Vivekanand Education Society's
Institute of Technology

(Affiliated to University of Mumbai, Approved by AICTE & Recognized by Govt. of Maharashtra)

Vivekanand Education Society's Institute of Technology
Department of Electronics & Telecommunication Engineering

Faculty In charge: Mr. Gaurav Y. Tawde
Subject : Microprocessors Peripheral & Interfacing (ECC501)
Branch : Electronics and Telecommunication Engineering (Semester V/D14B)
Academic Year :2020-2021

Course objectives:

- To understand the basic concepts of microcomputer systems
- To develop background knowledge and core expertise in 8086 microprocessor and co-processor 8087
- To write assembly language programs for 8086 microprocessor
- To understand peripheral devices and their interfacing to 8086 and to study the design aspects of basic microprocessor based system

Course outcomes:

After successful completion of the course student will be able to

- Understand the basic concepts of microcomputer systems
- Understand the architecture and software aspects of microprocessor 8086
- Write Assembly language program in 8086
- Know the Co-processor configurations
- Interface peripherals for 8086
- Design elementary aspect of microprocessor based system

Program Specific Outcomes (PSO)

The EXTC graduates will be able to

1. Apply their electronics and communication fundamentals to develop prototypes using analysis, synthesis, programming skills and realization
2. To demonstrate the ability to develop engineering solutions for modern electronics and communication problems of the industry

Text Books [T]:

1) John Uffenbeck: —8086/8088 family: —Design, Programming and Interfacing‖, Prentice Hall, 2nd Edition
2) B. B. Brey: "The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Pro Processor", Pearson Publication, 8th Edition
3) Hall D.V: "Microprocessor and Interfacing Programming and Hardware", Tata McGraw Hill, 2nd Edition
4) Yu -Cheng Liu/Glenn A. Gibson: "Microcomputer Systems: The 8086/8088 Family, Architecture, Programming and Design", Phi Learning

Reference Books [R]:

1) Peter Abel: "IBM PC ASSEMBLY LANGUAGE & PROGRAMMING", Learning Phi

2) A. K. Ray and K. M. Burchandi: "Advanced Microprocessor and Peripherals, Architecture Programming and Interfacing", Tata McGrawHill, 3rd Edition
3) Don Anderson, Tom Shanley: —Pentium Processor System Architecture‖, MindShare Inc., 2nd Edition
4) National Semiconductor: Data Acquisition Linear Devices Data Book
5) Intel Peripheral Devices: Data Book
6) The Intel 8086 family user manual

Program Outcomes (PO)

Engineering Graduates will be able to:

PO1) Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

PO2) Problem Analysis: identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences

PO3) Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO4) Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions

PO5) Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

PO6) The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

PO7) Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

PO8) Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice

PO9) Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

PO10) Communication: Communicate effectively on complex engineering activities with the

engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

PO11) Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

PO12) Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Mapping of course outcomes with program outcomes

CO code	Program Outcomes												PSO	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ECC501.1	3	2	1	-	-	-	-	-	3	-	-	3	3	1
ECC501.2	3	2	1	-	-	-	-	-	3	-	-	3	3	2
ECC501.3	3	3	3	3	3	3	-	-	3	3	-	3	3	3
ECC501.4	3	1	-	-	-	-	-	-	2	-	-	3	2	2
ECC501.5	3	3	3	3	3	3	-	-	3	3	-	3	3	3
ECC501.6	3	2	2	-	1	1	-	-	3	-	-	3	2	3

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Lecture Plan

Week	Topics to be Covered	Mapped CO	Mapped PO	Mapped PSO	Reference/ Remarks
1	**Introduction to Microcomputer System** Block diagram of microprocessor based system: CPU, I/O Devices, Clock, Memory, Concept of Address, Data and Control Bus and Tristate logic. Need of Assembly Language and its Comparison with higher level languages Need of Assembler and Compiler and their comparison	1,2	1,2,3,4,9,11,12	1,2	[T1,T2,T3]
2,3	**Architecture of 8086 Microprocessor** 8086 Architecture and organization, pin configuration, Minimum and Maximum modes of 8086, Read and Write bus cycle of 8086	2	1,2,3,4,5,9,11,12	1,2	[T2,T3,R2]
4,5,6	**Instruction set and programming of 8086** 8086 Addressing modes, 8086 Instruction encoding formats and instruction set, Assembler directives, 8086 programming and debugging of assembly language, Programs related to: arithmetic, logical, delay, string manipulation, stack and subroutines, input, output, timer/counters, Elementary DOS Programming: Introduction to int-21h services.	2,3	1,2,3,4,5,9,11,12	1,2	[T3,R1,R2]
7,8	**Peripherals interfacing with 8086 and applications** 8086-Interrupt structure, Programmable peripheral Interface 8255, Programmable interval Timer 8254, Elementary features of 8259A and 8257 and interface. Interfacing 8255, 8254 with 8086 and their applications	3,5,6	1,2,3,4,5,9,11,12	1,2	[T2,R2]
9,10	**ADC, DAC interfacing with 8086 and its application** Analog to Digital Converter (ADC) 0809, Digital to Analog Convertor (DAC) 0808, Interfacing ADC 0809, DAC 0808 with 8086 and their applications, 8086 based data Acquisition system	3,5,6	1,2,3,4,9,11,12	1,2	[T3,R2]
11,12	**8086 Microprocessor interfacing** 8087 Math coprocessor, its data types and interfacing with 8086, Memory interfacing with 8086 microprocessor	4,6	1,2,3,4,5,9,11,12	1,2	[R2]

- Mode of Delivery-Chalk board & PPTs
- Rubrics used for Assessment-Internal Assessment Test (IAT) & End Semester Exam

G. Y. Tawde

Mr. Gaurav Tawde
Subject Teacher

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Vivekanand Education Society's Institute Of Technology

Department of Information Technology

Academic Year: 2020-2021

Subject Code	Subject Name	Theory	Practical	Tutorial	Theory	Practical/Oral	Tutorial	Total
ITC603	Cloud Computing & Services	04						04

Subject Code	Subject Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
ITC603	Cloud Computing & Services	20	20	20	80	-	-	-	100

Faculty Incharge: Vinita Mishra

Prerequisite Subjects: Computer Network, Operating System

Course Objectives: Students will try to learn:
1. Basics of cloud computing.
2. Key concepts of virtualization.
3. Different Cloud Computing services
4. Cloud Implementation, Programming and Mobile cloud computing
5. Key components of Amazon Web Services
6. Cloud Backup and solutions

Course Outcomes: Students should be able to:
1. Define Cloud Computing and memorize the different Cloud service and deployment models
2. Describe importance of virtualization along with their technologies.
3. Use and Examine different cloud computing services
4. Analyze the components of open stack & Google Cloud platform and understand Mobile Cloud Computing
5. Describe the key components of Amazon web Service
6. Design & develop backup strategies for cloud data based on features.

COs	BL	
1	BL1	Define Cloud Computing and memorize the different Cloud service and deployment models
2	BL2	Describe importance of virtualization along with their technologies

Vivekanand Education Society's Institute Of Technology

Department of Information Technology

3	BL3,4	Use and Examine different cloud computing services.
4	BL4	Analyze the components of open stack & Google Cloud platform and understand Mobile Cloud Computing
5	BL2	Describe the key components of Amazon web Service
6	BL5,6	Design & develop backup strategies for cloud data based on features.

Text Books:

1. Barrie Sosinsky ,"Cloud Computing Bible",Wiley Publication.

2. Kailash Jayaswal, Jagannath Kallalurchi, Donald J. Houde, Dr. Deven Shah, "Cloud Computing Black Book", Dreamtech Press.

3. Joe Baron et.al ,"AWS certified solution Architect", Sybex publication.

4. Mastering Cloud Computing, Rajkumar Buyya, MGH publication

Reference Books:

1. Thomas Erl,Robert Cope,Amin naserpour,"Cloud Computing Design Patterns",Pearson Publication.

2. Judith Hurwitz ,"Cloud Computing for Dummies" , Wiley Publication.

Programme Outcomes:

PO1) Basic Engineering knowledge: An ability to apply the fundamental knowledge in mathematics, science and engineering to solve problems in Computer engineering.

