B.TECH. COMPUTER SCIENCE & INFORMATION TECHNOLOGY
SEMESTER - I

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
ENGL0101	G		ENGLISH	3	0	0	3	25	75	100
MATH0101	G		APPLIED MATHEMATICS – I	3	1	0	3.5	50	100	150
CHEM0101	G		INDUSTRIAL CHEMISTRY	3	0	0	3	25	75	100
CHEM0102	G		CHEMISTRY LAB	0	0	2	1	25	25	50
PHYS0101	G		APPLIED PHYSICS – I	3	1	0	3.5	50	100	150
PHYS0102	G		PHYSICS LAB – I	0	0	2	1	25	25	50
ECEN1101	G		ELECTRICAL TECHNOLOGY	2	0	0	2	25	50	75
ECEN1102	G		ELECTRICAL TECHNOLOGY LAB	0	0	2	1	25	25	50
CSEN1101	G		FUNDAMENTALS OF COMPUTERS AND PROGRAMMING (WITH C)	4	0	0	4	50	100	150
CSEN1102	G		FCPC LAB	0	0	2	1	25	25	50
	G		FOREIGN LANGUAGE PART-I #	2	0	0	2	25	50	75
TOTAL				**20**	**2**	**8**	**25**	**350**	**650**	**1000**

L = Lecture
T = Tutorial
P = Practical
C = Credit Point

 # FOREIGN LANGUAGE

One foreign language out of the following

French	LANF0101
German	LANG0102
Spanish	LANS0103

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

English

L	T	P
3	0	0

MODULE CODE	ENGL0101
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: The Question paper will comprise of seven questions distributed over three sections A, B and C. Section A comprises of very short answer type questions and is compulsory. Section B and Section C Comprise of short answer type and Long answer type questions and will have internal choices.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to vocabulary, synonyms, anatomize and to enhance English language skills as mentioned below:

1. To achieve knowledge and understanding on fundamentals of English Language and various aspects of it.
2. To get familiar with the rules of Grammar and their correct usage.
3. To enhance the creativity of the students related to verbal ability and reasoning or fluency of language.
4. To acquire knowledge and understanding the basic concepts of English language and its application in Science and & Engineering.
5. To acquire knowledge for the correct usage of technical English.

LEARNING OUTCOMES:

1. Able to achieve knowledge and understanding on fundamentals of English Language.
2. Able to get familiar with the rules of Grammar and their correct usage.
3. Enhance the creativity of the students related to verbal ability and reasoning or fluency of English.
4. Ability to acquire knowledge for the correct usage of technical English.

MODULE CONTENTS:

Unit I: Communicative Grammar Communicative Grammar: Spotting the errors pertaining to parts of speech, nouns, pronouns, adjective, adverbs, preposition, conjunction, genders, infinitives, participles, form of Tenses, use of articles ;Concord - grammatical concord, notional Concord and the principle of proximity between subject and verb and other exceptional usages.
Unit II: Lexis Lexis: Words often confused; One-Word Substitutes; Foreign Words (A selected list may be included for all the above components); Formation of Words (suffixes, prefixes and derivatives)..
Unit III: Introduction to principal components of spoken English Introduction to principal components of spoken English – Phonetics, Word-stress patterns, Intonation, Weak forms in English.
Unit IV: Developing listening and speaking skills through various activities Developing listening and speaking skills through various activities, such As: Role play activities Practicing short dialogues Group discussion Debates Speeches Listening to news bulletins Viewing and reviewing T.V. programs etc.
Unit V: Written Communication Written Communication: Developing reading and writing skills through such tasks/activities as developing outlines, key expressions, situations, slogan writing and theme building exercises. Reading verbal and non-verbal texts like cartoons, Graphs and tabulated data etc.
Unit VI: Technical Writing Business Letters, Format of Business letters and Business letter writing-Fully- blocked layout may be used-mail writing; Reports, Types of Reports and Format of Formal Reports; Press Report Writing.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Basic Business Communication: Raymond V Lesikar Mc A Graw Hill publications. 2. Communication Skills: D G Saxena, Kuntal Tamang Top Quark,New Delhi. 3. A textbook of English Phonetics for Indian Students: TBalasubramanian Macmillan India Limited, New Delhi.
REFERENCE BOOKS	1. Living English Structures:W S Allen Pearson Publications, New Delhi. 2. High School English Grammar and Composition: P C Wren and H Martin S.Chand Publications, New Delhi. 3. Essentials of Communication: B R Sharma and Sanjeev Gandhi Bharat publications, Yamuna Nagar

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2,3,4	1,2,3,4	1,2,3	1,2,3	2,4	3,4	1,4	3,4	2,5	1,2,3,5	1,5

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	05
2.	Sessional Test	2	15
3.	Group Discussion	4	05
4.	End Semester Exam	1	75

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x		
Quiz	x	x	x	x
Assignment			x	x

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

Applied Mathematics-I

L	T	P
3	1	0

MODULE CODE	MATH0101
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: The Question paper will comprise of seven questions distributed over three sections A, B and C. Section A comprises of very short answer type questions and is compulsory. Section B and Section C Comprise of short answer type and Long answer type questions and will have internal choices.

OBJECTIVES:

1. To achieve knowledge and understanding on fundamentals of matrices, their various properties and capabilities to model and solve wide range of problems in science and engineering.
2. To get familiar with concepts of differential calculus and develop ability to solve simple problems.
3. To understand multiple integrals and their applications in engineering problems.
4. To learn basic concepts of probability and its application in realistic decision making.
5. To acquire knowledge of statistical hypothesis testing and assess their effectiveness in problem solving.

LEARNING OUTCOMES:

1. Able to understand the evolution of matrices and their applications.
2. Exposure to differential calculus and their capabilities to solve problems.
3. Enhance the knowledge of multiple integrals.
4. Able to understand concepts of probability and its application.
5. Ability to acquire knowledge of statistical hypothesis testing and assess their effectiveness.

MODULE CONTENTS:

UNIT-I: Matrices & their Applications Rank of a matrix, elementary transformations, elementary matrices, inverse using elementary transformations, normal form of a matrix, linear dependence and in dependence of vectors, consistency of linear system of equations, linear and orthogonal transformations, Eigen values and Eigen vectors, properties of Eigen values, Cayley - Hamilton theorem and its applications. Determinants and their evaluations.
UNIT-II: Applications of Differentiation Taylor's and McLaurin's series, Asymptotes and Curvature. Partial Differentiation & its Applications : Functions of two or more variables; partial derivatives, Total differential and differentiability, Derivatives of composite and implicit functions, Jacobians, Higher order partial derivatives.
UNIT-III: Applications of Differentiation contd. Homogeneous functions, Euler's theorem, Taylor's series for functions of two variables (without proof), maxima-minima of function of two variables, Lagrange's method of undetermined multipliers, Differentiation under integral sign..
UNIT-IV: Multiple Integration Double integral, change of order of integration, Double integral in polar coordinates, Applications of double integral to find area enclosed by plane curves and volume of solids of revolution.
UNIT-V: Multiple Integration contd. Triple integral, volume of solids, change of variables, Beta and gamma functions and relationship between them.
UNIT-VI: Probability Distributions & Hypothesis Testing Conditional probability, Bayes theorem and its applications, expected value of a random variable. Properties and application of Binomial, Poisson and Normal distributions. Testing of a hypothesis, tests of significance for large samples, Student's t-distribution (applications only) and Chi-square test of goodness of fit. Chi-square test of independent events, F- Test.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Higher Engineering Mathematics: B.S. Grewal, Khanna Publishers, New Delhi. 2. Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & Sons, Inc., New York. 3. *Advanced Engineering Mathematics*, Peter V. O'Neil, Thomson Learning, Inc., Singapore.
REFERENCEBOOKS	1. Advanced Engineering Mathematics, R.K. Jain and S.R.K. Iyengar, Alpha science International Ltd. Pang Bourne, England. 2. Advanced Engineering Mathematics, Michael D Greenberg, Prentice-Hall, Englewood Cliffs, NJ.

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2,3,4,5	1,2,3,4,5	1,3,5	1,2,5	1,2,4	2,3	1,4,5	1,3	1,2,5	1,2,3	2,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory and 50 marks for practical.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x		x
Quiz			x		x
Assignment	x	x		x	

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

Industrial Chemistry

L	T	P
3	0	0

MODULE CODE	CHEM0101
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: The Question paper will comprise of seven questions distributed over three sections A, B and C. Section A comprises of very short answer type questions and is compulsory. Section B and Section C Comprise of short answer type and Long answer type questions and will have internal choices.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to fuel, lubricants and to enhance skills of industrial chemistry as mentioned below:

1. To achieve knowledge and understanding the phase rule for different systems and further for various engineering applications.
2. To get familiar with the importance of water, impurities in water & their effects like hardness, alkalinity & biological effects.
3. To understand & solve the problems like scale and sludge formation, boiler corrosion due to impurities present in water used for industrial purpose.
4. To learn basic concepts about the process of corrosion of different metals & its types with mechanism and cause.
5. To know various factors that can effect corrosion and to be able to produce different methods for prevention of corrosion of different metals used in machines.
6. To have knowledge of different lubricants and to use different lubricants for different machines.
7. To gain knowledge of different fuels and their efficiency.
8. To acquire knowledge about the preparation & properties of different polymers and to be able to recognize the use of different polymers & their composites for engineering applications.

LEARNING OUTCOMES:

1. Students will be able to develop an insight about the way the chemistry is connected to other occupations and appreciation of the role of chemistry in day to day life in society and the skills of solving related industrial problems.
2. Students will be able to demonstrate their knowledge of removal of hardness of water and different water treatments methods in energy and environment related industries.
3. Graduates will be able to apply their knowledge of preventions of corrosions in different machinery systems.
4. Students will be able to demonstrate the application of different lubricants for various machinery problems and energy usage as well as the influence of human and industrial activities on the environment.
5. Students will show their interest in manufacturing different polymers and polymer composites by using different polymerization techniques and their application in industries.
6. Graduates will be able to develop their challenging careers in the field of chemicals, petroleum, petrochemical, polymer, pharmaceutical, food, biotechnology, microelectronics, energy and nano-materials processing.
7. Graduates will be able to perform laboratory experiments and proper use of standard chemistry glassware and equipment compare and collect quantitative data obtained from experimentation and using various analytical techniques.
8. Graduates will be able to communicate effectively through assignments, presentations and discussions in technical as well as in non technical domain.

MODULE CONTENTS:

UNIT-I: Phase Rule Terminology, Gibb's phase rule equation, One component system (H_2O system and CO_2– system), Two components system: simple eutectic system (Pb–Ag), system with congruent melting point (Zn–Mg), system with incongruent melting point (Na–K), Applications of these systems and phase rule, Cooling curves.
UNIT-II: V Water & its treatment Impurities in water & their effects, hardness of water and its determination (EDTA method), alkalinity of water and its determination, treatment of water for domestic use: coagulation, sedimentation, filtration and disinfection, water softening methods: Lime-Soda process, Zeolite process, Ion–exchange process, Related numerical problems.
UNIT-III: Corrosion and its prevention Introduction, Chemical and Electrochemical corrosion, Types of corrosion: oxidation corrosion, galvanic corrosion, differential aeration corrosion, pitting corrosion, waterline corrosion, stress corrosion (caustic embrittlement), Factors affecting corrosion, preventive measures (Cathodic& anodic protection, electroplating, tinning, galvanization).
UNIT-IV: Lubricants and Fuels Need for lubricants, Classification, general properties & applications of lubricants, Properties of lubricating oils (Flash & Fire point, Viscosity and Viscosity index, Saponification value, Iodine value, Acid value, Aniline point), Definition and classification of fuel, Calorific value of fuels, Dulong' formula, Determination of calorific value of fuels (Bomb's calorimeter & Boy's Gas calorimeter), Related numerical problems.
UNIT-V: Polymers and Composites Classification of polymers, types & mechanism of polymerization (Addition and condensation), preparation properties and technical application of thermoplastics (PE, PVC, Teflon), thermosets (UF, PF) and elastomers (synthetic rubbers: SBR, Nitrile rubber), Inorganic polymers (silicones), Polymeric composites (composition, advantages and application areas), Introduction to conducting polymers and conducting polymer composites.
UNIT-VI: Instrumental Methods of Analysis Principle, instrumentation & general applications of thermal methods of analysis (TGA, DTA, DSC), Basic concepts of spectroscopy, Principal, instrumentation and general applications of spectroscopic techniques (UV-Vis spectroscopy, IR-spectroscopy & Flame photometery), Conductometric titrations, pH metry.

RECOMMENDED BOOKS:

TEXT BOOKS	1. *Engineering Chemistry*, P.C. Jain Monica Jain (Dhanpat Rai & Co) 2. *Fundamentals of Engineering Chemistry*, Shashi Chawla (Dhanpat Rai & Co) 3. *Chemistry for Engineers*, B.K. Ambasta (Luxmi Publication) 4. *Chemistry in Engineering & Tech*, Vol. I & II, Kuriacose (TMH)
REFERENCES	1. *Instrumental methods of Chemical analysis*, MERITT & WILLARD (EAST – WEST press) 2. *Physical Chemistry*, P.W Atkin (ELBS, OXFORD Press) 3. *Physical Chemistry*, W.J.Moore (Orient Longman)

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2,3,4,5,6,7	1,2,5,6,7	1,3,5,7	1,2,7	2,4,6	1,2,3,7	1,4,6.7	1,3,4,5,	2,5,6,8	1,2,4,7,8	2,3,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:
This subject will be evaluated for a total of 75 marks for theory and 25 marks for practical.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	05
2.	Sessional Test	2	15
3.	Group Discussion	4	05
4.	End Semester Exam	1	75

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5	6	7	8
Class Test		x	x	x		x	x	
Quiz	x	x	x	x		x		
Assignment	x		x					x

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

Industrial Chemistry Lab

L	T	P
0	0	2

MODULE CODE	CHEM0102
CREDIT POINTS	1
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to chemistry as mentioned below:

1. To achieve the practical knowledge of the importance of water and it's, impurities in water & their effects like hardness, alkalinity & biological effects.
2. To be able to understand & solve the problems like scale and sludge formation, boiler corrosion due to impurities present in water used for industrial purpose.
3. To get familiar with experimental methods for treatment of domestic water, water for industrial purpose.
4. To have knowledge of different properties of lubricants and further to use different lubricants for different machines.
5. To obtain data by cooling method for constructing a phase diagram which indicates the solid and liquid phase that is present at each temperature and composition.
6. To be effective in applying the basic concept of different polymerization synthesis techniques for preparation of different polymers and their applications.

LEARNING OUTCOMES:

1. Able to develop an insight about the way the chemistry is connected to other occupations and appreciation of the role of chemistry in day to day life in society and the skills of solving related industrial problems.
2. Able to perform laboratory experiments and proper use of chemicals in removal of hardness of water and different water treatments methods in energy and environment related industries.
3. Able to check the water samples for various purposes in industries, like chemical industry, Construction Company, pharmaceutical company and demonstrate the role of pure water in day to day life.
4. Able to demonstrate the application of different lubricants for various machinery problems.
5. Enhance the knowledge of different polymers by using some polymerization techniques in industries.
6. Ability to develop their challenging careers in the chemical, petroleum, petrochemical, polymer, pharmaceutical, food and other related industries compare quantitative data collected in the lab and interpret the data obtained from experimentation and using various analytical techniques.

MODULE CONTENTS:

1.	Determination of Ca^{+2} and Mg^{+2} hardness of water using EDTA solution
2.	Determination of alkalinity of water sample.
3.	Determination of dissolved oxygen (DO) in the given water sample.
4.	To determine TDS of Water samples of different sources.
5.	To find the eutectic point for a two component system by using method of cooling curve.
6.	To Prepare Urea formaldehyde and Phenol–formaldehyde resin.
7.	Determination of viscosity of lubricant by Red Wood Viscosity (No. 1 & N0. 2).
8.	To find out saponification no. of lubricating oil.
9.	Determination of concentration of KMnO4 solution spectrophotomererically.
10.	Determination of strength of HCl solution by titrating against NaOH solution conductometerically.
11.	To determine amount of sodium & potassium in given water sample by flame photometer.
12.	Determination of dissociation constant of a weak acid by pH-meter.
13.	Estimation of total iron in an iron alloy
Any other experiment carried out in the laboratory.	

RECOMMENDED BOOKS:

TEXT BOOKS	1. *Essential of Experimental Engineering Chemistry*, Shashi Chawla (DhanpatRai& Co.) 2. *Expeiments in Applied Chemistry*, SunitaRatan (S.K. Kataria& Sons)

REFRENCE BOOKS	1. *Vogel's Text Book of Quantitative Chemical Analysis*, A. I. Vogel, G. H. Jeffery Published by Longman Scientific & Technical, 5th Edition, 1989. 2. *Theory & Practice Applied Chemistry* – O.P.Virmani, A.K. Narula (New Age). 3. *A Text book on Experiments and Calculation– Engineering Chemistry*, S.S.Dara, (S.Chand & Company Ltd).

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2,3,4,6	1,2,4	1,3,6	1,2,4	2,4,6	1,4	1,2,4,6	1,2,5	1,3	1,2,3,6	1,2,3

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks.

Practical

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

Applied Physics I

L	T	P
3	1	0

MODULE CODE	PHYS0101
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: The Question paper will comprise of seven questions distributed over three sections A, B and C. Section A comprises of very short answer type questions and is compulsory. Section B and Section C Comprise of short answer type and Long answer type questions and will have internal choices.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to modern physics, interference, difference, polarization and to enhance skills of different type of laser and its applications as mentioned below:

1. To make students aware about Modern Physics, their various properties and capabilities tomodel and solve wide range of problems in science and engineering.
2. To acquire knowledge polarization and their applications in engineering problems.
3. To get familiar with concepts of interference and diffraction and develop ability to solve simple problems.
4. To learn basic concepts of different types of laser and its application in scientific problems.
5. To acquire knowledge of superconductivity implementation and assess their effectiveness in science and Technology.

LEARNING OUTCOMES:

1. Able to apply knowledge in developing advanced materials and devices.
2. Able to apply fundamental laws of superconductivity in engineering.
3. Able to identify and solve applied physics problems.
4. Able to apply knowledge to understand the concepts of fiber optics.
5. Ability to create new problems and solve with the help of applications used.

MODULE CONTENTS:

Unit I: Interference Coherent sources, conditions for sustained interference. Division of Wave-Front, Fresnel's Biprism, Division of Amplitude- Wedge-shaped film, Newton's Rings, Michelson Interferometer, applications, Resolution of closely spaced spectral lines, determination of wavelengths.
Unit II: Diffraction Difference between interference and diffraction, Fraunhofer and Fresnel diffraction, Zone Plate, Fraunhofer diffraction through a single slit, Plane transmission diffraction grating, absent spectra, dispersive power, resolving power and Rayleigh criterion of resolution.
Unit III: Polarization Polarized and unpolarised light, Uni-axial crystals double refraction, Nicol prism, quarter and half wave plates, Detection and Production of different types of polarized light, Polarimetry, Optical and specific rotation, Biquartz and Laurent's haled shade polar meter
Unit IV: Laser & Fibre Optics Absorption of radiation, spontaneous and stimulated emission, Laser action, Einstein Coefficient, characteristics of laser beam-concept of coherence, spatial and temporal coherence. He-Ne and semiconductor lasers (simple ideas), applications of Laser. Propagation of light in optical fibres, numerical aperture, V-number, single and multimode fibres, attenuation dispersion, applications.
Unit V: Nuclear Physics Introduction, Radioactivity, Alpha decay, Gama decay, Q value, Threshold energy, Nuclear reactions, Nuclear fission: Liquid drop model, Nuclear fusion, Particle accelerators: Linear accelerator, Cyclotron.
Unit VI: Theory of Relativity Introduction, Frame of reference, Galilean transformation, Michelson-Morley experiment, Postulates of special theory of relativity, Lorentz transformations, Length contraction, Time dilation, Mass energy relation.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Perspectives of Modern Physics, Arthur Beiser (TMH) 2. Modern Physics for Engineers,S.P. Taneja (R. Chand). 3. Modern Engineering Physics, A.S. Vasudeva (S. Chand). 4. Engineering Physics, SatyaPrakash (PragatiPrakashan). 5. Optics, Ajoy Ghatak (TMH).
REFERENCEBOOKS	1. Fundamentals of Physics, Resnick& Halliday (Asian Book). 2. Introduction to Electrodynamics, D.J. Griffith (Prentice Hall).

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2,3,4	1,3,5	1,2,4,5	1,2,3,4,5	1,3,4	1,4	1,2,5	1,3,5	1,4,5	1,2,5	1,3,5

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for theory and 50 marks for practical.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x		x
Quiz			x		x
Assignment	x	x		x	

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

Applied Physics Lab I

L	T	P
0	0	2

MODULE CODE	PHYS0102
CREDIT POINTS	1
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

1. To achieve knowledge and understanding on Modern Physics, their various properties and capabilities to model and solve wide range of problems in science and engineering.
2. To get familiar with concepts of interference and diffraction and develop ability to solve simple problems.
3. To understand polarization and their applications in engineering problems.
4. To learn basic concepts of different types of laser and its application in scientific problems.
5. To acquire knowledge of superconductivity implementation and assess their effectiveness in science and Technology.

LEARNING OUTCOMES:

1. Able to apply knowledge for finding wavelength of sodium, colours of white light using advanced technology.
2. Able to apply fundamental laws of superconductivity in engineering and technology.
3. Able to identify new problems and solve through different techniques.
4. Able to apply knowledge to understand the concepts of fiber optics.
5. Able to develop new experiment using advances technology.

MODULE CONTENTS:

1. To find he wavelength of sodium light by Newton's rings experiment.
2. To find the wavelength of sodium light by Fresnel's biprism experiment.
3. To find the wavelength of various colours of white light with the help of a plane transmission diffraction grating.
4. To find the refractive index and cauchey's constants of a prism by using spectrometer.
5. To find the wavelength of sodium light by Michelson Interferometer.
6. To find the resolving power of a telescope.
7. To find the pitch of a screw using He-Ne laser.
8. To find the specific rotation of sugar solution by using a polar meter.
9. To compare the capacitances of two capacitors by De'sauty bridge and hence to find the dielectric constant of a medium.
10. To find the flashing and quenching potentials of Argon and also to find the capacitance of unknown capacitor.
11. To study the photo-conducting cell and hence to verity the inverse square law.
12. To find the temperature co-efficient of resistance by using platinum resistance thermometer and calendar and Griffin bridge.

RECOMMENDED BOOKS

TEXT BOOKS	1. Advanced Practical Physics - B.L. Workshop and H.T. Flint (KPH)
REFERENCES	1. Practical Physics - S.L. Gupta & V. Kumar (Pragati Prakashan). 2. Advanced Practical Physics Vol. I & II- Chauhan & Singh (Pragati Prakashan).

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2,5	1,2, 4	1,2,3 5	1,2,4	2,5	1,3,5	3,5	1,3,5	3	2	3,5

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks.

Practical

Assessment #	Type of Assessment	Per Semester	Maximum Marks
1	Internal Assessment	2	25
2	External Assessment	1	25

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

Electrical Technology

L	T	P
2	0	0

MODULE CODE	ECEN1101
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	50
END SEMESTER EXAM DURATION	2 hrs
LAST REVISION DATE	

INSTRUCTIONS: The Question paper will comprise of seven questions distributed over three sections A, B and C. Section A comprises of very short answer type questions and is compulsory. Section B and Section C Comprise of short answer type and Long answer type questions and will have internal choices.

