalTVReceiver –DTT. | 10 |
| IV | **Dthworking** | DTHAntenna–DTHLNB–DTHReceiver–AdditionalAccessories–CompleteDTHProcess–Connecting more than One TV Receiver to a SingleDish , Connecting more than one tv to a Single SatelliteReceiver – Connecting more than one Dish/LNB to aSingleReceiver–ChangingSatelliteChannels–Need ofTelephoneJack. | 10 |
| V | **Dishinstallation** | Site Survey – Dish Roof and Wall mounts – AdjustingtheAzimuthandElevationSettings–DishAntennaConnectionProcedures–Precautions-TroubleShooting–AdjustmenttoCorrectPosition–LNBTesting–DDDirectPlus–SatellitesUsed–Comparison with Other DTH Systems – Reception ofDDDirectPlus–ReceiverInstallation–TV/Radio ChannelsonDDDirectPlus. | 10 |

**REFERENCEBOOKS**:

1. ModernTVPractice–R.R.Gulati–NAI–IIIrdEdition
2. ModernDTHDigitalSatelliteReceiver–ManahorLotia–BPB–Rs.120/-

3. CompositeSatelliteandCableTV–R.R.Gulati–NAI.

4. SatelliteCommunication-DennisRoddy–TMH

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTERV**

**ELECTIVEII-PAPERIV-Group**B

**MOBILECOMMUNICATON&SERVICING**

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**COURSEOBJECTIVES:**

- TointroducethebasicsofCellularstructureandoperation.
- Itprovidesentrepreneurshipopportunity&Practicaloriented.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | UnderstandthefundamentalconceptsofCellular. |
| **CO2** | Acquiretheknowledgeinbasicprinciple ofBTStransmission. |
| **CO3** | Understandthedifferentaccessingtechnology. |
| **CO4** | Understandthechiplevelsoftware servicingofmobile |
| **CO5** | Understandtheservicingofmobile |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|
| I | **Mobile datacommunication** | Introduction-CellularRadio-ElementsofaCellularNetwork-Cellular Telephony - Radio Propagation - SpeechCoding-ErrorCodingandError Corrrection. | 10 |
| II | **MobilityManagement** | Mobility Management - Hand OffManagement-HardHandOff-Soft HandOff-SwitchingandAuthentication-MTSOInterconnections-Circuit | 10 |

| | | | |
|---|---|---|---|
| | | SwitchedandPacketSwitchedDataServices | |

| | | | |
|---|---|---|---|
| | | onCellularNetworks. | |
| **III** | **Multipleaccesstechnologies** | Introduction - Frequency division multipleaccess-Timedivisionmultiple access - Code Division Multiple Access - SpreadSpectrumTechniques. | 10 |
| **IV** | **Mobileservicing** | Hardware/Software Repairing - VariousLocks-Installationof:UFSDriver, UFSSuite &Flashing Files - IMEI Number Detection-MobileUtilityCodes. | 10 |
| **V** | **Other mobileservicetools** | UltrasonicCleaner-ComputerConnectors-SIMCardReader-MemoryCard Reader- Mobile Virus - Virus Prevention - RemovingVirus-HealthHazardswithMobiles-SAR. | 10 |

**REFERENCEBOOKS**


1. WirelessCommunicationsAndNetworking–MadeSimple–SatishJain–BPBPublications.Rs.135/-(Units:I,II&III)
2. Modern Mobile Phone Repair using Computer Software & Service Devices - ManaharLotia -BPB-120/-(UnitsIV&V)
3. ModernMobilePhoneUnlocking&UtilityCodesForGSM&CDMAPhones-ManaharLotia-BPB-Rs.99/-(UnitIV)
4. MobileCellularTelecommunication–IIEdition-WilliamCYLee–TMH
5. MobileCommunications–Schiller–Pearson–IIEdition.
6. WirelessCommunications–Stalling–PearsonIIEdition.
7. Mobile&PersonalCommunicationSystems&Services-RajPandya-PHI–Rs.250/-

**B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERV**

**SKILLED BASED ELECTIVE COURSESBEC III - ELECTRONIC INSTRUMENTATION(INDEPTHTHEORY &ANALYSIS NOTREQUIRED)**

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**COURSEOBJECTIVES:**

- Tointroducethefundamentalelectronicinstrumentationthings.
- Toexposethestudentstoupgradetheirknowledgeinindustryside.
- Togetfamiliarizewithrecentinstrumentationtechnologies.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Gainknowledgeinthefundamentalprincipleofelectromechanicalinstruments. |
| **CO2** | BecomefamiliarwithBridgesNetworkcircuits |
| **CO3** | Acquiretheknowledgeindifferenttypesofoscilloscopes. |
| **CO4** | Understandthesignalgenerationtechniques. |
| **CO5** | Understandtheworkingfunctionandapplicationoftransducer. |

## Syllabus

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **Electromechanicalindicating instruments** | DC Ammeter - DC Voltmeter - Voltmeter Sensitivity - AC Voltmeter - Considerations in Analog Voltmeter - Series&ShuntTypeOhmmeter-CalibrationofDC Instruments–StudyofaTypicalDigitalMultimeter. | 05 |

| | | | |
|---|---|---|---|
| **II** | **Bridges** | Wheatstone Bridge - Balance Equation of General ACBridges– Capacitance&InductanceComparisonBridge-Maxwell– Hay-Schering-Wien-Kelvin& Kelvin'sDoubleBridge. | 05 |
| **III** | **Oscilloscope** | Block diagram - CRT - Vertical Deflection System - Delayline-HorizontalDeflectionSystem- CRTscreens&Graticules-OscilloscopeProbes- MeasurementofFrequency,Amplitude&Phase- Lissajou'sPatterns.Protocols. | 05 |
| **IV** | **Signalgeneration &signal analysis** | Sample & Hold Circuit - Instrumentation Amplifier - FunctionGenerator-PulseGenerator-QMeter- VectorImpedanceMeter-WaveAnalyzer-Harmonic DistortionAnalyzer. | 05 |
| **V** | **Transducers** | ResistiveTransducers–InductiveTransducers-Capacitive Transducers - Piezo Electric Transducer - ThermoElectricTransducers–Temperature Transducers–Microphones&LoudSpeakers. | 05 |

**REFERENCEBOOKS:**

1. ElectronicInstrumentation-H.S.Kalsi-TMH.
2. ModernElectronicInstrumentation&MeasurementTechniques-Cooper-PHI.
3. ElectronicMeasurements&Instrumentation–Salivahanan–S.Chand -Rs.270/-

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTERV**

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**COURSESBECIV-COMPETETIVE**

**SKILLS**

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**(SIMPLETHEORYONLY)**

**50MultipleChoiceQuestions.EACHQUESTION1.5MARKS.TE**

**NMultiple ChoiceQuestions FromEach Unit**

**COURSEOBJECTIVES:**

To provide students with solid foundation in CSE so that they are able touse this knowledge in getting jobs and maintaining their jobs. To develop students withprofessionalandethicalattitude,effectivecommunicationskillsandtheattitudeofworkingingroup/withpeopleforsuccessfulcareers.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Theabilitytoanalyzeaproblemandtoidentifytheappropriate Verbal reasoning. |
| **CO2** | Theabilitytoapplynonverbalreasoning. |
| **CO3** | Anunderstandingofprofessional,ethicalandsocialresponsibilities. |
| **CO4** | Theabilitytocommunicateeffectivelywith arangeofaudiences. |
| **CO5** | Theabilitytosucceedincompetitiveexams |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programmespecificqualificationattributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **Verbalr easoning** | Analogy–Classification–DirectionSenseTest –LogicalSequenceofWords– InsertingTheMissingCharacter–Situation ReactionTest. | 05 |

| | | | |
|---|---|---|---|
| **II** | **Non verbalreasoning** | Analytical Reasoning – Mirror Images – WaterImages-CompletionofIncompletePattern– CubesandDice. | 05 |
| **III** | **Arithmetical, ability** | Average–Problems onAge– Percentage– Profit&Loss–Ratio&Proportion–ChainRule– Time&Work. | 05 |
| **IV** | **Logarithms** | Pipes&Cistern–Time&Distance– ProblemsonTrains-Boats&Streams– SimpleInterest– CompoundInterest–Logarithms. | 05 |
| **V** | **Charts** | Area–Calendar–Clocks–Heights&Distances– BarGraphs–PieCharts. | 05 |