PO2) Problem Analysis: Identify, formulate, research literature and analyze computer engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and computer engineering and sciences.

PO3) Design/ Development of Solutions: Design solutions for complex computer engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

PO4) Conduct investigations of complex engineering problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

PO5) Modern Tool Usage: Create, select and apply appropriate techniques, resources and modern computer engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6) The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to computer engineering practice.

PO7) Environment and Sustainability: Understand the impact of professional computer engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

PO8) Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of computer engineering practice.

PO9) Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10) Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11) Project Management and Finance: Demonstrate knowledge and understanding of computer engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12) Life-long Learning: Recognize the need for and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Program Specific Outcomes (PSOs) :

PSO1. Professional Skills - The ability to develop programs for computer based systems of varying complexity and domains using standard practices.

PSO2. Successful Career – The ability to adopt skills, languages, environment and platforms for creating innovative career paths, being successful entrepreneurs or for pursuing higher studies.

CO – PO Mapping:

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11	P12	PSO 1	PSO 2
CO1		3	3		2	2	3		3			3		3
CO2		3	3		2	2	3		3			3	3	3
C03		3	3		2	2	3		3			3	3	3
CO4		3	3		2	2	3	2	3			3	3	3
CO5		3	3		2	2	3	2	3			3	3	3
CO6		3	3		2	2	3	2	3			3	3	3

Lecture Plan:

Week	Topics of Coverage	Reference	CO Mapped	Expected % attainment of CO	Mode of Delivery	Rubrics
1	Defining Cloud Computing, Cloud and other similar configurations, Components of Cloud Computing, Cloud types: NIST and Cloud Cube Models, Cloud Deployment Models and Service Models, Cloud computing architecture, Advantages and Disadvantages of Cloud Computing	T1,T2	CO1	70%	Ppts	Assignment test
2	Virtualization: Characteristics of virtualized environment, Understanding the importance of	T1,T2	CO2	70%	ppts	Assignment test

3	Hypervisors, Type I & Type II Hypervisors, Taxonomy of virtualization, Implementation Levels of Virtualization,	T1,T2	CO2	70%	Ppts	Assignment test
4	Virtualization, Virtualization of CPU, Memory and I/O Devices , Virtualization and Cloud Computing, Pros and Cons of virtualization, Technology Examples: KVM, Xen, Vmware and HyperV	T1,T2	CO2	70%	Ppts	Assignment test
5	Exploring Cloud Computing Services: SPI Model: Software as a service, Platform as a service, and Infrastructure as a service. Anything as a service or Everything as a service (XaaS): Security as a Service, Identity management as a Service,	T1,T2,R1	CO1 CO2 CO3	70%	Ppts	Assignment test
6	Database as a Service, Storage as a Service, Collaboration as a Service, Compliance as a	T1,T2,R1	CO1 CO2 CO3	70%	ppts	Assignment test

	Service, Monitoring as a Service, Communication as a Service, Network as a Service, Disaster recovery as a service, Analytics as a Service, Backup as a Service.					
7	Open Stack Cloud Architecture: Feature of Open stack, Components of Open stack, mode of operations. Programming support for Google apps engine	T1,T2	CO1 CO2 CO3 CO4	70%	Ppts	Assignment test
8	GFS, Bigtables, Chubby, Google APIs. Mobile Cloud Computing: Definition, architecture, benefits and challenges of mobile	T1,T2	CO1 CO2 CO3 CO4	70%	Ppts	Assignment test
9	AWS cloud computing Platform, a) Elastic Compute Cloud(EC2): Compute Basics, Instance types, Life cycle of instances. b) Simple Storage Service (S3): Basics and	T1,T2	CO1 CO2 CO3 CO4 CO5	70%	Ppts	Assignment test

	Operations, Features, Amazon Glacier, Glacier vs S3. c) Elastic Block Storage (EBS):Basics and Types of EBS Volumes.					
10	d)Amazon Virtual Private Cloud (Amazon VPC): Subnets, Route tables, Elastic IP Addresses (EIP), Elastic Network Interfaces (ENIs) & Security groups & ACL.	T1,T2	CO1 CO2 CO3 CO4 CO5	70%	Ppts	Assignment test
11	e) Exploring Elastic Load Balancing (ELB): Basics, Types of load balancers, Configuring Elastic Load Balancing, Basics of Cloud Watch & Auto Scaling	T1,T2,R1	CO1 CO2 CO3 CO4 CO5	70%	Ppts	Assignment test
12	Cloud Backup Solutions and their features, Cloud data management interface (CDMI), Cloud Storage gateways (CSG), Comparison between different cloud platforms: Amazon web services & Open stack (Based on Type of	T1,T2,R1,R2	CO1 CO2 CO3 CO4 CO5 CO6	70%	ppts	Assignment test

	deployment, Services supported and their components).					

Signature of faculty In-charge: 

Vivekanand Education Society's Institute of Technology

Department of Instrumentation

Academic Year: 2020-2021

Subject Code	Subject Name	Theory	Practical	Tutorial	Theory	Practical /Oral	Tutorial	Total
ISDLO 6023	Bio-Sensors and Signal Processing	3	-	-	3	-	-	3

Subject Code	Subject Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
ISDLO 6023	Bio-Sensors and Signal Processing	20	20	20	80	-	-	-	100

Faculty In charge: Mrs. Sangeetha Prasanna Ram

Pre-requisite: Basics of sensor / transducer technology

Course Objectives:

- To provide basic knowledge of various bio-sensors and their uses in biomedical applications.
- To provide understanding of principle and operation of different types of bio-sensors like potentiometric, optical and amperiometric sensors.
- To introduce the students to basic signal processing methods used in bio-signal measurement and analysis.

Course Outcomes: Students would be able

1. To describe the basic concept behind bioelectric phenomena.
2. To classify the different types of bio-sensors and describe their characteristics.
3. To distinguish between the different biosensors used for physical and chemical measurands.
4. To explain the various types of transducers found in biosensors and their significance.
5. To explain about the various basic signal processing techniques used in bio-signal acquisition and analysis.
6. To apply the appropriate biosensor for different applications.

Vivekanand Education Society's Institute of Technology

Department of Instrumentation

CO – PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11	P12	PSO1	PSO2	PSO3
CO1	2	3	1	1	1	2	2	1	1	1	1	1	3	1	2
CO2	2	3	1	1	1	2	2	1	1	1	1	1	3	1	2
CO3	2	3	1	1	1	2	2	1	1	1	1	1	3	1	2
CO4	2	3	1	1	1	2	2	1	1	1	1	1	3	1	2
CO5	2	3	1	1	1	2	2	1	1	1	1	1	3	1	2
CO6	2	3	2	1	1	3	2	1	1	1	1	1	3	1	2

Vivekanand Education Society's Institute of Technology

Department of Instrumentation

Lecture Plan:

Week	Topics of Coverage	Reference	CO Mapped	Expected % attainment of CO	Mode of Delivery	Rubrics
1	Introduction to the subject. Sensors / receptors in the human body, basic organization of nervous system-neural mechanism and circuit processing, General block diagram of Biomedical amplifier.	1,2	CO1	60%	PPT/ Blackboard	Direct Evaluation: Test/Viva /ESE/Lab
2	Electrode theory, electrode-tissue interface, metal-electrolyte interface, electrode-skin interface, electrode impedance, electrical conductivity of electrode jellies and creams.	1,2	CO1	40%	PPT/ Blackboard	Direct Evaluation: Test/Viva /ESE/Lab
3	Sensor architecture and Classification of biosensors: Medically significant measurands, functional specifications of medical sensors.	1, 2, 3	CO2	50%	PPT/ Blackboard/ Video lecture	Direct Evaluation: Test/Viva /ESE/Lab
4	Bio-sensor characteristics: linearity, repeatability, hysteresis, drift; Bio-sensor models in the time & frequency domains	1, 2, 3	CO2	50%	PPT/ Blackboard	Direct Evaluation: Test/Viva /ESE/Lab

