With effect from Academic Year 2015-2016

SCHEME OF INSTRUCTION & EXAMINATION

B.E. II YEAR (COMPUTER SCIENCE & ENGINEERING)

SEMESTER - II

S. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration in Hours	Maximum Marks	
			L/T	D/P		Univ. Exam	Sessionals
	THEORY						
1	MT 251	Mathematics-IV	4	-	3	75	25
2	CS 251	Object Oriented Programming Using Java	4	-	3	75	25
3	CS 252	Microprocessors & Interfacing	4	-	3	75	25
4	CS 253	Principles of Programming Languages	4	-	3	75	25
5	EE 221	Electrical Circuits and Machines	4	-	3	75	25
6	CE 222	Environmental Studies	4	-	3	75	25
	PRACTICALS						
1	CS 281	JAVA Lab	-	3	3	50	25
2	CS 282	Microprocessors Lab	-	3	3	50	25
		TOTAL	**24**	**6**	**24**	**550**	**200**

MT 251

MATHEMATICS-IV
(CSE, ECE, EEE, Mech. & Production)

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Course Objectives:

1. To impart the knowledge of essential mathematics tool like functions of complex variables and their properties.
2. To introduce the concepts of Z-transforms, Fourier transforms and their properties.
3. To introduce a few numerical methods to solve certain types of problems.

UNIT–I

Functions of Complex variables : Limit and Continuity of function, Analytic functions, Cauchy-Reimann equations, Cartesian and Polar forms, Harmonic functions, Complex integration, Cauchy's theorem, Derivative of Analytic functions, Cauchy's integral formula and it's applications.

UNIT–II

Residue theory and Transformations: Taylor's and Laurent's Series Expansions, Zeroes and Singularities, Residues, Residue theorem, Evaluation of real Integrals using Residue theorem, Conformal Mapping, Bilinear transformation.

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UNIT–III

Z-Transforms : Introduction, Basic Theory of Z-transforms, Z-transform of some standard sequences, Existence of Z-transform, Linearity property, Translation theorem, Scaling property, Initial and Final value theorems, Differentiation of Z-transforms, Convolution theorem, Solution of difference equations using Z-transforms.

UNIT–IV

Fourier Transforms: Introduction, Fourier integrals, Fourier sine and cosine integrals, Complex form of Fourier integral, Fourier transform, Fourier sine and cosine transforms, Finite Fourier sine and cosine transforms, Properties of Fourier transforms, Convolution theorem for Fourier transforms.

UNIT–V

Numerical Methods: Solutions of Algebraic and Transcendental equations, Bisection method and Newton-Raphson's method, Interpolation, Newton's Forward and Backward difference interpolation, Lagrange's interpolation, Newton's divided difference interpolation, Numerical differentiation, Solution of differential equations by Euler's method and Runge-Kutta method of order four.

***Suggested Reading**:*

1. R.K. Jain & S.R.K. Iyengar, *Advanced Engineering Mathematics*, Narosa Publications 4th Edition 2014
2. B.S. Grewal, *Higher Engineering Mathematics,* Khanna Publications, 43rd Edition, 2014.
3. Erwin Kreyszig, *Advanced Engineering Mathematics,* 9th Edition, 2012.
4. James Brown and Ruel Churchill, *Complex variables and Applications*, 9th edition, 2013.
5. Vasishtha and Gupta, *Integral Transforms*, Krishnan Prakashan Publications, 2014.

With effect from Academic year 2015-2016

CS 251

OBJECT ORIENTED PROGRAMMING USING JAVA

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

Course objective:

- To introduce fundamental object oriented concepts of java programming such as classes, inheritance, packages and interfaces.
- To introduce concepts of exception handling and multi threading.
- To use various classes and interfaces in java collection framework and utility classes.
- To introduce GUI programming using AWT controls.
- To introduce Java I/O streams and serialization.

UNIT-I

Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Concepts, Benefits of Object Oriented Development.

Java Programming Fundamentals: Introduction. Overview of Java, Data Type, Variables and Arrays, Operators, Control statements, Classes, Methods , Inheritance, Packages and Interfaces.

UNIT-II

Exceptions Handling, Multithreaded Programming, I/O basics, Reading Console input and output, Reading and Writing Files, Print Writer Class, String Handling.

UNIT-III

Exploring Java Language, Collections Overview, Collections Interfaces, Collections Classes, Iterators, Random Access Interface, Maps, Comparators, Arrays, Legacy classes and interfaces, Sting tokenizer, BitSet, Date, Calendar, Timer.