**ReferenceBooks**


1. A Modern Approach To Verbal & Non Verbal Reasoning - Revised Edition – R.S.Aggarwal–S.Chand.(Units:I&II)–Rs.750/-
2. QuantitativeAptitude-RevisedEdition-R.S.Aggarwal–S.Chand.Units:III,IV&V) –Rs.440/-
3. AnAdvancedApproachToDataInterpretation-R.S.Aggarwal–S.Chand.
4. AdvancedObjectiveGeneralKnowledge-R.S.Aggarwal–S.Chand
5. ObjectiveGeneralEnglish-R.S.Aggarwal–S.Chand

**B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERVI**

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## CORE VII - PC HARDWARE NETWORKING &TROUBLESHOOTING

**COURSEOBJECTIVES:**

Thiscourseguidesthecompleteviewofhardwareofthepersonalcomputerandpossibletroubleshooting.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Understandthemotherboardtypesandconnectionwithvarioustypesof RAM |
| **CO2** | StudythevariousversionsofBIOSandtheirfunctions. |
| **CO3** | Get the knowledge of Keyboard and Mouse connections and their troubleshooting |
| **CO4** | UnderstandthebasicofHarddiskandtheirconnections,withCDandDVD storagedevices&theprintertypes |
| **CO5** | Studythenetworkingandtheirconnectionswithassemblingof PCinthecabinet. |

## Syllabus

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Mother board** | Components - Support Circuits – Connectors - Installation - Troubleshooting – BIOS Beep Codes - Studyofa Latest Motherboard-FormFactor-PC Assembly-CabinetFormFactor . | 10 |
| **II** | **Memory systems** | MemoryModules-CacheMemory-ShadowMemory-CommonMemoryErrors-Battery-BIOSFunctions-BIOSSetup–BIOSUpgrade. | 10 |

| | | | |
|---|---|---|---|
| **III** | **Input deviceTroubleshooting** | **KEYBOARD :** Organisation - Troubleshooting - Ergonomics<br>**MOUSE:**Connection-Resolution-Installation-Troubleshooting.. | 10 |
| **IV** | **OutputdeviceTroubleshooting** | **HARDDISK**:FormFactor-StorageCapacity-DiskGeometry - Interfacing – Installation , Formatting &Troubleshooting.<br>**PRINTER:**Types,Interface&Troubleshooting. | 10 |
| **V** | **Networking** | **NETWORKING**:SettingupaNetwork–Preparationfor Network Installation – Network Configuration – SharingComputer–SharingPrinter–TroubleshootingNetworking.<br>**VIRUS:**Types-Working-Symptoms-Antivirus. | 10 |

**REFERENCEBOOKS:**


1. ModernComputerHardwareCourse-ManoharLotia-BPB-Rs.360/-
2. IbmPcAndClones–Govindarajulu–Tmh
3. IbmPcAdvancedTroubleShootingAndRepairingGuide–Robert.c.brenner-Phi.
4. TroubleShooting,Maintenance&RepairingPc's–stephenJ.bigelow-Tmh–IiEd
5. UpgradingandRepairingPC's-ScottMueller–Pearson-18th-Edition.
6. DOS6&6.22AnIntroduction-ManoharLotia–BPB–Rs.99/-
7. DOS6&6.22Companion-SatishJain-BPB–RS.210/-

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**COREVIII-NETWORKCOMMUNICATION&SECURITY**

**COURSEOBJECTIVES:**

- Describevariouscommunicationsnetworksandtheirmaincomponent
- Identifytheadvantagesanddisadvantagesofanetwork.
- Identifythefunctionofafirewall,andhowitkeepsacomputersecureandsafefromviruses.Prep are aplanforanti-virusprotection.

**COURSEOUTCOMES:**At theendofcourse,studentwillbeableto:

| | |
|---|---|
| **CO1** | IdentifythecomponentsassociatedwithTransmissionmethods. |
| **CO2** | Studentswilldetailsofsnetworkarchitecture,Topologytechnologyetc |
| **CO3** | Understandnetworksprotocolsandnetworkmanagement. |
| **CO4** | Theconceptofencapsulationanditsrelationshiptolayeringinthe networkmodel. |
| **CO5** | AnabilitytounderstandandanalyzetheissuesinprovidingQuality-Of-Service for network multimedia applications such as Internet, telephony&networksecurity |

**Syllabus**

| Unit | UnitTitle | Intended learning Chapters(Programmespecificqualification attributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Transmission methods** | Digital Signal Analog Transmission – BaudRate-AnalogSignalDigitalTransmission –Parallel&SerialCommunication– Asynchronous & SynchronousCommunication – Simplex – Half Duplex -Full | **10** |

| | | | |
|---|---|---|---|
| | | Duplex – Multiplexing - De-multiplexing-TypesofMultiplexing. | |
| **II** | **Network** | MeshTopology–StarTopology–Tree | **10** |

| | | | |
|---|---|---|---|
| | **topologies** | Topology –Ring – Bus – Hybrid – Basicsof Switching – Router & Routing – InternetTopology–ArchitectureofanISP– LogicalTypesofTopology. | |
| **III** | **Network protocols** | OSI Model – Physical Layer – Data LinkLayer – Network Layer – Transport Layer –SessionLayer–PresentationLayer– ApplicationLayer–OverviewofNetwork Protocols. | **10** |
| **IV** | **Lantech nologies** | Introduction–LANHardware– ImplementingLAN–FastLANS- Nonstandard LANS – Extending LANS – VirtualLANS–TokenPassingNetworks– FDDI–MAN–WAN. | **10** |
| **V** | **Internet access& networksecurit y** | Introduction–DialupAccess–Leasedlines – DSL - Cable Modems – DTE – DCEInterface – RS-232 & RS-449 Interface –SONET. NETWORKSECURITY:Introduction– TypesofComputerAttacks–Firewall– VirtualPrivateNetwork-Cryptography. | **10** |

**REFERENCEBOOKS:.**


1. DataCommunication&Networks-Achyut.S.Godbole&AtulKahate–TMH–2ED(Units:I,II,III&V)
2. AdvancedComputerNetworking(ConceptsandApplications)-SatishJain–BPB–Rs.195/-(Unit:IV&V)
3. DataCommunicationAndNetworking(UPDATEDEDITION)–SatishJain–BPBPublications.Rs.270/-
4. ComputerNetworks–UYLESSBLACK–PHI-IINDEDITION.
5. ComputerNetworks–ANDREW.S.TANENBAUM–PHI.
6. CommunicationProtocolEngineering-PallapaVenkataramandS.S.Manvi-PHI.
7. NetworkingConceptsAndNetware–Anand–HimalayaPublications

## B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERVI

## COREIX-BIOMEDICALINSTRUMENTS

**(SimpleTheoryOnly)ORPROJECTWORK**

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**COURSEOBJECTIVES:**

To introduce an fundamentals of HumanPhysiologyandexplore the human bodyparametermeasurementssetups

**COURSEOUTCOMES:**At theendofcourse,studentwillbeableto:

| | |
|---|---|
| **CO1** | Understandthehumanphysiologyofbiomedicalsystem |
| **CO2** | Measurebiomedicalandphysiologicalinformation |
| **CO3** | DiscusstheapplicationofElectronicsindiagnosticsandtherapeuticarea. |
| **CO4** | MakethestudentsunderstandtheconceptsPulseOximeterandpacemaker techniques |
| **CO5** | Givebasicideasaboutmodernmedicalimagingapplication |