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5	Bio-sensors for physical measurands: strain, force, pressure, acceleration, flow, volume, temperature and bio potentials.	1, 2	CO3	40%,	PPT/ Blackboard	Direct Evaluation: Test/Viva /ESE/Lab
6	Bio-sensors for measurement of chemicals: Potentiometric sensors, ion selective electrodes, Amperometry sensors, Clark Electrode biosensors, Catalytic biosensors, Immuno-sensors.	1, 2	CO3	60%	PPT/ Blackboard / video lecture	Direct Evaluation: Test/Viva /ESE/Lab
7	Various types of transducers; principles and applications - Resistive, Capacitive, Inductive, Photoelectric	1, 2	CO4	20%,	PPT/ Blackboard	Direct Evaluation: Test/Viva /ESE/Lab
8	Piezoelectric, mechanical and molecular electronics-based transducers in biosensors. Chemiluminescence - based biosensors, Liquid and solid ion exchange membrane electrode,	1, 2, 3	CO4	40%	PPT/ Blackboard / video lecture	Direct Evaluation: Test/Viva /ESE/Lab Indirect evaluation : Case study
9	Enzyme electrode, Principle of fiber optic cable, fiber optic sensors, Photo acoustic sensors in biomedical field.	1, 2, 3	CO4	40%	PPT/ Blackboard / video lecture	Direct Evaluation: Test/Viva /ESE/Lab Indirect evaluation : Case study

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10	Measuring ultra-small signals, noise. Electrical signals produced by cells, Signal conditioning circuit design	1, 2, 3	CO5	50%	PPT/ Blackboard / video lecture	Direct Evaluation: Test/Viva /ESE/Lab Indirect evaluation : Case study
11	Various types of signal processing techniques used for bio-signals- Fourier transform, FFT, Wavelet transform. Biosensors in clinical chemistry, medicine and health care	2, 3	CO5, CO6	50% 20%	PPT/ Blackboard / video lecture	Direct Evaluation: Test/Viva /ESE/Lab Indirect evaluation : Case study
12	Biosensors for veterinary, agriculture and food, Low cost biosensor for industrial processes for online monitoring; biosensors for environmental monitoring.	2, 3	CO6	80%	PPT/ Blackboard / video lecture	Direct Evaluation: Test/Viva /ESE/Lab Indirect evaluation : Case study
Extra activity SEL/QUIZ/Seminar/Debate/ (all the extra activity should focus on applications of the subject)						

References:

1. Richard S.C. Cobbold, "Transducers for Biomedical Measurements: Principles and Applications", John Wiley & Sons, 1992.
2. A.P.F. Turner, I. Karube & G.S. Wilson, "Biosensors: Fundamentals & Applications", Oxford University Press, Oxford, 1987.
3. John G. Webster, "Medical Instrumentation: Application and Design", John willey and sons, 1999.
4. Internet based search

12/01/21

Suggestions by Group Advisor	Case study on applications of bio-sensors

Vivekanand Education Society's Institute of Technology
Department of Electronics & Telecommunication Engineering

Subject: Electronics Devices & Circuits (EDC-1)

Class/Semester: SE EXTC (D9-A, B) Sem III

Academic Year: 2019-20

Lab Plan

Exp no	Name of Experiment	POs	COs	PSOs	Week
1	Study of different Measuring Instruments	PO1	CO1	PSO1	1
2	Zener diode as a regulator	PO1,PO2, PO9	CO1	PSO1, PSO2	2
3	To understand the characteristics of PN junction diode	PO1,PO2, PO9	CO1	PSO1	3
4	To find the DC load line & Q point of JFET using Self bias configuration.	PO1,PO2, PO5,PO9	CO1, CO2	PSO1, PSO2	4
5	To study capacitor filter with half wave rectifier and observe the dependence of ripple factor on capacitor	PO1,PO2, PO9	CO1, CO2	PSO1, PSO2	5
6	To study frequency response of Common Emitter single stage amplifier	PO1,PO2, PO9,PO12	CO4	PSO1, PSO2	6
7	To study frequency response of Common Source single stage amplifier using PSpice	PO1,PO2, PO5,PO9, PO12	CO4	PSO1	7
8	To study input output characteristics of transistor in CB configuration & finding out H parameter of BJT	PO1,PO2, PO9	CO1,CO2	PSO1, PSO2	8
9	Mini Project	PO1,PO2, PO3,PO4, PO5, PO9,PO11, PO12	CO1,CO2, CO3, CO4	PSO1, PSO2	9

Course Objective:

1. To understand operation of semiconductor devices.
2. To understand DC analysis and AC models of semiconductor devices.
3. To apply concepts for the design of Regulators and Amplifiers
4. To verify the theoretical concepts through laboratory and simulation experiments.
5. To implement mini projects based on concept of electronics circuit concepts.

Lab Evaluation

Evaluation of experiments of EDC-I is done based on following factors:

Factor	Marks
Observations	40%
Diagrams	15%
Explanation and Analysis	10%
Punctuality & regularity (in lab)	15%
Conclusion	20%

Extra Evaluation Techniques:-
* Mock Viva
* Assignments

Term Work will be assessed for EDC-I as

Factors	Marks (25)
Projects (Mini)	10
Journal/Experiments	10
Attendance (Theory)	05

Lab Tool: Pspice software

Mr. Chintan J.
(D9A)

RBNaik
Mrs. Rasika Naik
(D9B)

VES INSTITUTE OF TECHNOLOGY

DEPARTMENT OF INSTRUMENTATION ENGINEERING

Choice Based Credit and Grading System

Name of the Course : Applied Mathematics -IV

Semester / Class : IV/ D8 / CBCGS Revised 2016 (with effect from 2017-18)

Academic Year : 2019-20 (Even Sem)

Course outcome:

ISC401.1	The students will be able to find the probability distribution, expectation, variance and moments for the given data.
ISC401.2	The students will be able to use binomial distribution and Poisson distribution and normal distribution for the data for required probability.
ISC401.3	The students will be able to find the correlation coefficients and rank correlation coefficients and lines regression between the two data.
ISC401.4	The students will be able to apply Cauchy's integral formula and theorem and residue theorem to solve the integral problem.
ISC401.5	The students will be able to find eigenvalues and eigenvectors of matrix and can diagonalize the matrix.
ISC401.6	The students will be able to check the given set of vectors is the vector space.

Scheme of M.U. Examination:

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tut	Theory	TW/ Practical	Tut	Total
ISC401	Applied Mathematics-IV	4	-	1	4	1	-	5

Lesson Plan:

Week	Topic	Reference	Course Outcomes	Delivery Modes	Assessment Tools
Before each module	Applications of Applied Mathematics	Internet, STTP courses	CO1-CO6	Black Board,	
	Pre-requisites: Basics of Complex numbers, Analytic Function, Matrices, Symmetric, Orthogonal and Unitary matrices, Rank, Normal form, Solution of system of linear equations, L. I. & L. D. vectors, Basics of Probability.	R1-R4 T1,T2			
1-2	**Random Variables** Discrete & continuous random variables, expectation, Variance, Probability mass function and Density Function, Probability distribution for random variables Moments, Moment Generating Function. Functions of one random variable and their distribution and density functions	R1-R4 T1,T2	CO1	Black Board,	Test Tutorial
3-4	**Probability distribution** Probability distribution: Binomial distribution, Poisson & normal distribution (For detailed study)	R1-R4 T1,T2	CO2	Black Board,	Test Tutorial
5	**Correlation & Regression** Karl Pearson's coefficient of correlation, cov Rank correlation. Lines of Regression.	R1-R4 T1,T2	CO3	Black Board,	Tutorial
6-7	**Linear Algebra: Vector Matrix Theory** Characteristic equation, Eigen values and Eigen vectors, properties of Eigen values and Eigen vectors	R1-R3 T1,T2	CO4		Tutorial

