## Bachelor of Technology (Computer Science and Engineering) Credit Based Scheme of Studies/ Examination Semester III

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of Exam (Hrs) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | ES-227A | Principles of Programming Languages | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | PC-CS-201A | Data Structure and Algorithms | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | ES-207A | Digital Electronics | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PC-CS-203A | Object Oriented Programming | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | BS-205A | Mathematics-III | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | HM-902A | Business Intelligence and Entrepreneurship | 2:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 7 | PC-CS-205AL | Data Structure and Algorithms Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | ES-209AL | Digital Electronics Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 9 | PC-CS-207AL** | Object Oriented Programming Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| | | **Total** | | 30 | 24 | 450 | 270 | 180 | 900 | |
| 10 | SIM-201A* | Seminar on Summer Internship | 2:0:0 | 2 | | 0 | 50 | 0 | 50 | |

**\*Note: SIM-201A\* is a mandatory credit-less course in which the students will be evaluated for the Summer Internship (training) undergone after 2nd semester and students will be required to get passing marks to qualify.**

# JMIETI,Radaur

LessonPlanningofPrinciplesforProgrammingLanguages

Deptt.CSE

Semester 3$^{rd}$w.e.f…29.08.2022

NameofTeacher : Ms.

UpasanaSoodDesignation

:AssistantProfessor&HeadS

ubjectwithcode :**ES-227A**

ObjectiveofCourse:

1.Tointroducetheprinciplesandparadigmsofprogramminglanguagesfordesignan

dimplementthe software intensivesystems.

| Lecture | Topic/ChapterCovered | AcademicActivity | Test/Assignment |
|---|---|---|---|
| L1 | AbriefHistory,Characteristics ofgoodprogramminglanguage | **LECTURE** | |
| L2 | ProgrammingLanguage translatorscompilerandi nterpreters, | **LECTURE** | |
| L3 | Elementary data types – dataobjects,variableandconstan ts, datatypes. | **LECTURE** | |
| L4 | Specificationand implementation of elementarydatatypes ,Declarations, | **LECTURE** | |
| L5 | Type checking and typeconversions,assignment and Initialization | **LECTURE** | Assignment |
| L6 | NumericDatatypes, enumerations,Booleansandc haracters | **LECTURE** | |
| L7 | Syntax and semantics:introduction,generalp roblemof describingsyntax, | **LECTURE** | |
| L8 | Formal method of describingsyntax,attributegra mmar dynamicsemantic | **LECTURE** | Test/Assignment |

| L9 | Structured data objects and datatypes, specification andimplementationofstructureddata Types | **LECTURE** | |
|---|---|---|---|
| L10 | Declarationandtypecheckingof datastructured,vectorandarrays, | **LECTURE** | Test |
| L11 | Records character strings,variablesizedatastructures, Union, | **LECTURE** | |
| L12 | pointerandprogrammerdefined | **LECTURE** | |

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|---|---|---|---|
| | dataobjects | | |
| L13 | Sets | **LECTURE** | |
| L14 | Files | **LECTURE** | Assignment |
| L 15 | Evolutionofdatatypeconcept abstraction, | **LECTURE** | |
| L 16 | encapsulationandinformation hiding, | **LECTURE** | |
| L17 | Subprograms,typedefinition, | **LECTURE** | |
| L 18 | abstractdatatypes | **LECTURE** | |
| L 19 | overloadedsubprograms,generic subprograms, | **LECTURE** | Test |
| L 20 | Implicitandexplicitsequence Control | **LECTURE** | |
| L 21 | sequencecontrolwithin expression, | **LECTURE** | |
| L 22 | Sequencecontrolwithin statement, | **LECTURE** | Assignment |
| L23 | subprogramsequence control | **LECTURE** | |
| L24 | simplecallreturn, | **LECTURE** | |
| L25 | Recursivesubprograms,,coo Routines | **LECTURE** | |
| L 26 | exceptionandexceptionhandlers | **LECTURE** | |
| L 27 | Sequencecontrol., | **LECTURE** | |
| L 28 | Concurrencysubprogramlevel Concurrency | **LECTURE** | Test |
| L29 | synchronizationthrough semaphores | **LECTURE** | |
| L30 | monitorsand messagepassing | **LECTURE** | |
| L31 | DatacontrolNamesand referencingenvironment | **LECTURE** | |
| L32 | staticanddynamicscope | **LECTURE** | |
| L33 | Blockstructure, | **LECTURE** | |
| L34 | shareddata | **LECTURE** | |
| | localdataandlocal referencing environment | **LECTURE** | |
| L35 | Dynamicandstaticscope | **LECTURE** | |
| L36 | parameterandparameter transmissionschemes | **LECTURE** | Test |
| L37 | | **LECTURE** | |
| L38 | Majorruntimeelements requiringstorage, | **LECTURE** | |
| L39 | programmer and systemcontrolledstoragemanag ement andphases, | **LECTURE** | |
| L40 | Staticstoragemanagement, | **LECTURE** | |
| L41 | stackbasedstoragemanagement | **LECTURE** | |
| L42 | Heapstoragemanagement, | **LECTURE** | Assignment |
| L43 | variableandfixedsizeelements | **LECTURE** | |
| L44 | Introductiontoprocedural,, ComparisonofCand C++ programminglanguages, | **LECTURE** | |
| L45 | Logical,functionaland object orientedprogramminglanguage, | **LECTURE** | |

OutcomeofCourse: 1.UnderstandtheFundamentalconceptofdifferentprogramminglanguages.

2. EnhancestheskilltoDesignanewprogramminglanguage.

3. Outlinetheprerequisitesforcreatinganewprogramminglanguage.

4. Tointroducetheconcepts

   ofstoragemanagementusingprogramminglanguages.