OBJECTIVES:

The aim of teaching this subject is to impart knowledge primarily related to application of electricity so that learner will be able to make basic electrical circuits in real life. Some of the objectives of the course are:

1. To acquire basic knowledge of Electric Networks.
2. To inculcate the knowledge of AC and DC fundamentals.
3. To enable to solve electric circuit using various theorems and methods.
4. To get familiar with the concept of three phase circuit and its various connections.
5. To understand the concept of resonance in electrical network.
6. To gain knowledge of construction and working of Transformer.
7. To get exposure about working of AC and DC machines.

LEARNING OUTCOMES:

1. Able to understand basic aspects of electrical technology used in any kind of industry.
2. Able to understand various electrical applications in day to day life.
3. Get familiar with working of various components of a circuit.
4. Ability to analyze the behavior of electrical parameters in different forms.
5. Able to measure various electrical parameters.
6. Able to know the difference between single phase and three phase electrical supply.
7. Acquiring problem solving skills.

MODULE CONTENTS:

Unit I: D.C. Network Laws Ohm's Law, Kirchhoff's Laws, Nodal and Loop methods of analysis Star to Delta & Delta to Star transformation.
Unit II: Network Theorems Thevenin's theorem, Norton's theorem, superposition theorem, maximum power transfer theorem, Millman's theorem.
Unit III: Single Phase A.C. Circuits Sinusoidal signal, instantaneous and peak values, RMS and average values, crest and peak factor, Concept of phase, representation-polar & rectangular.
Unit IV: Series and Parallel A.C. circuits Series and Parallel A.C. circuits. Concept of active and reactive power, power factor, series and parallel resonance, Q factor, cut-off frequencies and bandwidth.
Unit V: Three Phase A.C. Circuits Three phase A.C. circuit, star and delta connection, phase and line voltage and currents, balanced star and circuits, power equation, measurement of power by two wattmeter method, introduction to unbalanced circuits.
Unit VI: Transformers & Machines Construction, EMF equation, ideal transformer, Phasor diagram on no load and full load, equivalent circuit, losses, regulation and efficiency, open and short circuit test. Introduction of AC and DC machines.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Electrical Technology (Vol-I), by B.L. Thareja & A. K. Thareja, S. Chand publications. 2. Electrical Technology (Vol-II), by B.L. Thareja& A. K. Thareja, S. Chand publications. 3. Basic Electrical Engineering, II edition, by V. N. Mittal & Arvind Mittal, TMH Publications.
REFERENCEBOOKS	1. Electrical Engineering Fundamentals : Deltoro, PHI 2. Network Analysis ; Valkenburg, PHI. 3. Electrical and Electronic Technology (8th Edition): Hughes, Pearson. 4. A textbook of Electrical Technology, J. B. Gupta, Katson publication. 5. Electrical Technology by Mukesh Saini.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 75 marks.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	05
2.	Sessional Test	2	15
3.	Group Discussion	4	05
4.	End Semester Exam	1	50

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Class Test				x	x	x	x
Quiz	x	x	x				
Assignment		x	x			x	x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,7	2	5	3		1,6		7,4			

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

Electrical Technology Lab

L	T	P
0	0	2

MODULE CODE	
CREDIT POINTS	1
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

1. To get familiar with various measuring instruments.
2. To understand practical aspects of Network theorems.
3. To get familiar with major parts of electrical machines.
4. To aware students about precautionary measures of using Electrical supply.
5. To analyze different components of any electrical network.
6. To get familiar with the constructional part of transformer.

LEARNING OUTCOMES:

1. Creates implementation skills.
2. Able to measure various electrical parameters.
3. Able to understand various electrical applications in day to day life.
4. Get familiar with working environment of three phase electrical supply.
5. Ability to analyze the electrical connections.

LIST OF EXPERIMENTS:

1.	To verify ohm's law.
2.	To verify KCL and KVL.
3.	To verify Thevenin's theorem.
4.	To verify Norton theorem.
5.	To verify superposition theorem.
6.	To verify Maximum power transfer theorem.
7.	To measure power and power factor by 3 voltmeter method.
8.	To measure power and power factor by 3 ammeter method.
9.	To study the construction of Transformer.
10.	To study about function of multimeter.
Experiments based on advanced topics:	
11.	To perform O.C. and S.C. tests of a transformer.
12.	To study frequency response of a series R-L-C circuit and determine resonant frequency and Q-factor for various values of R, L, and C.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	3	2,4		1	5	1,4		1,2		3	

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

Fundamentals of Computers (with 'C')

L	T	P
4	0	0

MODULE CODE	CSEN0101
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: The Question paper will comprise of seven questions distributed over three sections A, B and C. Section A comprises of very short answer type questions and is compulsory. Section B and Section C Comprise of short answer type and Long answer type questions and will have internal choices.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to components of computers, computer languages and to enhance skills of programming in 'C' language as mentioned below:

1. To make students aware of the evolution of computers in different generations including its classification in different categories based on its capabilities.
2. To acquire knowledge on major components of computers hardware, software, data and processes.
3. To get familiar with concepts of microprocessor interfacing and its applications.
4. To achieve an understanding on basic concepts of operating system and networking.
5. To demonstrate the working of system software.
6. To understand syntax and semantics of 'C' programming language.
7. To enable learner to build logic for a given problem and finally develop programs.

LEARNING OUTCOMES:

1. Able to understand the evolution of computer and basic terminology.
2. Exposure to various hardware and software and their compatibilities.
3. Enhance the knowledge regarding components and connectors such as ports etc to enable communication between computers.
4. Able to understand the basic functionality of OS and the process of secured data management.
5. Ability to differentiate the class of system software, its functionality versus application software.
6. Ability to create programs involving file handling and to understand the scenario of sequential as well as random data retrieval approach.

MODULE CONTENTS:

Unit I: Computers system and its fundamentals Evolution of computers, hardware organization of a computer; Introduction to microprocessors, generations of microprocessors, Input/Output devices, Input/Output ports and connectors; Programming languages- machine language, assembly language, low level languages, high level languages, types of high level languages.
Unit II: System software Translators- complier, interpreter, assembler; Macros, Loader, Linker, Relationship between Compiler, Interpreter, Loader and Linker; Operating System-fundamentals of operating system, functions of operating system, classification of operating systems, basic introduction to DOS, UNIX/LINUX OS, Windows XP.
Unit III: An overview of 'C' History of C, importance of C, basic structure of C programs, executing a 'C' program, character set, 'C' tokens, keywords and identifiers, constants, variables and data types, declaration of variables, declaration of storage class, operators and expressions, managing I/O operations, decision making with IF statement, the if..else statement, nesting of if…else statement, switch statement, conditional statement, GOTO statement, the while statement, the do statement, the for statement and jumps in loops.
Unit IV: Array, structure and union in 'C' Arrays: one-dimensional arrays, two-dimensional arrays, multi-dimensional arrays, dynamic arrays, character arrays and strings, user defined functions, structure-definition and initialization, declaring variables, accessing structure members; copying and comparing structure variables; operations on individual members; array of structure; structure within structure; unions, size of structure.
Unit V: Functions in 'C' Basics of functions, built-in and user defined functions, using string, Math and other built-in functions, advantages of using functions, working of a function, declaring, defining and calling user defined functions-The return statement, call by value and call by reference, function as an argument, recursion, advantages and disadvantages of recursion.
Unit VI: Pointers in 'C' Pointers- accessing the address of a variable, declaration and initialization of pointer variables, accessing a variable through its pointer; pointer Expressions; pointer and arrays, pointer and character strings; arrays of pointer; pointers as function arguments; functions returning pointers; pointers to functions.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Fundamental of Computers and Programming with C, by A.K.Sharma, Dhanpat Rai Publications, Delhi. 2. Computer Networks (4th Edition), by Andrew S. Tanenbaum. 3. Balagurusamy-Programming in ANSI C.
REFERENCE BOOKS	1. ANSI C, by Dennis Ritchi. 2. Balagurusamy-Programming in ANSI 'C'.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for theory and 50 marks for practical.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5	6
Class Test	x		x		X	
Quiz			x		X	X
Assignment	x	x		x		

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	2	3	5	2	5	3					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

Fundamentals of Computers (with 'C') Lab

L	T	P
0	0	2

MODULE CODE	CSEN0102
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to components of computers, computer languages and to enhance skills of programming in 'C' language as mentioned below:

1. To acquire knowledge on a programming language.
2. To learn problem solving techniques.
3. To understand syntax and semantics of 'C' programming language.
4. To get familiar with program writing in C.
5. To enable learner to build logic for a given problem and finally develop programs.

LEARNING OUTCOMES:

1. Read, understand and trace the execution of programs in C language.
2. Ability to write code in C for a given algorithm.
3. Implement programs with pointers and arrays.
4. Perform pointer arithmetic, and use of pre-processor.
5. Write programs that perform operations using derived data types.

LIST OF EXPERIMENTS

1.	Write a program to calculate Simple Interest.
2.	Write a program to print largest of three numbers (if-then-else).
3.	Write a program to print whether given number is prime or not.
4.	Write basic programs illustrating Switch Case statement.
5.	Write a program to print largest of ten numbers (for statement).
6.	Write a program to implement matrix multiplication.
7.	Write a program to print Fibonacci Series.
8.	Write a program to print factorial of a number.
9.	Write a program to implement different string functions.
10.	Write a program to check whether a string is palindrome or not.
11.	Write a program to swap two numbers using call by reference and call by value.
12.	Write a program to create records of student (Name, Roll No., DOB and Marks) using struct and union.
Experiments based on advanced topics:	
13.	Write a program to determine the length of a character string using pointers.
14.	Write a C program to count the lines, words and characters in a given text.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	3	2	4	1	1,2						

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

French Language – Part 1

L	T	P
2	0	0

MODULE CODE	LANF0101
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	50
END SEMESTER EXAM DURATION	2 hrs
LAST REVISION DATE	

INSTRUCTIONS: All questions are compulsory. Each question may have multiple options and will cover all units.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to oral and written skills of expressing and exchanging information / interacting in French language and to enhance skills as mentioned below:

1. To prepare students to develop basic understanding on French language.
2. To acquire knowledge on French grammar.
3. To understand syntax and semantics of language.
4. To achieve an understanding on basic communication in French language.
5. To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.

LEARNING OUTCOMES:

1. Able to understand the basic grammar of French language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the basics of French language.
4. Able to understand the French history.

MODULE CONTENTS

UNIT I:- BASIC COMMUNICATION – This module will develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: -

- Establish contact with someone
- Introduce self and others
- Greet, congratulate, and express condolences
- Spell
- Count
- Exchange simple information on self, preferences, feelings, plans, dreams
- Ask for information
- Tell the time
- Advice, order, suggest
- Buy, sell
- Make a reservation
- Order food or any article
- Invite, accept or refuse invitation
- Fix an appointment
- Locate a place
- Give directions
- Give chronological order of events
- Prepare an itinerary
- Ask for / Give explanations
- Describe a person, an object, an event, a place
- Describe the weather
- Compare

UNIT II: BASIC PHONETICS – This module will develop the ability in the students: -

- To pronounce words, say sentences, questions and give orders using the right accent and intonation.
- To express surprise, doubt, fear, displeasure and all positive or negative feelings using the right intonation
- To use 'liaison' and 'enchainment'
- To distinguish voiced and unvoiced consonants
- To distinguish between vowel sounds

UNIT III: BASIC GRAMMAR & FORMATION OF SENTENCES – This module will develops the ability in the students to construct sentences and frame questions using: -

- Nouns – gender and number
- Articles – definite and indefinite, partitif, articles contractés
- Pronouns – personal, relative (qui, que,où), y, en
- Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following

tenses (indicative mood) – present, present continuous, simple future, immediate future, recent past, simple past, past continuous
• Verbs – the imperative mood
• Adjectives – numeric, qualitative, possessive, demonstrative, interrogative – gender and number
• Adverbs – simple adverbs of time, place, quantity
• Prepositions – simple prepositions (place, time)
• Interrogation – interrogative words, interrogative phrases, inversion

RECOMMENDED BOOKS:

TEXT BOOKS	1. Nouveau Sans Frontières 1 by Philippe Dominique & Jacky Girardet 2. "CONNEXIONS-1" by Regine Merieux & Yves Loiseau Published by Didier.
REFERENCE BOOKS	3. Five in one Multilingual Glossary, published by Saraswati House Pvt. Ltd. New Delhi 2011.

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes										1,2	3,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 75 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	1	10
2.	Sessional Test	2	15
3.	End Semester Written Exam	1	50

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x	x	
Quiz	x	x	x	
Assignment			x	x

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

German Language – Part 1

L T P
2 0 0

MODULE CODE	LANG0102
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	50
END SEMESTER EXAM DURATION	2 hrs
LAST REVISION DATE	

INSTRUCTIONS: All questions are compulsory. Each question may have multiple options and will cover all units.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to oral and written skills of expressing and exchanging information / interacting in German language and to enhance skills as mentioned below:

1. To prepare students to develop basic understanding on German language.
2. To acquire knowledge on German grammar.
3. To understand syntax and semantics of language.
4. To achieve an understanding on basic communication in German language.
5. To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.

LEARNING OUTCOMES:

1. Able to understand the basic grammar of German language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the basics of German language.
4. Able to understand the German history.

MODULE CONTENTS

UNIT I:- BASIC COMMUNICATION – This module will develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: -

- Establish contact with someone
- Introduce self and others
- Greet, congratulate, and express condolences
- Spell
- Count
- Exchange simple information on self, preferences, feelings, plans, dreams
- Ask for information
- Tell the time
- Advice, order, suggest
- Buy, sell
- Make a reservation
- Order food or any article
- Invite, accept or refuse invitation
- Fix an appointment
- Locate a place
- Give directions
- Give chronological order of events
- Prepare an itinerary
- Ask for / Give explanations
- Describe a person, an object, an event, a place
- Describe the weather
- Compare

UNIT II: BASIC PHONETICS – This module will develop the ability in the students: -

- To pronounce words, say sentences, questions and give orders using the right accent and intonation.
- To express surprise, doubt, fear, displeasure and all positive or negative feelings using the right intonation
- To use 'liaison' and 'enchainment'
- To distinguish voiced and unvoiced consonants
- To distinguish between vowel sounds

UNIT III: BASIC GRAMMAR & FORMATION OF SENTENCES – This module will develops the ability in the students to construct sentences and frame questions using: -

- Nouns – gender and number
- Articles – definite and indefinite, articles
- Pronouns – personal, relative
- Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following

tenses (indicative mood) – present, present continuous, simple future, immediate future, recent past, simple past, past continuous
• Verbs – the imperative mood
• Adjectives – numeric, qualitative, possessive, demonstrative, interrogative – gender and number
• Adverbs – simple adverbs of time, place, quantity
• Prepositions – simple prepositions (place, time)
• Interrogation – interrogative words, interrogative phrases, inversion

RECOMMENDED BOOKS:

TEXT BOOKS	1. Tangram, Kursbuch und Arbeitsbuch, 1A, 1B & 2A, Max Hueber Verlag 2. Tangram, Kursbuch und Arbeitsbuch, 2B, 3A & 3B, Max Hueber Verlag
REFERENCE BOOKS	1. em Abschlusskurs, Kursbuch und Arbeitsbuch, Max Hueber Verlag

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes										1,2	3,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 75 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	1	10
2.	Sessional Test	2	15
3.	End Semester Written Exam	1	50

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x	x	
Quiz	x	x	x	
Assignment			x	x

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SEMESTER-I

Spanish Language – Part 1

L	T	P
2	0	0

MODULE CODE	LANS0103
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	50
END SEMESTER EXAM DURATION	2 hrs
LAST REVISION DATE	

INSTRUCTIONS: All questions are compulsory. Each question may have multiple options and will cover all units.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to oral and written skills of expressing and exchanging information / interacting in Spanish language and to enhance skills as mentioned below:

1. To prepare students to develop basic understanding on Spanish language.
2. To acquire knowledge on Spanish grammar.
3. To understand syntax and semantics of language.
4. To achieve an understanding on basic communication in Spanish language.
5. To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.

LEARNING OUTCOMES:

1. Able to understand the basic grammar of Spanish language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the basics of Spanish language.
4. Able to understand the Spanish history.

MODULE CONTENTS

UNIT I:- BASIC COMMUNICATION – This module will develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: -

- Establish contact with someone
- Introduce self and others
- Greet, congratulate, and express condolences
- Spell
- Count
- Exchange simple information on self, preferences, feelings, plans, dreams
- Ask for information
- Tell the time
- Advice, order, suggest
- Buy, sell
- Make a reservation
- Order food or any article
- Invite, accept or refuse invitation
- Fix an appointment
- Locate a place
- Give directions
- Give chronological order of events
- Prepare an itinerary
- Ask for / Give explanations
- Describe a person, an object, an event, a place
- Describe the weather
- Compare

UNIT II: BASIC PHONETICS – This module will develop the ability in the students: -

- To pronounce words, say sentences, questions and give orders using the right accent and intonation.
- To express surprise, doubt, fear, displeasure and all positive or negative feelings using the right intonation
- To use 'liaison' and 'enchainment'
- To distinguish voiced and unvoiced consonants
- To distinguish between vowel sounds

UNIT III: BASIC GRAMMAR & FORMATION OF SENTENCES – This module will develops the ability in the students to construct sentences and frame questions using: -

- Nouns – gender and number
- Articles – definite and indefinite, articles
- Pronouns – personal, relative
- Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following

tenses (indicative mood) – present, present continuous, simple future, immediate future, recent past, simple past, past continuous
• Verbs – the imperative mood
• Adjectives – numeric, qualitative, possessive, demonstrative, interrogative – gender and number
• Adverbs – simple adverbs of time, place, quantity
• Prepositions – simple prepositions (place, time)
• Interrogation – interrogative words, interrogative phrases, inversion

RECOMMENDED BOOKS:

TEXT BOOKS	1. Aula Internacional 1 and 2, Novellas and short stories 2. Aula Internacional 3, España and Latinoamérica: Historia y Cultura, Novellas
REFERENCE BOOKS	1. Español sin fronteras, I, SGEL, 1997 2. Nuevo Ven I, Edelsa 2004

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes										1,2	3,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 75 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	1	10
2.	Sessional Test	2	15
3.	End Semester Written Exam	1	50

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x	x	
Quiz	x	x	x	
Assignment			x	x

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

SEMESTER - II

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total
PHYS0103	G		APPLIED PHYSICS-II	3	1	0	3.5	50	100	150
PHYS0104	G		APPLIED PHYSICS LAB – II	0	0	2	1	25	25	50
ECEN0104	G		BASICS OF ELECTRONICS	2	0	0	2	25	50	75
ECEN0105	G		BASICS OF ELECTRONICS LAB	0	0	2	1	25	25	50
MECH0102	G		BASICS OF MECHANICAL ENGINEERING	2	0	0	2	25	50	75
MECH0103	G		BASICS OF MECHANICAL ENGINEERING LAB	0	0	2	1	25	25	50
MECH1102	G		WORKSHOP TECHNOLOGY LAB	0	0	2	1	25	25	50
CIVL0101	G		BASICS OF CIVIL ENGINEERING	2	0	0	2	25	50	75
CIVL0102	G		BASICS OF CIVIL ENGINEERING LAB	0	0	2	1	25	25	50
MATH0116	G		APPLIED MATHEMATICS-II	4	1	0	4.5	50	100	150
MATH0117	G		NUMERICAL METHODS	3	0	0	3	25	75	100
VALU1019	G		VALUE EDUCATION	2	0	0	2	25	50	75
CSEN1107	G		PC LAB	0	0	2	1	25	25	50
	G		FOREIGN LANGUAGE PART- II #	2	0	0	2	25	50	75
TOTAL				**20**	**2**	**12**	**27**	**400**	**675**	**1075**

 # FOREIGN LANGUAGE

MODULE CODE	MODULE NAME
LANF0104	FRENCH
LANG0105	GERMAN
LANS0106	SPANISH

L = Lecture

T = Tutorial

P = Practical

C = Credit Point

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Applied Physics II

L	T	P
3	1	0

MODULE CODE	PHYS0103
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to solid state physics, crystal geometries, quantum physics, nano-science, energy bands and electromagnetic theory to enhance skills in the field of electricity and magnetism and its applications as mentioned below:

1. To achieve knowledge and understanding on soli-state physics, various properties of crystals to model and solve wide range problems in science and engineering.
2. To get familiar with concepts of micro and nano scales of materials and develop ability to solve simple problems.
3. To understand the concepts of electricity and magnetism, distribution of solids according to band theory, free electrons, and applications of maxwell's equation in engineering problems.
4. To learn basic concepts of different types of magnetic properties of solids in scientific problems.
5. To acquire knowledge of crystal structure and assess their effectiveness in science and Technology.

LEARNING OUTCOMES:

1. Able to apply knowledge in developing advanced materials and devices.
2. Able to apply fundamental laws of electricity and magnetism in engineering.
3. Able to identify and solve crystal structure and semiconductor physics problems.
4. Able to solve applications based on Maxwell's equation
5. Able to apply knowledge to understand the concepts of quantum physics.
6. Able to identify and solve concepts related to nano particles.
7. Ability to create new problems and solve with the help of applications used.

COURSE CONTENT:

UNIT I: Crystal Structure Space lattice, unit cell and translation vector, Miller indices, simple crystal structure. Laue's treatment to Bragg's law, powder method, point defects in solids- Schottky and Frenkel defects, Bonding in solidsionic and covalent bonds.
UNIT II: Quantum Physics Difficulties with classical physics, introduction to quantum mechanics simple concepts, Black body radiations Discovery of Planck's constant, phase velocity and group velocity. Schrodinger wave equations-time dependent and time independent, Expectation value, Ehrnfest Theorem, particle in a one-dimensional box. Quantum Statistics, Bose-Einstein and Fermi-Dirac Statisticsz, Elementary ideas of quark, gluons and hadrons.
UNIT III: Nano-Science Features of nano-systems, concept of quantum size effect, quantum dots and their applications. Free Electron Theory: Elements of classical free electron theory and its limitations. Drude's theory of conduction, quantum theory of free electrons, Fermi level, density of states, Fermi-Dirac distribution function, Thermionic emission, Richardson's equation.
UNIT IV: Band Theory of Solids Origin of energy bonds, Kronig-Penny model (qualitative) E-K diagrams, Brillouin Zones, Concept of effective mass and holes. Classification of solids into metals, semiconductors and insulators. Fermi energy and its variation with temperature. Hall Effect and its applications.
UNIT V: Green Energy Introduction to Green energy, types of green energy, energy conversion mechanisms for solar energy, wind energy, ocean energy and geothermal energy.
UNIT VI: Electro Magnetic Theory Gradient, Divergence, Curl, Gauss' law, Ampere's Law, Continuity equation, Maxwell,s equation (differential and integral forms), Significance of Maxwell's equations, Poynting Theorem, Electromagnetic wave propagation inn dielectrics and conductors.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Concepts of Modern Physics, Arthur Beiser (TMGH) 2. Solid State Physics, S.O. Pillai (New Age Int. Ltd. Pub.) 3. Modern Physics for Engineers, S.P. Taneja (R. Chand) 4. Modern Engineering Physics, A.S. Vasudeva (S. Chand)
REFERENCEBOOKS	1. Introduction to Solid State Physics,Kittel (John Wiley) 2. Quantum Mechanics, A. Ghatak 3. A Textbook of Engineering Physics,Avadhanulu and Kshisagar (S. Chand)

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,3	1,7	1	1,7	1,2,6	1,4	1,2	1,5	2,3	1,2	1,3

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory and 50 marks for practical.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5	6
Class Test	x		x		x	
Quiz			x		x	x
Assignment	x	x		x		

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Applied Physics Lab II

L	T	P
0	0	2

MODULE CODE	PHYS0104
CREDIT POINTS	1
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES

1. To achieve the practical knowledge of low and high resistance and resistance of galvanometer by different methods.
2. To be able to find characteristic of a solar cell, V-I of a p-n diode and to find the fill factor and e/m for electrons by helical method.
3. To get familiar with ionization potential of Argon/Mercury using a thyratron tube and find the radius of coil by Stewart and Gee's apparatus.
4. To have knowledge of hysteresis loss by tracing a B-H curve.
5. To obtain the Planck's constant, co-efficient of self-inductance by using a Rayleigh bridge, Hall Co-efficient of semi-conductor.
6. To obtain band gap of intrinsic semi-conductor using four probe method.