19-20

	Cayley-Hamilton theorem, examples based on verification of Cayley- Hamilton theorem. Similarity of matrices, Diagonalisation of matrices. Functions of square matrix, derogatory and non-derogatory matrices.			Black Board,	
8-11	**Complex integration** Complex Integration: Line Integral, Cauchy's Integral theorem for simply connected regions, Cauchy's Integral formula. Taylor's and Laurent's Series Zeros, singularities, poles of f(z), residues, Cauchy's Residue theorem. Applications of Residue theorem to evaluate real Integrals of different type	R1-R3 T1,T2	CO5	Zoom-online lecture	Tutorial
12-13	**Linear Algebra: Vector Spaces** Vectors in n-dimensional vector space: properties, dot product, cross product, norm and distance properties in n-dimensional vector space. Vector spaces over real field, properties of vector spaces over real field, subspaces. The Cauchy-Schwarz inequality, Orthogonal Subspaces, Gram-Schmidt process.	R1-R4 T1,T2	CO6	Zoom-online lecture	Tutorial

Text Books:

1. Higher Engineering Mathematics by Dr. B. S. Grewal 42th edition, Khanna Publication.

2. Advanced Engineering Mathematics by Kreyszig E. 9th edition, John Wiley.

Reference Books:

1. A Text Book of Applied Mathematics Vol. II by P. N. Wartilar & J. N. Wartikar, Pune,

2. Advanced Engineering Mathematics by C. Ray Wylie & Louis Barrett. TMH International Edition.

3. Mathematical Methods of Science and Engineering by Kanti B. Datta, Cengage Learning.

4. Theory and Problems of Statistics by Murry R. Spieget, Schaum's outline series-McGraw Hill Publication.

Vivekanand Education Society's Institute Of Technology

Department of Instrumentation Engineering

Academic Year: 2018-2019

Subject Code	Subject Name	Theory	Practical	Tutorial	Theory	Practical/Oral	Tutorial	Total
ISEC	Robust Control	04	-	-	04	-	-	04

Subject Code	Subject Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
ISEC	Robust Control	20	20	20	80	-	-	-	100

Faculty In charge: Dr. Machhindranath Patil

Prerequisite:

Regulators and Servo Mechanism, Concepts in State-space analysis, Controllability and Observability.

Course Objectives

1. To study the effect of disturbance, parametric uncertainties and model errors on the stability of the system.
2. To study the robust control techniques such as a control based on Kharitonov theorem, internal model control and introduction to Quantitative feedback technique for the system with parametric uncertainties and external disturbances.
3. To study the sliding mode control for asymptotic stability in presence of disturbances.

Course Outcomes

1. The students should be able to understand the robustness properties of the system against uncertainties.
2. Students should be able to design robust control that overcomes parametric uncertainties.
3. Students should be able to design the internal model control for uncertain systems.
4. Students should be able to understand the concept of Quantitative feedback techniques.
5. Students should be able to design the sliding mode control for uncertain systems.

Vivekanand Education Society's Institute Of Technology

Department of Instrumentation Engineering

Programme Outcomes:

CO – PO Mapping:

	PO1	PO2	PO3	PSO1	PSO2	PSO3
CO1	1	2	2	-	3	-
CO2	3	3	3	-	3	-
CO3	3	3	3	-	3	-
CO4	1	1	1	-	3	-
CO5	3	3	3	-	3	-

Vivekanand Education Society's Institute Of Technology

Department of Instrumentation Engineering

Lecture Plan:

Week	Topics of Coverage	Reference	CO Mapped	Expected % attainment of CO	Mode of Delivery	Rubrics
1-2	**Introduction to Sliding Mode Control:** Main Concepts of Sliding Mode Control, Chattering Avoidance: Attenuation and Elimination, Concept of Equivalent Control, Sliding Mode Equations, The Matching Condition and Insensitivity Properties, Conventional Sliding Mode Controller Design.	Christopher Edwards and Sarah Spurgeon, **"Sliding mode control: theory and applications,"** CRC Press, 1998.	CO1 CO5	60	Chalk and Board, Laptop and Projector	Test-1
3-5	**Conventional Sliding Modes:** Introduction, Filippov Solution, Concept of Equivalent Control, State-Feedback Sliding Surface Design, Regular Form, Eigenvalue Placement, Quadratic Minimization, State-Feedback Relay, Control Law Design, Single-Input Nominal Systems, Single-Input Perturbed Systems, Relay Control for Multi-Input Systems.	Yuri Shtessel, Christopher Edwards, Leonid Fridman and Arie Levant, **"Sliding mode control and observation,"** New York, USA: Birkhuser, 2014.	CO1 CO5	60	Chalk and Board, Laptop and Projector	Test-1
5-7	**Interval Polynomials:** Kharitonov's Theorem: Kharitonov's Theorem for Real Polynomials, Kharitonov's Theorem for Complex Polynomials, Robust State Feedback Stabilization.	S. P. Bhattacharyya, H. Chapellat, and L. H. Keel, **"Robust control: the parametric approach," Upper Saddle River (1995).**	CO1 CO2	60	Chalk and Board, Laptop and Projector	Test-1

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Department of Instrumentation Engineering

8-10	**Internal Model Control (IMC):** Introduction to Model-Based Control, Practical Open-Loop Controller Design, Generalization of the Open-Loop Control Design Procedure, Model Uncertainty and Disturbances, Development of the IMC Structure, IMC Background, The IMC Structure, The IMC Design Procedure, Effect of Model Uncertainty and Disturbances, Improving Disturbance Rejection Design.	Manfred Morari and Evanghelos Za_riou, **"Robust process control,"** Vol. 488. Englewood Cliffs, NJ, Prentice hall, 1989. and B. Wayne Bequette, **"Process Control: Modeling, Design and Simulation,"** Prentice Hall Professional, 2003.	CO1 CO3	60	Chalk and Board, Laptop and Projector	Test-2
10-11	**The IMC-Based PID Control:** Background, The Equivalent Feedback Form to IMC, IMC-Based Feedback Design for Delay-Free Processes, IMC-Based Feedback Design for Processes with a Time Delay, Summary of IMC-Based PID Controller Design for Stable Processes, IMC-Based PID Controller Design for Unstable Processes.	B. Wayne Bequette, **"Process Control: Modeling, Design and Simulation,"** Prentice Hall Professional, 2003.	CO1 CO3	60	Chalk and Board, Laptop and Projector	Test-2
12	**Introduction to Quantitative Feedback Theory:** Quantitative Feedback Theory (QFT), Why Feedback, QFT Overview, QFT Design Objective, Structured Parametric Uncertainty, Control System Performance Specifications, QFT Design	Constantine H. Houpis, Steven J. Rasmussen and Mario Garcia-Sanz, —Quantitative feedback theory: fundamentals and	CO1 CO4	60	Chalk and Board, Laptop and Projector	Test-2

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Department of Instrumentation Engineering

	Overview, QFT Basics, QFT Design, Insight to the QFT Technique, Open-Loop Plant, Closed-Loop Formulation, Benefits of QFT.	applications," CRC Press, 2005.				
Extra activity SEL/QUIZ/Seminar/Debate/(all the extra activity should focused on applications of the subject)						

Suggestions by Group Advisor	

(Dr. M.D. Patil)

Vivekanand Education Society's Institute Of Technology

Department of INST/ EXTC/INFT

Academic Year: 2018-19

Subject Code	Subject Name	Theory	Practical	Tutorial	Theory	Practical/Oral	Tutorial	Total
ILO2026	Research Methodology	3	-	-	3	-	-	3

Subject Code	Subject Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
ILO2026	Research Methodolo gy	20	20	20	80	-	-	-	100

Faculty In charge: Mrs. Nilima Warke

Course Objectives:

- To understand Research and Research Process
- To acquaint students with identifying problems for research and develop research strategies
- To familiarize students with the techniques of data collection, analysis of data and interpretation

Course Outcomes: Learner will be able to…

- Prepare a preliminary research design for projects in their subject matter areas
- Accurately collect, analyze and report data
- Present complex data or situations clearly
- Review and analyze research findings

Programme Outcomes:

PO1) An ability to independently carry out research/investigation and development work to solve practical problems.

PO2) An ability to write and present a substantial technical report/document.

PO3) students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a higher level than the requirements in the appropriate bachelor program.