5. To outline the sequence control and data control Develop an understanding

   ofthecompilationprocess


(Sign.of HOD)                           (Sign.of TeacherConcernedwithdate)



2. EnhancestheskilltoDesignanewprogramminglanguage.

3. Outlinetheprerequisitesforcreatinganewprogramminglanguage.

# JMIETI,Radaur

LessonPlanningof DataStructuresandAlgorithms          Deptt. .
CSESemester 3rdw.e.f…29.08.2022

NameofTeacher        : Mr.

TajenderkumarDesignation   :AssistantProfessor

Subjectwithcode       :**PC-CS-201A**

Objectiveof Course:          1.Tointroducetheprinciplesand paradigmsofDataStructures fordesignand

implementthesoftwaresystemslogicallyandphysically.

| Lecture | Topic/ChapterCovered | AcademicActivity | Test/Assignment |
|---|---|---|---|
| L1 | DataTypes,BuiltinandUser DefinedDataStructures | **LECTURE** | |
| L2 | ApplicationsofDatastructure, AlgorithmAnalysis,Worst, | **LECTURE** | |
| L3 | BestandAverageCaseAnalysis | **LECTURE** | |
| L4 | NotationsofSpaceandTime ComplexityBasics of Recursion | **LECTURE** | |
| L5 | One Dimensional Arrays, TwoDimensionalArraysandMulti-DimensionalArrays | **LECTURE** | |
| L6 | Sparsematrices, | **LECTURE** | |
| L7 | Searching from array usingLinearAndBinarySearching Algorithm | **LECTURE** | Test |
| L8 | Sortingof arrayusingSelection | **LECTURE** | |
| L9 | InsertionSort | **LECTURE** | |
| L10 | Bubblesort | **LECTURE** | Test |
| L11 | Radix Algorithm | **LECTURE** | |
| L12 | Definition,Implementationof Stacksanditsoperations, | **LECTURE** | |
| L13 | EvaluationofInfix | **LECTURE** | |
| L14 | Prefixexpressioninter conversion ofinfix, | **LECTURE** | |
| L 15 | Postfix expressioninter conversionofinfix | **LECTURE** | Assignment |
| L 16 | prefixandpost –fixexpression | **LECTURE** | |
| L17 | ImplementationofMergesort | **LECTURE** | |
| L 18 | quicksort Algorithm | **LECTURE** | |
| L 19 | Definition,Sequential implementationoflinearQueuesandits operations, | **LECTURE** | |
| L 20 | CircularQueueandits Implementation | **LECTURE** | |

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|---|---|---|---|
| L 21 | PriorityQueues and its Implementation | **LECTURE** | Assignment |
| L 22 | Applicationofqueues ,needof dynamicDatastructures | **LECTURE** | |
| L23 | singlelinklistand | **LECTURE** | Test |
| L24 | Itsdynamicimplementation, traversinginsertion, | **LECTURE** | |
| L25 | deletionoperationsonsinglelink list | **LECTURE** | |
| L 26 | Comparisonbetweenstaticandd ynamic,implementationof linkedlist | **LECTURE** | |
| L 27 | Circularlinklist | **LECTURE** | |
| L 28 | doublylink list ,dynamic implementationofprimitive | **LECTURE** | |
| L29 | Operationson Doublylinkedlists andcircularlink list, | **LECTURE** | |
| L30 | Dynamicimplementationof Stacks | **LECTURE** | |
| L31 | Dynamicimplementationof Queues | **LECTURE** | Assignment |
| L32 | Definition , Basic terminology,Binarytree,external andinternal Nodes | **LECTURE** | |
| L33 | Staticanddynamic implementation of abinarytree | **LECTURE** | |
| L34 | Staticanddynamic implementation of abinarytree | **LECTURE** | |
| | primitiveoperation on Binary tree | **LECTURE** | |
| L35 | Primitivesoperationofbinary trees, | **LECTURE** | Test |
| L36 | binarytreetraversals pre-order, | **LECTURE** | |
| L37 | In–order andpostorder traversals, | **LECTURE** | |
| L38 | Representationofinfix,postfix andprefix expressionusingtrees | **LECTURE** | |
| L39 | Introductiontobinarysearch treesB+trees, | **LECTURE** | |
| L40 | ThreadedBinarytrees,balanced multiwaysearchtrees, | **LECTURE** | |
| L41 | Implementationofheapsort Algorithm | **LECTURE** | Assignment |
| L42 | BasicTerminolgy,Definition of undirectedanddirected Graphs, | **LECTURE** | |
| L43 | MemoryRepresentation of Graphs,minimumspanningtrees,w arshalalgorithm | **LECTURE** | |
| L44 | Graphtraversalsalgorithms, Breadthfirstanddepthfirst | **LECTURE** | |

Outcomeof Course:1.Understandanddeterminetheusageofprimitivedatastructures.

2. Implementandanalyzereallifeapplicationsofvariousdatastructuressuchasarray

3. Tostudyconceptofbinarytree,BST,AVLtrees,Btreeandtheirimplementation.

4. Tostudygraphstraversaltechniquesandspanningtechniques

5. Toteachtheconceptofprotectionandmanagementofdata.

6. Toimprovethelogicalability.

(Sign.of HOD)                                        (Sign.of TeacherConcernedwithdate)

# JMIETI,Radaur

LessonPlanningofDigitalElectronics          Deptt.
.CSESemester 3$^{rd}$w.e.f29.08.2022

NameofTeacher        : Ms. Ruchi

GuptaDesignation    :Assistant

ProfessorSubjectwithcode    :  **ES-207A**

ObjectiveofCourse:              1.Tolearnthebasicmethods forthedesign ofdigitalcircuitsandprovidethe

fundamentalconceptsusedinthedesignofdigital systems.