LEARNING OUTCOMES:

1. Able to apply knowledge for finding the characteristics of solar cells and their applications.
2. Able to apply fundamental laws of superconductivity in engineering and technology.
3. Able to identify new problems and solve through different techniques.
4. Able to apply knowledge to understand the concepts of p-n junction diode.
5. Able to develop new experiment using advances technology.

COURSE CONTENT

14. To find the low resistance by carey- Foster's bridge.
15. To find the resistance of a galvanometer by Thomson's constant deflection method using a post office box.
16. To find the value of high resistance by Substitution method.
17. To find the value of high resistance by Leakage method.
18. To study the characteristics of a solar cell and to find the fill factor.
19. To find the value of e/m for electrons by Helical method.
20. To find the ionisation potential of Argon/Mercury using a thyratron tube.
21. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's appratus.
22. To study the characteristics of (Cu-Fe, Cu-Constantan) thermo couple.
23. To find the value of Planck's constant by using a photo electric cell.
24. To find the value of co-efficient of self-inductance by using a Rayleigh beidge.
25. To find the value of Hall Co-efficient of semi-conductor.
26. To study the V-I characteristics of a p-n diode.
14. To find the band gap of intrinsic semi-conductor using four probe method.
15. To calculate the hysteresis loss by tracing a B-H curve.
Note: At least 12 experiments out of the list must be done in the semester.

RECOMMENDED BOOKS

TEXT BOOKS	3. Advanced Practical Physics, B.L. Workshop and H.T. Flint (KPH)
REFRENCE BOOKS	4. Practical Physics, S.L. Gupta & V. Kumar (Pragati Prakshan). 5. Advanced Practical Physics Vol. I & II – Chauhan & Singh (Pragati Prakshan).

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,5	2,4	2,3,5	1,2,4	1,5	3,4	2,3, 5	1,2,4	4,5	1	3,5

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks.

Practical

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Basics of Electronics

L	T	P
2	0	0

MODULE CODE	ECEN0104
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	50
END SEMESTER EXAM DURATION	1 hr 30 mins
LAST REVISION DATE	

INSTRUCTIONS: The Question paper will comprise of seven questions distributed over three sections A, B and C. Section A comprises of very short answer type questions and is compulsory. Section B and Section C Comprise of short answer type and Long answer type questions and will have internal choices.

OBJECTIVES:

The aim of teaching this subject is to impart knowledge primarily related to electronic circuitry so that learner may found it's applications in real life. Some of the objectives of the course are:

1. To acquire knowledge about semiconductor physics for intrinsic and extrinsic materials.
2. To get familiar with different type of electronic displays.
3. To acquire the knowledge of basic digital circuitry.
4. To analyze the performance of negative as well as positive feedback circuits.
5. To describe the scientific principles that apply to the basic flow of electricity and explain the function of various materials used as conducting, semiconducting, and insulating devices in the construction of standard electronic circuits.

LEARNING OUTCOMES:

1. Able to appreciate the significance of electronics in different applications.
2. Able to apply method and appropriate technology to the study of physical science.
3. Able to compile the different building blocks in digital electronics using logic gates and implement simple logic function using basic universal gates.
4. Acquiring problem solving skills.
5. Get familiar with working of various components of a circuit.
6. Get familiar with measurement devices for example CRO, multi meter.

MODULE CONTENTS:

Unit I: Semiconductor Physics Basic concepts, Intrinsic and extrinsic semiconductors, diffusion and drift currents, p-n junction under open- circuit, reverse bias and forward-bias conditions, p-n junction in the breakdown region, Ideal diode.
Unit II: Amplifiers Introduction of different types of amplifiers and their characteristics, Principle of amplification, concept of feedback in amplifiers, frequency response of RC coupled amplifiers.
Unit III: Oscillators Criteria for oscillations, study of different types of oscillators.
Unit IV: Digital Electronics Binary, Octal and Hexadecimal number system and conversions, Boolean Algebra, Truth tables of logic gates (AND, OR, NOT) NAND, NOR as universal gates.
Unit V: Electronics Instruments Role, importance and applications of general purpose test instruments viz Multimeter Digital and Analog, Cathode Ray Oscilloscope (CRO), and Function/Signal Generator
Unit VI: Display Seven segment display, Fourteen segment display, and Dot matrix display. LED Display: Introduction, Construction, and Advantage of LEDs in electronics display. LCD Display: Introduction, Types of LCD display- Dynamic scattering and field effect type; Types of liquid crystal cells: Transmitting type and reflective type, advantage and disadvantage of LCD display.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Electronic Devices & Circuits - Boylstad & Nashelsky. 2. J.S Katre "Basic Electronics" Tech Max Publications 3. J.B Gupta, "Basic Electronics" S K kataria and sons
REFERENCEBOOKS	1. Electrical and Electronic Technology (8th Edition): Hughes, Pearson. 2. Cooper and Helfrick, "Modern Electronic Instrumentation and Measuring Techniques", 4th print Prentice Hall of India, New Delhi (1996). 3. Cooper and Helfrick, "Modern Electronic Instrumentation and Measuring Techniques", 4th print Prentice Hall of India, New Delhi (1996).

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 75 marks.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	05
2.	Sessional Test	2	15
3.	Group Discussion	4	05
4.	End Semester Exam	1	50

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	**1**	**2**	**3**	**4**	**5**	**6**
Class Test	x			x		
Quiz	x		x			x
Assignment		x			x	x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	2	1	3	1,2	4		5,6	5			

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Basics of Electronics Lab

L	T	P
0	0	2

MODULE CODE	ECEN0105
CREDIT POINTS	1
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

1. To understand the practical aspects of basic electronics theory.
2. To Design and construct simple electronic circuits to accomplish a specific function
3. To understand the working of CRO and other measuring instruments.
4. To understand input and output characteristics of Bi-polar junction transistor.
5. To get familiar with ideal and practical characteristics of IC 741.
6. To provide experimental validation of the elementary analogue circuitry using analogue and digital testers.
7. To learn operation of electronic displays.
8. To understand their capabilities and limitations and make decisions regarding their best utilization in a specific situation.

LEARNING OUTCOMES:

1 Identify the basic tools and test equipment used to construct, troubleshoot, and maintain standard electronic circuits and systems.
2 Able to verify the working of diodes, transistors and their applications.
3 Able to design various basic circuits of digital electronics using simple gates and capable to work on IC 741**.**
4 Get familiar with the operation and applications of cathode ray oscilloscope.
5 To generate signals using function generator**.**
6 Build a common emitter/base/collector amplifier and measure its voltage gain.
7 Explore the operation and advantages of operational amplifiers.
8 Exploring the circuitry which converts an analog signal to digital signal.

LIST OF EXPERIMENTS:

1.	To get familiar with the working knowledge of the following instruments : a) Cathode ray oscilloscope (CRO) b) Multi meter (Analog and Digital) c) Function generator.
2.	a) Plot the forward and reverse V-I characteristics of P-N junction diode. b) Study of Zener diode in breakdown region.
3.	To plot and study the input and output characteristics of BJT in common-emitter configuration
4.	Verification of truth tables of logic gates (OR, AND, NOT, NAND, NOR).
5.	To get familiar with the working and use of seven-segment display.
6.	Verification of truth tables of flip-flops (S-R,. J-K).
7.	To measure phase difference between two waveforms using CRO.
8.	To find frequency response of a given amplifier and calculate its bandwidth.
9.	To get familiar with pin-configuration of typical op-amp (741)and its use as : a) Inverting amplifier b) Non-inverting amplifier c) Summing amplifier d) Difference amplifier
10.	Use of op-amp as a) Integrator b) Differentiator
Experiments based on advanced topics:	
11.	To assemble and test 5V/9 V DC regulated power supply and find its line-regulation and load-regulation
12.	To assemble Wein Bridge oscillator circuit and calculation of oscillation frequency and its verification from the observed output.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	4	1	2,3	1	3	3,5	6,8,7	4,5			

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Basics of Mechanical Engineering

L	T	P
2	0	0

MODULE CODE	MECH0102
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	50
END SEMESTER EXAM DURATION	1 hr 30 min
LAST REVISION DATE	

INSTRUCTIONS: The Question paper will comprise of seven questions distributed over three sections A, B and C. Section A comprises of very short answer type questions and is compulsory. Section B and Section C comprise of short answer type and Long answer type questions and will have internal choices.

OBJECTIVES:

1. To have an understanding of fundamental concepts of thermodynamics system and its properties.
2. To develop an ability to identify, formulate, and solve engineering problems.
3. To achieve an ability to use the techniques, skill, and modern engineering tools necessary for engineering practice.
4. An ability to work professionally in both thermal and mechanical systems areas.
5. Apply their mechanical engineering education to address the full range of technical and societal problems with creativity, imagination, confidence and responsibility.
6. To understand multiple integrals and their applications in engineering problems.

LEARNING OUTCOMES:

1. Able to apply knowledge of mathematics, science, and engineering.
2. An ability to design and conduct experiments, as well as to analyze and interpret data.
3. Enhance the knowledge about how to identify, formulate, and solve engineering problems.
4. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
5. Able to design and conduct experiments; analyze results.
6. Recognize and understand contemporary issues and the role of professionals in global society.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE CONTENT:

Unit I: Introduction to Machine tools Introduction to Machine Tool to Commonly used Machine Tools in a Workshop: - Lathe, Shaper, Planer, Milling, Drilling, Slotter. Introduction to Metal Cutting.
Unit II: Basic concept of thermodynamics Basic concept of thermodynamics, Introduction, States, Work, Heat, Temperature, Zeroth, 1st, 2nd and 3rd law of thermodynamics, Concept of internal energy, enthalpy and entropy. Problems Properties of Steam & Steam Generator Formation of steam at constant pressure, Thermodynamic properties of Steam, Use of steam tables, Measurement of dryness fraction by throttling calorimeter.
Unit III : Refrigeration & Air-conditioning Introduction to refrigeration and air -conditioning, Rating of refrigeration machines, Coefficient of performance, Simple refrigeration vapour compression cycle, Psychrometric charts and its use, Human comforts.
Unit IV: Hydraulic Turbines & Pumps Introduction, Classification, Construction details and working of Pelton, Francis and Kaplan turbines, Specific speed and selection of turbines, Classification of water pumps and their working.
Unit V: Power Transmission Methods and Devices Introduction to Power transmission, Belt, Rope, Chain and Gear drive. Types and functioning of clutches. Introduction to Manufacturing Systems, Fundamentals of Numerical Control (NC), Advantage of NC systems, Classifications of NC, Comparison of NC and CNC.
Unit VI : Stresses and Strains Introduction, Concept & types of Stresses and strains, Poison's ratio, stresses and strains in simple and compound bars under axial, flexure & torsional loading, Stress- strain diagrams, Hooks law, Elastic constants & their relationships.

RECOMMENDED BOOKS:

TEXT BOOK	1. Elements of Mechanical Engineering – R.K.Rajput Lakmi Pub., Delhi 2. Elements of Mechanical Engineering – D.S. Kumar, S.K. Kataria and Sons 3. Engineering Thermodynamics- P.K.Nag TMH, New Delhi 4. Refrigeration &Airconditioning – Arora & Domkundwar, Dhanpatrai & co.pvt ltd
REFERENCE	1. Hydraulic Machines – Jagdish Lal, Pub.- Metropolitan, Allahbad. 2. Strength of Materials - G.H. Ryder, Pub.- ELBS. 3. Hydraulic and Fluid Mechanics – Modi and Seth, Pub. – Standard Book House, New Delhi 4. Engineering Thermodynamics – C.P. Arora, Pub. - TMH, New Delhi.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 75 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	05
2.	Sessional Test	2	15
3.	Group Discussion	4	05
4.	End Semester Exam	1	50

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5	6
Class Test	x		x		x	
Quiz			x		x	x
Assignment	x	x		x		

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	2	5		2,4	4	3	6	2		3	4

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Basics of Mechanical Engineering Lab

L	T	P
0	0	2

MODULE CODE	MECH0103
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs.
LAST REVISION DATE	

OBJECTIVES:

1. To learn effective engineering communication.
2. Ability to work in teams on multidisciplinary projects in industry and research organizations.
3. Develop awareness of the ethical, professional and environmental implications of work in a global and societal context.
4. To learn modern engineering tools, techniques, skills and contemporary engineering practice, necessary for engineering work.
5. Have an understanding to solve mechanical engineering problems based on data interpretation, design, experiment and analysis of results.

LEARNING OUTCOMES:

1. Able to apply knowledge of mathematics (including differential equations and statistics), physical and life sciences, and engineering to carry out analysis and design to solve problems at the interface of engineering and biology.
2. Exposure to design and conduct experiments, as well as to measure, analyze and interpret data from living systems.
3. Ability to design a system, component, or process to meet desired needs, including systems that involve the interaction between living and non-living materials.
4. Ability to identify, formulate, and adapt engineering solutions to unmet biological needs.
5. Ability to create the techniques, skills, and modern engineering tools necessary for engineering practice, including the ability to model and analyze biological systems as engineering systems.

LIST OF EXPERIMENTS

1.	To study the Cochran and Babcock & Wilcox boilers.
2.	To study the working and function of mountings and accessories in boilers.
3.	To study Two-Stroke & Four-Stroke Diesel Engines.
4.	To Study Two-Stroke & Four-Stroke Petrol Engines.
5.	To study the vapour compression Refrigeration System and determination of its C.O.P.
6.	To study the functioning of Window Room Air Conditioner.
7.	To study the constructional features and working of Pelton Wheel Turbine, Francis Turbine and Kaplan Turbine.
9.	To calculate the Mechanical Advantage, Velocity Ratio and Efficiency of Single Start, Double
10.	Start and Triple Start Worm Wheel.
11.	To calculate Mechanical Advantage, Velocity Ratio and Efficiency of Single Purchase and Double purchase winch crab and plot graphs.

RECOMMENDED BOOKS:

TEXT BOOK	1. Elements of Mechanical Engineering – R.K.Rajput Lakmi Pub., Delhi. 2. Elements of Mechanical Engineering – D.S.Kumar, S.K. Kataria and Sons.
REFERENCE	1. Strength of Materials - G.H. Ryder, Pub.- ELBS. 2. Hydraulic and Fluid Mechanics – Modi and Seth, Pub. – Standard Book House, New Delhi.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	3,4	2	3,5	1	1,2		4		3		1

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Workshop Technology Lab

L	T	P
0	0	2

MODULE CODE	MECH1102
CREDIT POINTS	1
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs.
LAST REVISION DATE	

OBJECTIVES:

1. To practice workshop safety rules effectively.
2. To acquire knowledge and use simple hand tools.
3. To acquire knowledge and use simple measuring and gauging instruments.
4. To operate simple drilling machines for producing small holes.
5. To understand about various machine tools for producing simple metal components and articles.

LEARNING OUTCOMES:

1. Able to understand applications of hand tools and power tools.
2. Able to get familiar with operations of machine tools.
3. Ability to select the appropriate tools required for specific operation.
4. Exposure to safety measures required to be taken while using the tools.
5. Ability to acquire knowledge and practice on foundry, forging and welding.

COURSE CONTENT:

1	To study different types of measuring tools used in metrology and determine least counts of vernier calipers, micrometers and vernier height gauges.
2	To study different types of machine tools (lathe, shape or planer of slotter, milling, drilling machines).
3	To prepare a job on a lathe involving facing, outside turning, taper turning, step turning, radius making and parting-off.
4	To study different types of fitting tools and marking tools used in fitting practice.
5	To prepare lay out on a metal sheet by making and prepare rectangular tray pipe shaped components e.g. funnel.
6	To prepare joints for welding suitable for bull welding and lap welding.
7	To perform pipe welding.
8	To study various types of carpentry tools and prepare simple types of at least two wooden joints.
9	To prepare simple engineering components/shapes by forging.
10	To prepare mold and core assembly to put metal in the mold and fettle the casting.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Workshop Technology Vol. 1 and 2 BY RAGHUVANSHI, Title: B.S. Dhanpat Rai & Sons. 2. Workshop practices, Author HS BAWA, TITLE: Tata McGraw-Hill.
REFERENCE BOOKS	1. Workshop practices and materials, author BJ BLACK, Title: CRC press. 2. Mechanical practice workshop, author KC john, Title: PHI learning.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	2	3		2,5	4	3		2		1,3	4

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Basics of Civil Engineering

L	T	P
2	0	0

MODULE CODE	CIVL0101
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	50
END SEMESTER EXAM DURATION	1.30 Hrs
LAST REVISION DATE	

INSTRUCTIONS: The Question paper will consist of seven questions distributed over three sections A, B and C. Section A comprises of very short answer type questions and is compulsory. Section B & C comprise of short answers type and long answer type questions. These sections will have internal choice.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to basic knowledge of different sections of civil engineering as mentioned below:

1. To achieve knowledge and understanding about engineering aspects related to buildings.
2. To get familiar with different building materials and their properties.
3. To understand importance of surveying and the transportation systems.
4. To learn basic concepts related to water supply and sewage disposal.
5. To understand the fundamental concepts of geotechnical engineering and properties of soil.

LEARNING OUTCOMES:

1. Able to know about basic civil engineering terms and their applications.
2. Able to learn about the basic building material used in construction.
3. Able to understand about importance of surveying in civil engineering.
4. Able to know about soil behaviour and soil properties in different conditions.
5. Able to learn about water supply system and different layout of water distribution systems.

MODULE CONTENT:

UNIT -I : Building Materials Introduction of Civil Engineering materials: Bricks– composition, classifications, properties and uses. Stone – classification of rocks, quarrying, dressing properties and uses. Timber – properties, uses. Cement – grades, types, properties, uses. Steel – mild steel, medium steel, hard steel, their properties, uses. Concrete – grade designation, properties and uses.
UNIT-II: Building Components Building – selection of site, classification, components. Foundations –functions, classification bearing capacity. Flooring – requirements, selection, types. Roof – types and requirements.
UNIT-III: Surveying Introduction, Principles of surveying, use and adjustment of various instruments employed in chain survey, compass surveying and plane table surveying. Definition and working principles of a levelling instruments, Use and adjustment of dumpy and tilting levels, Establishment of Bench Marks by levelling.
UNIT-IV: Transportation Highway –classification, cross section and components of roads. Railway – cross section and components of permanent way and their functions. Waterway – docks and harbour, classifications, components. Bridge – introduction and components of bridge.
UNIT-V: Water Supply And Sewage Disposal Water supply – objective, quantity of water, sources, standards of drinking water, distribution system. Sewage – classification, technical terms, septic tank, components and functions.
UNIT-VI: Geotechnical Engineering Soil mechanics– Introduction, formation, composition, classification and properties of soil.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Basics of Civil Engineering, Raju .K.V.B, Ravichandran .P.T, Ayyappa Publications. 2. Engineering Material's, Rangwala .S.C Charotar Publishing House.
REFERENCE BOOKS	1. Basics of Civil Engineering, Shrikrishna, Kiran M . Tajne, Shrikrishna A Dhale. S.Chand Publication 2. Basic Civil Engineering, Satheesh Gopi. Publisher: Pearson India

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory and 50 marks for practical.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	5
2.	Sessional Test	2	15
3.	Group Discussion	4	5
4.	End Semester Exam	1	50

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x	x	x
Quiz	x	x		x	
Assignment	x		x		x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	3,4,5	1,2,3,4,5	1,2,4,5	1,3	1,5	5	1,2	1,3,5	3,5	2	

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Basics of Civil Engineering Lab

L	T	P
0	0	2

MODULE CODE	CIVL0102
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects of Civil Engineering field to the students of all branches of Engineering.

1. To study the practical experiments in chaining, compass.
2. To study the basics properties of cement.
3. To study the practical application of theodolite.
4. To study the properties of soil.
5. To give experience in handling surveying equipments.

LEARNING OUTCOMES:

1. Able to determine linear measurement like horizontal distance.
2. Ability to determine properties of cement experimentally.
3. Ability to determine different properties of soil experimentally.
4. Ability to determine C B R value of soil.
5. Ability to handle different surveying instruments.

LIST OF EXPERIMENTS

1.	Linear measurement using tape, chain.
2.	Chain survey – Determination of area by perpendicular offset.
3.	Theodolite- Measurement of horizontal and vertical angles by Vernier Theodolite.
4.	To determine the normal consistency of cement paste.
5.	To determine soundness of given cement by Le-Chatelier method
6.	To determine initial and final setting time of cement
7.	To determine the fineness of cement.
8.	To determine water content of soil mass.
9.	To determine Atterberg Limit of soil.
10.	C B R Value test.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	I	j	k
Course Learning Outcomes		1,2, 3	1,2,3, 4		1,2,3 ,4						

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Applied Mathematics-II

L	T	P
4	1	0

MODULE CODE	MATH0116
CREDIT POINTS	4.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

1. To achieve knowledge and understanding of differential equations, their various properties and capabilities to model and solve wide range of problems in science and engineering.
2. To get familiar with concepts of Laplace transforms and develop ability to solve simple and complex problems.
3. To understand Fourier series and their applications in engineering problems.
4. To learn basic concepts of Fourier Transforms and its application in scientific problems.
5. To acquire knowledge of complex functions and assess their effectiveness in science and Technology.

LEARNING OUTCOMES:

1. Able to understand differential equations and their capability to solve problems.
2. Exposure to Laplace transforms and their compatibilities.
3. Enhance the knowledge regarding Fourier series and their applications
4. Able to understand Fourier Transforms and its application.
5. Ability to acquire knowledge of complex functions and assess their effectiveness in science and Technology.

MODULE CONTENT:

UNIT-I: Ordinary Differential Equations & its Applications Exact differential equations. Equations reducible to exact differential equations. Applications of Differential equations of first order & first degree to simple electric circuits, Newton's law of cooling, heat flow and orthogonal trajectories.
UNIT-II: Linear Differential Equations. Linear differential equations of second and higher order. Complete solution, complementary function and particular integral, method of variation of parameters to find particular Integral, Cauchy's and Legendre's linear equations, simultaneous linear equations with constant coefficient. Applications of linear differential equations to simple pendulum, oscillatory electric circuits.
UNIT-III: Partial Differential Equations and Its Applications Formation of partial differential equations, Lagrange's linear partial differential equation, First orders non-linear partial differential equation, Char pit's method. Method of separation of variables and its applications to wave equation and one dimensional heat equation, two dimensional heat flow, steady state solutions only.
UNIT-IV: Laplace Transforms and its Applications Laplace transforms of elementary functions, properties of Laplace transforms, existence conditions, transforms of derivatives, transforms of integrals, multiplication by t^n, division by t. Evaluation of integrals by Laplace transforms. Laplace transform of Unit step function, unit impulse function and periodic function. Inverse transforms, convolution theorem, application to linear differential equations and simultaneous linear differential equations with constant coefficients.
Unit –V: Fourier Series and Fourier Transforms Euler's formulae, conditions for a Fourier expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and cosine series. Fourier integrals, Fourier transforms, Shifting theorem (both on time and frequency axes), Fourier transforms of derivatives, Fourier transforms of integrals, Convolution theorem.
UNIT-VI: Functions of Complex Variable Definition, Exponential function, Trigonometric and Hyperbolic functions, Logarithmic functions. Limit and Continuity of a function, Differentiability and Analyticity, Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic, polar form of the Cauchy-Riemann equations. Harmonic functions, application to flow problems. Integration of complex functions. Cauchy-Integral theorem and formula.