**Syllabus**

| Unit | UnitTitle | Intended learning Chapters(Programme specific qualificationattributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Introduction toHumanPhysiologys** | IntroductiontoHumanPhysiology– MicroElectrodes– SkinSurfaceElectrodes– NeedleElectrodes–ReferenceElectrodes- DigitalThermometer– SphygmoManometer- ElectronicSthethoscope | **10** |

| | | | |
|---|---|---|---|
| **II** | **Recorders andmeters** | ECG - EEG - EMG - – Cardio Tocography - Electro Oculography - Electro Retinography - PolySomnography-Spirometer-BloodFlow | **10** |

| | | | |
|---|---|---|---|
| | | Meter-Doppler-Audiometer | |
| **III** | **Ts** | TS.UpperEndoscope-LowerEndoscope-ENTEndoscope--Diathermy - Surgical Diathermy- MicroWaveDiathermy-MultiparaPatientMonitor. | **10** |
| **IV** | **Intensive carets** | PulseOximeter-BlockDiagram&Sensor – Ventilator – Cardiac Monitor - ECGHolder-Defibrillator-Pace maker : Implantable and External Pacemakers - Infant Warmer - Infant Incubator - BabyPhototherapy–Nebulizer. | **10** |
| **V** | **Electricalsafety ofmedicalinstruments** | Radiation Safety - Physiological EffectsDue to 50 Hertz Current Passage - MicroShock-MacroShock-ElectricalAccidentsinHospitals-DevicestoProtectAgainstElectricalHazards–SMPSinMedical Equipments. . | **10** |

**REFERENCEBOOKS:**


1. BiomedicalInstrumentation&Measurements–AnandaNatarajan–PHIRS.275/-
2. BiomedicalInstrumentationAndMeasurements-LeslieCromwell-PHI-2ndEdition.
3. Bio-MedicalInstrumention-Dr.M.Arumugam- AnuradhaAgencies-2ndEdition
4. HandbookOfBiomedicalInstrumentation- R.S.Khandpur–TMH.
5. MedicalInstrumention,ApplicationAndDesign–JohnG.Webster-WEL-3rdEdition
6. ATextOfBookOfMedicalInstruments–Ananthi–NewAgeInternationaRs.275/-
7. Internet:AdditionalReferenceforallUnits.

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**ELECTIVEIII-PAPERIGROUPCPCBDESIGNANDFABRICATION**

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**COURSEOBJECTIVES:**:

UnderstandtheneedforPCBandstepsinvolvedinPCBDesignandFabricationprocess.PCB(PrintedCircuitBoard)designingisanintegralpartofeachelectronics products and this program is designed to make students capable to design theirownprojectsPCB uptoindustrialgrade.

**COURSEOUTCOMES:**At theendofcourse,studentwillbeableto:

| | |
|---|---|
| **CO1** | AppreciatethenecessityandevolutionofPCB,typesandclassesof PCB. |
| **CO2** | Understandthestepsinvolvedinschematic,layout,fabricationand assemblyprocess ofPCBdesign. |
| **CO3** | FamiliarizeSchematicandlayoutdesignflowusing CAMTools. |
| **CO4** | ThisisabasiccoursefordesigningofPCBusingsoftware.Design (schematicandlayout)andfabricatePCBforsimplecircuits. |
| **CO5** | Understandtheenvironmentalconcerns |

## Syllabus

| Unit | UnitTitle | Intended learning Chapters(Programme specific qualificationattributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **Quick start &components** | PCB Introduction – Surface Mount andThrough hole – Prototyping – InstallingEAGLELightEditiononWindows-LightEditionLimitations–Creating NewProject–DrawingtheSchematic– | **10** |

| | | | |
|---|---|---|---|
| | | Electrical Rule Check – Laying out theBoard– U.S.VersusEuropeanCircuitSymbols– Resistors–Capacitors–Transistors& Diodes–IC'S–Connectors – Other Components – Buying Components–PaperPCB. | |
| **II** | **Editingschematics &Pcb layout** | The Anatomy of the Schematic Editor – The Command Toolbar – Nets – Buses – Worked Examples. **PCBLAYOUT:** Experimenting–Layers– TheCommandToolbar-TheGrid– SoundMeterLayout(ThroughHole) –SoundMeterLayout(SurfaceMount)– Manual Layout. | **10** |
| **III** | **Pcb fabrication &pcbsoldering** | GerberFiles–LoadingaCAMJob–Running a CAM Job – Measure Twice,Cut Once – Submitting a job to a PCBService – Instructions – Photoetching –Milling PCBs – TonerTransfer. **PCBSOLDERING**:GeneralTools-ToolsforSurfaceMountDevices– Soldering Through Hole PCB's – SMDHandSoldering–SMTwithHotAir Gun–Using aReflowOven. | **10** |
| **IV** | **Commands &scripts** | Commands-Scripts– UserLanguagePrograms– CreatingLibrary– CopyingaDevicefromAnotherLibrary– ThePart Editor – Devices , Symbols , andPackages–EditingaPart–Creating NewPart. | **10** |

| | | | |
|---|---|---|---|
| **V** | **Environmental concerns** | PollutionControlinPCBIndustry– PollutiongAgents–RecyclingofWater –RecoveryTechniques–AirPollution– | **10** |

| | | | |
|---|---|---|---|
| | | Recyclingof PCB's – Environmental Standards–SafetyPrecautions– ToxicChemicals. | |

**REFERENCEBOOKS:**


1. MakeYourOwnPCB'sWithEAGLE–SimonMonk–McgrawHill(2014)
2. EAGLEMANUAL–VersionV–SeventhEdition.
3. PCBDesignFabrication,AssemblyandTesting–Dr.R.S.Khandpur–TMH.
4. PCBDesign&Fabrication–Walter.C.Bosshart–TMH

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**ELECTIVE III - PAPER II - GROUP**

**CPROGRAMMINGUSINGVERILOGHDL(SIMPLECONCEPTSONLY)**

**COURSEOBJECTIVES:**Studentswilltrytolearn:

Understand the concepts of Verilog Language, Inspect how effectively ICs are embedded inpackage and assembled in PCBs for different application. Design and diagnosis of processorsand I/O controllersusedinVHDL.

**COURSEOUTCOMES:**At theendofcourse,studentwillbeableto:

| | |
|---|---|
| **CO1** | DescribethebasiclanguagefeaturesofVerilogHDLandtheroleofHDLindigital logicdesign. |
| **CO2** | Describethebasic concepts VerilogHDL |
| **CO3** | DescribeVerilogmodelforsequentialcircuitsand testpattern generation. |
| **CO4** | Designdataflowmodeling. |
| **CO5** | Synthesizedifferent typesofbehavioralmodeling. |

## Syllabus

| Unit | UnitTitle | IntendedlearningChapters (Programme specific qualificationattributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Basic verilogtopics** | Overview–DesignFlow–HierarchicalModelingConcepts–DesignMethodologies–Modules–Instances–ComponentsofSimulation. | **10** |

| | | | |
|---|---|---|---|
| **II** | **Basicconcepts** | LexicalConventions–WhiteSpace–Comments–Operators–NumberSpecification–Strings–Identifierand Keywords–DataTypes–Nets–Registers– | **10** |

| | | | |
|---|---|---|---|
| | | VectorsArrays–Memories–Parameters–Strings–System Tasks and CompilerDirectives. | |
| **III** | **Modules andports** | Modules – Ports – Port Declaration – PortConnectionRules– ConnectingPortstoExternalSignals– GateLevelModeling– GateTypes. | **10** |
| **IV** | **Data flowmodeling** | ContinuousAssignment–Delays– Expression–OperatorsandOperands– OperatorTypes–BehaviorModeling-StructureProcedures–Procedural Assignments–TimingControls. | **10** |
| **V** | **Behavioral modeling** | Conditionalstatements– MultiwayBranching–Loops– SequentialandParallel Blocks – Generate Blocks – LogicSynthesiswithVerilogHDL-ImpactofLogicSynthesis– VerilogHDLSynthesis– SynthesisDesignFlow. | **10** |

**TextBook:**

1. VerilogHDL–AGuidetoDigitalDesignandSynthesis–SamirPalnitkar–Pearson-IIEDITION.

## B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERVI

## ELECTIVE III - PAPER III - GROUP CELECTRONICDEFENSESYSTEMS

**(SIMPLETHEORYONLY)**

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**COURSEOBJECTIVES:**Studentswilltrytolearn:

Understand the concept of electronic warfare. and acquainted with the basiccharacteristics and requirements of electronic warfare receivers,the basic principles ofelectroniccountermeasures,itstypesandclassesofECMandtheparametersofradars,and radar systemspertainingtoECM,