| Lecture | Topic/ChapterCovered | AcademicActivity | Test/Assignment |
|---|---|---|---|
| L1 | BinaryDigits,Logiclevels,anddigitalwaveforms,logicsystem positiveandnegative | **LECTURE** | |
| L2 | Logic operations, logicaloperators,logicGates,AND,Or NOT, | **LECTURE** | |
| L3 | NAND,NOR | **LECTURE** | |
| L4 | Exclusive–ORand Exclusive–NOR, | **LECTURE** | |
| L5 | Activehighandactivelow concepts | **LECTURE** | |
| L6 | Universalgatesandrealizationof othergates usinguniversal gates, | **LECTURE** | |
| L7 | GatePerformanceCharacteristics andParameters, | **LECTURE** | Assignment |
| L8 | Boolean Algebra:rulesandlaws ofBooleanAlgebra | **LECTURE** | |
| L9 | Demorgan'sTheorems,Boolean ExpressionsandTruthTables | **LECTURE** | |
| L10 | StandardSOPandPOSforms | **LECTURE** | |
| L11 | MintermandMazterms, | **LECTURE** | |
| L12 | Canaonicalrepresentationof Booleanexpression, | **LECTURE** | Assignment |
| L13 | DualityTheorem,Simplification ofBooleanExpressions, | **LECTURE** | |
| L14 | MinimizationTechniquesfor BooleanExpressionsusing KarnaughMap | **LECTURE** | Test |
| L 15 | QuineMcCluskeyTabular method | **LECTURE** | |
| L 16 | IntroductionofTTLandCMOS logicandtheircharacterisitics, | **LECTURE** | |
| L17 | Tristategates | **LECTURE** | Assignment |
| L 18 | Introductiontocombinational | **LECTURE** | |

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|---|---|---|---|
| | Circuits, | | |
| L 19 | Adders–HalfAdder and Full Adder, | **LECTURE** | |
| L 20 | SubtractorsHalfandfull subtractor; | **LECTURE** | |
| L 21 | paralleladderandsubtractor | **LECTURE** | |
| L 22 | Look –Ahead Carryadders , BCDadder,BCDsubtractor, | **LECTURE** | Assignment |
| L23 | ParityChecker/ Generator | **LECTURE** | |
| L24 | Multiplexer,Demultiplexer, Enocder, PriorityEncoder, Decoder, | **LECTURE** | |
| L25 | BCD to Seven Segment DisplayDecoder/Driver,LCDDisplay andComparators | **LECTURE** | |
| L 26 | Introductiontosequential Circuits,Flip-Flop: | **LECTURE** | |
| L 27 | TypesofFlipFlopRS,T,D,JK; Edgetriggering | **LECTURE** | |
| L 28 | LevelTriggeringFlipFlop conversions:MasterSalveJK | **LECTURE** | |
| L29 | Introductiontoshiftregisters, BasicShiftRegisterOperations, | **LECTURE** | |
| L30 | typesofshiftregisters,, BidirectionalshiftRegisters, | **LECTURE** | Test |
| L31 | ShiftRegisterCounters, Introductiontocounters, | **LECTURE** | |
| L32 | TypesofCountersAsynchronous andsynchronouscounters, | **LECTURE** | |
| L33 | Up/DownSynchronous Counters, Modulo-n Counter,Statetable, | **LECTURE** | Assignment |
| L34 | excitationtableconceptsDesigno fasynchronousand synchronouscounters, | **LECTURE** | |
| | Ringcounter,Application of counters, | **LECTURE** | |
| L35 | DigitaltoAnalogConverter, | **LECTURE** | |
| L36 | WeighedRegister:R-2R ladder Network | **LECTURE** | |
| L37 | AnalogtodigitalConversion, SuccessiveApproximationtype, | **LECTURE** | |
| L38 | DualSlopetype | **LECTURE** | |
| L39 | Classificationofmemories– Rom:ROMorganization, PROM,EPROM | **LECTURE** | |
| L40 | EEPROM, EAPROM ,RAM: RAM organization writeoperation, | **LECTURE** | |
| L41 | Readoperation,Memorycycle,T imingwaveforms, memory expansion | **LECTURE** | |
| L42 | StaticRAMCell, MOSFET | **LECTURE** | Assignment |

| | RAMcellstructure,Dynamic RAMCellstructure | | |
|---|---|---|---|
| L 43 | ProgrammablelogicDevices Programmablelogicarray(PLA) | **LECTURE** | |
| L 44 | Programmable arraylogic(PAL), Implementation of PLA, PALusingROM | **LECTURE** | |

OutcomeofCourse:

1. TointroducebasicpostulatesofBooleanalgebraandshows thecorrelation betweenBooleanexpressions

2. TointroducethemethodsforsimplifyingBooleanexpressions

3. Tooutlinetheformalproceduresfortheanalysisanddesignofcombinationalcircuit sandsequentialcircuits

4. Tointroducetheconceptofmemoriesandprogrammablelogicdevices

(Sign.of HOD)                    (Sign.of TeacherConcernedwithdate)

# JMIETI,Radaur

LessonPlanningof ObjectOrientedProgramming          Deptt. CSESemester3rdw.e.f.29.08.2022

NameofTeacher      :   Ms.PriyankaKamboj

Designation          :Assistant Professor

Subjectwithcode    :**PC-CS-203A**

ObjectiveofCourse:          1.TointroducetheprinciplesandparadigmsofObjectOrientedProgramming

Languagefordesignandimplementthe ObjectOrientedSystem.