RECOMMENDED BOOKS

TEXT BOOKS	1. Higher Engineering Mathematics: B.S. Grewal, Khanna Publishers, New Delhi. 2. Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & Sons, Inc., New York. 3. Advanced Engineering Mathematics, Peter V. O'Neil, Thomson Learning, Inc., Singapore.
REFERENCES	1. Advanced Engineering Mathematics, R.K. Jain and S. R .K. Iyengar, Alpha science International Ltd. Pang Bourne, England. 2. Advanced Engg. Mathematics, Michael D. Greenberg, Prentice-Hall, Englewood Cliffs, NJ.

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2,5	2, 5	3,4	1,2,3,4	2,3	3,4	2,3,5	1,3	4,5	1,2	1,3

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory and 50 marks for practical.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5	6
Class Test	x		x		x	
Quiz			x		x	x
Assignment	x	x		x		

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Numerical Methods

L	T	P
3	0	0

MODULE CODE	MATH0117
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to develop understanding of different methods related to error, area numerically, using different techniques to enhance skills of numerical methods as mentioned below:

1. To achieve knowledge and understanding of different types of error, interpolation, extrapolation and capabilities to solve by different methods with wide range of problems in science and engineering.
2. To get familiar with concepts of nonlinear equations and develop ability to solve simple Complex problems.
3. To understand direct and indirect methods solve simultaneous linear equations and their applications in engineering problems.
4. To learn basic concepts of area solve by integration and its application in realistic decision making.
5. To acquire knowledge of ordinary and partial differential equations solve by different methods and assess their effectiveness in problem solving.

LEARNING OUTCOMES:

1. Able to understand the evolution of techniques and basic terminology.
2. Exposure to various methods and techniques and their compatibilities.
3. Enhance the knowledge regarding different types of error, linear, non-linear and ordinary and partial differential equations.
4. Able to understand the basic techniques and start to implement in real life.
5. Ability to find the largest Eigen values and corresponding Eigen vector.

MODULE CONTENT:

Unit I: Errors in Numerical Calculation Introduction, Numbers and their accuracy, Absolute, relative and Percentage errors and their analysis, General error formula. Interpolation and Curve Fitting: Newton's forward and backward; Gauss forward and backward; central difference interpolation formulae; Lagrange's and Newton divided difference interpolation formula, Interpolating with a cubic spline, Bezier curves and B-spline curves, Curve fitting by Least squares approximations.
Unit II: Nonlinear equations Bisection method, Regula False method, Secant method, Iteration Method, Newton's Raphson method, Giraffe's methods, Muller's method.
Unit III: Simultaneous linear equations Gauss Elimination method, Gauss-Jordan method, LU- decomposition Method, Jacobi's method, Gauss- Seidal method, Relaxation method.
Unit IV: Numerical differentiation and Integration Derivatives from differences tables, higher order derivatives, Newton-cotes integration formula, Trapezoidal rule, Simpson's rules, Boole's rule and Weddle's rule, Romberg's Integration.
Unit V: Numerical solution of ordinary differential equations Taylor series methods, Euler and modified Euler method, Runge-Kutta methods, Milne's method, Adams-Moulton method.
Unit VI: Numerical solution of partial differential equations Finite difference approximation of partial derivatives, solution of Laplace equation (standard 5-point formula only), one dimensional heat equation (Schmidt method, Crank-Nicolson method, Dufort and Frankel method). Eigen Value Problems: Power method, Jacobi, Given's and Householder's methods for symmetric matrices.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Applied Numerical analysis: Curtis F Gerald and Patrick, G Wheatley-Pearson Education. 2. Numerical Methods*:* Fairs & Burden, Brooks Cole, 2001. 3. Numerical Methods in Engineering and Science, B S Grewal, Khanna Publishers.
REFERENCE BOOKS	1. Numerical Methods for Scientific and Engineering computations, M.K. Jain, S.R.K. Iyenger and R.K. Jain-Wiley Eastern Ltd. 2. Numerical Methods for engineers, Steven C. Chapra, Raymond P. Can ale, McGraw Hill.

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2	1,3	1,5	1,3,5	2,3	2,3,4	1,2, 4	1,4	1,3	2,5	1,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory and 50 marks for practical.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	10
3.	Group Discussion	4	05
4.	End Semester Exam	1	75

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x		x
Quiz			x		x
Assignment	x	x		x	

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

Value Education

L	T	P
2	0	0

MODULE CODE	VALU1019
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75
END SEMESTER EXAM DURATION	2 hrs
LAST REVISION DATE	

INSTRUCTIONS: All questions are compulsory. Each question may have multiple options and will cover all units.

OBJECTIVES:

The Purpose of Value Education is specifying the present deterioration in the value system in the fast changing world trends and to develop understanding of moral values in different aspects of life for inculcating the skills as mentioned below:

1. To prepare students to develop basic understanding of Value Education.
2. To acquire knowledge on Value Education.
3. To understand the ethics, character building, leadership & goal setting.
4. To understand the success & personal growth.
5. To support the women empowerment & environmental awareness.

LEARNING OUTCOMES:

1. Able to understand the Importance of Values in Life – what is a Value system?
2. Exposure to various principles, concepts, types, advantages and disadvantages of value education.
3. Ability to understand the life style management & self esteem.
4. To behave morally in society.

MODULE CONTENTS:

UNIT 1: VALUE EDUCATION • Definition, Concept and Classification of values • The need for value education • Pedagogy of Values • Challenges of Value Adoption • Life Style Management
UNIT 2: VALUE & PERSONAL DEVELOPMENT • The principles of integrity • Character Development • Values in everyday life • Values, Virtues, Powers & Qualities • Successful Personality
UNIT 3:VALUES IN SOCIETY • Character Building • Positive thinking & Emotional Maturity • Women Empowerment • Overcoming Addiction • Environmental Awareness
UNIT 4: PERSONAL PROGRESS & FIELD STUDY • Personal progress manual • Field Project

RECOMMENDED BOOKS:

TEXT BOOKS	1. Seven Habits of Highly Effective People, Covey Stephen, Free Press, United States, 1989 2. You Can Win, Khera Shiv, Macmillan India Limited, New Delhi, 1998
REFERENCE BOOKS	Mani Jacob, ed., (2002). Resource for Value Education, New Delhi: Institute of Value Education.

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	H	i	j	k
Course Learning Outcomes										1,2	3,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	1	10
2.	Sessional Test	2	15
3.	End Semester Written Exam	1	50
4.	End Semester Oral Exam	1	25

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x	x	
Quiz	x	x	x	
Assignment			x	x

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

PC Lab

L	**T**	**P**
0	0	2

MODULE CODE	CSEN1107
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

The main objective of the lab is to provide the students the knowledge of computer hardware, the processors, memories, motherboards, different add-on cards, and other peripherals like printers, plotters and the scanners. The students are trained for the assembly and disassembly of PCs. Another important objective is to impart knowledge about the troubleshooting and fault finding the computers and the peripherals.

LEARNING OUTCOMES:

Following this course, students will be able to:

1. Learn about different hardware components of a computer and their troubleshooting.
2. Understand different peripherals, their performance and cost characteristics
3. Understand installation of various operating systems, their capabilities
4. Learn commonly used PC software like MS Word, Excel and PowerPoint.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

PC Software: Application of basics of MS Word 2013, MS Excel 2013, MS Power Point 2013, MS Access 2013.

1.	To prepare the Your Bio Data using MS Word.
2.	To prepare the list of marks obtained by students in different subjects and show with the help of chart/graph the average, min and max marks in each subject.
3.	Prepare a presentation explaining the facilities/infrastructure available in your department.
4.	Create a database of books in the library on a mini scale w.r.t. Computers and manipulate the database using different forms and reports.

PC Hardware:

1.	To check and measure various supply voltages of PC.
2.	To make the comparative study of various motherboards.
3.	To make the comparative study of various processors.
4.	To study various cables used in computer communication.
5.	To study various connections and ports used in computer communication.
6.	To study various cards used in a Computer System.
7.	To remove, study and replace CD-Rom, Harddisk.
8.	To observe various cables and connectors used in networking.
9.	To assemble a PC.
10.	Troubleshooting exercises related to various components of computer like monitor, drives, memory and printers etc.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	I	j	k
Course Learning Outcomes	3	2	4	1	1,2						

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

L	T	P
2	0	0

French Language – Part 2

Pre-requisite - French Language – Part 1

MODULE CODE	LANF0104
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75 (Written – 50, Oral – 25)
END SEMESTER EXAM DURATION	2 hrs
LAST REVISION DATE	

INSTRUCTIONS: All questions are compulsory. Each question may have multiple options and will cover all units.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to oral and written skills of expressing and exchanging information / interacting in French language and to enhance skills as mentioned below:

1. To prepare students to develop advance understanding on French language.
2. To acquire the command over the French grammar.
3. To read and write short, simple texts.
4. To enable learner to build logic in French language.
5. To make students aware of the French culture, customs & traditions.

LEARNING OUTCOMES:

1. Able to understand the advance grammar of French language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the advance of French language.
4. Able to understand the French history.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENTS

UNIT I: MODERATE COMMUNICATION – This module will sharpen the communicative skills already acquired in the **PART 1 - BASIC COMMUNICATION** and further builds on them. It develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: - • Describe in detail people, relationships, events, places, cultures of countries • Compare people, relationships, events, places, cultures and the changes that they have undergone • Apply for a job • Exchange personal and professional information • Express opinion on people, places, events encountered in one's personal life and on press articles, television programmes, multimedia, films, and books • Argue, justify and substantiate a point of view • Describe hypothetical or imaginary situations • Express plans, dreams, aspirations of the future • Paragraph writing • Professional communication
UNIT II: MODERATE PHONETICS – This module will re-enforces all the notions introduced in the **PART 1- BASIC PHONETICS**.
UNIT III: MODERATE GRAMMAR – This module will sharpen the concepts introduced in the **PART 1 - BASIC GRAMMAR & FORMATION OF SENTENCES** and further develops the following linguistic skills: - • Pronouns – relative (don't), possessive, indefinite, demonstrative and the use of double pronouns • Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following tenses (indicative mood) – past perfect, future perfect • Verbs – the subjunctive mood (past and present) • Verbs – conditional (past and present) and gerund forms, • Adverbs of time, place, quantity and indefinite adverbs • Direct/indirect speech • Comparative and superlative structures • Active/passive structures • Multiple clause sentences – independent clauses joined by co-ordinating conjunctions, dependant clause (subordinate clause) • Phrases to express cause, consequence, and objective

RECOMMENDED BOOKS:

TEXT BOOKS	1. Nouveau Sans Frontières 1 by Philippe Dominique & Jacky Girardet 2. "CONNEXIONS-1" by Regine Merieux & Yves Loiseau Published by Didier.
REFERENCE BOOKS	Five in one Multilingual Glossary, published by Saraswati House Pvt. Ltd. New Delhi 2011.

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes										1,2	3,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	1	10
2.	Sessional Test	2	15
3.	End Semester Written Exam	1	50
4.	End Semester Oral Exam	1	25

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x	x	
Quiz	x	x	x	
Assignment			x	x

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and

- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

L	T	P
2	0	0

German Language – Part 2
Pre-requisite - German Language – Part 1

MODULE CODE	LANG0105
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75 (Written – 50, Oral – 25)
END SEMESTER EXAM DURATION	2 hrs
LAST REVISION DATE	

INSTRUCTIONS: All questions are compulsory. Each question may have multiple options and will cover all units.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to oral and written skills of expressing and exchanging information / interacting in German language and to enhance skills as mentioned below:

1. To prepare students to develop advance understanding on German language.
2. To acquire the command over the German grammar.
3. To read and write short, simple texts.
4. To enable learner to build logic in German language.
5. To make students aware of the German culture, customs & traditions.

LEARNING OUTCOMES:

1. Able to understand the advance grammar of German language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the advance of German language.
4. Able to understand the German history.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENTS

UNIT I: MODERATE COMMUNICATION – This module will sharpen the communicative skills already acquired in the **PART 1 - BASIC COMMUNICATION** and further builds on them. It develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: - • Describe in detail people, relationships, events, places, cultures of countries • Compare people, relationships, events, places, cultures and the changes that they have undergone • Apply for a job • Exchange personal and professional information • Express opinion on people, places, events encountered in one's personal life and on press articles, television programmes, multimedia, films, and books • Argue, justify and substantiate a point of view • Describe hypothetical or imaginary situations • Express plans, dreams, aspirations of the future • Paragraph writing • Professional communication
UNIT II: MODERATE PHONETICS – This module will re-enforces all the notions introduced in the **PART 1- BASIC PHONETICS**.
UNIT III: MODERATE GRAMMAR – This module will sharpen the concepts introduced in the **PART 1 - BASIC GRAMMAR & FORMATION OF SENTENCES** and further develops the following linguistic skills: - • Pronouns – relative (don't), possessive, indefinite, demonstrative and the use of double pronouns • Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following tenses (indicative mood) – past perfect, future perfect • Verbs – the subjunctive mood (past and present) • Verbs – conditional (past and present) and gerund forms, • Adverbs of time, place, quantity and indefinite adverbs • Direct/indirect speech • Comparative and superlative structures • Active/passive structures • Multiple clause sentences – independent clauses joined by co-ordinating conjunctions, dependant clause (subordinate clause) • Phrases to express cause, consequence, and objective

RECOMMENDED BOOKS:

TEXT BOOKS	1. Tangram, Kursbuch und Arbeitsbuch, 1A, 1B & 2A, Max Hueber Verlag 2. Tangram, Kursbuch und Arbeitsbuch, 2B, 3A & 3B, Max Hueber Verlag
REFERENCE BOOKS	em Abschlusskurs, Kursbuch und Arbeitsbuch, Max Hueber Verlag

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes										1,2	3,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	1	10
2.	Sessional Test	2	15
3.	End Semester Written Exam	1	50
4.	End Semester Oral Exam	1	25

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x	x	
Quiz	x	x	x	
Assignment			x	x

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and

- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - II

L	T	P
2	0	0

Spanish Language – Part 2
Pre-requisite - Spanish Language – Part 1

MODULE CODE	LANS0106
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75 (Written – 50, Oral – 25)
END SEMESTER EXAM DURATION	2 hrs
LAST REVISION DATE	

INSTRUCTIONS: All questions are compulsory. Each question may have multiple options and will cover all units.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to oral and written skills of expressing and exchanging information / interacting in Spanish language and to enhance skills as mentioned below:

1. To prepare students to develop advance understanding on Spanish language.
2. To acquire the command over the Spanish grammar.
3. To read and write short, simple texts.
4. To enable learner to build logic in Spanish language.
5. To make students aware of the Spanish culture, customs & traditions.

LEARNING OUTCOMES:

1. Able to understand the advance grammar of Spanish language and differentiation of genders and objects.
2. Exposure to various syntax & communication methods with others.
3. Ability to read, write, speak & listen the advance of Spanish language.
4. Able to understand the Spanish history.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENTS

UNIT I: MODERATE COMMUNICATION – This module will sharpen the communicative skills already acquired in the **PART 1 - BASIC COMMUNICATION** and further builds on them. It develops oral and written skills of understanding, expressing and exchanging information / interacting on the topics given below: - • Describe in detail people, relationships, events, places, cultures of countries • Compare people, relationships, events, places, cultures and the changes that they have undergone • Apply for a job • Exchange personal and professional information • Express opinion on people, places, events encountered in one's personal life and on press articles, television programmes, multimedia, films, and books • Argue, justify and substantiate a point of view • Describe hypothetical or imaginary situations • Express plans, dreams, aspirations of the future • Paragraph writing • Professional communication
UNIT II: MODERATE PHONETICS – This module will re-enforces all the notions introduced in the **PART 1- BASIC PHONETICS**.
UNIT III: MODERATE GRAMMAR – This module will sharpen the concepts introduced in the **PART 1 - BASIC GRAMMAR & FORMATION OF SENTENCES** and further develops the following linguistic skills: - • Pronouns – relative (don't), possessive, indefinite, demonstrative and the use of double pronouns • Verbs – conjugation of regular and irregular verbs (affirmative and negative) in the following tenses (indicative mood) – past perfect, future perfect • Verbs – the subjunctive mood (past and present) • Verbs – conditional (past and present) and gerund forms, • Adverbs of time, place, quantity and indefinite adverbs • Direct/indirect speech • Comparative and superlative structures • Active/passive structures • Multiple clause sentences – independent clauses joined by co-ordinating conjunctions, dependant clause (subordinate clause) • Phrases to express cause, consequence, and objective

RECOMMENDED BOOKS:

TEXT BOOKS	1. Aula Internacional 1 and 2, Novellas and short stories 2. Aula Internacional 3, España and Latinoamérica: Historia y Cultura, Novellas
REFERENCE BOOKS	1. Español sin fronteras, I, SGEL, 1997 2. Nuevo Ven I, Edelsa 2004

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes										1,2	3,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	1	10
2.	Sessional Test	2	15
3.	End Semester Written Exam	1	50
4.	End Semester Oral Exam	1	25

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x	x	
Quiz	x	x	x	
Assignment			x	x

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

SEMESTER – III

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEN2101	E	PC	DATA STRUCTURE USING 'C'	3	0	0	3	25	75	100
CSEN2102	E	PC	DATA STRUCTURE USING 'C' LAB	0	0	3	1.5	25	50	75
CSEN2103	E	PC	DISCRETE STRUCTURE	3	1	0	3.5	50	100	150
CSIT2101	E	PC	MULTIMEDIA TECHNOLOGIES	4	0	0	4	50	100	150
	E	PE	ELECTIVE-I	4	0	0	4	50	100	150
	E	PE	ELECTIVE-II	4	0	0	4	50	100	150
MGMT0101	M		MANAGEMENT & PROFESSIONAL LEADERSHIP	3	0	0	3	25	75	100
VALU0119	P	AE	APTITUDE I	2	0	0	2	25	50	75
VALU0123	P	SE	PROFESSIONAL COMMUNICATION-I	2	0	0	2	25	50	75
ENGL0109	P	AE	ACADEMIC WRITING	0	0	2	1	25	25	50
	P	AE	YOGA/ NCC/ NSS	0	0	2	1	50	0	50
TOTAL				**25**	**1**	**7**	**29**	**400**	**725**	**1125**

L = Lecture
T = Tutorial
P = Practical
C = Credit Point

MODULE CODE	MODULE
VALU0118	YOGA
VALU0121	NCC
VALU0122	NSS

ELECTIVE I

MODULE CODE	MODULE
CSEN2205	E- COMMERCE
CSEN2206	DIGITAL ELECTRONICS
CSEN2207	INTERNET AND WEB TECHNOLOGY

ELECTIVE II

MODULE CODE	MODULE
CSEN2208	MODELLING AND SIMULATION
CSEN2209	ENGINEERING ANALYSIS AND DESIGN
CSEN2210	SYSTEM PROGRAMMING AND SYSTEM ADMINISTRATION

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - III

Data Structure Using 'C'

L	T	P
3	0	0

MODULE CODE	CSEN2101
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to teach students how to design, write, and analyse the performance of various data structures. It will also enable students to learn advanced data structure such as Tree, Graph, hash tables.

1. To teach the behavior of basic data structure (list, stack, queue, hash table, trees, and graph).
2. To understand and analyse elementary algorithms: sorting, searching.
3. To make students familiar with basic techniques of algorithm analysis including time and space complexity.
4. To teach the implementation of linked data structures such as linked lists and binary trees.
5. To make students familiar with advanced data structures such as balanced search trees, hash tables, priority queues and the disjoint set union/find data structure.
6. To make students familiar with some graph algorithms such as shortest path and minimum spanning tree.

LEARNING OUTCOMES:

Following this course, students will be able to:

1. Students will be able to characterize the space and time complexity of algorithms.
2. Students will understand different data structures including stack, queue, linked list, tree, heap, graph, and hash table.
3. Students will be able to implement insert, retrieve, and delete operations and traversals of binary search trees.
4. Ability to understand traversals and algorithms on graphs.
5. Student will be able to implement hash tables along with insert and retrieve operations.

MODULE CONTENT:

UNIT-I: Overview of 'C', Data structures and Algorithms Introduction, Flow of Control, and Input output functions, Arrays and Structures, Function. Data structures and Algorithms: an overview**:** concept of data structure, choice of right data structures, types of data structures, basic terminology Algorithms, how to design and develop an algorithm: stepwise refinement, use of accumulators and counters; algorithm analysis, complexity of algorithms Big-oh notation.
UNIT-II: Arrays: Searching and Sorting Introduction, One Dimensional Arrays, operations defined: traversal, selection, searching, insertion, deletion, and sorting. Multidimensional arrays, address calculation of a location in arrays. Searching: linear search, binary search; Sorting: selection sort, bubble sort, insertion sort, merge sort, quick sort, shell sort, quick Sort, Heap sort.
UNIT-III: Stacks and Queues Stacks, array representation of stack. Applications of stacks: Infix, postfix, prefix representation, Conversions. Queues, Circular queues, array representation of Queues, Deques, priority queues, Applications of Queues.
UNIT-IV: Pointers and Linked list Pointer variables, Pointer and arrays, array of pointers, Dynamic allocation. Linked Lists: Concept of a linked list, Circular linked list, doubly linked list, operations on linked lists. Concepts of header linked lists. Applications of linked lists, linked stacks, linked Queues.
UNIT-V: Trees Introduction to trees, Basic Terminology of trees, binary trees, Properties of binary trees, traversal of trees: pre-order, post-order, In-order traversal, types of binary trees, Binary Search Tree, threaded binary trees, B Trees,m-Way Tree, B+Tree,AVL trees, Application of trees.
UNIT-VI: Graphs and Hashing Definition of Undirected and Directed Graphs, Basic terminology of Graphs, the Array based implementation of graphs, Adjacency matrix, path-matrix implementation, The Linked List representation of graphs, Graph Traversal–Breadth-first-Traversal, Depth-first-Traversal Hashing: Search efficiency in lists and skip lists, hashing as a search structure, hash table, collision avoidance, linear open addressing and chains

RECOMMENDED BOOKS:

TEXT BOOK	1. Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub. 2. Data Structures using C by A. K. Sharma, Pearson
REFERENCE	1. Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition. 2. Data Structures and Program Design in C By Robert Kruse, PHI, 3. Theory & Problems of Data Structures by Jr. Symour Lipschetz, Schaum's outline by TMH 4. Introduction to Computers Science -An algorithms approach, Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H. 5. Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	5
2.	Sessional Test	2	15
3.	Group Discussion	4	5
4.	End Semester Exam	1	75

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x		x
Quiz			x		x
Assignment	x	x		x	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	2	3	5	2	5	3					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - III

Data Structure Using 'C' Lab

L	T	P
0	0	3

MODULE CODE	CSEN2102
CREDIT POINTS	1.5
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	50
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

1. To teach the behavior of basic data structure (list, stack, queue, hash table, trees, and graph).
2. To understand and analyse elementary algorithms: sorting, searching.
3. To make students familiar with basic techniques of algorithm analysis including time and space complexity.
4. To teach the implementation of linked data structures such as linked lists and binary trees.
5. To make students familiar with advanced data structures such as balanced search trees, hash tables, priority queues and the disjoint set union/find data structure.
6. To make students familiar with some graph algorithms such as shortest path and minimum spanning tree.

LEARNING OUTCOMES:

1. To implement the space and time complexity of algorithms.
2. To implement different data structures including stack, queue, linked list, tree, heap, graph, and hash table.
3. To implement insert, retrieve, and delete operations and traversals of binary search trees.
4. To implement traversal algorithms on graphs.
5. To implement hash tables along with insert and retrieve operations.