**COURSEOUTCOMES:**At theendofcourse,studentwillbeableto:

| | |
|---|---|
| **CO1** | Gain knowledge in the fundamental principle of Electronic defensesystem,weapon systems |
| **CO2** | Analysethefunctioningandinterrelationsofsubsytemsinanelectronic warfaresystem |
| **CO3** | Developetechnicalarchitectureofelectronicinterceptsystemsinpreliminary systemdesignlevel |
| **CO4** | Developebasicsimulationandanalysistoolsfortheassesmentofagiven ECM. |

**Syllabus**

| Unit | UnitTitle | Intended learning Chapters(Programme specific qualificationattributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **Electronicdefense** | Introduction – Systems in Use in theArmedForces– TheMainWeaponSystems– Objectives & OrganizationofElectronicDefense– OperationalObjectives - Information Operation &Warfare– NeedfortheStudyof WeaponSystems. | **10** |

| | | | |
|---|---|---|---|
| **II** | **Weaponsystems** | Artillery Systems – Missile Systems (Any3)–PassiveAntiradiationMissiles– StealthAircraft– CommunicationSystems–Information Operations. | **10** |
| **III** | **Electronic interceptsystems** | Introduction–RadarWarningReceivers– ElectronicSupportMeasures– OmnidirectionalAntennas –AntennasforDirectionFinding– DigitalReceivers– ElectronicIntelligentSystems– AdvancedPassive Location Techniques – InfraredInterceptSystems– Communications ESM&CommunicationIntelligence. | **10** |
| **IV** | **Electroniccountermeasuresystems** | Introduction– OffBoardPassive&ActiveECMSystems – OnBoardPassive&ActiveECMSystems –ECM Techniques ( Any 3 ) – InfraredCountermeasures– CommunicationsCountermeasures– Information Warfare. | **10** |
| **V** | **Electronic counter-countermeasuresystems** | Introduction–TrackingRadarCounter-Countermeasures–InfaredCounter-Countermeasures – Communications Counter – Countermeasures–NewElectronic DefenseArchitectures. | **10** |

**TextBook:**

1. IntroductionToElectronicDefenseSystems–FilippoNeri–NewAgeInternational–SecondEdition-Rs.395/-

**B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERVI**

**ELECTIVEIII- PAPERIV-GROUPC**

**NANOELECTRONICS**

**(SIMPLE THEORYONLY)**

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**COURSEOBJECTIVES:**Students willtryto learn:

To introduce the nanoelectronics, nanodevices, spintronicsandmolecular electronics.Understandthediverselectronicdevicefabricationdescribetheprinciple and the operation of nanoelectronic devices.In-depth technical knowledge in one ormoreareasofspecialization.

**COURSEOUTCOMES**

| | |
|---|---|
| **CO1** | AbilitytoperformsimpleanalysisofNanoelectronicdevicesandcalculatethe densityofstatesinNanoelectronicdevices. |
| **CO2** | Abilitytoperformin-depthanalysisofselfassemblyinNanoelectronicdevices |
| **CO3** | NanoElectronicsandNanoMicrofabricationcourseisdesignedtoencompass all these aspects, viz., nano and micro regime design, simulation and fabricationand all typesofIC's, microfludics. |
| **CO4** | Itisexpectedthat,afterundergoingthiscourse,thestudentswillacquireboththeoretical knowledgeandpracticalskillsindiverseupcomingareasofcurrent technology. |

**Syllabus**

| Unit | UnitTitle | Intended learning Chapters(Programmespecificqualification attributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **Introduction &ethicalissues** | WhatisNanotechnology-Advantages-Scope - Limits of Nanotechnology - SolutionscauseProblems-Changecauses | **10** |

| | | | |
|---|---|---|---|
| | | Problems - Clean, Decentralized Productioncauses Problems - Even Wealth & LeisurecauseProblems-ChangingEmploymentcausesProblems-FrequentlyAsked Questions. | |
| **II** | **Selfassembly** | Bottom - Up Self Assembly - Top BottomAssembly-OtherProductionProcesses-MEMSProcess-DepositionProcesses-Lithography-EtchingProcesses. | **10** |
| **III** | **Instrumentation techniques** | AFM - SEM - TEM - Auger ElectronSpectroscopy-LASERInducedBreakdown Spectroscopy. | **10** |
| **IV** | **Nanoelectronics &carbonnano tubes** | TripleGateMOSFET&EJ-FETProperties - CarbonNanotubes-FabricationMethods - CNTBasedBiosensorsandAdvantages-PropertiesofCNT-Fuelcells &Nanotech. | **10** |
| **V** | **Nano -bio** | NanotechnologyinMedicine-WorkingOutsideTISSUES-WorkingWithinTissues.Applications:KillingCancerCells - Providing Oxygen - Artificial Mitochondria. | **10** |

**REFERENCEBOOKS:**

1. NanoTechnology-AFutureTechnologyWithVisions-AppinLABS-BPB–Rs.270/-
2. Nano:TheEssentials“UnderstandingNanoScience&NanoTechnology“-TPradeep–TMH

## B.SC.ELECTRONICSANDCOMMUNICATION

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### SEMESTERVI

### SKILLED BASED ELECTIVE

### COURSESBECVI-LIFE

### DEVELOPMENTSKILLS

**COURSEOBJECTIVES:**

Thiscourseisdesignedtoenhancetheemployabilityandmaximizethepotentialof the students by introducing them to the principles that underly personal and professionalsuccess, and help them acquire the skills needed to apply these principles in their lives andcareers.Prerequisite

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | DefineandIdentifydifferentlifeskillsrequiredinpersonalandprofessionallife |
| **CO2** | Developanawarenessoftheselfandapplywell-definedtechniquestocopewith emotionsandstress. |
| **CO3** | DevelopanPreparingforaJobInterview |
| **CO4** | Understandthebasicsofteamworkandleadership |
| **CO5** | thebasicmechanicsofeffectivecommunication. |

## Syllabus

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstructio n |
|---|---|---|---|
| **I** | **Selfanalysis** | SelfAnalysisandSelfConcept– UnderstandingSelf:Attitude, Aptitude and Self Esteem – Assertiveness –ConfidenceBuilding– Motivation:Concept,TheoriesandImportance. | 05 |

| | | | |
|---|---|---|---|
| **II** | **Selfdeve lopment** | Introduction – Goal Setting : Concept, Setting SmartGoals– Emotion:Concept,Types,EmotioinalIntelligence– Creativity:ConceptandFactors EnhancingCreativity–StressManagement–Health | 05 |

| | | | |
|---|---|---|---|
| | | Management : Importance, Dietary Guidelines andExercises– TimeManagement:Importanceandprocess. | |
| **III** | **Looking forajob** | IdentifyingDifferentSourcesAnnouncingJobVacancies– Skimming,ScanningandReadingAdvertisementsinDetail – WritingEffectiveCVs–Covering Letters that Accompany CVs - Techniques ofWritingJobApplicationLetters/CoveringLetters– PreparingforaJobInterview. | 05 |
| **IV** | **Non – verbal skills** | GraphicCommunication–NonVerbalCommunication – Aspects of body Language – Formal WrittenCommunication–Memos(Memoranda)–E-mails– Netiquette–BusinessCorrespondents. | 05 |
| **V** | **Telephone skills** | UnderstandingTelephoneCommunication– Typesofcalls–HandlingCalls–LeavingaMessage– MakingRequests–AskingforandGivingInformation– GivingInstructions – Agreeing and Disagreeing – Making or Changing Appointments – Reminding – MakingComplaintsandHandlingComplaints– TelephoneEtiquette. | 05 |

**REFERENCEBOOKS:**


1. DevelopmentOfLifeSkillsAndProfessionalPractice–ShaliniVerma– VikasPublishingHousePvtLtd.,Rs.200/-(Units:I&II)
2. DevelopmentOfLifeSkills–II–ShaliniVerma– VikasPublishingHousePvtLtd.,Rs.225/-(Units:III& IV)
3. A Course In Communication Skills - P. KiranmaiDutt– Cambridge University PressIndiaPvt.Ltd.,FoundationBooks,CambridgeHouse,4381/4,AnsariRoad,Daryaganj ,NewDelhi-110002.(Unit:V)