2.Tobuildup logiccapabilities

| Lecture | Topic/ChapterCovered | Academic Activity | Test/Assignment |
|---|---|---|---|
| L1 | Introductionto C++,C++standard Library, IllustrativesimpleC++Programs | **LECTURE** | |
| L2 | Headerfiles,Namespaces, | **LECTURE** | |
| L3 | Applicationofobjectorientedprogramming | **LECTURE** | |
| L4 | Objectorientedconcepts, | **LECTURE** | |
| L5 | Introductiontoobjectsandobjectoriented programming | **LECTURE** | |
| L6 | Introductiontoobjectsandobjectoriented programming | **LECTURE** | |
| L7 | Encapsulation, | **LECTURE** | |
| L8 | Polymorphism | **LECTURE** | |
| L9 | Overloading, | **LECTURE** | |
| L10 | Inheritance, | **LECTURE** | |
| L11 | AbstractClasses | **LECTURE** | Assignment |
| L12 | Accessspecifier(public/protected/private,) Classscopeand accessingclass member | **LECTURE** | |
| L13 | Controllingaccessfunction,constant | **LECTURE** | |
| L14 | classmember | **LECTURE** | |
| L 15 | structureandclass | **LECTURE** | |
| L 16 | Friendsfunctionand | **LECTURE** | |
| L17 | friendclasses | **LECTURE** | |
| L 18 | thispointer | **LECTURE** | |
| L 19 | DynamicMemoryAllocation and De-allocation(NewandDelete) | **LECTURE** | |
| L 20 | StaticClassmembers, | **LECTURE** | |
| L 21 | Constructors, | **LECTURE** | |
| L 22 | parameterConstructors, | **LECTURE** | |
| L23 | copyconstructors | **LECTURE** | |
| L24 | Destructors | **LECTURE** | |
| L25 | Introductionofinheritance, | **LECTURE** | |

| L 26 | TypesofInheritance, | **LECTURE** | |
|------|---------------------|-------------|---|
| L 27 | TypesofInheritance | **LECTURE** | |
| L 28 | Public,ProtectedandPrivateInheritance, | **LECTURE** | |
| L29 | EffectofconstructorsandDestructorsof BaseClassinDerivedClasses | **LECTURE** | Assignment |
| L30 | Polymorphism,PointertoDerivedClass, | **LECTURE** | |
| L31 | VirtualFunctionsPureVirtualFunction | **LECTURE** | |
| L32 | Abstract BaseClasses,StaticandDynamic Binding, | **LECTURE** | |
| L33 | VirtualDestructors | **LECTURE** | |
| L34 | Fundamentalsof OperatorOverloading,rule forOperatorsOverloading | **LECTURE** | |
| | ImplementationofOperatorOverloadingL ike <<>>UnaryOperators, Binary Operators | **LECTURE** | |
| L35 | Textstreams andbinarystream, | **LECTURE** | |
| L36 | SequentialandRandomaccessfile | **LECTURE** | |
| L37 | Streaminput/Outputclasses,stream manipulators. | **LECTURE** | |
| L38 | BasicsofC++ExceptionHanding | **LECTURE** | Assignment |
| L39 | Try, Throw,Catch, Multiple Catch | **LECTURE** | |
| L40 | Re-throwingan exception,Exception Specifications | **LECTURE** | |
| L41 | Templates:FunctionTemplates, | **LECTURE** | |
| L42 | OverloadingTemplateFunction | **LECTURE** | |
| L 43 | ClassTemplate,ClassTemplates | **LECTURE** | |
| L 44 | Non–typetemplatearguments | **LECTURE** | |

Outcomeof Course:

1. Tounderstand thedifferencesbetweenproceduraldesignand object-orienteddesign

2. TounderstandtheConceptofinheritance,polymorphism,dynamicbindingandGenericstructures

3. Object-orientedprogramdesignbasedontemplatemodelofC++.

4. forcreatingefficientcodes,exceptionhandlingMechanisms useinC++

5. Performobjectorientedprogrammingtodevelop solutionstoproblemsdemonstratingusageofcontrolstructures,modularity, I/O.and otherstandardlanguageconstructs.

6. Tolearnhowto designC++classesforcodereuse.

(Sign.of HOD)                                      (Sign.of TeacherConcernedwithdate)

# JMIETI, Radaur

LessonPlanningof Mathematics 3 Deptt.
CSESemester3$^{rd}$w.e.f.29.08.2022

NameofTeacher : Ms. PoonamKalra

Designation : Assistant Professor

Subjectwithcode :**BS-205A**

| S.No. | TOPIC | No.ofLectures |
|---|---|---|
| 1. | **ISTORDERORDINARYDIFF.EQNS(UnitII)** <br> L1-Exact,linearandBernoulli'sequations <br> L2- ............do............ <br> L3-Euler'sequations <br> L4-Equationsnotof firstdegreeequationssolvableforp <br> L5-Equationssolvablefory,equationssolvableforxandClairaut'stype. <br> L6- ..........do.......... <br> L7-Secondorderlineardifferentialequations withconstantcoefficients <br> L8- ..........do.......... <br> L9-Methodofvariationofparameters <br> L10-CauchyandLegendre'slineardifferentialequations | 10 |
| 2. | **SEQUENCESANDSERIES(UnitI)** <br> L1-Convergenceofsequenceandseries <br> L2- Tests for convergence (Comparison test)L3-D'Alembert's Ratio test, Logarithmic testL4..........do............ <br> L5-Cauchyroottest,Raabe'stest <br> L6- do ................ <br> L7-Powerseries. <br> L8-Fourierseries:Introduction,Fourier-EulerFormula,Dirichlet'sconditionsL9 ......................do.................... <br> L10Changeofintervals <br> L11-FourierseriesforevenandoddfunctionsL12-Half rangesineandcosineseries. | 12 |