CO – PO Mapping:

	PO1	PO2	PO3
CO1	2	3	3
CO2	2	3	3
CO3	2	3	3
CO4	3	3	3

Lecture Plan:

Week	Topics of Coverage	Reference	CO Mapped	Expected % attainment of CO	Mode of Delivery	Rubrics
1 2	**Introduction and Basic Research Concepts:** Research – Definition; Concept of Construct, Postulate, Proposition, Thesis, Hypothesis, Law, Principle. Research methods vs Methodology. Need of Research in Business and Social Sciences , Objectives of Research, **Issues** and Problems in Research, Characteristics of Research: Systematic, Valid, Verifiable, Empirical and Critical	2,3	CO1	60%	Transparancies/PPT slides/Videos,	**Test 1**
3 4	**Types of Research:** Basic Research, Applied Research, Descriptive Research, Analytical Research, Empirical Research, Qualitative and Quantitative Approaches	2,3	CO2	60%	Transparancies/PPT slides/Videos,	Test 1
5 6	**Research Design and Sample Design :** Research Design – Meaning, Types and Significance, Sample Design – Meaning and Significance Essentials of a good sampling Stages in Sample Design Sampling methods/techniques Sampling Errors	2,3	CO2	60%	Transparancies/PPT slides/Videos,	Test 1
7 8 9	**Research Methodology :** Meaning of Research Methodology, Stages in Scientific Research Process a. Identification and Selection of Research Problem b. Formulation of Research Problem c. Review of Literature	2,3	CO2	60%	Transparancies/PPT slides/Videos,	Test 2

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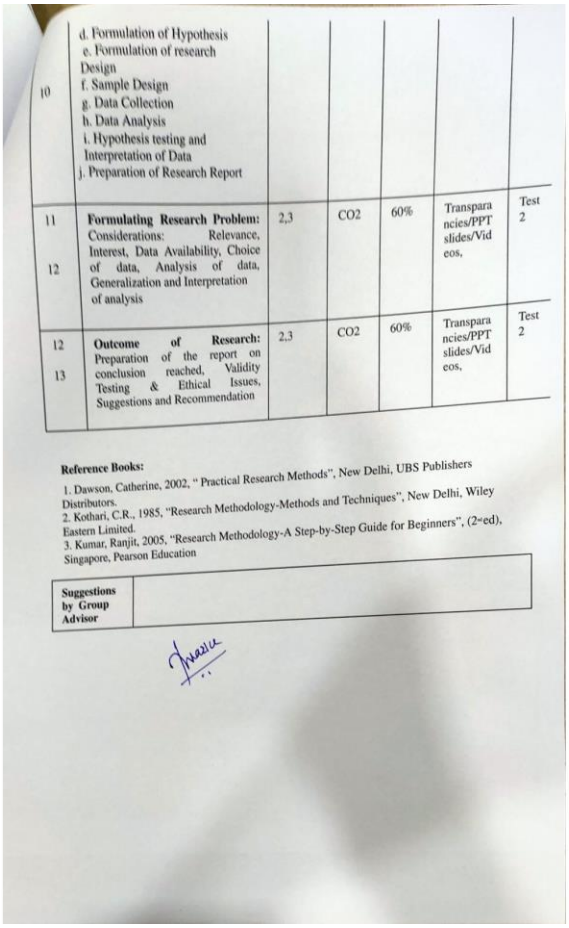

10	d. Formulation of Hypothesis e. Formulation of research Design f. Sample Design g. Data Collection h. Data Analysis i. Hypothesis testing and Interpretation of Data j. Preparation of Research Report					
11 12	**Formulating Research Problem:** Considerations: Relevance, Interest, Data Availability, Choice of data, Analysis of data, Generalization and Interpretation of analysis	2,3	CO2	60%	Transparancies/PPT slides/Videos,	Test 2
12 13	**Outcome of Research:** Preparation of the report on conclusion reached, Validity Testing & Ethical Issues, Suggestions and Recommendation	2,3	CO2	60%	Transparancies/PPT slides/Videos,	Test 2

Reference Books:

1. Dawson, Catherine, 2002, " Practical Research Methods", New Delhi, UBS Publishers Distributors.
2. Kothari, C.R., 1985, "Research Methodology-Methods and Techniques", New Delhi, Wiley Eastern Limited.
3. Kumar, Ranjit, 2005, "Research Methodology-A Step-by-Step Guide for Beginners", (2nd ed), Singapore, Pearson Education

Suggestions by Group Advisor	

Vivekanand Education Society's Institute of Technology
Department of Electronics & Telecommunication Engineering

Faculty In charge : Mrs.Ashwini S. Sawant

Subject : Discrete Time Signal Processing

Branch : Electronics and Telecommunication Engineering (Semester V)

Academic Year : 2017-18

Prerequisites: Signals & Systems

Course Objective: After successful completion of the course student will be able to

- To develop a thorough understanding of DFT and FFT and their applications.
- To teach the design techniques and performance analysis of digital filters
- To introduce the students to digital signal processors and its applications.

Course Outcome: Students will get:

ECC504.1	Understand the concepts of discrete-time Fourier transform and fast Fourier transform.
ECC504.2	Apply the knowledge of design of IIR digital filters to meet arbitrary specifications.
ECC504.3	Apply the knowledge of design of FIR digital filters to meet arbitrary specifications..
ECC504.4	Analyze the effect of hardware limitations on performance of digital filters.
ECC504.5	Apply knowledge of DSP Processors for various applications.

Text Book {T}

1.Emmanuel C. Ifeachor, Barrie W. Jervis, —*Digital Signal Processing*", A Practical Approach by, Pearson Education

2. Tarun Kumar Rawat, — *Digital Signal Processing*", Oxford University Press, 2015

Reference Books and User Manuals

1.Proakis J., Manolakis D., "*Digital Signal Processing*", 4th Edition, Pearson Education.

2. Sanjit K. Mitra , Digital Signal Processing – A Computer Based Approach – 4th Edition McGraw Hill Education (India) Private Limited.

3. Oppenheim A., Schafer R., Buck J., "*Discrete Time Signal Processing*", 2nd Edition, Pearson Education.

4. B. Venkata Ramani and M. Bhaskar, —*Digital Signal Processors, Architecture, Programming and Applications*l, Tata McGraw Hill, 2004.

5. L. R. Rabiner and B. Gold, —*Theory and Applications of Digital Signal Processing*l, Prentice-Hall of India, 2006.

LECTURE PLAN

Week	Contents	CO	PO/PSO	Text book
1.5	**Module 1** **Discrete Fourier Transform & Fast Fourier transform** **1.1** Definition and Properties of DFT, IDFT, Circular convolution of sequences using DFT and IDFT. Filtering of long data sequences: Overlap-Save and Overlap-Add Method for computation of DFT **1.2** Fast Fourier Transforms (FFT), Radix-2 decimation in time and decimation in frequency FFT algorithms, inverse FFT, and introduction to composite FFT.	1	1,2,3,4,6 /2	T1,T2,R1
1.5	**Module 2** **IIR Digital Filters** **2.1.** Types of IIR Filters (Low Pass, High Pass, Band Pass, Band Stop and All Pass), Analog filter approximations: Butterworth, Chebyshev I, Elliptic **2.2** Mapping of S-plane to Z-plane, impulse invariance method, bilinear transformation method, Design of IIR digital filters (Butterworth and Chebyshev-I) from Analog filters with examples. **2.3** Analog and digital frequency transformations with design examples.	2	1,2,3,4,6 /2	T1,T2,R1
1.5	**Module 3** **3.1**Characteristics of FIR digital filters, Minimum Phase, Maximum Phase, Mixed Phase and Linear Phase Filters. Frequency response, location of the zeros of linear phase FIR filters. **3.2** Design of FIR filters using Window techniques (Rectangular, Hamming, Hanning, Blackmann, Kaiser), Design of FIR filters using Frequency Sampling technique, Comparison of IIR and FIR filters.	3	1,2,3,4,6 /2	T1,T2,R1
1	**Module 4** **4.1** Quantization, truncation and rounding, Effects due to truncation and rounding, Input quantization error, Product quantization error, Co-efficient quantization error, Zero-input limit cycle oscillations, Overflow limit cycle oscillations, Scaling. **4.2** Quantization in Floating Point realization of IIR digital filters, Finite word length effects in FIR digital filters.	2,3,4	1,2,3,4,6 /2	T1,T2,R1, R4,R5
1	**Module 5** **DSP Processors** **5.1** Introduction to General Purpose and Special Purpose DSP processors, fixed point and floating point DSP processor, Computer architecture for signal processing, Harvard Architecture, Pipelining, multiplier and accumulator (MAC), Special Instructions, Replication, On-chip memory, Extended Parallelism.	5	1,2,3,4,6,7 /2	T1,T2,R1, R4,R5