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTERV&VI**

**COREPRACTICALIV**

**IC'S&COMMUNICATIONLAB**

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**(ANYHARDWAREBASED SIMULATIONTOOL MAYALSO BEUSED)**

**(Any22Experiments)**

## COURSEOBJECTIVES:

The main aim of this lab is to teach the linear and non-linear applications of operationalamplifiers (741). Students are made familiar with theory and applications of 555 timers.Students are made to Design combinational logic circuits using digital ICs &To acquirethebasic knowledgeofspecialfunctionICs

## COURSEOUTCOMES:

| | |
|---|---|
| **CO1** | Designandanalysethevariousdigitalcircuits. |
| **CO2** | Designandanalysethevariouslinear&nonlinearapplicationofop-amp. |
| **CO3** | Designandanalyseoscillatorsandmultivibratorcircuitsusingop-amp& Timers. |
| **CO4** | Designandanalysethevariouscommunicationapplicationofop-amp. |
| **CO5** | Practicethebasicmechanicsofconvertions. |

## Syllabus

1. NANDGATEImplementationUsingTTL.
2. NOT/NAND/NORGATEImplementationUsingIIL/CMOS.
3. OR/NORGATEImplementationUsingECL.
4. Inverting/Non-InvertingAmplifierUsingOp-Amp
5. Inverting/Non-InvertingAdderUsingOp-Amp.
6. SubtractorUsingOp-Amp.

7. Multiplier/DividerUsingOp-Amp.
8. Differentiator/IntegratorUsingOp-Amp.
9. LowPass/HighPassFilterUsingOp-Amp.
10. BandPass/BandRejectFilterUsingOp-Amp.
11. VoltagetoCurrentConverter(Groundedload).
12. CurrenttoVoltageConverter.
13. SolvingofSimultaneousEquationsUsingOp-Amp.
14. SquareWaveGenerationUsingOp-Amp
15. TriangularWaveGenerationUsingOp-Amp
16. PhaseShiftOscillatorUsingOp-Amp.
17. WeinBridgeOscillatorUsingOp-Amp.
18. AmplitudeModulation&Demodulation.
19. PulseAmplitudeModulation&Demodulation.
20. PulseWidthModulation&Demodulation.
21. AstableMultivibratorUsing555IC
22. MonostableMultivibratorUsing555ICTriangular
23. WaveformGenerationUsing555IC
24. VoltageControlledOscillatorUsing555IC
25. SchmittTriggerUsing555IC
26. FrequencyMultiplicationUsing565IC
27. BinaryWeightedResistorTypeofDAC
28. R-2RLadderTypeofDAC.
29. ADCUsingADC0809
30. DACUsingDAC0800

## B.SC. ELECTRONICS AND

## COMMUNICATIONSEMESTERV&VI

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## COREPRACTICALV-GroupD

## 8051MICROCONTROLLER&INTERFACINGLAB

**(ANYEMBEDDED BASEDSIMULATIONTOOLMAYALSOBEUSED**

**(Any17Experiments)**

**CourseObjectives**

Toexposestudentstotheoperationoftypical Microcontroller(8051)**simulation tool/** trainer kit.solve different problems by developing different programs&todevelop thequalityof assessing and analyzingthe obtaineddata.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | **Identify**relevantinformationtosupplementtotheMicrocontroller(8051). |
| **CO2** | Set up programming strategies and select proper mnemonics and run their program onthetrainingboards. |
| **CO3** | **Practice**differenttypesofprogrammingkeepinginmindtechnicalissuesand evaluatepossiblecausesofdiscrepancy2experimentalobservationsincomparison. |
| **CO4** | Developtestingandexperimentalprocedures on Microcontroller(8051)**analyze**theiroperationunder differentcases. |
| **CO5** | **Prepare** professional quality textual and computational results, incorporating accepteddataanalysisandsynthesismethods,simulationsoftware,andword-processing tools. |

**Syllabus**

1. AdditionofTwo;8BitNumbers&SubtractionofTwo;8BitNumbers
2. MultiplicationofTwo;8BitNumbers
3. DivisionofTwo;8BitNumbers
4. BCDAddition

5. BCDSubtraction
6. FILL
7. BLOCKMOVE
8. 1's&2'sComplementofa16BitNumber.
9. Smallest/Largestof;NNumbers.
10. Ascending/DescendingOrderof;NNumbers.
11. SumofN;8BitNumbers.
12. MultiByteAddition.
13. 3-DigitDecimaltoTwo-digitHexadecimalConversion.
14. Two-digitHexadecimalto3-digitDecimalConversion.
15. ADCInterface.
16. DACInterface.
17. WaveformGenerationUsingDAC.
18. StepperMotorInterface.
19. InterfaceWithSwitches&InterfacewithLED's
20. HexKeyboardInterface.
21. InterfaceWithSingleSevenSegmentDisplay.
22. InterfacingWithMultipleSevenSegmentDisplays.
23. InterfaceWithLCD's.
24. InterfacingWithSolidStateRelay.
25. MovingDisplay.
26. BlinkingDisplay.
27. DigitalClock.
28. TrafficLightControl.

**B.SC. ELECTRONICS AND**

**COMMUNICATIONSEMESTERV&VI**

**COREPRACTICALV-GroupD**

| L | T | P | C |
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| 2 | 2 | 2 | 4 |

**16F877MICROCONTROLLER&INTERFACING LAB**

**(ANYEMBEDDEDBASEDSIMULATIONTOOLMAYALSOBEUSED**

**(Any17Experiments)**

**CourseObjectives**

Toexposestudentstotheoperationoftypical Microcontroller(**16F877**)**simulation tool/** trainer kit.solve different problems by developing different programs&todevelop thequalityof assessing and analyzingthe obtaineddata.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | **Identify**relevantinformationtosupplementtotheMicrocontroller(**16F877**). |
| **CO2** | Setupprogrammingstrategiesandselectpropermnemonicsandruntheirprogramonthe trainingboards. |
| **CO3** | **Practice**differenttypesofprogrammingkeepinginmindtechnicalissuesandevaluatepossiblecausesofdiscrepancyinpracticalexperimentalobservationsin comparison. |
| **CO4** | DeveloptestingandexperimentalproceduresonMicrocontroller(**16F877**)**analyze** theiroperationunderdifferentcases. |
| **CO5** | **Prepare**professionalqualitytextualandcomputationalresults,incorporating accepteddataanalysisandsynthesismethods,simulationsoftware,andword-processing tools. |

**Syllabus**

1. AdditionofTwo;8BitNumbers&SubtractionofTwo;8BitNumbers
2. MultiplicationofTwo;8BitNumbers
3. DivisionofTwo;8BitNumbers

4. BCDAddition
5. BCDSubtraction
6. FILL
7. BLOCKMOVE
8. 1's&2'sComplementofa16BitNumber.
9. Smallest/Largestof;NNumbers.
10. Ascending/DescendingOrderof;NNumbers.
11. SumofN;8BitNumbers.
12. MultiByteAddition.
13. 3-DigitDecimaltoTwo-digitHexadecimalConversion.
14. Two-digitHexadecimalto3-digitDecimalConversion.
15. ADCInterface.
16. DACInterface.
17. WaveformGenerationUsingDAC.
18. StepperMotorInterface.
19. InterfaceWithSwitches&InterfacewithLED's
20. HexKeyboardInterface.
21. InterfaceWithSingleSevenSegmentDisplay.
22. InterfacingWithMultipleSevenSegmentDisplays.
23. InterfaceWithLCD's.
24. InterfacingWithSolidStateRelay.
25. MovingDisplay.
26. BlinkingDisplay.
27. DigitalClock.
28. TrafficLightControl.