UNIT-IV

Introducing AWT working With Graphics: AWT Classes, Working with Graphics.

Event Handling: Two Event Handling Mechanisms, The Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces.

AWT Controls: Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, CheckboxGroup, Choice Controls, Using Lists, Managing Scroll Bars, Using TextField, Using TextArea, Understanding Layout Managers, Menu bars and Menus, Dialog Boxes, FileDialog, Handling events by Extending AWT Components, Exploring the controls, Menus and Layout Managers.

UNIT-V

Java I/O classes and interfaces, Files, Stream and Byte classes, Character Streams, Serialization.

Suggested Reading:

1.Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill, 2005.
2.James M Slack, Programming and Problem solving with JAVA, Thomson Learning, 2002
3.C Thomas Wu, An Introduction to Object Oriented programming with Java, Tata McGraw Hill, 2005.

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CS252

MICROPROCESSORS AND INTERFACING

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

Course objectives:

- To introduce 8085 architecture and programming in assembly language.
- To introduce basic concepts of interfacing memory and peripheral devices to a microprocessor.
- To introduce serial and parallel bus standards.
- To introduce 8051 microcontroller.
- To introduce various advanced processor architectures such as 80X86, Pentium and Multi-core Processors.

UNIT-I

8085 Architecture: Introduction to microprocessors and microcontrollers,

8085 Processor Architecture, Internal operations, Instructions and timings,

Programming the 8085 – Introduction to 8085 instructions, addressing modes and Programming techniques with Additional instruction.

UNIT-II

Stacks and subroutines, interfacing peripherals - Basic interfacing concepts, interfacing output displays, interfacing input keyboards. Interrupts - 8085 Interrupts, Programmable Interrupt Controller (8259A). Direct Memory Access (DMA) – DMA Controller (Intel 8257), Interfacing 8085 with Digital to Analog and Analog to Digital converters.

UNIT-III

Programmable peripheral interface (Intel 8255A), Programmable communication interface (Intel 8251), Programmable. Interval timer (Intel 8253 and 8254), Programmable Keyboard / Display controller (Intel 8279). Serial and parallel bus standards RS 232 C, IEEE 488.

UNIT-IV

Introduction to Microcontrollers, 8051 – Architecture – Instruction set, Addressing modes and Programming Techniques. Comparison of various families of 8-bit micro controllers. System Design Techniques Interfacing of LCD, ADC, Sensors, Stepper motor, keyboard and DAC using microcontrollers Communication standards – serial RS232 and USB

UNIT-V

Microprocessor Applications and trends in microprocessor Technology – 8-bit, 16-bit and 32-bit microprocessors. Advanced Processor Architecture – Register structure, Instruction set, Addressing modes of 8086. Features of advanced microprocessors. 80386, 80486, Pentium and Multi-Core Processors.

Suggested Readings:

1. Ramesh S Gaonkar, Microprocessor architecture, Programming and applications with 8085, 5/E Prentice Hall, 2002.
2. Barry B. Brey, The Intel Microprocessor, 8086/8088,8018/80188, 80286, 80386, 80486, Pentium and Pentium pro-processors – architecture, Programming and interfacing, 4 Edition, Prentice Hall 1993.
3. Kenneth Ayala " The 8051 Microcontroller" West publishing company.
4. Myke Predko, programming and customizing the 8051 Microcontroller, Tata McGraw-Hill, 1994.

CS 253

PRINCIPLES OF PROGRAMMING LANGUAGES

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

Course objectives:

- TO introduce the major programming paradigms, and the principles and techniques involved in design and implementation of modern programming languages.
- To introduce notations to describe syntax and semantics of programming languages.
- To analyze and explain behavior of simple programs in imperative languages using concepts such as binding, scope, control structures, subprograms and parameter passing mechanisms.
- To introduce the concepts of ADT and object oriented programming for large scale software development.
- To introduce the concepts of concurrency control and exception handling.

UNIT I :

Preliminary Concepts: Reasons for Studying Concepts of Programming Languages, Programming Domains, Language Evaluation Criteria, Influences on Language Design, Language Categories, Language Design Trade-offs, Implementation Methods, Programming Environments, Evolution of the Major Programming Languages.

Describing Syntax and Semantics: General Problem of Describing Syntax, Formal Methods of Describing Syntax, Attribute Grammars, Describing the Meaning of Programs.