LIST OF EXPERIMENTS

1.	Write a program to search an array in a 2-d array using linear search.
2.	Write a program to search an element in an array using binary search.
3.	Write a program to perform following operations on matrices (A) Addition (B)Subtraction (C)Multiplication (D)Transpose
4.	Using iteration and recursion concepts write the program for quick sort.
5.	Write a program for swapping of two numbers using 'call by value' and 'call by reference' methods.
6.	Write a program to perform various operations on link list 1. Add a node 2. Delete a node 3. Display
7.	Write a program to perform various operations on stack such as insertion, deletion, traverse using array.
8.	Write a program to sort numbers using the bubble sort algorithm.
9.	Write a program to perform various operation on circular queue such as insert, delete, traverse using array.
10.	Write a program to sort numbers using selection sort algorithm.
11.	Write a program to simulate the various graph traversing algorithms.
12.	Write a program which simulates the various tree traversal algorithms.
Experiments based on advanced topics:	
13.	Write a program to perform various operation on queue such as insert, delete, traverse using array.
14.	Write a program to sort numbers using insertion sort algorithm.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 75 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	50

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	3	2	4	1	1,2						

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - III

Discrete Structure

L	T	P
3	1	0

MODULE CODE	CSEN2103
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to provide basic knowledge of integration of Algebra with computers. It discusses technical issues relating to set theory, propositional calculus, algebraic structures, graphs and trees.

1. Simplify and evaluate basic logic statements including compound statements, implications, inverses, converses, and contra positives using truth tables and the properties of logic.
2. Express a logic sentence in terms of predicates, quantifiers, and logical connectives.
3. Apply the operations of sets and use Venn diagrams to solve applied problems; solve problems using the principle of inclusion-exclusion.
4. Determine if a graph has an Euler or a Hamilton path or circuit.

LEARNING OUTCOMES:

On successful completion of this module, students should be able to:

1. Understand and analyze partial order relations and their applications
2. Work on counting techniques.
3. Work on graph algorithms and tree usages
4. Understand the need of algebra in computer science.

MODULE CONTENT:

Unit-I: Set Theory Introduction to set theory, Set operations, Algebra of sets, Duality, Finite and Infinite sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions , Partial ordering relations and lattices Function and its types, Composition of function and relations, Cardinality and inverse Relations.
Unit-II: Propositional Calculus Introduction to propositional Calculus: Basic operations: AND(^), OR(v), NOT(~), Truth value of a compound statement, propositions, tautologies, contradictions.
Unit-III: Techniques of Counting and Recursion and recurrence Relation Permutation with and without repetition, Combination. Polynomials and their evaluation, Sequences, Introduction to AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.
Unit-IV: Algebric Structures Definition and examples of a monoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem.
Unit-V: Section Graphs Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eurelian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula.
Unit-VI: Trees Trees, Spanning trees, Binary trees and its traversals.

RECOMMENDED BOOKS:

TEXT BOOK	Elements of Discrete Mathematics by C.L Liu, 1985, McGraw Hill
REFERENCE BOOKS	1. Discrete Mathematics by Johnson Bough R., 5th Edition, PEA, 2001. 2. Concrete Mathematics: A Foundation for Computer Science by Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley. 3. Mathematical Structures for Computer Science by Judith L. Gersting, 1993, Computer Science Press. 4. Applied Discrete Structures for Computer Science by Doerr and Levasseur.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test		x		
Quiz	x			
Assignment			x	x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,3		2,4								

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - III

Multimedia Technologies

L	T	P
4	0	0

MODULE CODE	
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to understand about multimedia concepts like CD-ROM, JPEG, image processing, virtual reality and DVI technology which helps students to get practical knowledge in multimedia terms.

1. To formulate a working definition of interactive multimedia.
2. To demonstrate competence in using the authoring program Hyper Studio.
3. To demonstrate the use of animation, digitized sound, video control, and scanned images;
4. To use basic instructional design principles in the development of stacks; will develop conceptual maps of content and process for interactive multimedia instructional programs
5. Be motivated for the use of an interesting topic such as Virtual Reality.

LEARNING OUTCOMES:

1. Able to learn the different forms of communication like text, graphics, animation, audio, video etc.
2. Able to understand various image compression techniques and standards.
3. Able to know about different applications of multimedia.
4. Able to understand the concepts of virtual reality.

MODULE CONTENT:

Unit-I Basics of Multimedia Technology: Computers, communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD- Audio, CD-ROM, CD-I, presentation devices and the user interface; multimedia presentation and authoring; professional development tools.
Unit-II LANs and multimedia; internet, World Wide Web & multimedia distribution network-ATM & ADSL; multimedia servers & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti-aliasing; morphing; video on demand.
Unit-III Image Compression & Standards: Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; JPEG performance; overview of other image file formats as GIF, TIFF, BMP, PNG etc.
Unit-IV Audio & Video: Digital representation of sound; time domain sampled representation; method of encoding the analog signals; subband coding; fourier method; transmission of digital sound; digital audio signal processing; stereophonic & quadraphonic signal processing; editing sampled sound.
Unit-V MPEG Audio; audio compression & decompression; brief survey of speech recognition and generation; audio synthesis; musical instrument digital interface; digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.
Unit-VI Virtual Reality: Applications of multimedia, intelligent multimedia system, desktop virtual reality, VR operating system, virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems. Applications of environment in various fields.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Multimedia in Action by James E Shuman, 1997, Wadsworth Publ. 2. Multimedia in Practice by Jeff coate Judith, 1995,PHI. 3. Multimedia Systems by Koegel, AWL.
REFERENCE	1. Multimedia Making it Work by Vaughar, etl. 2. Multimedia Systems by John .F. Koegel, 2001, Buford. 3. Multimedia Communications by Halsall & Fred, 2001, AW.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test		x	x	
Quiz	x	x		x
Assignment	x		x	

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		2	1	3	4			3		1	

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – III (ELECTIVE I)

E-Commerce

L	T	P
4	0	0

MODULE CODE	CSEN2205
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS:
In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

The aim of this subject is to teach students how to provide better understanding of the concepts of Electronic Commerce .It will also enable students to learn about security in e-commerce, intelligent agents.

1. To teach students about E-Commerce Framework and EDI.
2. To teach students about Security in E-Commerce.
3. To make students understand about Intelligent Agents.

LEARNING OUTCOMES

Following this course, student will be able to learn:
1. About E-Commerce Framework and EDI.
2. About Security in E-Commerce.
3. About Electronic Payment Systems.
4. About Intelligent Agents.

MODULE CONTENT

UNIT-I: Introduction History of E- Commerce, overview of E-commerce framework, E-Business models, network infrastructure, role of Internet, E- commerce and World Wide Web.
UNIT-II: Consumer Oriented E-Commerce Consumer oriented E-commerce applications, mercantile process models, electronic payment systems, Digital Token based EPS: Smart cards, credit cards, risks designing EPS.
UNIT-III: Organizational Commerce & EDI Electronic Data Interchange, EDI applications in business, EDI and E-commerce, EDI standardization and implementation, Internet based EDI.
UNIT-IV: Security Internet security standards, secure electronic payment protocols, cryptography and authentication, security issues, encryption techniques.
UNIT-V: E-commerce Payment Mechanisms E-commerce payment mechanisms, SET protocol, electronic check, electronic cash, E-commerce ethics, regulations and social responsibility.
UNIT-VI: Intelligent Agents Definition and capabilities, limitation of agents, security, web based marketing, search engines and directory registration, online advertisements, portables and info mechanics, website design issues.

RECOMMENDED BOOKS

TEXT BOOK	1. Frontiers of Electronic Commerce by Ravi Kalakota and Andrew B. Whinston, Pearson Education Asia, 1999. 2. Electronic commerce: Security, Risk Management and Control by Marilyn Greenstein and Todd M Feinman, Tata McGraw-Hill , 2000.
REFERENCE	1. E Marketing by Judy Strauss and Raymond Frost, PHI, 2002. 2. Managing e Commerce Business by Brenda Kienan, PHI, 2001. 3. Developing e Commerce Sites – an integrated approach by Vivek Sharma and Rajiv Sharma, Pearson Education Asia, 2000.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Assessments	1	2	3	4
Class Test	x	x		
Quiz	x		x	
Assignment	x		x	x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1		3	4	2					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - III

Digital Electronics

L	T	P
4	0	0

MODULE CODE	CSEN2206
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total, EIGHT questions will be set. Question ONE will be compulsory and cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to develop understanding on basics of digital circuits, combinational and sequential circuits so that learner will be able to make basic digital circuits in real life. Some of the objectives of the course are:

1. To acquire basic knowledge of the basic concepts of basic digital circuits and its advantages.
2. To inculcate the knowledge of Digital Electronics fundamentals.
3. To enable to solve digital circuits adders, subtractors, multiplexer and demultiplexer.
4. To get familiar with the concept of designing like flip-flops & Counters.
5. To understand the concept of semiconductor memories like RAM, ROM, PLA, PAL, FPGA etc.
6. To gain knowledge of A/D &D/A converters.

LEARNING OUTCOMES:

1. Able to understand basic aspects of digital circuits used in any kind of industry.
2. Able to understand various digital electronics applications in day to day life.
3. Get familiar with working of various gates and IC of a circuit.
4. Ability to analyze the behavior of digital circuits in different forms.
5. Able to measure various digital circuit parameters.
6. Able to design different semiconductor memories.
7. Able to convert one analog circuit to digital circuit and vice versa.

MODULE CONTENTS:

Unit I: Number System and Binary Code Introduction, Binary, Octal and Hexadecimal Number System (Conversion, Addition & Subtractions). Signed and unsigned numbers, Binary Subtractions using 1's and 2's compliment, ASCII code, Excess 3 code, Grey code, BCD code and BCD additions.
Unit II: Minimization of logic function OR, AND,NOT,NOR,NAND,EX-OR, EX-NOR, Basic theorem of Boolean Algebra, Sum of Products and Product of Sums, canonical form, Minimization using K-map and Q-M method.
Unit III: Combinational Circuits Introduction, Combinational circuit design, Encoders, decoders, Adders, Subtractors and Code converters. Parity checker, seven segment display, Magnitude comparators. Multiplexers, De-multiplexer, Implementation of Combinational circuit using MUX.
Unit IV: Sequential Circuits Introduction, flip flops, Clocked flip flops, SR, JK, D, T and edge triggered flip-flops. Excitation tables of Flip flops. Shift Registers, Type of Shift Registers, Counter, Counter types, counter design with state equation and state diagrams.
Unit V: D/A and A/D Converters Introduction, Weighted register D/A converter, binary ladder D/A converter, steady state accuracy test, D/A accuracy and resolution, parallel A/D converter, Counter type A/D converter Successive approximation A/D converter. Single and dual slope A/D converter, A/D accuracy and resolution.
Unit VI: Semiconductor Memories Introduction, Memory organisation, Classification and characteristics of memories, Sequential memories, ROMs, R/W memories. Content addressable memories. PLA and PAL.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Digital Design by Morris Mano Prentice Hall of India Pvt. Ltd 2. Digital Principles and Applications, by Donald P. Leach and Albert Paul Malvino , Tata McGraw Hill Publishing Company Limited, New Delhi, 2003. 3. Modern Digital Electronics, by R. P. Jain, Tata McGraw–Hill publishing Company limited, New Delhi, 2003.
REFERENCE BOOKS	1. Digital Fundamentals, by Thomas L. Floyd, Pearson Education, Inc, New Delhi, 2003.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Class Test				x	x	x	x
Quiz	x	x	x				
Assignment		x	x			x	x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	K
Course Learning Outcomes	1	2	5	3	7	5,6	4	7			

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – III

Internet & Web Technology

L	T	P
4	0	0

MODULE CODE	CSEN2207
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS:

In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to teach students how to provide better understanding of the concepts of internet & web technology. It will also enable students to learn about router technologies, search engines, web crawlers & website development.

1. To teach students about internet & router technologies.
2. To teach students about web server technologies.
3. To make students understand about functioning of search engines & web crawlers.
4. To make students learn about website development.

LEARNING OUTCOMES

Following this course, student will be able to learn:

1. About Internet & router technologies.
2. About Web Server technologies.
3. About browsing systems.
4. About functioning of Search Engines & Web Crawlers.
5. About website development.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT

UNIT-I: Introduction Internet protocol model, Internet addresses, IP routing concepts, table driven and next hop routing, other routing related protocols, Internet access through PPP, SLIP,WWW, web servers, browsers.
UNIT-II: Router Technology Hubs, bridges, routers, routing protocols, routing security, switch based routing, routing in unicast environment, multicasting, mobile routing.
UNIT-III: Web Server Technology HTML, HTTP, accessing a web server, publishing on web server, Secure HTTP, secure sockets layer, WWW proxies.
UNIT-IV: Browsing Systems Searching and web casting Technique, popular web servers, basic features bookmarks, cookies, progress indicators, customization of browsers, browsing tricks, next generation web browsing.
UNIT-V: Search Engines & Web Crawlers Search engines, architecture of search engines, search tools, web crawlers, types of crawlers, scalable web crawler, incremental crawler, parallel crawler, focused crawler, agent based crawler.
UNIT-VI: Website Development HTML, XHTML, DHTML, XML, structuring data, namespaces, XML schema documents, simple API for XML, XSL, ASP.Net, security and management issues for creating a website.

RECOMMENDED BOOKS

TEXT BOOK	1. Fundamentals of the Internet and the World Wide Web by Raymond Greenlaw and Ellen Hepp – 2001, TMH. 2. Internet & World Wide Programming by Deitel, Deitel& Nieto, 2000, Pearson Education. 3. Beginning XHTML by Frank Boumpery, Cassandra Greer, Dave Raggett, JenetRaggett, SubastianSchnitenbaumer& Ted Wugofski, 2000, WROX press(Indian Shroff Publ. SPD) Ist Edition.
REFERENCE	1. Complete Reference Guide to Java script by Aron Weiss, QUIE, 1997. 2. Intranet & Internet Engg. byMinoli. 3. Internet & Web Technology by Rajkamal.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Assessments	1	2	3	4	5
Class Test	x	x			x
Quiz	x		x		
Assignment	x		x	x	x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1	2	1,3	4	5					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – III (ELECTIVE – II)

Modelling and Simulation

L	T	P
4	0	0

MODULE CODE	CSEN2208
CREDIT POINTS	4
FORMATIVE ASSESSMENT MARKS	50
SUMMATIVE ASSESSMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to teach students about fundamental and techniques for designing and using simulation, modelling, and optimization algorithms.

1. Introduce computer simulation technologies and techniques.
2. Introduce concepts of modelling layers of society's critical infrastructure networks.
3. Build tools to view and control simulations and their results.
4. Utilize the Modelling Process to identify the key parameters of a model, estimate model outcomes, utilize a computational tool
5. Explain and conduct the transforming of continuous functions and dynamics equations into discrete computer representations.

LEARNING OUTCOMES:

1. Solve problem with a breadth and perspective on modelling.
2. Have good training in computation and simulation methods.
3. Create a computer representation of a specific detailed description of the problem domain.
4. Up-to-date with the current state of relevant technologies, to skilled in a variety of relevant software tools and methodologies.
5. To create simulation models of different types by understanding simulation principles.

MODULE CONTENT:

UNIT-I: Introduction to simulation Introduction, Advantages and disadvantages of Simulation ,Areas of application, Systems and system environment, Components of a system, Discrete and continuous systems, Model of a system, Types of Models, Discrete-Event System Simulation, Steps in a Simulation Study, The basics of Spread sheet simulation, Simulation example: Simulation of queuing systems in a spread sheet.
UNIT-II: General Principles, Simulation Software Concepts in Discrete-Event Simulation: The Event-Scheduling / Time-Advance Algorithm, World Views, Manual simulation Using Event Scheduling, List processing, Simulation in Java; Simulation in GPSS.
UNIT-III: Statistical Models and Queuing Models in Simulation Review of terminology and concepts, Useful statistical models, Discrete distributions, Continuous distributions, Poisson process, Empirical distributions, Characteristics of queuing systems, Queuing notation, Long-run measures of performance of queuing systems, Steady-state behavior of M/G/1 queue, Networks of queues, Rough-cut modeling: An illustration.
UNIT-IV: Random-Number Generation, Random-Variate Generation Properties of random numbers, Generation of pseudo-random numbers, Techniques for generating random numbers, Tests for Random Numbers Random-Variate Generation: Inverse transform technique, Acceptance-Rejection technique, Special properties.
UNIT-V: Input Modeling Data Collection; Identifying the distribution with data, Parameter estimation, Goodness of Fit Tests, Fitting a non-stationary Poisson process, Selecting input models without data, Multivariate and Time-Series input models.
UNIT-VI: Estimation of Absolute Performance Types of simulations with respect to output analysis, Stochastic nature of output data, Absolute measures of performance and their estimation, Output analysis for terminating simulations, Output analysis for steady-state simulations, Model building, verification and validation, Verification of simulation models, Calibration and validation of models, Optimization via Simulation.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Simulation Model Design and Execution by Fishwick P, Prentice Hall, 1995, ISBN 0-13-098609-7
REFERENCEBOOKS	1. Simulation Modelling and Analysis, by Law A., Kelton D, McGraw-Hill, 1991, ISBN 0-07-100803-9 2. Modelování a simulace, by Rábová Z. a kol, VUT Brno, 1992, ISBN 80-214-0480-9 3. Simulation by Ross, S, Academic Press, 2002, ISBN 0-12-598053-1

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x	x			x
Quiz	x		x		
Assignment	x		x	x	

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2		1,3	4		5	2				

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - III

Engineering Analysis and Design

L	T	P
4	0	0

MODULE CODE	CSEN2209
CREDIT POINTS	4
FORMATIVE ASSESSMENT MARKS	50
SUMMATIVE ASSESSMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to teach students about fundamental and techniques for designing and using simulation, modelling, and optimization algorithms.

1. To impart the importance of design in today's context of global competition, environmental awareness and customer oriented market.
2. To impart the basic concepts and various aspects of design using simple examples and case studies.
3. To develop innovative technologies and find solutions to contemporary issues in engineering design.
4. To develop an aptitude to use engineering principles to conceptualize, create, model and test.
5. To evaluate designs within the context of local and global needs.

LEARNING OUTCOMES:

1. Appreciate the aspects of need for design, materials and processes used for designing various components.
2. Acquainted with the knowledge of designing creative components
3. Equipped with tools for improving quality, reliability and performance of a Product.
4. Demonstrate an ability to design and conduct experiments.
5. Interpret data in the area of design engineering through software.

MODULE CONTENT:

UNIT-I: Design Fundamentals Importance of design, The design process-Considerations of Good Design, Morphology of Design ,Organization for design, Computer Aided Engineering, Designing to codes and Standards, Concurrent Engineering, Product and process cycles, Technological Forecasting, Market Identification, Competition Bench marking.
UNIT-II: Customer Oriented Design & Societal Considerations Identification of customer needs-customer requirements, Quality Function Deployment, Product Design Specifications, Human Factors in Design, Ergonomics and Aesthetics.Societal consideration, Contracts, Product liability,Protecting intellectual property, Legal and ethical domains, Codes of ethics, Ethical conflicts, Environment responsible design, future trends in interaction of engineering with society.
UNIT-III: Design Methods Creativity and Problem Solving, Creativity methods, Theory of Inventive Problem Solving (TRIZ), Conceptual decomposition, Generating design concepts, Axiomatic Design, Evaluation methods, Embodiment Design, Product Architecture, Configuration Design-Parametric Design, Role of models in design, Mathematical Modeling, Simulation, Geometric Modeling, Rapid prototyping Finite Element Analysis, Optimization, Search Methods.
UNIT-IV: Material Selection Processing and Design Material Selection Process, Economics, Cost Vs. Performance, Weighted property Index, Value Analysis, Role of Processing in Design, Classification of Manufacturing Process, Design for Manufacture ,Design for Assembly, Designing for castings, Forging, Metal Forming, Machining and Welding, Residual Stresses, Fatigue, Fracture and Failure.
UNIT-V: Probability Concepts in Design for Reliability Probability, Distributions, Test of Hypothesis, Design of Experiments, Reliability Theory, Design for Reliability, Reliability centered Maintenance, Robust Design, Failure mode Effect Analysis.
UNIT-VI: Design for Quality Quality Function Deployment**,** House of Quality, Objectives and functions, Targets, Stakeholders, Measures and Matrices, Design of Experiments, design process, Identification of control factors, noise factors, and performance metrics, developing the experimental plan, experimental design, Testing noise factors, Running the experiments, Conducting the analysis, Selecting and conforming factor, Set points, reflecting and repeating.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Engineering Design - A Materials and Processing Approach, by Dieter, George E, McGrawHill, International Editions, Singapore, 2000.
REFERENCEBOOKS	1. Engineering Design-A systematic approach by Pahl, G, Beitz, W, Feldhusen, J, Grote, K. H Springer Verlag, NY. 2007. 2. Elements of Engg. Design by Ray, M.S. Prentice Hall Inc. 1985. 3. The principles of Design by Suh, N.P, Oxford University Press, NY.1990. 4. Product Design and Development by Karl T. Ulrich and Steven D. Eppinger McGraw Hill Edition 2008.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x	x			x
Quiz	x		x		
Assignment	x		x	x	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	5	2,3,5	4	4		1,2,3					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - III

System Programming and System Administration

L	T	P
4	0	0

MODULE CODE	CSEN2210
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to understand and learn system software like compiler, linker, assembler etc. Students can learn UNIX administration and shell programming.

1. To be familiar with system programming tools like linker, loaders, assembler, compiler and macro processor etc.
2. To be familiar with the major components and describe the architecture of the UNIX operating system.
3. To be familiar with Basic UNIX Shell programming concepts (variables, expressions etc).
4. To be familiar with files and directories operations.
5. To be familiar with use of the vi text editor to create and modify files.
6. To be familiar with I/O redirection, pipes, quoting, and filename expansion mechanisms.

LEARNING OUTCOMES:

1. Able to describe how compiler and linker can put together in a program.
2. Describe how computer and operating system executes and switches programs.
3. Able to write programs that handle several processes and/or threads that communicate with signals.
4. Describe how computer and operating system handles the memory.
5. Able to create shell programs.

MODULE CONTENT:

Unit-I: Evolution of Components Systems Programming Assemblers, loaders, linkers, macros, compilers; software tools, text editors, interpreters and program generators, debug monitors, programming environment. Compiler, Assembler and Loader: Compiler: brief overview of compilation process, Assembler: problem statement, single phase and two phase assembler, symbol table; Loader schemes, compile and go loader, general loader, absolute loader, subroutine linkage, reallocating loader, direct linkage loader, binders, linking loader, overlays.
Unit-II: Macros & Theoretical Concept of Unix Operating System Macro language and macro-processor, macro instructions, features of macro facility, macro instruction arguments, conditional macro expansion, macro calls within macros, macro instruction defining macros. Basic features of operating system; File structure, CPU scheduling; Memory management: swapping, demand paging; File system: block and fragments, i-nodes, directory structure.
Unit -III: Getting Started with Unix User names and groups, logging in; Format of Unix commands; Changing your password; Characters with special meaning; Unix documentation; Files and directories; Current directory, looking at the directory contents, absolute and relative pathnames, some Unix directories and files; Looking at the file contents; File permissions; basic operation on files; changing permission modes; Standard files: standard output, standard input, standard error; filters and pipelines; Processes; finding out about processes; Stopping background process.
Unit-IV: Text Manipulation Inspecting files; File statistics; Searching for patterns; Comparing files; Operating on files; Printing files; Rearranging files; Sorting files; Splitting files; Translating characters; AWK utility.
Unit-V: Shell Programming UNIX editor vi, programming in the Borne and C-Shell; Wild cards; Simple shell programs; Shell variables; Shell programming constructs; interactive shell scripts; Advanced features.
Unit-VI: System Administration Definition of system administration; Booting the system; Maintaining user accounts; File systems and special files; Backups and restoration; Role and functions of a system manager.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Systems Programming by Donovan, TMH. 2. The Unix programming environment by Brain Kernighen& Rob Pike, 1984, PHI & Rob Pike.
REFERENCE BOOKS	1. Advanced Unix programmer's Guide by Stephen Prato, BPB 2. Unix- Concept and applications by Sumitabha Das, 2002, T.M.H.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5	6
Class Test	x		x		x	
Quiz			x		x	x
Assignment	x	x		x		

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	2		4	5	3					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and

- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - III

Management and Professional Leadership

L	T	P
3	0	0

MODULE CODE	MGMT0101
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total SEVEN questions will be set. Question ONE will be compulsory and will cover all units. Remaining six questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to teach students how to design, write, and analyse the financial data of a firm or a company. It will also enable students to learn the complete accounting process.