**B.SC. ELECTRONICS AND COMMUNICATIONSEMESTERV &VI**

| L | T | P | C |
|---|---|---|---|
| 2 | 2 | 2 | 4 |

**CORE PRACTICAL**

**VPLCPROGRAMMINGLAB**

**(ANYEMBEDDEDBASEDSIMULATIONTOOLMAYALSOBEUSED)**

**(Any17Experiments)**

**CourseObjectives**

To explain the basic concepts of a Programmable Logic Controller. StudentswillbeabletostatebasicPLCterminologyandtheirmeanings.Studentswillbeableto explainandapplytheconceptofelectricalladderlogic,itshistory,anditsrelationshiptoprogrammedPLCinstruction.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | StudentswillbeabletodescribetypicalcomponentsofaProgrammableLogic Controller. |
| **CO2** | Studentswillbeabletoexplainandapplytheconceptofelectricalladderlogic, itshistory,anditsrelationshiptoprogrammedPLCinstruction. |
| **CO3** | Studentswillbeabletoexplaintheconceptofbasicdigitalelectronicsanddata manipulation. |
| **CO4** | Studentswillbeabletousetimer,counter,andotherintermediateprogramming functions |
| **CO5** | Studentswillbeabletousetimer,counter,andotherintermediateprogramming functions |

**Syllabus**

1. StudyofPLCSymbols
2. StudyofVariousLogicExecutioninLadderDiagram.

3. WritingofLadderLogicforDifferentStatements.
4. LadderDiagramDevelopmentforDifferentTypesofLogicGatesusingSuitableSoft ware
5. PLCInput-OutputWiringMethods
6. OperatingSimpleLoadsusingRelays,SwitchesandPushbuttons
7. DifferentApplicationsofPushButtons
8. ProgrammingthePLCViaLadderlogic
9. WorkingofDifferentTypesofTimers
10. Study&Implement;ONdelaytimerinPLC
11. Study&implement;OFFdelaytimerinPLC
12. WorkingOfDifferentTypesofCounters
13. Study&ImplementationofUpCounterinPLCProgramming.
14. Study&ImplementationofDownCounterinPLCProgramming.
15. Interlocking
16. Sequencer
17. SequentialOperationofOn/OffofASetofLights
18. ForwardAndReverseDirectionControlofMotors
19. LatchingandUnlatchingofmotor
20. PreparethePhysicalandProgrammedLadderDiagramfortheControlProblemshow nbelow &Implementthesame.
21. PLCProgrammingforBottleFillingPlant.
22. ProcedureforProducingaLadderLogicDiagramforCarParkingSimulation
23. PositionControlforSatelliteDishDCMotors
24. StartingThreePhaseInductionMotorsViaStar-DeltaStarter
25. AutomaticIndicationofWaterTankLevel
26. TrafficLightsIndication

## B.SC.ELECTRONICSAND COMMUNICATION

## CIRCUITIMPLEMENTATIONUSINGARDUINOUNOBOARDSCOMMONFO RALL PRACTICALS UNDERGROUPD

**ANYFIVE**

| L | T | P | C |
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| 2 | 2 | 2 | 4 |

**CourseObjectives**

To provide knowledge of different Smart System applications.To familiarizestudentswithArduinoasIDE,programminglanguage&platform.Toprovidekno wledge of Arduino boards and basic components. Develop skills to design andimplement varioussmartsystemapplication.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | FamiliarwithArduinoenvironmentanditsapplications. |
| **CO2** | AbletounderstandArduinoprogrammingwithC++. |
| **CO3** | AbletoDesignSmartsystemsapplications. |
| **CO4** | LearnandunderstandaboutanynewIDE,compiler,and MCUchipinArduino |

### Syllabus

1. LEDControlThroughPushButtons
2. PhotoResistorasLightIntensityDetector
3. DCMotorDirectionControlusingL293D
4. DCMotorSpeedControlusingL293D
5. DisplayingTextonLCDDisplay
6. ScrollingTextonLCDDisplay
7. Interfacing4x3KeypadandLCD
8. DisplayingAlphanumericCharactersonDotMatrixDisplay
9. DisplayofNumericCharactersusing7SegmentDisplay.

10. UnipolarStepperMotorSpeedControlUsingULN2003A
11. LEDControlThroughSerialCommunication
12. LEDControlusingInfrared
13. DisplayingCurrentDateandTimeon16x2LCD
14. SwitchingControlofACLoadusingTriac
15. VoltageRegulationAcrossACLoadusingTriac
16. SwitchingControlofACLoadThroughSMSTextMessage

**REFERENCEBOOK**

**ArduinoProjectsforEngineers-NeerparajRai–BPBPublications –Rs.297/-**

**B.SC. ELECTRONICS AND COMMUNICATIONAPPLIEDELECTRONICS-I (ALLIED)**

**(ForB.ScCS, BCA,B.ScIT,&B.ScPHY)**

**I/IIYEAR-I/IIISEMESTER**

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| 4 | | | 4 |

**COURSEOBJECTIVES:**

- Tostudyaboutthefundamentalsofsemiconductor.
- Togainthebasicknowledgeofelectroniccomponentsandthefunctionofpowersupply.
- Tounderstandtheoperationofoscillator,amplifierandfilters.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Understandtheprincipleofsemiconductordevices. |
| **CO2** | Haveathoroughunderstandingofthefundamentalconceptsofelectronic components |
| **CO3** | Analyzeanddesignvarioustheconceptualtheoryofthepowersupply. |
| **CO4** | Distinguishbetweenthesinusoidalandnonsinusoidal waveforms. |
| **CO5** | Acquiretheknowledgeonthetypesandprinciplesofoscillators,amplifiersand filters. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programme specificqualificationattributesK1,K2, K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **SemiconductorTheory** | IntrinsicSemiconductor–ExtrinsicSemiconductor-TheoryofPNJunctiondiode-ZenerDiode–Avalanche Breakdown - Zener Break down - OperationofPNP&NPNTransistor-CB,CE,CC ConfigurationandCharacteristics-TransistorasanAmplifier. | 10 |

| | | | |
|---|---|---|---|
| **II** | **Resistors,Capacitors&Inductors** | Resistors,Capacitors&InductorsinSeriesandParallel -FactorsgoverningtheResistanceofaResistor,Capacitor & Inductor - Colour Coding of Resistors -Various Other Passive & Active Devices – Ohm's &KirchoffLaws-SeriesCircuits–ParallelCircuits-Series&ParallelCircuits-OpenCircuit-ShortCircuit | 10 |
| **III** | **PowerSupply's** | HalfWaveRectifier-FullWaveRectifier-BridgeRectifier-CapacitorFilter-FixedICRegulatedPower Supplyusing78XX-DualICRegulatedPowerSupplyusing78XX&79XX. | 10 |
| **IV** | **Waveforms** | SinusoidalWaveform-Non-SinusoidalWaveform-Peak Value - Peak to Peak Value - Average Value – RMSValue–Period&FrequencyMeasurement–Use ofDigitalMultimeter –UseofCRO. | 10 |
| **V** | **Oscillators,Amplifiers &Filters** | Barkhausen Criterion – SinsoidalOscillators : Hartley ,PhaseShift&CrystalOscillator.NonSinusoidalOscillators :Astable , Monostable& UJT as a SawtoothOscillator.Amplifiers:RCCoupled&TransformerCoupledAmplifiers.Filters:LowPass,HighPass, BandPass &BandReject Filters . | 10 |

**Books forStudy**

1. ElectronicDevices&Circuits-S.Salivahanan -TMH-IIEdition

2. Circuits&Networks-Sudhakar-TMH-4thEdition..

**B.SC. ELECTRONICS AND COMMUNICATIONAPPLIEDELECTRONICS-II(ALLIED)**

**(ForB.ScCS,BCA,B.ScIT,&B.ScPHY)**

**I/IIYEAR-II/IVSEMESTER**

| L | T | P | C |
|---|---|---|---|
| 4 | | | 4 |

**COURSEOBJECTIVES:**

- Tostudyaboutthefundamentalsconceptsoftransducersandop-amps.
- TogainthebasicknowledgeofICandPCBfabricationprocess.
- Tounderstandthefundamentalsofcommunicationprinciple,modulationtechniques,transmissionandreception.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | Understandtheprincipleandtypesofthevarioustransducers. |
| **CO2** | analyzeanddeignbasicop-ampcircuits,non-linearcircuits,comparator,signal generators,andoscillator. |
| **CO3** | acquirequalitativeknowledgeaboutthefabricationprocessofintegratedcircuit &PCBfabrication |
| **CO4** | Comprehendtheworkingprincipleofthecommunicationsystems. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters(Programmespecificqualificationattributes K1, K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Transducers** | ResistiveTransducers–InductiveTransducers-Capacitive Transducers - Piezo Electric Transducer - ThermoElectricTransducers–TemperatureTransducers–Instrumentation Amplifier – Microphones&LoudSpeakers. | 10 |