Teaching Aids: - PPT Presentations, Chalk-board, Videos

Subject Teacher

Mrs. Ashwini Sawant
Asst. Professor,
EXTC Dept. VESIT

Vivekanand Education Society's Institute of Technology

Department of Computer Engineering

Laboratory Plan

Name of the Course : Digital Logic Design and Analysis (DLDA)

Year/Sem/Class : S.E.(Comp.) / Sem III / D7A

Sr. No.	List of Experiments	COs
1	To study and verify the truth table of various logic gates using ICs and realize Boolean expressions using gates	CO2
2	To realize basic gates using universal gates	CO2
3	To realize binary to gray code and gray code to binary converter.	CO2, CO3
4	To realize arithmetic circuits i) Half adder ii) Full adder iii) Half subtractor iv) Full subtractor	CO2, CO3
5	To realize parity generator and detector.	CO2, CO3
6	To Study multiplexer IC and realization of full adder using multiplexer IC	CO2, CO3
7	To Study decoder IC and realization of combinational logic using decoder IC	CO2, CO3
8	Study of flip-flops using IC's	CO4
9	To realize asynchronous 3 bit up counter.	CO4
10	To realize shift registers using flip flops	CO4
11	To realize 4:1 multiplexer using VHDL.	CO3,CO5
12	To realize 4 bit counter using VHDL	CO4, CO5

Hardware and software used :

- Digital IC's
- Digital trainer kits
- Xilinx simulation/synthesis software

Dr. Gresha Bhati
Subject Teacher-D7C

Indu Dokare
Subject Teacher-D7A

Sonali Bapte
Subject Teacher-D7B

I. LO Mapping (Indirect Assessment)

Sr. No.	Rubrics	LO1	LO2	LO3	LO4	LO5	LO6
1	MOCK VIVA	3	3	3	3	3	3
2	Mock practical	3	3	3	3	3	3

J.Lab Plan

Sr. No.	Topic	LO Mapping
1. Python Basics	1. Write a Program to swap two numbers and check if the first number is positive or negative or zero. 2. Write a menu driven Program to check whether the entered number and string is palindrome and find the factorial of the input number. 3. Write a driven program to demonstrate Use of List a. Separate even and odd nos from the list b. merge and sort the two list c. update the first element with x value and delete the middle element of the list. d. find the minimum and maximum element from the list. e. add n names in to the existing list and check if the work python is present in the list. 4. Write a program to demonstrate Use of Tuples a. Insert student details (rno, name , subjects marks, total) b. Display the details c. Sort the tuples wrt to total	LO1
2. Sets,Dictionary,Class and objects,Inheritance	1. Write a program to demonstrate Use of Sets a. Accept two strings from the user. b. Display the common letters. (INTERSECTION) c. Display letters present only in the first string (SET DIFFERENCE) d. Display all letters of both string (UNION) e. Display letters which are not common in both string. (SYMMETRIC DIFFERENCE) 2. WAP to Create a dictionary to perform the following operations. a. Update, concatenate, delete	LO1

	b. search a key c. mapping two list into dictionary. 3. Design employee class using python for reading and displaying the employee information. 4. WAP to demonstrate single and multiple inheritance (Method overloading and Method Overriding.	
3.Arrays and Exception handling	**Program on Arrays**: 1.To search a given element in the Array. 2 Exception Handling a. WAP to demonstrate Exception Handling using try-multiple except-finally b. WAP to create User Defined Exceptions	LO1
4 Files in Python, Directories	Exploring Files and Directories 1 WAP to read the content of file and write it in another file. 2 WAP to append data into existing file and then display the entire file. 3 WAP to count number of lines, words and characters in a file. 4 WAP to display the file availability in the current directory.	LO2,LO5
5.Building Modules, Packages	1.WAP to implement module and import that modules. 2.WAP to create packages and import that package in some other program	LO2
6. Text Processing, Regular expression in python	1. WAP to search for for two literal strings, 'this' and 'that', in a text string. 2. WAP to implement search,findall,finditr,start and end methods	LO2
7. Data Structures in Python : Link List, Stack	WAP to build data structures like stack and linked list	LO3
8.Queues, Dequeues	WAP to implement various queues and dequeues operations in python	LO3
9.Python Integration Primer	1. Creation of simple socket for basic information exchange between Server and Client for reading content of URL.	LO6

10. Perl Basics	1. Write a Perl script to find the factorial of a number using for and until looping statements, If the number is an even number. 2. WAP to demonstrate the use of Array.	LO1
11.Objects, Packages and Modules	1. WAP to demonstrate the use of hash 2. Write a Perl script to create a math package and demonstrate the use of module. 3. Design a class Person and create its objects.	LO1,LO5
12.Advanced Perl	Advanced Perl	LO5
13.Working with Files, Data manipulation	1. WAP to demonstrate File Handling (Create, Read File). 2. WAP using Regular Expressions for Text Processing in Perl.	LO5
14. Database Systems	WAP to access database system from front end in python	LO5
15.Networking	1. Write a Perl script to send a email and read the content of URL.	LO4,LO6
Mini Project	Mini Project	LO1,LO2,LO3,LO4,LO5,LO6

K. REFERENCES AND TEXTBOOKS :

1. Core Python Programming, Dr. R. Nageswara Rao, Dreamtech Press

2. Beginning Python: Using Python 2.6 and Python 3.1. James Payne, Wrox publication

3. Perl: The Complete Reference. Second Edition. Martin C. Brown, McGraw-Hill

4. Introduction to computing and problem solving using python , E Balagurusamy,McGraw Hill Education

1.Perl Black Book, 2nd Edition: Steven Holzner,Dreamtech Press

2. Learn Python the Hard Way: (3rd Edition) (Zed Shaw's Hard Way Series)

3. Python Projects , Laura Cassell,Alan Gauld,wrox publication

Digital Material:

4."The Python Tutorial", http://docs.python.org/release/3.0.1/tutorial/
5. Beginning Perl,https://www.perl.org/books/beginning-perl/

L Term Work:

Students will submit term work in the form of journal that will include:

1. At least 12-14 programs.
2. One mini-project in a group 2-3 student.
3. Two assignments covering whole syllabus.

Term Work (25) = 15 marks (Experiments & Assignments) + 10 marks (Mini Project) + 05 marks (Attendance)

Faculty Signature

Prof.Manisha Gahirwal Prof.Lifna Jos Prof. Pooja Nagdev/ Prof. Abha Tewari

INSTITUTE OF TECHNOLOGY V.E.S. DEPT. OF CMPN

Vivekanand Education Society's
Institute of Technology

(Affiliated to University of Mumbai, Approved by AICTE & Recognized by Govt. of Maharashtra)

Vivekanand Education Society's Institute of Technology

Department of Computer Engineering

Academic Year 2017-18

Name of the Course	:	System Programming and Compiler Construction (SPCC)
Course Code	:	CPC601
Class	:	D12A, D12B , D12C
Faculty In charge	:	Mrs.Rashmi Patel / Mrs. Lifna C S / Miss. Kajal Jewani
Email	:	rashmi.patel@ves.ac.in, lifna.cs@ves.ac.in, kajal.jewani@ves.ac.in

Program Outcomes (PO):

1. **Basic Engineering knowledge:** An ability to apply the fundamental know[redacted] mathematics, science and engineering to solve problems in Computer engineerin[redacted]
2. **Problem Analysis:** Identify, formulate, research literature and analyze computer engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and computer engineering and sciences.
3. **Design/ Development of Solutions:** Design solutions for complex computer engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
4. **Conduct investigations of complex engineering problems** using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
5. **Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern computer engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to computer engineering practice.
7. **Environment and Sustainability:** Understand the impact of professional computer engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of computer engineering practice.
9. **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
11. **Project Management and Finance:** Demonstrate knowledge and understanding of computer engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Lifelong Learning:** Recognize the need for and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Program Specific Outcomes (PSO) :

A. **Professional Skills** - The ability to develop programs for computer based systems of varying complexity and domains using standard practices.
B. **Successful Career** - The ability to adopt skills, languages, environment and platforms for creating innovative career paths, being successful entrepreneurs or for pursuing higher studies.