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| 3. | **MULTIVARIABLECALCULUS(UnitIII)** | **10** |
|---|---|---|
| | L1- Multiple Integration:Double integrals (Cartesian)L2-....do............... | |
| | L3-ChangeoforderofintegrationindoubleintegralsL4 ....................do...................... | |
| | L5-Changeofvariables(Cartesiantopolar) | |
| | L6-Applications:areasandvolumes | |
| | L7-.............do.............. | |
| | L8-Tripleintegrals(Cartesian),orthogonalcurvilinearcoordinates | |
| | L9-Simpleapplicationsinvolvingcubes,sphereandrectangularparallelepipeds.L10 ....................do...................... | |
| 4. | **VECTORCALCULUS(UnitIV)** | **10** |
| | L1- Introduction, Scalar and Vector point functionsL2-Gradient ,Directionalderivative. | |
| | L3-Divergence&CurlandtheirpropertiesL4- .....................do...................... | |
| | L5-Lineintegrals | |
| | L6-Surface integralsL7-Volumeintegrals | |
| | L8-Green'sTheorem(withoutproof).L9-GaussTheorem(withoutproof). | **10** |
| | L10-StokesTheorem (withoutproof). | |
| | **TOTALLECTURES** | |
| | | **42** |

Tutorialsheet(UnitI)

1. Showthatthefollowingsequence
   - (i) $\{a_n\}=(-1)^n/n$converges
   - (ii) $\{a_n\}=2n$diverges
   - (iii) $\{a_n\}=1+(-1)^n$oscillates

2. Testtheconvergenceoftheseries $\dfrac{1}{1*2*3}+\dfrac{1}{2*3*4}+\dfrac{1}{3*4*5}+\ldots\ldots\ldots-$

3. Testtheconvergenceoftheseries$\Sigma(n^3+a)/(2^n+a)$

4. FindtheHalfRangeCosine seriesforthe function$f(x)=(x-1)^2$intheinterval$0<x<1$.Henceshowthat

$$1)\frac{1}{1^2}+\frac{1}{2^2}+\frac{1}{3^2}+\frac{1}{4^2}+\ldots\ldots\ldots=\frac{\pi^2}{6}$$

$$2)\frac{1}{1^2}-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\ldots\ldots\ldots=\frac{\pi^2}{12}$$

$$3)\frac{1}{1^2}+\frac{1}{3^2}+\frac{1}{5^2}+\frac{1}{7^2}+\ldots\ldots\ldots=\frac{\pi^2}{8}$$

6. Expand$f(x)=e^{-x}$asaFourierseriesintheinterval$(-\pi,+\pi)$

7. FindaFourierseriesto represent$x^2$intheinterval $(-c,+c)$

8. If$f(x)=\left|\cos x\right|$,expand$f(x)$asafourierseriesintheinterval$(-\Pi,+\Pi)$

9. DefinePowerserieswithexamples.

1. Solve the following equation

   (a) $(3x^2+6xy^2)dx$

   $+(6x^2y+4y^3)dy=0$ (b) $(y^2+2x^2y)dx+(2x^3-$

   $xy)dy=0$

   (c) $2ydx+x(2logx-y)dy=0$

2. Solve the initial value problem $cosx dy/dx+y=sinx, y(0)=2$

3. Solve $dy/dx+y/x=3x^2y^2$

4. Solve $y=xy'-(y')^2$

5. Solve by the method of variation of parameters

$$y''-2y'+2y=e^x tanx$$

6. Solve $x^2 \dfrac{d^2y}{dx^2} -2x \dfrac{dy}{dx} -4y=x^2+2logx$

7. Solve $(1+x)^2 \dfrac{d^2y}{dx^2} +(1+x) \dfrac{dy}{dx} +y=4coslog(1+x)$

8. Solve the differential equation: $(D^2+2D+1)Y=coshx -cos^2x$

1. Evaluate the following integral by changing the order of integration:

$$\int_0^{} \int_x^{\sqrt{2-x^2}} \frac{x}{\sqrt{x+y^2}}dydx$$

2. Find by double integration, the area of lemniscate $r^2 =a^2 cos2\theta$

3. Evaluate the integral:

$$\iint (x+y)^2 dxdy \text{ over the area bounded by ellipse } \frac{x^2}{a^2}+\frac{y^2}{b^2} =1.$$

4. Evaluate the integral:

$$\int_0^{a}\int_0^{x}\int_0^{x+y} e^{x+y+z}dzdydx.$$

5. Find by double integration, the area lying between the parabola $y=4x-x^2$ and the line $y=x$.

6. Find the area lying inside the cardiods $r=1+cos\theta$ and outside the parabola $r(1+cos\theta)=1$

7. Evaluate $\iiint dxdydz/\sqrt{(a^2-x^2-y^2-z^2)}$ (i) Over the positive octant of the sphere $x^2+y^2+z^2=a^2$
   (ii) Taken throughout the volume of the sphere $x^2+y^2+z^2=a^2$

8. Evaluate $\iint_D exp\{-(x^2+y^2)\}dydx$, where D is the region bounded by $x^2+y^2=a^2$

1. In what direction from (3,1,-2) is the directional derivative of $\phi= x^2y^2z^4$ maximum? Find also

   the magnitude of this maximum.

2. Give geometrical interpretation of gradient, curl, divergence.

3. *For a solenoidal vector **F**, show that curl curl curl **F**$=\nabla^4 F$*

4. Calculate (a) curl(grad f), given $f(x,y,z) = x+y^2-z^2$.

   (b) curl curl **A**, given that **A** = $xy$**I**$+yz^2$**J**$+zy^2$**K**

5. Find the values of $\lambda$ and $\mu$ so that the surfaces $\lambda x^2y+\mu z^3=4$ may cut the surface

   $5x=2yz+9x$ orthogonally at $(1,-1,2)$

6. The acceleration of a particle at any time t $\geq 0$ is given by $12\cos 2t$**I**$-8\sin 2t$**J**$+16t$**k,** the velocity and acceleration are initially zero. Find the velocity and displacement at any time.