| | | | |
|---|---|---|---|
| **II** | **Op–Amp's** | Introduction - The ideal OP-AMP - OP-Amp stages - OP-Ampparameters-<br>Inverting&NonInvertingAmplifier-Adder-Subtractor-Multiplier-Divider-<br>Integrator - Differentiator - V to I Converter - I to VConverter. | 10 |
| **III** | **IC Fabrication Process** | BasicPlanarProcess-FabricationofaTypicalCircuit -ActiveandPassiveComponents-<br>FabricationofFET,MOSFET&CMOS-Thin&ThickFilmTechnology. | 10 |
| **IV** | **PCB Fabrication Process** | PCB Types – Layout & General Rules – Design RulesFor Digital Circuit PCB's – Artwork – Properties &Types of Copper Clad Laminates – Photo Printing – Screen Printing–Types of Etchants–ManualRouting –AutoRouting–DesignRuleCheck. | 10 |
| **V** | **CommunicationSystems** | NeedForModulation–<br>AmplitudeModulation&Detection - Frequency Modulation & Detection – AMTransmitter - AM Receiver – FM Transmitter - FMReceiver–Modulation&Detectionof:PAM–PPM<br>– PWM–PCM. | 10 |

**Books forStudy**

1. ElectronicDevices&Circuits-S.Salivahanan -TMH-IIEdition
2. PCBDesign–Walter.C.Bosshart–TMH
3. ElectronicCommunicationSystems-Kennedy-TMH–IVEdition.

## B.SC.ELECTRONICSANDCOMMUNICATION

## APPLIEDELECTRONICSLAB(ALLIED)

**(ForB.ScCS, BCA,B.ScIT,&B.ScPHY)**

## I/IIYEAR-II/IVSEMESTER

**(ANYHARDWAREBASEDSIMULATION TOOLMAYALSOBEUSED)**

**(Any18Experiments)**

| L | T | P | C |
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**CourseObjectives**

Tointroduceelectriccircuitsanditsanalysis&
to impart knowledge on solving circuits using network theorems,digital circuits & electroniccircuits.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | AnalysethecharacteristicsofPNJunctiondiode,transistors |
| **CO2** | Toimpartknowledgeonsolvingcircuitsusingnetworktheorems |
| **CO3** | DeterminefrequencyresponseofRCcircuitsandsimulateseries,parallelresonant circuits. |
| **CO4** | LearnprincipalofdigitalElectronics. |
| **CO5** | Demonstratetheapplicationsofop-amp&timer |

### Syllabus

1. PNJunctionDiodeCharacteristics
2. CEInputCharacteristics
3. CEOutputCharacteristics
4. Ohm'sLaw
5. Kirchoff'sCurrentLaw.
6. Kirchoff'sVoltageLaw.

7. ResistorsinSeries&Parallel
8. CapacitorsinSeries&Parallel
9. MeasurementofAmplitude&FrequencyUsingCRO.
10. NANDasaUNIVERSALGATE(AND/OR)
11. NORasaUNIVERSALGATE(AND/OR)
12. VerificationofDeMorgan'sTheorem.
13. TruthTableVerificationofBASICGates(Anyonegate)
14. HalfAdder/FullAdder
15. HalfSubtractor/FullSubtractor.
16. EncoderUsing74147IC
17. DecoderUsing7442IC
18. MultiplexerUsing74153IC
19. DemultiplexerUsing74155IC
20. ClockGenerationUsingNAND/NORGATE
21. FullWaveRectifierWithCapacitorFilter.
22. DualICRegulatedPowerSupply(78XX&79XX).
23. InvertingAdder/Non-InvertingAdderUsingOp-Amp
24. SubtractorUsingOp-Amp
25. LowPassFilter/HighPassFilter.

**B.SC. ELECTRONICS AND**

**COMMUNICATIONELECTRONICS–**

**I(ALLIED)**
**ForB.Sc[MATHS,STATISTICS,MATHS(CA), BIO CHEMISTRY,MICROBIOLOGY,BIO-TECH]I/II YEAR-I/IIISEMESTER**

| L | T | P | C |
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**COURSEOBJECTIVES:**:

To understand operation of semiconductor devices.,DC analysis and ACmodels of semiconductor devices. To verify the theoretical concepts through laboratoryand simulationexperiments..

**COURSEOUTCOMES:**At theendofcourse,studentwillbeableto:

| | |
|---|---|
| **CO1** | Understandthecurrentvoltagecharacteristicsofsemiconductordevices, |
| **CO2** | Analyzedccircuitsandrelateacmodelsofsemiconductordeviceswith theirphysicalOperation, |
| **CO3** | DesignandanalyzeofelectroniccircuitsLaws |
| **CO4** | Evaluatefrequencyresponsetounderstandbehaviorof waveforms. |

**Syllabus**

| Unit | UnitTitle | IntendedlearningChapters (Programme specific qualificationattributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **I** | **Semiconductor theory** | IntrinsicSemiconductor– ExtrinsicSemiconductor-TheoryofPNJunctionDode-ZenerDiode-AvalancheBreakdown-ZenerBreakDown-OperationofPNP&NPNTransistor-CB,CE,CCConfigurationandCharacteristics-Transistoras an Amplifier. | 10 |

| | | | |
|---|---|---|---|
| **II** | **Resistors , capacitors&inductors** | Resistors,Capacitors&InductorsinSeries and Parallel - Factors GverningResistance,Capacitance&Inducatance-ColourCodingofResistors-EnergyStoredinaCapacitor-EnergyStoredinanInductor-VariousOtherPassive&ActiveDevices. | 10 |
| **III** | **Circuitlaws** | Ohm's Law - Kirchoff's Current Law - Kirchoff'sVoltageLaw-VoltageDivision-CurrentDivision-SeriesCircuits - Parallel Circuits - Series &ParallelCircuits-OpenCircuit-Short Circuit. | 10 |
| **IV** | **Waveforms** | Sinusoidal Waveform - Non-SinusoidalWaveforms-PeakValue-PeaktoPeakValue-AverageValue-RMSValue– Period&FrequencyMeasurement | 10 |
| **V** | **Powersupply** | HalfWaveRectifier-FullWaveRectifier - Bridge Rectifier - CapacitorFilter-FixedICRegulatedPowerSupplyusing78XX-DualICRegulatedPowerSupplyusing78XX &79XX. | 10 |

**REFERENCEBOOKS:**

1. ElectronicDevices&Circuits-S.Salivahanan -TMH-IIEdition

2. Circuits&Networks-Sudhakar-TMH-4thEdition.

**B.SC. ELECTRONICS AND**

**COMMUNICATIONELECTRONICS–II**

**(ALLIED)**

| L | T | P | C |
|---|---|---|---|
| 4 | | | 4 |

**For B.Sc [MATHS,STATISTICS,MATHS (CA),BIOCHEMISTRY,MICROBIOLOGY,BIO-TECH]**

**I/IIYEAR-II/IVSEMESTER**

**COURSEOBJECTIVES:**

- Toacquirethebasicknowledgeofdigitallogiclevelsandapplicationofknowledgetounderstanddigitalelectroniccircuits.
- Topreparestudentstoperformtheanalysisanddesignofvariousdigitalelectroniccircuits.
- To learnthe designprocessofregisters,countersandconversionofanalog todigitalconversionandvice-versa.