1. To provide knowledge and understanding of the basics of management.
2. To develop an understanding of leadership and its styles.
3. To make them understand the role of planning, organizing and decision making to lead the organization.
4. To identity value of group involvement and team building.
5. To make them understand the role of communication to lead the organization.
6. To provide an understanding of role of motivation to lead in the organization.

LEARNING OUTCOMES

Following this course student will be able to:

1. Develop an understanding of the process of management in the organizations and to apply that process for effective utilization of resources.
2. Develop an understanding of role of leadership in the organizations.
3. Acquaint themselves to apply leadership styles and theories as it relates to management practices.
4. Identify value of motivation, emotional intelligence and stability in resolving organizational problems.
5. Develop an understanding of communication and its role to the organization.
6. Analyse group formations, work team and team building strategies of the organization.

MODULE CONTENT

Unit 1: Management–introduction Nature and functions of management, principles of management, levels of management, management as an art, management as science and profession, management process, managerial skills and roles; Evolution of Management Thoughts; Managerial competencies.
Unit II:: Basic concepts of Leadership Leadership: Functions of leaders, styles of leadership, leadership theories- Trait theory, Behavioral Theory.
Unit III: Planning, Organizing and Decision making Planning- process of planning, elements of planning; steps in Organizing, authority and responsibility, delegation, centralization vs. decentralization; decision making, rationality in decision making.
Unit IV:: Team Development Work team , nature of work teams, types of team, stages of team development, role of leadership in team development.
UNIT-V: Communication Communication: Communication process, importance of communication, communication channels, Roles and barriers to communication.
Unit VI: Motivation: Process and motivation models/approaches; relevance of motivation theories in Business.

RECOMMENDED BOOKS

TEXT BOOK	1. Fundamentals of Management: Robbins, S.P. and Decenzo, D.A Pearson Education Asia, New Delhi 2. Organizational Behaviour: F Luthan's, Tata McGraw Hill, New Delhi
REFERENCE	1. Organizational behaviour: S P Robbins, Prentice Hall of India, New Delhi 2. Essentials of management: Chhabra T.N. , Sun India publications

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for Theory.

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	05
2.	Sessional Test	2	15
3.	Group Discussion	4	05
4.	End Semester Exam	1	75

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5	6
Class Test	x			x		
Quiz			x			x
Assignment	x	x		x		x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes			1	4	6		5		2	3	

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,

- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – III

Aptitude – Part 1

L	T	P
2	0	0

MODULE CODE	VALU0119
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	50
END SEMESTER EXAM DURATION	2 hrs
LAST REVISION DATE	

INSTRUCTIONS: All questions are compulsory. Each question may have multiple options and will cover all units.

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to analytical and business skills in Aptitude and to enhance skills as mentioned below:

1. To prepare students to develop basic understanding in Aptitude.
2. To acquire knowledge on various analytical tools.
3. To understand syntax and semantics of Aptitude in business.

LEARNING OUTCOMES:

1. Able to understand the basic fundamentals & concepts of Aptitude.
2. Exposure to various analytical tools used in business.
3. Ability to use different mathematical techniques.
4. Able to understand the importance of Aptitude.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENTS

UNIT 1:- FUNDAMENTALS & USES OF ARITHMETIC-

Percentage, Ratio & Proportion: Percentage Meaning and Computations of Percentages, Definition of Ratio, Continued Ratio, Inverse Ratio, Definition of Proportion, Continued Proportion, Direct Proportion.

Profit And Loss : Terms and Formulae, Trade discount, Cash discount, Problems involving cost price, Selling Price, Trade discount and Cash Discount, Problems involving cost price, selling price, trade discount and cash discount.

Interest: Simple Interest, Compound Interest, Equated Monthly Instalments (EMI), Word Problems.

Sequence and Series: AP, GP (simple word problems only).

Average: Definition, meaning and simple problems on average.

UNIT 2: DATA ANALYSIS-

To understand different types of data format.

To acquire skills for analyzing different data format.

To understand scope and limitations of data uses in business.

Bar graph: Reading and interpretation of bar graph in vertical forms, reading scales, creating bar graph from given data, solving problems using information presented in bar graph.

Table: Creating table from given data, Reading and interpreting table, solving problems using information presented in table.

Line graph: Reading and interpreting line graph, solving problems using information presented in line graph.

Shares and Dividends: Concept of shares, stock exchange, Face value, Market value, Dividend, Equity shares, Preferential shares, Bonus share with examples.

Matrices and Determinants : Definition of Matrix ,Types of Matrix, Algebra of Matrix (Addition and Multiplication), Determinant, Adjoint of Matrix, Inverse of Matrix via Adjoint matrix, Solving simultaneous equations(Order3).

UNIT 3: ESSENTIALS OF LANGUAGE AND COMMUNICATION-

Speaking Skills: Formal and Informal Conversation, Conversation in the work place, Interviews, Public Speech, Lectures.

Listening Skills: Comprehending, Retaining, Responding, Tactics, Barriers to Listening, Overcoming listening barriers, Misconception about listening.

Reading Skills: Acquiring Reading, Reading Development, Methods of Teaching, Reading difficulties.

Writing skills: Note-making, CV's, Report writing, Copy Writing, Agenda, Minutes, Circular, Essay writing on any current issues, Paragraph, Essay Writing, Writing Research Papers, Dissertation.

UNIT4:
Assignment 1,
Assignment2,
Project

RECOMMENDED BOOKS:

TEXT BOOKS	1. R S Agarwal quantitative aptitude book 2. Abhijit Guha quantitative aptitude book 3. Minippally, Methukutty. M. 2001. Business Communication Strategies. 11th Reprint. Tata McGraw – Hill. New Delhi.
REFERENCE BOOKS	1. Aptitude books by Arihant publication 2. Swets, Paul. W. 1983. The Art of Talking So That People Will Listen: Getting Through to Family, Friends and Business Associates. Prentice Hall Press. New York.

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes										1,2	3,4

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	1	10
2.	Sessional Test	2	15
3.	End Semester Written Exam	1	50
4.	End Semester Oral Exam	1	25

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x	x	
Quiz	x	x	x	
Assignment			x	x

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – III

Professional Communication - I

SUBJECT CODE	VALU0123
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	50
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS : The question paper will consist of ten questions distributed over three sections A, B and C Section A comprise of one question carrying very short answer type questions and is compulsory, Section B comprise of two short answer type questions and Section C comprises of five long answer type questions These sections will also have internal choices of questions.

OBJECTIVE

1. To learn the fundamentals of different structures of English grammar
2. To calculate the structures and patterns of English Language and to use them correctly in speaking
3. To learn about the creative literature writings
4. To improve speaking and writing
5. To inculcate professional skills of presenting and working
6. To understand different types of literatures and background with critical insights
7. To make students aware of the detailed exposition of English Language

LEARNING OUTCOMES

Following this course students will be able to :-

1. Identify the different structures and patterns of English Language
2. To make students a good Public Speaker
3. To make students aware about different literature of the World
4. To make students speak well in Professional English Speaking and writing highly professional in particular
5. Know the process of Communication and its ethics
6. To make students write in professional manner

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT

UNIT : I GENERAL COMMUNICATION SKILLS

- Introduction to Communication
- Nature of Communication
- One-way versus two way Communication
- Characteristics of Communication and its objects
- Various stages of communication process
    - Downward/upward and Horizontal Communication
- Presentation Skills
- Introduction to the Novel
- Reading Comprehension and Group Discussion
- Tense-Formation
- Short Stories
    - Joothan by Prem Chand
    - Raja Rao (Kanthapura)
    - DH Lawrance (Sons and Lovers)

UNIT : II PATTERN AND STRUCTURE OF ENGLISH GRAMMAR AND EFFECTIVE SPEAKING

- Articles
- Quantifiers
- Usage of different comma's in writing
- Bio-data and resume writing
- Speech (Formation and public speaking)
- The Gift of Magi
- The lament, by Anton Chekov
- The Barber's trade union by Mulak Raj Anand
- Bertolt Brecht (The Good Woman of Setzuan)

UNIT : III LINGUISTICS AND PARALINGUISTIC FEATURES OF DELIVERY OF SPEECH

- What is Linguistics
- Passive Voice
- Adverbs
- Phrasal Verbs
- Modals
- Conjunctions
- Notice
- Reading Comprehension
- AS Byatt (Virgin in the Garden)
- Caustave Flaubert Madame Bovery
- Alice Walker (Color Purple)

UNIT : IV LINGUISTIC PATTERNS OF LANGUAGE AND COMMUNICATIONS

- Article Writing
- The formation of words
- Formation of abstract Nouns from Concrete Nouns
- Components of communication and their implementation

- Formation of verbs from Noun

LITERARY WORKS

a. Joe Orton :- What the Butler Saw
b. Leo Tolstoy :-Anakerenine
c. Ivan Turgenev :- Fathers and Son

UNIT : V PROFESSIONAL SPEAKING SKILLS-I

- Professional Speaking (PUBLIC SPEAKING ART)
- Complaint and Job/Sales Letters
- Noun and the number countable/uncountable/collective/abstract and material
- Syntax (Infinitive/General and different structures of Grammar
- Past/Present and Future (Tense formation)
- Literary works
  - Tess of the d'urbervillers by Thomas hardy
  - The old man and the sea by Ernest Hemingway
  - Deliverane by Prem Chand
  - Jane Austen (Emma)

UNIT : VI PROFESSIONAL SPEAKING SKILLS -II

- Derrida's views upon language
- Description of Tools of Communication
- One word Substitute
- Sentence Structure
- Verb Patterns and their usage

LITERARY WORKS

a. GB Shaw :- Arms and the man
b. JM Synge :- Playboy of the western world
c. Jeanette winterson :- Oranges are not the only fruit
d. SomerestMaugham :- Razor's edge

Recommends Books

TEXT BOOK	Essential of Communication by BR Sharma
Reference	Derrida (Semiotics and Sign Structure)

MAPPING OF COURSE OBJECTIVES AGAINST STUDENTS LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e
Mapping of Course Objectives with Students Learning Outcomes	1, 2, 5	1, 2	2, 3, 5	2, 3, 4, 5	6, 7

METHODS OF TEACHING AND STUDENT LEARNING

The subjects is delivered through lectures, on-line support, text book/course material reading and practical exercises Some videos will be shown to demonstrate certain concepts and research areas will be discussed Resources material is provided with the help of PDM Educational Directory Services (PEDS)

ASSESSMENT METHODOLOGIES

This subject will be evaluated for a total of 75 marks for theory

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1	Class Text	4	05
2	Sessional Text	2	15
3	Group Discussion	4	05
4	End Semester Exam	1	50

EVALUATION

At the end of Semester Subject teacher will submit an evaluation report The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved The review report contains the following

- Approved refinement decisions due for implementation
- Actions taken based on previous subject review
- Problems encountered in the subject delivery
- Report discussed and analyzed action taken as a result of this process and are communicated to the main stakeholders

SEMESTER – IV

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEN2111	E	PC	DATABASE MANAGEMENT SYSTEMS	3	0	0	3	25	75	100
CSEN2112	E	PC	DBMS LAB	0	0	2	1	25	25	50
CSEN2113	E	PC	OBJECT ORIENTED PROGRAMMING USING C++	3	1	0	3.5	50	100	150
CSEN2114	E	PC	OOPS using C++ LAB	0	0	2	1	25	25	50
CSEN2115	E	PC	PRINCIPLES OF OPERATING SYSTEM	3	0	0	3	25	75	100
CSEN2116	E	PC	OPERATING SYSTEM LAB	0	0	2	1	25	25	50
CSEN2117	E	PC	DESIGN AND ANALYSIS OF ALGORITHMS	3	1	0	3.5	50	100	150
CSIT2102	E	PC	OBJECT ORIENTED ANALYSIS AND DESIGN	3	1	0	3.5	50	100	150
CSIT2103	E	PC	OBJECT ORIENTED ANALYSIS AND DESIGN LAB	0	0	2	1	25	25	50
	E	PE	ELECTIVE- III	4	0	0	4	50	100	150
	E	PE	ELECTIVE-IV	4	0	0	4	50	100	150
TOTAL				**23**	**3**	**8**	**28.5**	**400**	**750**	**1150**

L = Lecture
T = Tutorial
P = Practical
C = Credit Point

ELECTIVE III

MODULE CODE	MODULE
CSEN2220	NATURAL LANGUAGE PROCESSING
CSEN2221	DIGITAL SIGNAL SPEECH PROCESING
CSEN2222	SOFT COMPUTING

ELECTIVE IV

MODULE CODE	MODULE
CSEN2223	FUZZY LOGIC
CSIT2204	NETWORK PROGRAMING & MANAGEMENT
CSEN2225	SYSTEM PROGRAMMING

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER –IV

Database Management Systems

L	T	P
3	0	0

MODULE CODE	CSEN2111
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

The aim of this subject is to provide keen knowledge of database and data protection by keeping data backup, recovery.

1. Understand the role of a database management system in an Organization, Understand basic database concepts, including the structure and operation of the relational data model.
2. Construct simple and moderately advanced database queries using Structured Query Language (SQL).
3. Understand the concept of a database transaction and related database facilities, including concurrency control, journaling, backup and recovery, and data object locking and protocols.
4. Describe and discuss selected advanced database topics, such as distributed database systems and the data warehouse.

LEARNING OUTCOMES

Following this course, students will be able to:

1. Analyse the basic concepts and architecture associated with DBMS.
2. Apply normalization steps in database design and removal of data anomalies.
3. Describe the characteristics of database transactions and how they affect database integrity and consistency.
4. Create, maintain and manipulate a relational database using SQL Learning the techniques of recovery and security in databases.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

Unit- I: Introduction to DBMS Overview of DBMS, views of data, data Models, Introduction to Database Languages. Advantages of DBMS over file processing systems, Responsibility of DBA. E-R Diagram and Keys: Introduction to Client/Server architecture, three levels architecture of Database Systems, E-R Diagram (Entity Relationship), mapping Constraints, Keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, Reduction of E-R diagram into tables.
Unit- II: Relational Model and Calculus Relational data Model and Language: Relational data model concepts, integrity constraints, entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, and tuple and domain calculus.
Unit- III: Introduction on SQL Characteristics of SQL, advantage of SQL. SQL data type and literals. Types of SQL commands. SQL operators and their procedure. Tables, views and indexes. Queries and sub queries. Aggregate functions. Insert, update and delete operations, Joins, Unions, Intersection, Minus, Cursors, Triggers, and Procedures in SQL/PL SQL.
Unit- IV: Data Base Design & Normalization Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependence, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.
Unit- V: Transaction Processing Concept& Concurrency Control Techniques Transaction system, Testing of serializability, serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling. Concurrency Control Techniques: Concurrency control, Locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi version schemes, Recovery with concurrent transaction.
Unit-VI: Distributed Database& File Organization Introduction to Distributed Data processing, parallel Databases, data mining & data warehousing. File Organization: Sequential Files, index sequential files, direct files, Hashing, B-trees Index files.

RECOMMENDED BOOKS:

TEXT BOOK	1. Database System Concepts by A. Silberschatz, H.F. Korth and S. Sudarshan, 3rd edition, 1997, McGraw-Hill, International Edition. 2. Introduction to Database Management system by Bipin Desai, 1991, Galgotia Pub
REFERENCE	1. Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3rd edition, 2000, Addision-Wesley, Low Priced Edition.

METHODS OF TEACHING AND STUDENT LEARNING:

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	5
2.	Sessional Test	2	15
3.	Group Discussion	4	5
4.	End Semester Exam	1	75

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Assessments	1	2	3	4
Class Test	x	x		
Quiz	x		x	
Assignment			x	x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	K
Course Learning Outcomes			2,3	1	2	4					

EVALUATION:

At the end of semester, course faculty will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and

- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Database Management System Lab

L	T	P
0	0	2

MODULE CODE	CSEN2112
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

1. Understand the role of a database management system in an Organization.
2. Understand basic database concepts, including the structure and operation of the relational data model.
3. Construct simple and moderately advanced database queries using Structured Query Language (SQL).
4. Understand and successfully apply logical database design principles, including E-R diagrams and database normalization.
5. Understand the concept of a database transaction and related database facilities.

LEARNING OUTCOMES:

1. Analyze the basic concepts and architecture associated with DBMS.
2. Apply normalization steps in database design and removal of data anomalies.
3. Describe the characteristics of database transactions and how they affect database integrity and consistency.
4. Create, maintain and manipulate a relational database using SQL.
5. Learn the techniques of recovery and security in databases.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

1	To study about DBMS, RDBMS and ORDBMS.
2.	To study about SQL (Structured Query language).
3.	Write SQL commands to create database.
4.	Write SQL commands to add data constraints.
5.	Write SQL query to implement SELECT command with different clauses.
6.	Write SQL commands to implement SINGLE ROW functions (character, numeric).
7.	Write SQL commands to implement GROUP functions (avg, count, max, min, Sum).
8.	Write SQL commands to implement various type of SET OPERATORS (Union, Intersect, Minus).
9.	Write SQL commands to implement various type of Integrity Constraints.
10.	Write commands to implement various SQL operators.
11.	Write SQL commands to implement Various type of JOINS.
12.	Write SQL commands to create view and index.
Experiments based on advanced topics:	
13.	Write sub queries in SQL.
14.	Introduction to PL/SQL.

Note: At least 12 Experiments out of the list must be done in the semester.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	C	d	e	f	g	h	i	j	k
Course Learning Outcomes		3	4	4,5	1	2	2				

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Object Oriented Programming using C++

L	T	P
3	1	0

MODULE CODE	CSEN2113
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

1. To get a clear understanding of object-oriented concepts.
2. To understand object oriented programming through C++.
3. Demonstrate adeptness of object oriented programming in developing solutions to problems demonstrating usage of data abstraction, encapsulation, and inheritance.
4. Demonstrate ability to implement one or more patterns involving realization of an abstract interface and utilization of polymorphism in the solution of problems which can take advantage of dynamic dispatching.

LEARNING OUTCOMES:

1. Gain the basic knowledge on Object Oriented concepts.
2. Ability to develop applications using Object Oriented Programming Concepts.
3. Ability to implement features of object oriented programming to solve real world problems.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

Unit-I: Introduction C++ Standard Library, Basics of a Typical C++ Environment, Pre-processors Directives, Illustrative Simple C++ Programs. Basic concepts of Object Oriented Programming. Introduction, Structure Definitions, Accessing Members of Structures, Class Scope and Accessing Class Members, Separating Interface from Implementation, Classes: Const(Constant) Object and Const Member Functions, Object as Member of Classes, Access Modifiers: Controlling access to a class, method, or variable (public, protected, private, package), Other Modifiers.
Unit-II: Constructors and Destructors Declaration and Definition, Characteristics of Constructors, Types of Constructors, Using Default Arguments with Constructors, Using Destructors. Friend Function and Friend Classes, Using This Pointer, Dynamic Memory Allocation with New and Delete, Static Class Members.
Unit-III: Overloading Function Overloading, Operator Overloading, Restrictions on Operators Overloading, Operator Functions as Class Members vs. as Friend Functions, Overloading Unary Operators, Overloading Binary Operators, Overloading vs overriding. Stream Input/output Classes and Objects, Stream Output, Stream Input, Unformatted I/O (with read and write), Stream Manipulators, Stream Format States, Stream Error States.
Unit-IV: Inheritance Introduction to Inheritance, Base Classes and Derived Classes, Protected Members, Casting Base- Class Pointers to Derived- Class Pointers, Using Member Functions, Overriding Base – Class Members in a Derived Class, Public, Protected and Private Inheritance, Using Constructors and Destructors in derived Classes, Implicit Derived –Class Object To Base-Class Object Conversion, Composition Vs. Inheritance.
Unit-V: Virtual Functions and Exception Handling Introduction to Virtual Functions, Abstract Base Classes and Concrete Classes, Polymorphism, New Classes and Dynamic Binding, Virtual Destructors. Introduction to Exception Handling, Basics of C++ Exception Handling: Try Throw, Catch, Throwing an Exception, Catching an Exception, Rethrowing an Exception, Exception specifications, Processing Unexpected Exceptions, Stack Unwinding, Constructors, Destructors and Exception Handling, Exceptions and Inheritance.
Unit-VI: File Handling Files and Streams, Creating a Sequential Access File, Reading Data From A Sequential Access File, Updating Sequential Access Files, Random Access Files, Creating A Random Access File, Writing Data Randomly To a Random Access File, Reading Data Sequentially from a Random Access File. Function Templates, Overloading Template Functions, Class Template, Class Templates and Non-Type Parameters, Templates and Inheritance, Templates and Friends, Templates and Static Members.

RECOMMENDED BOOKS:

TEXT BOOKS	1. C++ How to Program by H M Deitel and P J Deitel, 1998, Prentice Hall 2. Object Oriented Programming in Turbo C++ by Robert Lafore1994, The WAITE Group Press. 3. Programming with C++ By D Ravichandran, 2003, T.M.H.
REFERENCE	1. Object oriented Programming with C++ by E Balagurusamy, 2001, Tata McGraw-Hill 2. Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley, 3. The Complete Reference in C++ By Herbert Schildt, 2002, TMH.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3
Class Test	x		x
Quiz	x	x	x
Assignment	x		

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	3	1	2,3	2	1	2,3					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

OOPS using C++ Lab

L	T	P
0	0	2

MODULE CODE	CSEN2114
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES

1. To strengthen their problem solving ability by applying the characteristics of an object oriented approach.
2. To introduce object oriented concepts in C++.
3. To learn the characteristics of an object-oriented programming language: data abstraction and information hiding, inheritance, and dynamic binding of the messages to the methods.

LEARNING OUTCOMES

Following this course, students will be able to:

1. Explain what constitutes an object-oriented approach to programming and identify potential benefits of object-oriented programming over other approaches.
2. Apply C++ features to design and implement program using Object Oriented Programming Concepts.
3. Ability to implement features of object oriented programming to solve real world problems.
4. Understand the concepts of file handling and streams. In addition they must know how to apply generic programming through templates to make code reusable.
5. Discover errors in a program and describe techniques to resolve them.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

1.	Given that an EMPLOYEE class contains following members: data members: Employee number, Employee name, Basic, DA, IT, Net Salary and print data members. Write a C++ program to read the data of N employee and compute Net salary of each employee (DA=52% of Basic and Income Tax (IT) =30% of the gross salary).
2.	Write a C++ program to implement single, multiple, multilevel, hierarchical, hybrid inheritance.
3.	Write a C++ program to invoke Constructor and Destructor.
4.	Write a C++ program to overload unary operator, binary operator.
5.	Write a program to design a class having static member function.
6.	Write a program to find maximum out of two numbers using friend function.
7.	Write a C++ program to use pointer for both base and derived classes and call the member function. Use Virtual keyword.
8.	Write a C++ program to implement stream manipulators.
9.	Write a C++ program to implement function template.
10.	Write a C++ program to implement class template.
11.	Write a C++ program to implement the exception handling with rethrowing an exception.
12.	Write a C++ program to perform read/write binary input/output operation on a file.
Experiments based on advanced topics:	
13.	Write a C++ program to make scientific calculator.
14.	Write a C++ program to make paint brush.