Course Outcomes(CO's):

C307.1	Identify different system software.
C307.2	Use Lex tool used for generating Lexical analyzer.
C307.3	Write macros as and when required to increase readability and productivity.
C307.4	Design handwritten lexical analyzer.
C307.5	Design new language structures with the help of grammars.
C307.6	Appreciate the role of Operating System functions such as memory management as pertaining to runtime storage management.
C307.7	Appreciate the role of Intermediate code generation in connection with language designing.
C307.8	Apply optimization principles on given code
C307.9	Implement various parser types and use YACC.

CO-PO-PSO Mapping :

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C307.1	3	-	-	-	-	-	-	-	-	3	-	-	3	-
C307.2	2	3	-	-	3	-	-	-	-	2	-	-	3	-
C307.3	3	3	-	-	-	-	-	-	-	1	-	2	2	-
C307.4	3	3	-	-	-	-	-	-	-	3	-	2	3	-
C307.5	3	3	-	-	-	-	-	-	-	3	-	2	3	-
C307.6	3	2	-	-	-	-	-	-	-	2	-	3	2	-
C307.7	3	2	-	-	-	-	-	-	-	2	-	-	2	-
C307.8	3	2	-	-	-	-	-	-	-	2	-	1	2	-
C307.9	3	3	-	-	3	-	-	-	-	3	-	-	3	-

CO Mapping (Indirect Assessment)

No	Rubrics	CO1	CO2	CO3	CO4	CO5	CO6	CO7	CO8	CO9
1	Mock Viva	3	3	2	1	2	1	3	3	3
2	Mock Practical	1	3	1	3	2	1	3	3	3
3	Case Study	3	-	-	-	-	-	-	-	-
4	NPTEL	3	-	-	-	-	3	-	-	-
5	Extra Assignment	3	-	3	-	-	3	3	3	-

Rubrics Assessment with CO Matrix

Rubrics Used For Assessment	Course Outcomes (CO)								
	CO1	CO2	CO3	CO4	CO5	CO6	CO7	CO8	CO9
End Semester Exam (ESE)	50%	3%	5%	3%	10%	5%	5%	5%	10%
Class Test 1 (CT1)	15%	10%	-	15%	55%	-	-	-	5%
Class Test 2 (CT2)	65%	-	10%	-	-	-	15%	10%	-
Laboratory Work (Experiments / Practical & Case Studies) (LWEPCS)	45.00 %	5.00 %	5.00 %	5.00 %	15.00 %	0.00 %	5.00 %	5.00 %	15.00%
Assignment (A)	35%	10%	1%	10%	15%	2%	5%	2%	20%
Attendance (Theory + Practical) (ATP)	50%	3%	5%	3%	10%	5%	5%	5%	10%
Oral & Practical Exam (VPE)	50%	3%	5%	3%	10%	5%	5%	5%	10%

Schema of M.U. Examination:

Subject	Scheme of Instructions Hours per week		Scheme of Evaluation				
SPCC CPC601	Theory	Practical	Theory		TW	Oral/Practical	Total
			Hours	Marks			
	04	02	3Hr	80	25	25 (PRAC)	150

Lesson Plan:

Week	Topic	Ref	COs
01	**Module 1 : Introduction to System Software** Concept, introduction to various system programs such as assemblers, loaders , linkers ,macro processors, compilers, interpreters, Operating systems, device drivers	T1, T4	1
02	**Module 6 :Compilers** Introduction to Compilers, Phases of a compiler, comparison of compilers and interpreters	T2, T3	1,2,4
03	**Module 7 : Lexical Analysis** Role of a Lexical analyzer, input buffering, specification and recognition of tokens, Designing a lexical analyzer generator, Pattern matching based on NFA's.	T2, T3, R1	2,4
04,05	**Module 8: Syntax Analysis** Role of Parser, Top down parsing, Recursive descent and predictive parsers (LL), Bottom Up parsing, Operator precedence parsing, LR, SLR and LALR parsers.	T2, T3 R1	5,9
06	**Module 9: Syntax Directed Translation** Syntax directed definitions, Inherited and Synthesized attributes, Evaluation order for SDDs , S attributed Definitions , L attributed Definitions	T2, T3	1,5,9
07	**Module 10 : Intermediate Code Generation** Intermediate languages: declarations, Assignment statements, Boolean expression, case statements, back patching , procedure calls	T2, T3	1,7
08	**Module 11 : Code Generation** Issues in the design of Code Generator , Basic Blocks and Flow graphs, code generation algorithm , DAG representation of Basic Blocks	T2, T3	1,7

09	**Module 12 : Code Optimization** Principal sources of Optimization, Optimization of Basic Blocks , Loops in Flow graph ,Peephole Optimization	T2, T3	1,8
09,10	**Module 13: Run Time storage** Storage Organization , storage allocation strategies, parameter passing , Symbol table , introduction to garbage collection and compaction	T2, T3	1,6
10	**Module 14: Compiler compilers** JAVA compiler environment, YACC compiler compiler	T2, T3	1,9
11,12	**Module 2 : Assemblers** General Design Procedure , Design of Assembler (Single Pass –Assembler IBM PC , multi pass Assembler IBM 360/370 Processor), Statement of Problem , Data Structure , format of Databases , Algorithm, Look for modularity	T1, T4	1
12,13	**Module 3 : Macros & Macro processors** Macro instructions, Features of Macro facility, Design of 2 pass microprocessors	T1, T4	1,3
13,14	**Module 4 : Loaders and Linkers** Loader schemes, Design of Absolute loader , Design of Direct linking loader	T1, T4	1
14	**Module 5 : Software Tools** Software Tools for Program development, Editors: Types of Editors , Design of Editor Debug Monitors	T1, T4	1

Delivery Modes : Blackboard, Powerpoint Presentations, Lecture Notes

Assessment Modes : Assignments,Quiz, Term Tests, Mock Viva

Assignment List :

No	Module name	CO
1	System Software,compiler, Lexical Analysis	1,2,4
2	Syntax Analysis, Syntax Directed Translation,runtime storage management	1,5,9
3	ICG, Code generation, Code optimization,	1,6,7,8
4	Assembler, loader, macro processor,editor	1,3
5	NPTEL : Garbage Collection	1,6

Test

	Portion	CO mapping
TestI	System Software, Compiler(Lexical Analysis, Syntax Analysis)	1,2,4,5,9
TestII	ICG, Code generation, Code optimization, Macros, Loader and Assembler	1,3,6,7,8

Text Books:

1. J. J Donovan: Systems Programming Tata McGraw Hill Publishing Company
2. V. Aho, R. Shethi and J.D. Ulman; Compilers Principles, Techniques and Tools, Pearson Education
3. V. Aho, R. Shethi, Monica Lam , J.D. Ulman : Compilers Principles,Techniques and Tools, Pearson Education , Second Edition.
4. D. M Dhamdhere: Systems programming, Tata McGraw Hill

Reference Books:

1. Lex & Yacc, 2nd Edition by John R. Levine, Tony Mason & Doug Brown O'Reilly
2. D.M. Dhamdhere : Systems programming ,Tata McGraw Hill

Term Work:

Journal should include at least 10 experiments (out of which at least 7 from suggested list below) and at least 2 assignments. The final certification and acceptance of term work ensures that satisfactory performance of laboratory work and minimum passing marks in term work. The distribution of marks for term work shall be as follows:

- Laboratory work (experiments): ..... (15) Marks.
- Assignment:..... (05) Marks.
- Attendance ..... (05) Marks
- TOTAL: ..... (25) Marks.