**COURSEOUTCOMES:**At theendofcourse,studentwillbeableto:

| | |
|---|---|
| **CO1** | Examinethestructureofvariousnumbersystemsanditsapplicationin digitaldesign. |
| **CO2** | Haveathoroughunderstandingofthefundamentalconceptsand minimizationtechniquesusedindigitalelectronics. |
| **CO3** | UnderstandvariousBooleanalgebraanditsapplications |
| **CO4** | Understandvariouscombinationallogiccircuitsanditsapplications |
| **CO5** | AnalyzeanddesignvariousElectroniccircuitsanditsapplications |

**Syllabus**

| Unit | UnitTitle | Intended learning Chapters(Programme specific qualificationattributes K1,K2,K3,K4) | Hours ofInstruction |
|---|---|---|---|
| **I** | **Numbersystems** | Introduction-BinaryNumberSystem- | 10 |

| | | | |
|---|---|---|---|
| | | OctalNumberSystem-DecimalNumber System - Hexadecimal NmberSystem-ConversionFromOneSystem toAnother. | |
| **II** | **Binaryrules** | Binary Addition - Binary Subtraction - BinaryMultiplication-BinaryDivision -1's&2'sComplementSubtraction-9's&10'sComplementSubtraction. | 10 |
| **III** | **Booleanalgebra** | Logic GATES - NAND as aUNIVERSALGATE-NORasa UNIVERSAL GATE - Basis Laws ofBooleanAlgebra-PrincipleofDuality –DeMorgan'sTheorem. | 10 |
| **IV** | **Combinational elements** | Half Adder - Full Adder - HalfSubtractor - Full Subtractor - Encoder -Decoder-Multiplexer– Demultiplexer. | 10 |
| **V** | **Electroniccircuits** | Barkhausen Criterion – SinusoidalOscillators (Hartley , Phase Shift&Crystal Oscillator ) - Amplitude &Frequency : Modulation & Detection –Amplifiers : RC Coupled &Transformer Coupled . Filters : LowPass, High Pass , Band Pass & BandReject Filters – Op-Amp's & TheirApplications ( Addition , Subtraction,Multiplication ,Division, DifferentiationandIntegration). | 10 |

**REFERENCEBOOKS:**

1. DigitalCircuits&Design–Salivahanan-VikasPub-IIIEdition.

2. ElectronicDevices&Circuits-S.Salivahanan -TMH-IIEdition

## B.SC.ELECTRONICSANDCOMMUNICATION

**ELECTRONICSLAB(ALLIED)**

**For B.Sc [MATHS,STATISTICS,MATHS (CA),BIOCHEMISTRY,MICROBIOLOGY,BIO-TECH]**

**I/IIYEAR-II/IVSEMESTER**

| L | T | P | C |
|---|---|---|---|
| 2 | 1 | 1 | 2 |

**(ANYHARDWAREBASEDSIMULATION TOOLMAYALSOBEUSED)**

**(Any18Experiments)**

**CourseObjectives**

To introduce electric circuits and its analysis & to impart knowledge on solving circuitsusingnetwork theorems,digitalcircuits&electronic circuits.

**COURSEOUTCOMES:**Aftercompletionofthiscourse,studentableto

| | |
|---|---|
| **CO1** | AnalysethecharacteristicsofPNJunctiondiode,transistors |
| **CO2** | Toimpartknowledgeonsolvingcircuitsusingnetworktheorems |
| **CO3** | DeterminefrequencyresponseofRCcircuitsandsimulateseries,parallelresonant circuits. |
| **CO4** | LearnprincipalofdigitalElectronics. |
| **CO5** | Demonstratetheapplicationsofop-amp&timer |

**Syllabus**

1. PNJunctionDiodeCharacteristics
2. CEInputCharacteristics
3. CEOutputCharacteristics
4. Ohm'sLaw
5. Kirchoff'sCurrentLaw.

6. Kirchoff'sVoltageLaw.

7. ResistorsinSeries&Parallel
8. CapacitorsinSeries&Parallel
9. MeasurementofAmplitude&FrequencyUsingCRO.
10. NANDasaUNIVERSALGATE(AND/OR)
11. NORasaUNIVERSALGATE(AND/OR)
12. VerificationofDeMorgan'sTheorem.
13. TruthTableVerificationofBASICGates(Anyonegate)
14. HalfAdder/FullAdder
15. HalfSubtractor/FullSubtractor.
16. EncoderUsing74147IC
17. DecoderUsing7442IC
18. MultiplexerUsing74153IC
19. DemultiplexerUsing74155IC
20. ClockGenerationUsingNAND/NORGATE
21. FullWaveRectifierWithCapacitorFilter.
22. DualICRegulatedPowerSupply(78XX&79XX).
23. InvertingAdder/Non-InvertingAdderUsingOp-Amp
24. SubtractorUsingOp-Amp
25. LowPassFilter/HighPassFilter.

**PROFESSIONAL ENGLISH– I**

**https://drive.google.com/file/d/1-edgjNpnnMIapLxZyqVH9z3jugy53CIm/view?usp=drive_web**

**PROFESSIONAL ENGLISH-II**

**https://mail.google.com/mail/u/0?ui=2&ik=6b5209cdff&attid=0.1&permmsgid=msg-a:r3514885601167464 04&th=17921a031456e9df&view=att&disp=inline&realattid=f_ko3v5ewj0**

# PERIYAR UNIVERSITY

SALEM – 636011, TAMIL NADU, INDIA
NAAC A Grade - State University - NIRF Rank 68

THE REGISTRAR

PU/AD-1/BOS MEETING/ B.Sc.E& C /2020 Date: 30-01-2020

## BOARD OF STUDIES - MEETING NOTICE

I am, by direction, to inform that the meeting of the Board of Studies in **B.Sc. Electronics and Communication -UG (Affiliated Colleges)** is scheduled to be held on **12-02-2020 at 10.00 a.m.** at Food Court, Periyar University, Salem-11.

## AGENDA

1. To frame the syllabus for **B.Sc. Electronics and Communication** from the academic year 2020-2021 and thereafter.
2. Any other item.

I request you to make it convenient to attend the above meeting on 12-02-2020. TA & DA will be paid as per the University norms.(Remuneration will be paid through ECS only)

30.1.2020
REGISTRAR i/c

To:

| | | |
|---|---|---|
| 1. | Ms.S.Vennila<br>Assistant Professor<br>Dept. of Elec. & Communication,<br>Government Arts College, Dharmapuri-636705.<br>Ph:9952626888. | Chairman |
| 2. | Thiru L.Dhatchinamurthy<br>Assistant Professor, Dept. of Elec. & Communication,K.S.R College of Arts & Science,<br>K.S.R. Kalvi Nagar,Tiruchengode – 637209.<br>Ph:9894588233. | Member |
| 3. | Thiru T.Suresh<br>Assistant Professor & Head, Dept. of Elec. & Communication, Salem Sowdeswari College,<br>Kondalampatti, Salem - 636010.<br>Ph:9245519021. | Member |
| 4. | Thiru S.Karthikeyan<br>Assistant Professor, Dept. of Elec. & Communication,<br>K.S.R. College of Arts Science, K.S.R. Kalvi Nagar, Thiruchengode – 637209. Namakkal Dt.<br>Ph:9865650753. | Member |

| | | |
|---|---|---|
| 5. | Dr.R.Ramesh<br>Assistant Professor, Department of Physics<br>Periyar University, Salem-11<br>Ph:9790177663. | Member |
| 6. | Dr.J.Kalyanasundar<br>Assistant Professor, Department of Physics<br>Periyar University, Salem – 636011.<br>Ph:9965432165. | University Nominee |
| 7. | Dr.R.S.Sabeenian,<br>Professor & HOD/ECE, R&D Head – SONA SIPRO, Department of Electronics & Communication Engineering, Sona College of Technology,<br>Salem – 636 005, India. Ph:9894859444. | External Member |
| 8. | Mr. Prakash Manuel Joe J<br>Associate Professor, Dept. of Electronics,<br>PSG College of Arts and Science is a College,<br>Avinashi Rd, PSG CAS, Civil Aerodrome Post,<br>Peelamedu, Coimbatore, Tamil Nadu 641014. | External Member |
| 9. | Thiru Gopalakrishan Manickam<br>Technology Lead, Infosys Limited,<br>Mahindra orld City, Chengalpet,<br>Chennai-603004. Mobile:9842448433. | Industrial Personal |
| 10. | Thiru S.Kannan<br>Assistant Professor & Head, Dept. of Electronics & Communication, Muthayammal College of Arts and Science, Rasipuram, Namakkal-637408.<br>Mobile:9943734799. | Alumni |

Copy to:1. P.A to Vice-Chancellor
2. P.A to Registrar
3. The Librarian, Library, Periyar University.