7. Compute the line integral $\int_C (y^2dx-x^2dy)$ about the triangle whose vertices are $(1,0),(0,1)$ and $(-1,0)$.

8. Evaluate by Stoke's theorem $\int_C \circ (yzdx+zxdy+xydz)$ where C is the curve $x+y^2=1, z=1.5$.

9. If S is any closed surface enclosing a volume V and **F**=$ax$**I**$+by$**J**$+cz$**K,** prove that $\int_S F.Nds=(a+b+c)V$

**JMIETI,Radaur**

Lesson Planning of Business Intelligence & Entrepreneurship, Deptt. Applied Sc. & Humanities, CSE Semester 3rd w.e.f. 29.08.2022

Name of Teacher : Ms.

Medha Designation : Assistant

Prof. Subject with code : HM-

902A Objective of Course

1. Students will be able to understand who the entrepreneurs are and what competences needed to become an Entrepreneur.

2. Students will be able to understand insights into the management, opportunity search, identification of a product, market feasibility studies, project finalization required for small business enterprises.

| Lecture | Topic/Chapter Covered | Academic Activity | Test/Assignment |
|---------|----------------------|-------------------|-----------------|
| L1 | Concepts & Definitions of Entrepreneurship | Lecture | |
| L2 | Entrepreneurship & Economic Development | Lecture | |
| L3 | Classification of Entrepreneurs | Lecture | |
| L4 | Types of Entrepreneurs | Lecture | |
| L5 | Entrepreneurial Competencies | Lecture | |
| L6 | Factors affecting Entrepreneurial Growth (economic & Non Economic) | Lecture | |
| L7 | EDP Programmes | Lecture | |

| | | | |
|---|---|---|---|
| L8 | EntrepreneurialTraining | Lecture | |
| L9 | Traits&QualitiesofanEntrepreneur | Lecture | Assignment |
| L10 | Managervs.Entrepreneurs | Lecture | |
| L11 | EntrepreneurialChallenges | Lecture | |
| L12 | EntrepreneurialOpportunitySearch& Identification | Lecture | |
| L13 | EntrepreneurialOpportunitySearch& Identification | Lecture | |
| L14 | Criteriato Selecta Product | Lecture | |
| L 15 | ConductingFeasibilityStudies | Lecture | |
| L 16 | ConductingFeasibilityStudies | Lecture | |
| L17 | SourceofBusinessIdea | Lecture | |
| L 18 | MarketingResearchProcess | Lecture | |
| L 19 | MarketingMix | Lecture | |
| L 20 | MarketingMix | Lecture | |
| L 21 | Launchinganewproduct | Lecture | |
| L 22 | ExportMarketing | Lecture | |
| L23 | MethodsofProjectAppraisal | Lecture | |
| L24 | ProjectReportPreparation | Lecture | Assignment |
| L25 | SpecimenofProjectReport | Lecture | |
| L 26 | NetworkingTechniques | Lecture | |
| L 27 | PERT/CPM | Lecture | |
| L 28 | DefinitionsofSmallScale,,Objective,Scope, | Lecture | |
| L29 | Rationale ofSSI | Lecture | |
| L30 | RoleofSSIin Economic DevelopmentinIndia | Lecture | |
| L31 | SSIRegistration | Lecture | |
| L32 | NOCfromPollutionBoard | Lecture | |
| L33 | Machinery&EquipmentSelection | Lecture | |
| L34 | MajorProblemsfaced bySSI, MSME | Lecture | |
| | MSMESchemes | Lecture | |
| L35 | Challenges andDifficultiesinMSMESchemes | Lecture | |
| L36 | Directorof IndustriesDIC,SIDO,SIDBI,SIDC,SISI,NSIC,NISBUD, Statefinancial CorporationSFC | Lecture | |
| L37 | DirectorofIndustriesDIC,SIDO,SIDBI,SIDC, SISI,NSIC,NISBUD,StatefinancialC orporationSFC | Lecture | |
| L38 | VentureCapital -Concept | Lecture | |
| L39 | FinancingSchemes byvarious institutions in India | Lecture | |
| L40 | LegalIssues- FormingBusinessEntity | Lecture | |
| L41 | FormationofPublic/PrivateLimitedCompany | Lecture | |
| L42 | IntellectualPropertyRights(IPR)&Importance | Lecture | Assignment |
| L 43 | Patents, CaseStudy | Lecture | |
| L 44 | Copyrights, Trademarks | Lecture | |

OutcomeofCourse

1. Studentscanbeabletowriteareportandpresentoralpresentationonthe topicssuchasprojectidentification,business idea, export marketing.

2. Studentswillbeableto knowthedifferentfinancial andotherassistance availablefor thesmallindustrialunits.


(Sign.ofHOD)                                                    (Sign.ofTeacherConcernedwith date)

| PC-CS205AL | DataStructureandAlgorithmsLab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **MinorTest** | **Practical** | **Total** | **Time** |
| 0 | 0 | 4 | 2.0 | 40 | 60 | 100 | 3 |
| **Purpose** | Tointroduce theprinciples andparadigms ofDataStructures fordesignandimplementthe software systemslogicallyandphysically. | | | | | | |
| **CourseOutcomes(CO)** | | | | | | | |
| **CO1** | TointroducethebasicconceptsofDatastructure,basicdatatypes,searchingandsortingbased on arraydatatypes. | | | | | | |
| **CO2** | TointroducethestructureddatatypeslikeStacksandQueueanditsbasicoperation's implementation. | | | | | | |
| **CO3** | Tointroducedynamicimplementationoflinkedlist. | | | | | | |
| **CO4** | TointroducetheconceptsofTreeandgraphandimplementationoftraversalalgorithms. | | | | | | |

**LISTOFEXPERIMENTS:**

1. WriteaprogramforBinarysearch methods.
2. Writeaprogramforinsertionsort,selectionsortandbubblesort.
3. Writeaprogramto implementStackand itsoperation.
4. Writeaprogramforquicksort.
5. Writeaprogramformergesort.
6. Writeaprogramtoimplement Queueanditsoperation.
7. Writeaprogramtoimplement Circular Queueanditsoperation.
8. Writeaprogramtoimplement singlylinkedlist forthe followingoperations:Create,Display,searching,traversinganddeletion.
9. Writeaprogramtoimplement doublylinkedlist forthefollowingoperations:Create,Display,inserting,counting,searching, traversinganddeletion.
10.
   Writeaprogramtoimplementcircularlinkedlistforthefollowingoperations:Create,Display,inserting,counting,searching, traversinganddeletion.
11. Writeaprogramtoimplement insertion,deletionandtraversinginBtree.