UNIT II :

Names, Binding, Type Checking, and Scopes: Names, Variables, The Concept of Binding, Type Checking, Strong Typing, Type Compatibility, Scope, Scope and Lifetime, Referencing Environments, Named Constants.

Data Types: Primitive Data Types, Character String Types, User- Defined Ordinal Types, Array Types , Associative Arrays, Record Types, Union Types, Pointer and Reference Types.

Expressions and Assignment Statements: Arithmetic Expressions, Overloaded Operators, Type Conversions, Relational and Boolean Expressions, Short-Circuit Evaluation, Assignment Statements, Mixed- Mode Assignment.

UNIT III

Statement-Level Control Structures: Selection Statements, Iterative Statements, Unconditional Branching, Guarded Commands.

Subprograms: Fundamentals and Design Issues for Subprograms, Local Referencing Environments, Parameter –Passing Methods, Parameters That are Subprograms Names, Overloaded Subprograms, Generic Subprograms, Design Issues for Functions, User-Defined Overloaded Operators.

Implementing Subprograms: The General Semantics of Calls and Returns, Implementing "Simple" Subprograms, Implementing Subprograms with Stack-Dynamic Local Variables, Nested Subprograms, Blocks, Implementing Dynamic Scoping.

Abstract Data Types: The Concept of Abstraction, Introduction to Data Abstraction, Design Issues for Abstract Data Types, Language Examples, Parameterized ADT, Encapsulation Constructs, Naming Encapsulation.

UNIT IV

Object Oriented Programming: Design Issues, Object Oriented Programming in Smalltalk, C++, Java, C#, Ada 95, Ruby, The Object Model of JavaScript, Implementation of Object Oriented Constructs.

Concurrency: Subprogram level Concurrency, Semaphores, Monitors, Massage Passing, Ada Support for Concurrency, Java Threads, C# Threads, Statement-Level Concurrency.

Exception Handling and Event Handling: Introduction to Exception Handling, Exception Handling in Ada, C++ and Java, Introduction to Event Handling, Event Handling with Java.

UNIT V :

Functional Programming Languages: Introduction, Mathematical Functions, Fundamentals of FPL, LISP, Introduction to Scheme, COMMON LISP, ML, Haskell, Application of Functional Programming Languages and A Comparison of Functional and Imperative Languages.

Logic Programming Languages: Introduction to Predicate Calculus, Predicate Calculus and Proving Theorems, An Overview of Logic Programming. The Origins, Basic Elements and Deficiencies of Prolog, Applications of Logic Programming.

Scripting Languages: Key concepts, Case Study: Python(From the Suggested Reading 2).

Suggested Reading:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.
2. Programming languages –Watt, Wiley Dreamtech, 2004.
3. Programming Languages –Louden, Second Edition, Cengage, 2003.
4. Programming languages –Ghezzi, 3/e, John Wiley, 1998.
5. Programming Languages Design and Implementation – Pratt and Zelkowitz, Fourth Edition PHI/Pearson Education, 2001.

EE 221

ELECTRICAL CIRCUITS AND MACHINES

(Common to CSE, ME and PE)

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

***Course objectives*:**

- To acquire knowledge in electrical circuits.
- To be able to understand the basic principle operation and performance of electrical machines.

Unit-I

DC & AC Circuits: Analysis of circuits using loop current method, Thevenin's and Norton's theorems, Sinusoidal sources, Phasor representation of sinusoidal quantities, Average and rms values, Active power, Reactive power, Energy stored in inductance and capacitance, Mutual inductance, Dot convention, analysis of simple coupled circuits.

Unit-II

Production of 3-Phase Voltages: Analysis of 3-phase balanced circuits, 3-phase power measurement by two-wattmeter method. Transformers: Principle of transformation of voltages and currents, Equivalent circuit of transformer on no load and load, Efficiency and regulation of transformer, OC and SC tests, Auto-transformer.

Unit - III

DC Machines: Construction and working principle of a DC machine, Production of emf in a generator, Types of excitation, Characteristics of series, shunt and compound motors, Speed control and application of DC motors, Losses and efficiency, three point starter.

Unit-IV

Induction Motors: Production of rotating magnetic field, Construction and principle of operation of induction motors, Speed-torque characteristics, Methods of starting and Speed control of 3-phase induction motors,

Unit-V

Single-Phase & Special Motors: Various types of single phase motors, Spilt phase, Capacitor start and Capacitor run, Basic features of Stepper motor and Brushless DC motor.