Practical/Oral examination:

Practical examination will be conducted based on above syllabus

Grading for Credit Based Grading System (CBSGS)

Sr. No.	Range	Grade	Grade Point
1	80 and above	Outstanding (O)	10
2	75.00 – 79.99	Excellent (A)	9
3	70.00 – 74.99	Very Good (B)	8
4	60.00 – 69.99	Good (C)	7
5	50.00 – 59.99	Fair (D)	6
6	45.00 – 49.99	Average (E)	5
7	40.00 – 44.99	Pass (P)	4
8	Less than 40.00	Fail (F)	0

EXTRA ACTIVITIES

1. Mock Practical
2. Mock Viva
3. Case Study
4. NPTEL
5. Extra Assignment

V.E.S. INSTITUTE OF TECHNOLOGY DEPT. OF CMPN

Mrs. Rashmi Patel
D12A

Mrs. Lifna C S
D12B

Ms. Kajal Jewani
D12C

VES INSTITUTE OF TECHNOLOGY

Department of Computer Engineering

A) Name of the Course : Object Oriented Programming & Methodology

B) Year/Sem/Class : S.E.(Comp)/Sem III /D7A/B/C Code:CPC302

C) Faculty Incharge : Mrs Pooja Nagdev/Mrs. Lifna C.S./Mrs. Rupali Hande

D) List of PO's are as follows

PO	Description
PO1	**Basic Engineering knowledge**: An ability to apply the fundamental knowledge in mathematics, science and engineering to solve problems in Computer engineering.
PO2	**Problem analysis**: Identify, formulate, research literature and analyze computer engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and computer engineering and sciences.
PO3	**Conduct investigations of complex engineering problems** using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions
PO4	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern computer engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11	**Project Management and Finance:** Demonstrate knowledge and understanding of computer engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

E) List of PSO's are as Follows:

PSO1	**Professional Skills** - The ability to develop programs for computer based systems of varying complexity and domains using standard practices.
PSO2	**Successful Career** - The ability to adopt skills, languages, environment and platforms for creating innovative carrier paths, being successful entrepreneurs or for pursuing higher studies.

F) Course Outcomes (CO's): Learner will be able to…

C202.1	Students will be able to solve computational problems using basic constructs like if-else, control structures, array, strings.
C202.2	Student can understand how to model real world scenario using class diagram.
C202.3	Students will exhibit communication between 2 objects using sequence diagram.
C202.4	Students will be able to implement relationships between classes.
C202.5	Students will be able to demonstrate various collection classes.
C202.6	The students will be able to demonstrate programs on exceptions, multithreading and applets.

G) CO-PO-PSO Mapping :

Course Outcomes (COs)	Program Outcomes(POs)						Program Specific Outcome (PSO1)
	PO1(a)	PO2(b)	PO3(d)	PO4(e)	PO10(j)	PO11(k)	
C202.1	3	3	2				3
C202.2		3	3	1	3	2	3
C202.3		3	3	1	3	2	3
C202.4	3			1	3	2	3
C202.5	3	3	2		3		3
C202.6	3	3	3	1	3	2	3

H) Rubrics Assessment with CO Matrix

Rubrics Used For Assessment	Maximum Marks	Overall %	Course Outcomes (CO)					
			CO1	CO2	CO3	CO4	CO5	CO6
End Semester Exam (ESE)	80	53.33%	31%	41%	1%	11%	6%	9%
Class Test 1 (CT1)	20	13.33%	20%	80%	0%	0%	0%	0%
Class Test 2 (CT2)	20	13.33%						
Internal Class Test (ICT)	20	13.33%						
Laboratory Work	15	10.00%	27%	24%	3%	21%	15%	10%
Assignment (A)	5	3.33%						
Attendance (Theory + Practical) (ATP)	5	3.33%	16%	16%	16%	16%	16%	16%
Oral & Practical Exam (VPE)	25	16.67%	31%	41%	1%	11%	6%	9%
Total Marks	150	100.00 %						

H) Schema of M.U. Examination:

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tut	Theory	TW/ Practical	Tut	Total
CSC302	OOPM	4	2	-	4	1	-	5

I) Lesson Plan:

Week	Topic Covered	Ref.	Course Outcomes (COs)	Delivery Modes	Assessment Tools
1	**Object Oriented Programming:** Java Evolution: History, How java differs from others, Overview of Java language: Introduction, Installing and implementing Java, JVM **Java Language Elements and Flow Control Statements:** Identifiers, Keywords, Literals, Constants, Separators	2, 3	CO1	Lecture	Test, Viva, Final Exam
2	Variables, Data types, Operators and Expressions, Revision of Branching and looping	2, 3	CO1	Lecture, Black Board,	Test, Viva, Final Exam, Practical Assgn
3	**OO Concepts:** Object, Class, Encapsulation or information hiding, Inheritance, Polymorphism, Message communication, Abstraction, Reuse, Coupling and Cohesion	2, 4	CO2	Lecture, PPts, Notes	Test, Viva, Final Exam

4-5	**Class Object and Method:** member, method, Modifier, Selector, constructer, destructor, iterator, State of an object, Method Overloading **Classes and Relationships:** Implementation of Association and Aggregation using simple scenarios	1, 2 1, 2	CO1, CO2 CO2, CO3, CO4	Lecture, Black Board, Notes Lecture, Black Board, PowerPoint Slide Show, Sample	Test, Viva, Final Exam Test, Viva, Final Exam
6	Inheritance, Method Overriding, Final class, abstract class and method	1, 2	CO2	Lecture, Black Board, Notes	Test, Viva, Final Exam
7	**Managing Error and Exception**	1, 2	CO4, CO6	Lecture, Black Board, Notes	Test, Viva, Final Exam
8	**Programming Approach from procedural to Object-Orientation:** OO methodologies: Grady Booch Methodology of OO development, Sufficiency Completeness and Primitiveness, Meta class	2, 4	CO2	Lecture, Notes	Test, Viva, Final Exam
9.	**Array, String, Vector**	2, 3	CO1, CO4, CO5	Lecture, Black Board, Notes	Test, Viva, Final Exam
10	**Interfaces**	1,2,3	CO1,CO2,CO4	Lecture, Black Board, Notes	Test, Viva, Final Exam

10	**Grouping of classes for deployment and reuse:** Built-in	2, 3	CO2, CO4, CO5	Lecture, Black Board,	Test, Viva, Final Exam
11	**Multithread programming**	1, 2, 4	CO1, CO6	Lecture, Notes	Test, Viva, Final Exam
12	**AWT and Applet programming**	1, 2	CO1,CO2, CO6	Lecture	Test, Viva, Final Exam

J) Assignment

Sr no	Chapter	CO Mapping
1	2,3,4	CO1,CO2
2	5,7,8	CO1,CO2,CO3,CO4,CO5
3	1,6,11	CO1,CO2,CO3,CO4,CO6
4	9,10,12	CO1,CO6,CO4,CO5,CO6

k) Test

Test no	Chapter	CO Mapping
1	2,3,4,5,7,8	CO1,CO2
2	1,6,9,10,11,12	CO1,CO2,CO3,CO4,CO5,CO6

L) Text Books:

1.Ralph Bravaco , Shai Simoson , "Java Programing From the Group Up" ,Tata McGraw-Hill

2. Grady Booch, Object Oriented Analysis and Design ;

3. Jaime Nino, Frederick A. Hosch, 'An introduction to Programming and Object Oriented Design using Java', Wiley Student Edition.

References:

1. Java: How to Program, 8/e, Dietal, Dietal, PHI

2. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", Pearson Education

3. Sachin Malhotra, Saurabh Chaudhary "Programming in Java", Oxford University Press, 2010

4. IBM PC Assembly Language and Programming: Peter Abel, 5th Edition, Prentice Hall.

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