Note: At least 12 Experiments out of the list must be done in the semester.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1	2,3	2,3	1	5	3				

EVALUATION

At the end of semester, course faculty will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Principles of Operating System

L	T	P
3	0	0

MODULE CODE	CSEN2115
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to teach students about different aspects of operating system.

1. To make students familiar with the basic concepts of Operating System & its types.
2. To learn different concepts of process and CPU Scheduling Algorithms.
3. To make students gain in-depth understanding of memory allocation schemes and to understand the concept of Virtual Memory using Demand Paging.
4. To learn File System this includes file and directory access methods.
5. To make students familiar with the Process Synchronization & Deadlocks.
6. To understand I/O System, UNIX and Windows NT architecture.

LEARNING OUTCOMES:

Following this course, students will be able to:

1. Understand design issues associated with operating systems and comparison of different operating systems.
2. Understand concepts of memory management including virtual memory.
3. Handle issues related to file system, disk scheduling, management and associated Algorithms.
4. Understand protection and security mechanisms & operating system types including Unix and Windows NT.
5. Gain knowledge about various process management concepts including scheduling, synchronization and deadlocks.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

Unit-I: Introduction Introduction to Operating System Concepts (including multitasking, multiprogramming, multi user, multithreading etc.), Types of Operating Systems: Batch operating system, Time-sharing systems, Distributed OS, Network OS, Real Time OS; Various Operating system services, architecture, System programs and calls.
Unit–II: Process Management Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms: First Come First Serve (FCFS), Shortest Job-First (SJF), Priority Scheduling, Round Robin (RR), Multilevel Queue Scheduling.
Unit–III: Memory Management Logical & Physical Address Space, swapping, contiguous memory allocation, non-contiguous memory allocation paging and segmentation techniques, segmentation with paging; Virtual Memory Management: Demand Paging & Page-Replacement algorithms; Demand Segmentation.
Unit–IV: File System Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms; Introduction to distributed file system.
Unit–V: Process Synchronization Classical Synchronization problems: Readers/Writers Problem, Producer and Consumer problem, Critical Section Problem, Semaphores.
Unit-VI: Deadlocks Critical Section Problems, semaphores; methods for handling deadlocks, deadlock prevention, avoidance & detection, deadlock recovery.

RECOMMENDED BOOKS:

TEXT BOOK	Operating System Concepts by Silberchatz et al, 5th edition, 1998, Addison-Wesley
REFERENCE	1. Operating System By Peterson , 1985, AW. 2. Operating System ByMilankovic, 1990, TMH. 3. Operating System Incorporating With Unix & Windows By Colin Ritche, 1974, TMH. 4. Operating Systems By Deitel, 1990, AWL. 5. Operating Systems – Advanced Concepts By Mukesh Singhal, N.G. Shivaratri, 2003, T.M.H.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	5
2.	Sessional Test	2	15
3.	Group Discussion	4	5
4.	End Semester Exam	1	75

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x	x			x
Quiz	x		x		x
Assignment			x	x	

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		2	1	3	4	5		3		1	

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;

- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Operating System Lab

L	T	P
0	0	2

MODULE CODE	CSEN2116
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES

1. To learn the fundamentals of Operating Systems Lab.
2. To learn commands of WINDOWS & Linux.
3. To learn various commands in UNIX.
4. To learn vi editor and its different modes.
5. To implement programs in shell.

LEARNING OUTCOMES

Following this course students will be able to:

1. Explain the objectives and functions of operating systems Lab.
2. Understand various commands of Operating System.
3. Understand difference between various types of OS commands.
4. Understand vi editor.
5. Make program using shell programming.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

1.	Study of Windows 2000 operating system.
2.	Administration of Windows 2000 operating system (including DNS, LDAP, Directory services).
3.	Study of LINUX operating system.
4.	Introduction to various commands in Unix.
5.	Study of directory related commands in Unix.
6.	Study of commands to perform operations on file in Unix.
7.	Study of process related and other commands in Unix.
8.	Study about vi editor and its different modes.
9.	Write a program in vi editor to find greatest of three number.
10.	Write a program in vi editor to find whether the given number is even or odd.
11.	Write a program in vi editor to find factorial of a given number.
12.	Write a program in vi editor to find number is prime or not.
Experiments based on advanced topics:	
13.	Write a program in vi editor to find string is palindrome or not.
14.	Write a program in vi editor to generate Fibonacci series.

Note: At least 12 Experiments out of the list must be done in the semester.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	1	3,4	5	1	2	1	5		2	

EVALUATION

At the end of semester, course faculty will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Design and Analysis of Algorithms

L	T	P
3	1	0

MODULE CODE	CSEN2117
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVE:

The aim of this subject is to understand and analyse efficient algorithms for various applications. Obtaining efficient algorithms is very important in modern computer engineering as the world wants applications to be time and space efficient.

1. Learn principles of algorithm and design.
2. Understand the algorithm analysis and estimate their worst-case and average-case behavior.
3. Get familiar with fundamental data structures and with the manner in which these data structures can best be implemented.
4. Learn how to apply their theoretical knowledge in practice (via the practical component of the course).

LEARNING OUTCOMES

After learning the course the students should be able to:

1. Analyze the asymptotic performance of algorithms.
2. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
3. Find optimal solution by applying various methods.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT-I: Introduction to Algorithms Definition, algorithm vs program, complexity of algorithms, asymptotic notation. Divide and Conquer: General method, binary search, merge sort, quick sort, selection sort, Strassen's matrix multiplication algorithms and analysis of algorithms for these problems.
UNIT-II: Greedy Method General method, knapsack problem, job sequencing with deadlines, minimum spanning trees, single source paths and analysis of these problems.
UNIT-III: Dynamic Programming General method, matrix chain multiplication, longest common subsequence, O/I knapsack, the traveling salesperson problem.
UNIT-IV: Back Tracking General method, 8 queen's problem, graph coloring, Hamiltonian cycles, analysis of these problems.
UNIT-V: Branch and Bound Method, O/I knapsack and traveling salesperson problem, efficiency considerations. Techniques for algebraic problems, some lower bounds on parallel computations.
UNIT-VI: Graph Searching and traversal Overview, traversal methods (DFS, BFS), Trees: Binary search tree-traversal, insertion, deletion, B-tree, B^{+}tressNP Hard and NP Complete Problems: Basic concepts, Cook's theorem, NP hard graph and NP scheduling problems some simplified NP hard problems.

RECOMMENDED BOOKS:

TEXT BOOK	1. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, PHI. 2. Fundamental of Computer algorithms, Ellis Horowitz and Sartaj Sahni,1978, Galgotia Publ.
REFERENCE	1. The Design and Analysis of Computer Algorithm, Aho A.V. Hopcroft J.E., 1974, Addison Wesley. 2. Algorithms-The Construction, Proof and Analysis of Programs, Berlion, P.Bizard, P., 1986. Johan Wiley & Sons. 3. Writing Efficient Programs, Bentley, J.L., PHI.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3
Class Test		x	x
Quiz	x	x	
Assignment	x		x

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1			3	2	1		3			

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Object Oriented Analysis & Design

L	T	P
3	0	0

MODULE CODE	CSIT2102
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to focus on the object-oriented approach for analysis and design where students will study Object-oriented modelling (OOM) techniques supported by the Unified Modelling Language framework and learn its application throughout the entire software development life cycle.

1. To understand the formal object-oriented analysis and design processes.
2. To make the students familiar with the development an appreciation for the risks inherent to large-scale software development.
3. To learn techniques, processes, and artifacts that can mitigate these risks.
4. To determine processes and OOAD techniques that should be applied to a given project.
5. To understand the application of OOAD practices from a software project management perspective.

LEARNING OUTCOMES:

Following this course students will be able to:

1. Use an object-oriented method for analysis and design
2. Analyse information systems in real-world settings.
3. Use a variety of approaches of systems development and evaluation.
4. Achieve the objective and expected results of a systems development process
5. Know different types of prototyping and UML for notation.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT I- Introduction Object Basics, Object oriented philosophy, objects, classes, attributes, object behavior and methods, encapsulation and information hiding, class hierarchy, polymorphism, object relationships and associations, aggregations and object containment, case study, object identity, persistence
UNIT II - Object Oriented Systems Development Life Cycle Software development process, Building high quality software, Use- case driven approach, Reusability.
UNIT III- Object Oriented Methodologies Rumbaugh et al.'s object modeling technique, Booch methodology, Jacobson et al methodologies, patterns, frameworks, the unified approach. Unified modeling language: Static and dynamic models, UML diagrams, UML class diagrams, use-case diagrams, UML dynamic modeling, packages, UML extensibility and UML meta model.
UNIT IV- Object Oriented Analysis Process Business object analysis, use-case driven object oriented analysis, business process modeling, use-case model, developing effective documentation, case study. Classification: Classification theory, noun phrase approach, common class patterns approach, use-case driven approach, classes, responsibilities, and collaborators, naming classes.
UNIT V - Identifying Object Relationships, Attributes And Methods Association, super-subclass relationships, a-part of relationships, case study, class responsibility, defining attributes for vianet bank objects, object responsibility, defining methods for vianet bank objects Design process and design axioms: Corollaries, design patterns.
UNIT VI - Designing Classes UML object constraint languages, designing classes, class visibility, refining attributes for the vianet bank objects, designing methods and protocols, designing methods for the vianet bank objects, packages and managing classes. Designing access layer, case study. Designing view layer, macro level process.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Object Oriented Systems Development using the Unified Modeling Language by Ali Bahrami, McGraw Hill, Reprint 2009. 2. The Unified Modeling Language User Guide by Booch, Rumbaugh, Jacobson, Addison Wesley, 1999.
REFERENCE BOOKS	1. Visual Modeling with Rational Rose and UML; Terry Quatrani, Addison Wesley, 1998. 2. Fowler, M., Scott, K., UML Distilled: Applying the Standard Object Modeling Language, Addison-Wesley, 2007.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x		x
Quiz			x		x
Assignment	x	x		x	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	4	3	5	4	2					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Object Oriented Analysis & Design Lab

L	T	P
0	0	2

MODULE CODE	CSIT2103
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES:

The aim of this subject is to develop understanding on different aspects related to components of object oriented analysis and design to enhance skills of project design as mentioned below:

1. To teach the Object oriented analysis and design.
2. To understand and analyse User Interface, Domain objects, and Technical services
3. To make students familiar with the interaction between objects using UML Interaction diagrams.
4. To teach the implementation of various partial layered, logical architecture diagram with UML package diagram notation.
5. To make students familiar with draw the State Chart diagram.

LEARNING OUTCOMES:

Following this course, students will be able:

1. To develop a problem statement.
2. To develop an IEEE standard SRS document. Also develop risk management and project plan.
3. To identify Use Cases and develop the Use Case model.
4. To identify the business activities and develop an UML Activity diagram.
5. To identity the conceptual classes and develop a domain model with UML Class diagram.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

1.	Introduction to UML Diagrams.
2.	SRS for Recruitment System.
3.	UML diagrams for ATM System.
4.	UML diagrams for Expert System.
5.	UML diagrams for Library Management System.
6.	UML diagrams for Course Registration System.
7.	UML diagrams for Online Ticket Reservation System.
8.	UML diagrams for Payroll System.
9.	UML diagrams for Quiz System.
10.	UML diagrams for Real Time Scheduler.
11.	UML diagrams for Remote Procedure Call.
12.	UML diagrams for Stock Maintanance System.
Experiments based on advanced topics:	
13.	E-book management system
14.	BPO Management System

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	3	4	2	4,5						

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER –IV

Natural Language Processing

L	T	P
4	0	0

MODULE CODE	CSEN2220
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to provide a sound understanding of Natural Language Processing and challenges involved in that area.

1. To provide the student with knowledge of various levels of analysis involved in NLP.
2. To understand language modeling.
3. To gain knowledge in automated natural language generation and machine translation.

LEARNING OUTCOMES

After successful completion of this course, students should be able to:

1. Outline Natural Language Processing tasks in syntax, semantics, and pragmatics.
2. Explain Morphology and Part of Speech Tagging.
3. Show how syntax parsing techniques can be used.
4. Explain the use of semantic analysis methods.
5. Relate a few applications of NLP.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT- I : Overview and Language Modeling Overview: Origins and challenges of NLP-Language and Grammar-Processing Indian Languages-NLP Applications-Information Retrieval. Language Modeling: Introduction-Various Grammar-based Language Models-Statistical Language Model
UNIT- II :Word Level Analysis and Syntactic Analysis Word Level Analysis: Introduction- Regular Expressions-Finite-State Automata-Morphological Parsing-Spelling Error Detection and correction-Words and Word classes-Part-of Speech Tagging. Syntactic Analysis: Introduction-Context-free Grammar-Constituency Parsing-Probabilistic Parsing
UNIT- III :Semantic Analysis and Discourse Processing Semantic Analysis: Introduction- Meaning Representation-Lexical Semantics Ambiguity-Word Sense Disambiguation. Discourse Processing: Introduction- cohesion-Reference Resolution Discourse Coherence and Structure
UNIT-IV: Natural Language Generation and Machine Translation Natural Language Generation: Introduction-Architecture of NLG Systems Generation Tasks and Representations-Application of NLG. Machine Translation: Introduction-Problems in Machine Translation Characteristics of Indian Languages- Machine Translation Approaches-Translation involving Indian Languages
UNIT –V: Information Retrieval Introduction-Design features of Information Retrieval Systems-Classical, Non-classical, Alternative Models of Information Retrieval - Evaluation LEXICAL RESOURCES: Introduction-WordNet-FrameNet-Stemmers-POS Tagger Research Corpora
UNIT- VI: Case Study Generation - Strategies for generation - Planning English referring expressions -KING, a Natural language generation systems. Typical systems - ELIZA - Baseball - GLJS - PARRY - LADDER - SOPGIE & POET current trends in NLP.

RECOMMENDED BOOKS:

TEXT BOOK	1. Natural Language Processing and Information Retrieval by Tanveer Siddiqui, U.S. Tiwary, Oxford University Press, 2008.
REFERENCE	1. Speech and Language Processing: An introduction to Natural Language Processing, Computational Linguistics and Speech Recognition by Daniel Jurafsky and James H Martin, Prentice Hall, 2nd Edition, 2008. 2. Natural Language Understanding by James Allen, Bejamin/cummings, 2nd edition, 1995.

METHODS OF TEACHING AND STUDENT LEARNING:

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Assessments	1	2	3	4	5
Class Test	x	x		x	x
Quiz	x		x		
Assignment	x	x		x	

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	2,5	3	2,3	1	5	1	3	1		5

EVALUATION:

At the end of semester, course faculty will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and

- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Digital Signal Speech Processing

L	T	P
4	0	0

MODULE CODE	CSEN2221
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

1. To provide adequate knowledge about various signals and filter used in signal and speech processing.
2. To cater the knowledge of digital signal speech processing for controlling real time systems.
3. To learn about the different algorithms used in speech processing.
4. To learn about the latest applications like speech, image, seismic, medical and other areas.

LEARNING OUTCOMES

Following this course, students will be able to:

1. Understand the basic fundamental of digital signal speech processing.
2. Design IIR and FIR filters.
3. Understand algorithms used in digital signal speech processing.
4. Innovate new ideas and applications used in research.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT-I: Introduction Digital signals and their properties, review of human speech and acoustic theory, nature of sound, harmonics, resonance measurement, virtual display, music theory, pitch, duration, intervals, rhythm, human speech production, the vocal tract, the Larynx, the source filter.
UNIT-II: Signal Processing Review of filter design. Signal processing-the phasor mode, fourier transfer, DFT, FFT. The hardware use of FIR & IIR filters linear phase FIR filters, Fundamental of Digital Filters, FIR system, IIR Systems, methods of FIR and IIR filter design.
UNIT-III: Speech Processing The Fundamentals of Digital Speech Processing, Review of Discrete-Time Signal & Systems, the Z-transform, model of speech modulation, short time spectral analysis/transform, channel vocodor, homomorphic speech processing MMSE Criterion.
UNIT-IV: Algorithm LMS algorithms, recursive least square algorithms for FIR filters and lattice ladder, elements of speech synthesis-speech recognition-speech in the computer-human interface
UNIT-V: Digital Representation of speech Waveform Sampling speech signals, statistical model, Instantaneous quantization, Instantaneous, companding, quantization for optimum SNR, Adaptive quantization, Feed-forward Feedback adaptions.
UNIT-VI: Applications Applications of FIR & IIR filters in speech, image, seismic, medical and other areas, Applications of speech and image processing.

RECOMMENDED BOOKS:

TEXT BOOK	1. Digital Signal Processing - by Proakis & Manolakis
REFERENCE	1. Speech and Audio Processing for multimedia PC's - by Iain Murray. 2. An Introduction with MATLAB and Applications-by Zahir M. Hussain, Amin Z. Sadik Peter O'Shea.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x		
Quiz		x		x	x
Assignment	x			x	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2	3	3,5	4	2	2,3	2,4	5			

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Soft Computing

L	T	P
4	0	0

MODULE CODE	CSEN2222
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

The aim of this subject is to teach student's concept Artificial Neural Networks, how it is related to biological neural networks and how it is implemented and to understand Fuzzy logic's concepts.

1. To familiarize with soft computing concepts.
2. To introduce the ideas of neural networks, fuzzy logic and use of heuristics based on human experience.
3. To introduce the concepts of Genetic algorithm and its applications to soft computing using some applications.

LEARNING OUTCOMES

Following this course, students will be able to:

1. Apply various Soft Computing frame works.
2. Design various neural networks.
3. Understand the use of Fuzzy Logic.
4. Apply genetic programming.
5. Understand hybrid soft computing.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

Unit I : Artificial Neural Network Introduction , Fundamental concept, Evolution of Neural Networks, Basic Models of Artificial Neural Networks, Important Terminologies of ANNs, McCulloch, Pitts Neuron, Linear Separability, Hebb Network. Supervised Learning Network: Perceptron Networks, Adaline, Multiple Adaptive Linear Neurons, Back Propagation Network.
UNIT II: Associative Memory Associative Memory Networks: Training Algorithms for Pattern Association, Auto-associative Memory Network, Hetero-associative Memory Network, Bidirectional Associative Memory, Hopfield Networks, Iterative Auto-associative Memory Networks.
UNIT III: Unsupervised Learning Networks: Fixed weight Competitive Nets, Kohonen, Self-organizing Feature Maps, Learning Vector Quantization, Adaptive Resonance Theory Networks.
UNIT IV: Fuzzy Set Theory Introduction to Classical Sets and Fuzzy sets, Classical Relations and Fuzzy Relations, Tolerance and Equivalence Relations, Membership Functions: Fuzzification, Methods of Membership Value Assignments, Defuzzification, Lambda, Cuts for Fuzzy sets and Fuzzy Relations.
UNIT V: Fuzzy Arithmetic and Fuzzy Measures Fuzzy Arithmetic and Fuzzy Measures: Fuzzy Rule Base and Approximate Reasoning: Truth values and Tables in Fuzzy logic, Fuzzy Propositions, Fuzzy Reasoning, Fuzzy Inference Systems (FIS), Fuzzy Logic Control Systems.
UNIT VI: Hybrid Fuzzy Soft Computing based Hybrid Fuzzy Controllers, Soft Computing based Rocket Engine Control.

RECOMMENDED BOOKS:

TEXT BOOK	1. Principles of Soft Computing, by S.N. Sivanandan and S.N. Deepa, Wiley India, 2007. ISBN: 10: 81,265,1075,7.
REFERENCE	1. Neural Networks, Fuzzy Logic and Genetic Algorithms by S. Rajasekaran and G.A.V.Pai, PHI, 2003. 2. Fuzzy Logic with Engineering Applications by Timothy J.Ross, , McGraw Hill, 1997. 3. Neuro, Fuzzy and Soft Computing by J.S.R. Jang, C.T. Sun and E.Mizutani, PHI, 2004, Pearson Education.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x		x
Quiz		x	x		
Assignment	x		x	x	

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	A	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		2	1	3	4	5		3		1	

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Fuzzy Logic

L	T	P
4	0	0

MODULE CODE	CSEN2223
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

1. To cater the knowledge of Fuzzy Logic Control and use these for controlling real time systems.
2. To provide adequate knowledge of application of fuzzy logic control to real time systems.
3. To provide comprehensive knowledge of fuzzy logic control
4. To learn about the adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.
5. To learn about the concept of fuzziness involved in various systems.
6. To provide adequate knowledge about fuzzy set theory.

LEARNING OUTCOMES

Following this course, students will be able to:

1. Understanding principles of fuzzy logic fundamentals.
2. Design the required and related systems.
3. Implement various fuzzy operations.
4. Attempt to generate new ideas and innovations in fuzzy logic and fuzzy system.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT-I: Fuzzy Sets and Uncertainty Uncertainty and information, fuzzy sets and membership functions, chance verses fuzziness, properties of fuzzy sets, fuzzy set operations.
UNIT-II: Fuzzy Relations Cardinality, operations, properties, fuzzy cartesian product and composition, fuzzy tolerance and equivalence relations, forms of composition operation.
UNIT-III: Fuzzification and Defuzzification Fuzzification and Defuzzification: Various forms of membership functions, fuzzification, defuzzification to crisp sets and scalars.
UNIT-IV: Fuzzy Logic and Fuzzy Systems Introduction to fuzzy systems, classic and fuzzy logic, approximate reasoning, Natural language, linguistic hedges, fuzzy rule based systems, graphical technique of inference.
UNIT-V: Development of membership functions Membership functions, membership value assignments, intuition, inference, rank ordering, neural networks, genetic algorithms, inductive reasoning..
UNIT-VI: Fuzzy Arithmetic and Extension Principle Fuzzy arithmetic and extension principle, functions of fuzzy sets, extension principle, fuzzy mapping, interval analysis, vertex method and DSW algorithm.

RECOMMENDED BOOKS:

TEXT BOOK	1. Fuzzy Logic with Engineering Applications by Ross, T. J., Wiley India Pvt. Ltd., 3rd Ed.
REFERENCE	1. Fuzzy Set theory and its application by Zimmerman, H. J., Springer India Pvt. Ltd., 4th Ed. 2. Fuzzy Set and Fuzzy Logic: Theory and Applications by Klir, G. and Yuan, B., Prentice Hall of India Pvt. Ltd. 3. Fuzzy Sets, Uncertainty and Information by Klir, G. and Folger, T., Prentice Hall of India Pvt. Ltd.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x		
Quiz	x		x	
Assignment	x		x	x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2	2,3	4	2	4	2,3	2				

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

Network Programming and Management

L	T	P
4	0	0

MODULE CODE	CSIT2204
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The course provides practical foundation level training that enables immediate and effective participation in Network Programming. To develop in Depth Knowledge and understanding of the Network Programming domain.

1. To learn Sockets Programming: TCP Programming (TELNET, HTTP).
2. To apply UDP Sockets: TFTP, DNS.
3. To understand Web Programming: HTTP, CGI, Cookies, JavaScript, HTML, XML.
4. To understand Network Security: Secure Sockets (SSL), TLS, SSH, HTTPS.
5. To implement Client/Server Programming, 4-tier architecture.
6. To understand Remote Method Invocation (RMI).