Suggested Reading:

1. Naidu M.S. & Kamakshiah S, *Introduction to Electrical Engineering*, Tata McGraw Hill, 1995.
2. Jhon Bird, Electrical Circuit theory and Technology, Routledge Taylor & Francis Group, Fourth Edition, 2012.
3. Mehtu V.K., *Principles of Electrical Engineering and Electronics*, S.Chand & Co.,1999.
4. A.Chakrabarti, Sudipta Nath,Chandan Kumar Chanda, 'Basic Electrical Engineering" Tata McGraw Hill Education PVT. LTD., 2009.

CE 222

ENVIRONMENTAL STUDIES
(Common to all Branches)

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Course objective:

- To study the sources of water, floods and its impact on environment.
- To know about the ecosystem and energy resource system.
- To understand the biodiversity concepts and its advantages.
- To study different types of pollution and its impact on environment.
- To know the social and environment related issues and their preventive measures.

UNIT-I

Environmental studies: Definition, scope and importance, need for public awareness. Natural resources: Water resources; use and over utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. Effects of modern agriculture, fertilizer-pesticide problems, water logging salinity. Energy resources, growing energy needs, renewable and non-renewable energy sources. Land Resources, land as a resource, land degradation, soil erosion and desertification.

UNIT-II

Ecosystems: Concepts of an ecosystem, structure and functions of an ecosystem, producers, consumers and decomposers, energy flow in ecosystem, food chains, ecological pyramids, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT-III

Biodiversity: Genetic species and ecosystem diversity, bio-geographical classification of India. Value of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity.

UNIT-IV

Environmental Pollution: Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution and solid waste management.

Environment Protection Act: Air, water, forest and wild life acts, issues involved in enforcement of environmental legislation.

UNIT-V

Social Aspects and the Environment: Water conservation, watershed management, and environmental ethics. Climate change, global warming, acid rain, ozone layer depletion. Environmental protection act, population explosion.

Disaster Management: Types of disasters, impact of disasters on environment, infrastructure and development. Basic principles of disaster mitigation, disaster management, and methodology, disaster management cycle, and disaster management in India.

Suggested Reading :

1.A. K. De, *Environmental Chemistry*, New Age Publications, 2002.

2.E. P. Odum, *Fundamentals of Ecology*, W.B. Sunders Co., USA.

3.GL. Karia and R.A. Christian, *Waste Water Treatment, Concepts and Design Approach*, Prentice Hall of India, 2005.

4.Benny Joseph, *Environmental Studies*,TataMcGraw-Hill, 2005

5.V. K. Sharma, *Disaster Management*, National Centre for Disaster Management, IIPE, Delhi,

CS 281

JAVA LAB

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

Course objectives:

- Write programs using classes, inheritance and abstract classes.
- Write multi threaded programs with synchronization.
- Write real world applications using java collection frame work and I/O classes
- Write Event driven GUI programs using AWT/Swing

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1.A program to illustrate the concept of class with constructors, methods and overloading.

2.A program to illustrate the concept of inheritance and dynamic polymorphism.

3.A program to illustrate the usage of abstract class.

4.A program to illustrate multithreading.

5.A program to illustrate thread synchronization.

6.A program using StringTokenizer.

7.A program using Linked list class.

8.A program using TreeSet class.

9.A program using HashSet and Iterator classes.

10.A program using map classes.

11.A program using Enumeration and Comparator interfaces.

12.A program to illustrate the usage of filter and Buffered I/O streams.

13.A program to illustrate the usage of Serialization.

14.An application involving GUI with different controls, menus and event handling.

15.A program to implement AWT/Swing.

CS 282

MICROPROCESSOR LAB

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

Course objectives:

- Write simple assembly language program using 8085 instruction set
- Write programs to interface various peripheral devices with 8085.
- Design simple applications using 8051 Micro controller.

PART A: 8085 PROGRAMMING USING MICROPROCESSOR TRAINER KIT

1.Simple programming examples using 8085 instruction set. To understand the use of various instructions and addressing modes.

2.Interfacing and programming of 8255. (E.g. traffic light controller).

3.Interfacing and programming of 8254.

4.Interfacing and programming of 8279.

PART B: 8051 PROGRAMMING

1.Simple Programming examples using 8051 Micro Controller.

2.A/D and D/A converter interface.

3.Stepper motor interface.

4.Display