**NOTE:**

**At least seven experiments are to be performed from above list and the concerned institution as per thescopeof the syllabusmayset remaining eight**

| ES-209AL | DigitalElectronicsLab | | | | | | |
|---|---|---|---|---|---|---|---|
| Lecture | Tutorial | Practical | Credit | MinorTest | Practical | Total | Time |
| 0 | 0 | 4 | 2.0 | 40 | 60 | 100 | 3 |
| Purpose | Tolearnthe basicmethods forthedesign ofdigitalcircuitsandsystems. | | | | | | |
| CourseOutcomes(CO) | | | | | | | |
| CO1 | ToFamiliarizationwithDigitalTrainerKitandassociatedequipment. | | | | | | |
| CO2 | ToStudyanddesignofTTLgates | | | | | | |
| CO3 | Tolearntheformalproceduresfortheanalysisanddesignofcombinationalcircuits. | | | | | | |
| CO4 | Tolearntheformalproceduresfortheanalysisanddesignofsequentialcircuits | | | | | | |

## LISTOFEXPERIMENTS:

1. FamiliarizationwithDigitalTrainerKitandassociatedequipment.
2. StudyofTTLgatesAND, OR,NOT, NAND, NOR,EX-OR,EX-NOR.
3. Designandrealizeagiven functionusingK-Mapsandverify itsperformance.
4. Toverifythe operationofMultiplexer andDe-multiplexer.
5. Toverifythe operationofComparator.
6. Toverifythetruthtableof S-R, J-K,T,DFlip-flops.
7. ToverifytheoperationofBi-directionalshiftregister.
8. Todesignandverifytheoperationof3-bitasynchronouscounter.
9. TodesignandverifytheoperationofasynchronousUp/downcounter usingJ-KFFs.
10. TodesignandverifytheoperationofasynchronousDecadecounter.
11. StudyofTTLlogicfamilycharacteristics.
12. StudyofEncoderand Decoder.
13. StudyofBCD to 7segmentDecoder.

**NOTE:**

**Atleasttenexperimentsaretobeperformedfromabovelistandtheconcernedinstitutionasperthescopeofthe
syllabusmaysetremainingfive.**

| PC-CS207AL | ObjectOrientedProgrammingLab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **MinorTest** | **Practical** | **Total** | **Time** |
| 0 | 0 | 4 | 2.0 | 40 | 60 | 100 | 3 Hour |
| **Purpose** | TointroducetheprinciplesandparadigmsofObjectOrientedProgrammingLanguagefordesign andimplementtheObjectOrientedSystem. | | | | | | |
| **CourseOutcomes(CO)** | | | | | | | |
| **CO1** | Tointroducethebasicconceptsofobjectorientedprogramminglanguage and theits representation. | | | | | | |
| **CO2** | Toallocatedynamic memory, accessprivatemembersofclassandthebehaviorofinheritance anditsimplementation. | | | | | | |
| **CO3** | Tointroducepolymorphism,interfacedesignandoverloadingofoperator. | | | | | | |
| **CO4** | Tohandlebackup systemusingfile,generalpurposetemplateand handlingofraised exception duringprogramming. | | | | | | |

## LISTOFEXPERIMENTS:

**Q1**.Raisinganumbernto apower pisthesameas multiplying nbyitselfp times.Writeafunctioncalledpower( ) that takes a double value for n and an int value for p, and returns the result as double value. Use a defaultargumentof2forp,sothatifthisargumentisomitted,thenumberwillbesquared.Writeamain()functionthatgetsva luesfromtheuserto testthisfunction.

**Q2**.A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Ycoordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis and 5 units upthe Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the Xcoordinates of the points and whose Y coordinate is the sum of their Y coordinates. Write a program that uses astructurecalledpointtomodelapoint.Definethreepoints,andhavetheuserinputvaluestotwoofthem.Thenset the third point equal to the sum of the other two, and display the value of the new point. Interaction with theprogrammightlooklike this:

    EntercoordinatesforP1:34

    Enter coordinates for P2: 5

    7CoordinatesofP1+P2are :8,11

**Q3**. Create the equivalent of a four function calculator. The program should request the user to enter a number, anoperator, and another number. It should then carry out the specified arithmetical operation: adding, subtracting,multiplying, or dividing the two numbers. (It should use a switch statement to select the operation). Finally itshould display the result. When it finishes the calculation, the program should ask if the user wants to do anothercalculation. The response can be 'Y' or 'N'. Some sample interaction with the program might look like this. Enterfirstnumber, operator, andsecondnumber:10/3

    Answer =

    3.333333Doanother(

    Y/N)?Y

    Enterfirstnumber,operator,secondnumber12+100Ans

    wer = 112

    Doanother (Y/N)?N

**Q4**. A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code (212), theexchange (767) and the number (8900). Write a program that uses a structure to store these three parts of a phonenumber separately. Call the structure phone. Create two structure variables of type phone. Initialize one, and havetheuser inputanumber fortheotherone. Thendisplayboth numbers.Theinterchangemightlooklikethis:

    Enter

    yourareacode,exchange,andnumber:4155551212Mynumbe

    ris(212)767-8900

    Yournumberis(415)555-1212

**Q5**. Create two classes DM and DB which store the value of distances. DM stores distances in metres andcentimeters and DB in feet and inches. Write a program that can read values for the class objects and add oneobject of DM with another object of DB. Use a friend function to carry out the addition operation. The object thatstores the results maybe a DM object or DB objects, depending on the units in which the results are required. Thedisplayshould beintheformatoffeetand inchesormetresandcenitmetresdependingon theobjectondisplay.

**Q6**. Create aclass rational whichrepresentsanumerical value by twodouble values-NUMERATORandDENOMINATOR.Include the followingpublicmemberFunctions:

    • constructorwithnoarguments(default).

    • constructor withtwoarguments.

    • voidreduce()thatreducesthe rationalnumberbyeliminatingthe

      highestcommonfactorbetweenthenumeratoranddenominator.

- Overload+operatortoaddtworationalnumber.
- Overload>>operatortoenableinputthroughcin.

Overload<<operatortoenableoutputthroughcout.Writeamain()to
testallthefunctionsintheclass.

**Q7**.Considerthefollowingclassde
finition class father
{protected :intage;
public;
father(intx){age=x;}vir
tualvoidiam( )
{ cout<< "I AM THE FATHER, my age is : "<<
age<<end1:}};

Derive the two classes son and daughter from the above class and for each, define iam ( ) to write our similar butappropriate messages. You should also define suitable constructors for these classes. Now, write a main ( ) thatcreates objects of the three classes and then calls iam ( ) for them. Declare pointer to father. Successively, assignaddresses of objects of the two derived classes to this pointer and in each case, call iam ( ) through the pointer todemonstratepolymorphisminaction.

**Q8**.Writeaprogramthatcreatesabinaryfilebyreadingthe dataforthestudents fromthetherminal.Thedataofeachstudentconsistofrollno.,name( astringof30 or lesserno. ofcharacters) andmarks.

**Q9**. A hospital wants to create a database regarding its indoor patients. The information to storeinclude a)Name ofthe patient
b) Dateofadmission
c) Disease
d) Dateofdischarge

Create a structure to store the date (year, month and date as its members). Create a base class to store the aboveinformation. The member function should include functions to enter information and display a list of all thepatients in the database. Create a derived class to store the age of the patients. List the information about all the tostoretheageofthepatients.Listtheinformationaboutallthepediatricpatients(lessthantwelveyearsinage).

**Q10**. Make a class **Employee** with a name and salary. Make a class **Manager** inherit from **Employee**. Add aninstance variable, named department, of type string. Supply a method to **to String** that prints the manager's name,department and salary. Make a class **Executive** inherits from **Manager**. Supply a method **to String** that prints thestring **"Executive"** followed by the information stored in the **Manager** superclass object. Supply a test programthatteststhese classesandmethods.

**Q11**.ImagineatollboothwithaclasscalledtollBooth.Thetwodataitemsareatypeunsignedinttoholdthetotal number of cars, and a type double to hold the total amount of money collected. A constructor initializes boththeseto0.AmemberfunctioncalledpayingCar()incrementsthecartotalandadds0.50tothecashtotal.Another

function, called nopayCar ( ), increments the car total but adds nothing to the cash total. Finally, amember function called displays the two totals. Include a program to test this class. This program should allow theuser to push one key to count a paying car, and another to count a nonpaying car. Pushing the ESC kay shouldcausethe programto printoutthetotal carsand total cashandthenexit.

**Q12**. Write a function called reversit ( ) that reverses a string (an array of char). Use a for loop that swaps the firstand last characters, then the second and next to last characters and so on. The string should be passed to reversit ( )as an argument. Write a program to exercise reversit ( ). The program should get a string from the user, callreversit ( ), and print out the result. Use an input method that allows embedded blanks. Test the program withNapoleon's famousphrase, "AblewasI ere I sawElba)".

25

**Q13**. Create some objects of the string class, and put them in a Deque-some at the head of the Deque and some atthe tail. Display the contents of the Deque using the forEach ( ) function and a user written display function. Thensearch the Deque for a particular string, using the first That ( ) function and display any strings that match. FinallyremovealltheitemsfromtheDequeusingthegetLeft()functionanddisplayeachitem.Noticetheorderinwhich the itemsare displayed: UsinggetLeft ( ), those insertedon theleft (head) ofthe Deque are removedin"last in first out" order while those put on the right side are removed in "first in first out" order. The oppositewould be true ifgetRight()were used.

**Q14**. Assume that a bank maintains two kinds of accounts for customers, one called as savings account and theother as current account. The savings account provides compound interest and withdrawal facilities but no chequebook facility. The current account provides cheque book facility but no interest. Current account holders shouldalsomaintainaminimumbalanceand ifthebalancefallsbelowthislevel,aservicechargeisimposed. Createaclassaccountthatstorescustomername,accountnumber andtypeofaccount.Fromthisderivetheclasses cur_acctandsav_acctto makethemmorespecifictotheirrequirements.Includenecessarymemberfunctionsinorder toachieve thefollowingtasks:
a) Acceptdepositfromacustomerandupdatethebalance.

b) Display the balance.

c) Compute and deposit interest.

d) Permit withdrawal and update the balance.

e) Check for the minimum balance, impose penalty, necessary and update the balance.

f) Do not use any constructors. Use member functions to initialize the class members.

**Q15**. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get_data( ) to initialize base class data members and another member function display_area( ) to compute and display the area of figures. Make display_area ( ) as a virtual function and redefine this function in the derived classes to suit their requirements. Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display the area.

Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height the case of triangles and used as follows:

Area of rectangle = x * y
Area of triangle = ½ *x*y

**NOTE:**

**At least ten experiments are to
be performed from above list and the concerned institution as per the scope of the syllabus may set remaining five.**