LEARNING OUTCOMES:

Upon completion of this course student will be able to:

1. Analyse the requirements of a networked programming environment and identify the issues to be solved;
2. Create conceptual solutions to those issues and implement a programming solution;
3. Apply understand the key protocols that support the Internet.
4. To understand the use of TCP/UDP sockets.
5. To apply advanced programming techniques such as Broadcasting, Multicasting.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT-I: ***Introduction to Network Programming***   OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.
UNIT-II: ***Elementary TCP Sockets***   Introduction to Socket Programming, Overview of TCP/IP Protocols, Introduction to Sockets , Socket address Structures, Byte ordering functions, address conversion functions, Elementary TCP Sockets, socket, connect, bind, listen, accept, read, write, close functions, Iterative Server, Concurrent Server.
UNIT-III: ***Application Development***   TCP Echo Server, TCP Echo Client, Posix Signal handling, Server with multiple clients, boundary conditions: Server process Crashes, Server host Crashes, Server Crashes and reboots, Server Shutdown, I/O multiplexing, I/O Models, select function, shutdown function, TCP echo Server (with multiplexing), poll function, TCP echo Client (with Multiplexing).
UNIT-IV: ***TCP client server***   Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.
UNIT-V: ***Elementary UDP sockets***   Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.
UNIT-VI: ***Simple Network Management***   SNMP network management concepts, SNMP management information, standard MIB's, SNMP v1 protocol and Practical issues, introduction to RMON, SNMPv2 and SNMPv3.

RECOMMENDED BOOKS:

TEXT BOOK	1. UNIX Network Programming by W. Richard Stevens, Vol. I, Sockets API, 2nd Edition. -, Pearson Edn. Asia.
REFERENCE	1. UNIX Network Programming by W. Richard Stevens, 1st Edition, PHI. 2. NIX Systems Programming using C++ by T CHAN, PHI. 3. Advanced UNIX Programming 2nd Edition M. J. ROCHKIND, Pearson Education. 4. Intrenet working with TCP/IP by Vol- III, (BSD Sockets Version), D.E. Comer second Edition, PHI, 2003.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x	x	x		x
Quiz				x	
Assignment	x	x	x		x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		3,4	1,5	1,5		5					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

System Programming

L	T	P
4	0	0

MODULE CODE	CSEN2225
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

1. To be familiar with System Software and Language Processors.
2. To be familiar with system programming tools like linker, loader, assembler, compiler and macro processor etc.
3. To be familiar with Basic concepts of Scanning and Parsing.
4. To be familiar with Interpreters and Debuggers.

LEARNING OUTCOMES

After completing this course the student must demonstrate the knowledge and ability to:

1. Independently understand basic concepts of system software.
2. Understand and explain the system programming tools.
3. Understand the design of Assembler and explain the types of assemblers.
4. Identify the various types of Parsing technique.
5. Understand the concepts of Compiler, Interpreters, and Debuggers.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT-I:Overview of System Software and Language Processors Overview of System Software: Introduction, Software, Software Hierarchy, Systems Programming, Machine Structure, Interfaces, Address Space, Computer Languages, Tools, Life Cycle of a Source Program, Different Views on the Meaning of a Program, System Software Development, Recent Trends in Software Development, Levels of System Software *Overview of Language Processors:* Programming Languages and Language Processors, Language Processing Activities, Program Execution, Fundamental of Language Processing, Symbol Tables Data Structures for Language Processing: Search Data structures, Allocation Data Structures.
UNIT-II: Assemblers, Macro and Macro Processors *Assemblers:* Elements of Assembly Language Programming, Design of the Assembler, Assembler Design Criteria, Types of Assemblers, Two-Pass Assemblers, One-Pass Assemblers, Single pass Assembler for Intel x86 Algorithm of Single Pass Assembler, Multi-Pass Assemblers, Advanced Assembly Process, Variants of Assemblers Design of two pass assembler. *Macro and Macro Processors:*Introduction, Macro Definition and Call, Macro Expansion, Nested Macro calls, Advanced Macro Facilities, Design Of a Macro Pre-processor, design f a Macro Assembler, Functions of a Macro Processor, Basic Tasks of a Macro Processor, Design Issues of Macro Processors, Features, Macro Processor Design Options, Two-Pass Macro Processors, One-Pass Macro Processors.
UNIT-III: Linkers and Loaders Introduction, Relocation of Linking Concept, Design of a Linker, Self-Relocating Programs, Linking in MSDOS, Linking of Overlay Structured Programs, Dynamic Linking, Loaders, Different Loading Schemes, Sequential and Direct Loaders, Compile-and-Go Loaders, General Loader Schemes, Absolute Loaders, Relocating Loaders, Practical Relocating Loaders, Linking Loaders, Relocating Linking Loaders, Linkers v/s Loaders.
UNIT-IV: Scanning and Parsing Programming Language Grammars, Classification of Grammar, Ambiguity in Grammatic Specification, Scanning, Parsing, Top Down Parsing, Bottom up Parsing, Language Processor Development Tools, LEX, YACC.
UNIT-V: Compilers Causes of Large Semantic Gap, Binding and Binding Times, Data Structure used in Compiling, Scope Rules, Memory Allocation, Compilation of Expression, Compilation of Control Structure, Code Optimization.
UNIT-VI: Interpreters & Debuggers Benefits of Interpretation, Overview of Interpretation, The Java Language Environment, Java Virtual Machine, Types of Errors, Debugging Procedures, Classification of Debuggers, Dynamic/Interactive Debugger.

RECOMMENDED BOOKS:

TEXT BOOK	1. System Programming by D. Dhamdhere, McGraw Hill Publication. 2. Systems Programming by Donovan, TMH.
REFERENCE	1. System Programming by Srimanta Pal, Oxford Publication. 2. System Software – An Introduction to Systems Programming by LelandL. Beck, Pearson Education, Asia, 2000.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:
This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES
Theory:

Assessments	1	2	3	4	5
Class Test	x		x		x
Quiz	x		x		
Assignment	x	x		x	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	C	d	e	F	g	h	i	j	k
Course Learning Outcomes	1,2	2	2,4	2	2,5	4	4,5	3,5		4	3

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

B.TECH. COMPUTER SCIENCE & INFORMATION TECHNOLOGY

SEMESTER - V

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEN3101	E	PC	COMPUTER NETWORKS	3	1	0	3.5	50	100	150
CSEN3102	E	PC	COMPUTER NETWORKS LAB	0	0	2	1	25	25	50
CSEN3103	E	PC	COMPUTER GRAPHICS	3	1	0	3.5	50	100	150
CSEN3104	E	PC	COMPUTER GRAPHICS LAB	0	0	2	1	25	25	50
CSEN3105	E	PC	THEORY OF AUTOMATA & COMPUTATION	3	1	0	3.5	50	100	150
CSEN3106	E	PD	INDUSTRIAL TRAINING I (TRAINING TO BE UNDERGONE AFTER IV SEMESTER)	0	0	2	1	50	0	50
CSEN3107	E	PD	SPECIALIZED MINOR PROJECT (GROUP)	0	0	4	2	50	50	100
	E	PE	ELECTIVE-V	4	0	0	4	50	100	150
	E	PE	ELECTIVE-VI	4	0	0	4	50	100	150
VALU0136	P	AE	APTITUDE II	2	0	0	2	25	50	75
VALU0140	P	SE	PROFESSIONAL COMMUNICATION-II	2	0	0	2	25	50	75
TOTAL				**21**	**3**	**10**	**27.5**	**450**	**700**	**1150**

L = Lecture
T = Tutorial
P = Practical
C = Credit Point

ELECTIVE V

MODULE CODE	MODULE
CSEN3208	MOBILE APPLICATION DEVELOPMENT
CSEN3209	BIG DATA ANALYSIS
CSIT3201	DISTRIBUTED COMPUTING

ELECTIVE VI

MODULE CODE	MODULE
CSEN3211	CRYPTOGRAPHY
CSEN3212	MOBILE COMPUTING
CSEN3213	IMAGE PROCESSING

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - V

Computer Networks

L	T	P
3	1	0

MODULE CODE	CSEN3101
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

1. Build an understanding of the fundamental concepts of computer networking.
2. Familiarize the student with the basic taxonomy and terminology of the computer networking area.
3. Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
4. Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

LEARNING OUTCOMES

Following this course, students will be able to:

1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. Identify the different types of network devices and their functions within a network.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT-I: Introduction to Computer Networks Computer Networks and its applications, ARPANET, Network Topologies, Types of Networks, Layering architecture of networks, OSI and TCP/IP model -functions, services and protocols of each layer.
UNIT-II: The Physical Layer Transmission media: Guided and Unguided media, Switching, Multiplexing (FDM, WDM, and TDM).
UNIT-III: The Data Link Layer Data link layer design issues, Error detection and Correction Techniques, Elementary data link control protocols, sliding window protocols.
UNIT-IV: The Medium Access Sub layer The channel allocation problem, multiple access protocols, IEEE 802 standards for LANs, Network devices-repeaters, hubs, bridge, switches, routers and gateways.
UNIT-V: The Network Layer Network layer design issues, routing algorithms, congestion control algorithms, Quality of Service, Introduction to IPv4 Addressing, Sub networks and Subneting, IPv4 protocol Packet Format, IPv4 vs IPv6.
UNIT-VI: Transport layer & Application Layer Transport layer services, Elements of transport protocols, Overview of TCP and UDP, Domain Name System, Email – SMTP, POP, IMAP; FTP, HTTP.

RECOMMENDED BOOKS:

TEXT BOOK	1. Data Communications & Networking by B. A Forouzan, 4th Ed, Tata McGraw Hill, 2007. 2. Computer Networks (3rd edition) by Tanenbaum Andrew S, International edition, 1996.
REFERENCE	3. Data Communications, Computer Networks and Open Systems (4th edition) by Halsall Fred, 2000, Addison Wesley, Low Price Edition. 4. Data and Computer Communications by W. Stallings, Pearson Education, 8th Ed, 2007.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x		x
Quiz	x			x	
Assignment	x	x		x	

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	2	4	3	5			4	2		

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - V

Computer Networks Lab

L	T	P
0	0	2

MODULE CODE	CSEN3102
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	50
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES

1. To introduce the key concepts and principles of computer networks.
2. To implement the deployment of communications services in practical networks.
3. To study about CISCO Packet Tracer Stimulation Tool.
4. To study the advanced background on relevant computer networking topics to have a comprehensive and deep knowledge in computer networks.

LEARNING OUTCOMES

Following this course, students will be able:

1. To get the concepts of Data Communication and Networking.
2. To get the knowledge of different trouble shooting commands.
3. To learn about the resource sharing.
4. To create a VLAN and star topology.
5. To configure a network using routing protocols.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

1.	Study of computer network and interconnected devices.
2.	To study about trouble shooting commands.
3.	To study about IPconfig and net stat commands.
4.	To study about IPV4 and IPV6.
5.	To study about File and desktop Sharing.
6.	Connect the computers in LAN.
7.	To study about CISCO Packet Tracer Stimulation Tool.
8.	Configure a network topology using packet tracer software.
9.	To create a LAN via switches and transfer packets between them.
10.	Activity to create a VLAN and star topology.
11.	Configure a network using distance vector routing protocol.
12.	Configure a network using link state routing protocol.
Experiments based on advanced topics:	
13.	Study of different types of network cables and practically implement crosswire and Straight cable.
14.	Write a Program in C++ to check the whether a 32-bit IP address is in binary notation or not and determine its class.

Note: At least 12 Experiments out of the list must be done in the semester.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,2	2	2,5	2	2,5	3	4,5	3,5		3	3

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - V

Computer Graphics

L	T	P
3	1	0

MODULE CODE	CSEN3103
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

The aim of this subject is to provide keen knowledge graphics by understanding 2-D, 3-D transformations and scan conversions.

1. To make students familiar with the wide variety of examples and applications of computer graphics
2. To make students familiar with an understanding of the line & circle drawing algorithms and various clipping algorithms
3. To make students familiar with an understanding of the 2-D and 3-D transformations
4. Understand the concepts of visible surface algorithms, shading and mapping

LEARNING OUTCOMES

Following this course, students will be able to:

1. Write functions to implement graphics primitives.
2. Write programs that demonstrate geometrical transformations.
3. Work with software used in computer graphics.
4. Implement 2D graphics and algorithms including line drawing, polygon filling, clipping, and transformations.
5. Develop techniques used in 3D computer graphics, including viewing transformations, hierarchical modeling, color, lighting and texture mapping.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

Unit-I: Introduction to Computer Graphics What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, Random scan displays, Raster scan displays.
Unit-II: Scan Conversions Points and Lines, Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms: Using polar coordinates, Bresenham's circle drawing, mid-point circle drawing algorithm; Filled area algorithms.
Unit-III: Clipping and 2D Viewing Cohen Sutherland, Cyrus Beck, Midpoint Subdivision, Liang-Barsky, Nicholl-Lee-Nicholl ,Polygon clipping -Sutherland Hodgman, Weiler Atherton, Polygon Filling-Seed fill, Scanline Approach Anti-Aliasing: Un-Weighted and Weighted Area Sampling, Gupta-Sproull Algorithm for Anti-Aliasing.
Unit-IV: Two/Three Dimensional Transformations Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation. Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation. Viewing in 3D: Projections, types of projections, the mathematics of planner geometric projections, coordinate systems.
Unit-V: Hidden surface removal Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm. Representing Curves and Surfaces: Parametric representation of curves: Bezier curves, B-Spline curves. Parametric representation of surfaces; Interpolation method.3
Unit-VI: Basic illumination models Ambient light, Diffuse reflection, Specular reflection and Phong model, Combined approach, Warn model, Intensity Attenuation, Color consideration, Transparency and Shadows, What is an image? Filtering, image processing, geometric transformation of image.

RECOMMENDED BOOKS:

TEXT BOOK	Computer Graphics C Version by Donald Hearn and M Pauline Baker, Pearson Education.
REFERENCE	1. Computer Graphics by Amrendra N Sinha and Arun D Udai, Tata McGraw Hill. 2. Computer Graphics with OpenGL by Donald Hearn and M Pauline Baker, Pearson education. 3. Computer Graphics by R.K. Maurya, Wiley Dream tech Publication. 4. Fundamentals of Computer graphics & Multimedia by Mukherjee, PHI Learning Private Limited, Delhi. 5. Computer Graphics principle by Foley, Vandam, Feiner, Hughes, Pearson Education.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test		X		X	X
Quiz	X		X		
Assignment	X			X	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1	2	2,3	3	4,5					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - V

Computer Graphics Lab

L	T	P
0	0	2

MODULE CODE	CSEN3104
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	50
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES

1. To understand and implement graphics architectures and software.
2. To make students familiar with color models (RGB, CMY, HLS) &color transformations.
3. To teach the implementation of Geometric transformations.
4. To make students familiar with shading models.
5. To implement line drawing via Bresenham's algorithm, clipping and polygonal fill.

LEARNING OUTCOMES

Following this course, students will be able:

1. To understand the core concepts of computer graphics.
2. To understand different algorithms supporting computer graphics.
3. To design and implement models of surfaces, lights, and textures.
4. To select among models for lighting/shading.
5. To design and implement model and viewing transformations.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

1.	To study basic graphic functions defined in 'graphics.h'.
2.	Write a menu driven program to draw a line, circle or rectangle.
3.	Write a program to draw a hut using basic graphic functions.
4.	Write a program in 'C' to draw a line using DDA.
5.	To draw a line using Bresenham's algorithm.
6.	To draw a circle using Bresenham's algorithm.
7.	To draw circle using mid-point algorithm.
8.	Write a program to move a character above and below a line.
9.	Write a program for flood fill.
10.	Write a program to fly a kite.
11.	Write a program to design a clock.
12.	Write a program in 'C' to demonstrate 2-D translation of a triangle.
Experiments based on advanced topics:	
13.	Write a program in 'C' to demonstrate 2-D scaling of a triangle.
14.	To make a traffic light signalling system in 'C'.

Note: At least 12 Experiments out of the list must be done in the semester.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 100 marks for practical.

Practical:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	K
Course Learning Outcomes	3	1,2	4		5	4	1,2	4,5	1,5		

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - V

Theory of Automata & Computation

L	T	P
3	1	0

MODULE CODE	CSEN3105
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

The aim of this subject is to clear the concepts of formal languages and to provide keen knowledge of computation using Turing Machine.

1. Identify different formal language classes and their relationships.
2. Design grammars and recognizers for different formal languages.
3. Determine the decidability and intractability of computational problems.
4. Present the theory of automata as the first step towards learning advanced topics such as compiler design.
5. Develop the understanding of computation using Turing Machine.

LEARNING OUTCOMES

Following this course, students will be able to:

1. Design and analyse automata, regular expressions and context-free grammars accepting or generating a certain languages
2. Define Turing machines performing simple tasks
3. Apply mathematical and formal techniques for solving problems in computer science.
4. Define formal languages and explain how they can be generated by different automata.
5. Create an automaton to solve a particular computational problem.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

Unit-I: Finite Automata Finite State Machines, Properties and limitations of FSM, Basic Definitions of Non-Deterministic finite automata (NDFA), Deterministic finite automata (DFA), Equivalence of DFA and NDFA, finite automata with epsilon transitions.
Unit-II: Introduction to Machines & Formal languages Concept of basic Machine, Moore and mealy Machines, Equivalence of Moore and Mealy machines. Formal Grammar's Introduction, Language recognition by the given Grammar, Creation of Grammar for particular language, Recursive & Recursive Enumerable Language, Chomsky hierarchies of grammars, unrestricted grammars, Context sensitive languages, Relation between Languages.
Unit-III: Regular Expressions & Regular Sets Regular Expressions, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa. State and prove Arden's Method. The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.
Unit-IV: Grammars Definition, Context free and Context sensitive grammar, Ambiguity of regular grammar, Reduced forms, Removal of useless Symbols, Normal forms for grammar Chomsky Normal Form (CNF), Griebach Normal Form (GNF).
Unit-V: Pushdown Automata Introduction to Pushdown Machines, Designing of PDA, Application of Pushdown Machines, equivalence of CFL and PDA, inter conversion.
Unit-VI: Turing Machines Turing machine, Programming techniques for Turing machine, Design of T.M, Multi-tape T.M., Universal Turing Machine, Halting problem of T.M., PCP Problem, Decidability & undecidability of Problems.

RECOMMENDED BOOKS:

TEXT BOOK	Automata theory, language & computations by Hopcroaft & O.D.Ullman, RMothwani, 2001, AW.
REFERENCE	1. Automata, Languages and computation by K.L.P.Mishra & N.Chandrasekaran, 2000, PHI. 2. Introduction to formal Languages & Automata by Peter Linz, 2001, Narosa Publ. 3. Principles and Practice by Ramond Greenlaw and H. James Hoover, 1998, for "Fundamentals of the Theory of Computation" 4. Introduction to languages and the Theory of Computation by John C. Martin 2003, T.M.H.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test		x	x	x	x
Quiz	x	x			
Assignment	x		x	x	

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	A	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	2		4,5	3	4	2	2	4		

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – V (ELECTIVE – V)

Mobile Application Development

L	T	P
4	0	0

MODULE CODE	CSEN3208
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to teach students how mobile communication works and how to build mobile apps for android operating system.

1. To develop application models of mobile application frameworks.
2. To understand User-interface design for mobile applications.
3. To understand how to manage application data.
4. To understand addressing enterprise requirements in mobile applications – performance, scalability, modifiability, availability and security.
5. To use current mobile platforms and their architectures.

LEARNING OUTCOMES:

Following this course student will be able to:

1. Explain functioning of different mobile technology.
2. Demonstrate android activities life cycle.
3. Execute operations on GUI objects.
4. Perform event driven programming.
5. Develop mobile systems with dynamically varying sensor setup using goal oriented cooperative sensing.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT-I: Introduction To Mobile Computing Concept of Mobile Communication, Mobile devices vs. desktop devices, ARM and INTEL architectures, Power Management, Screen resolution, Touch interfaces, Application deployment (App Store, Google Play, Windows Store) Native vs. web applications.
UNIT-II: Frameworks and Tools Development Environments: Development Environments (XCode, Eclipse, VS2012, Phone GAP, etc.) Development Tools (HTML5, CSS, JavaScript, JQuery) Mobile-specific enhancements (Browser-detection, Touch interfaces, Geo location, Screen orientation) Mobile browser "interpretations" (Chrome/Safari/Gecko/IE).
UNIT-III: Mobile OS Architectures Mobile OS Architectures (Android, iOS, Windows), Mobile OS (Darwin, Linux, Windows) Runtime Environments (Objective-C, Dalvik, winRT), Mobile Agents and Peer-to-Peer Architecture. Hardware Architecture: Introduction to the processors used for Mobile and Handheld devices and SoC architecture like OMAP and Snap Dragon and its case study with reference to protocols, Input and output interfaces, GPU, DSP etc.
UNIT-IV: Introduction to Android Overview of Android, Environment setup for Android apps Development, Framework Android SDK, Eclipse, Emulators, Android AVD, Android Emulation Creation and set up First Android Application.
UNIT-V: Developing an Application Building a simple "Hello World" App (Android, iOS, Windows) App-structure, built-in Controls, file access, basic graphics, Building useful apps, Database, Network, File access Packaging and Deployment.
UNIT-VI: Advanced UI Programming System-level Apps, Native programming (Android), Low-level programming (iOS), Low-level APIs (Windows).

RECOMMENDED BOOKS:

TEXT BOOK	1. Programming Mobile Devices: An Introduction for Practitioners by Tommi Mikkonen , John Wiley & Sons Ltd, 2007.
REFERENCE	6. Building Android Apps IN EASY STEPS, McGrawHill Education. 7. Mobile Python Rapid Prototyping of Applications on the Mobile Platform by J Scheible and Ville Tuulos John, Wiley India Pvt. Ltd, 2008. 8. Ubiquitous Computing: Smart Devices, Environments and Interactions by S. Poslad , Wiley, 2009. 9. Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML by Reza Behravanfar, Cambridge University Press, October, 2004. 10. Fundamentals of Mobile and Pervasive Computing by Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, McGraw-Hill Professional, 2005.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x	x			x
Quiz			x	x	
Assignment	x				

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1	2	2,3	3	4,5					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - V

Big Data Analysis

L	T	P
4	0	0

MODULE CODE	CSEN3209
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The course provides practical foundation level training that enables immediate and effective participation in Big Data Projects. The course provides grounding in basic and advanced methods to Big Data technology and tools including MapReduce and Hadoop.

1. To develop in –Depth Knowledge and understanding of the Big Data analytic domain.
2. To understand the computational approaches to Modelling, Feature Extraction.
3. To understand the various search algorithms applicable to Big Data.
4. To analyse and interpret Streaming data.
5. To learn how to handle large datasets in main memory.
6. Use advanced analytical tools, decision making tools and operation research techniques to analyse complex problems.

LEARNING OUTCOMES:

Upon completion of this course student will be able to:

1. Design algorithm by employing Map Reduce technique for solving Big Data problems.
2. Design algorithms for handling petabytes of datasets.
3. Design algorithm and propose solutions for Big Data by optimizing main memory consumption.
4. Design and build MongoDB based Big Data applications and learn MongoDB query language.
5. Learn difference between conventional SQL query language and NoSQL basic concepts.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT-I: Introduction to Big data Introduction to Big Data and its importance, Big Data characteristics, types of Big Data, Traditional vs. Big Data business approach, Four Vs, Drivers for Big Data, Big data Analytics, Algorithm Using Map reduce ,Matrix –Vector Multiplication by Map-Reduce .
UNIT-II: Introduction to Hadoop and Hadoop Architecture What is Hadoop? Core Hadoop Components, Hadoop Eco system –Moving Data In and Out of Hadoop, Hadoop Limitations, Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands, Anatomy of File Write and Read, NameNode, Secondary Name Node, and Data Node, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Task trackers.
UNIT-III: NoSQL What is it? Where it is Used Types of NoSQL databases, Why NoSQL? Advantages of NoSQL, Use of NoSQL in Industry, SQL vs NoSQL, NewSQL.
UNIT-IV: HDFS, HIVE AND HIVEQL, HBASE Overview, Installation and Shell, Java API; Hive Architecture and Installation, Comparison with Traditional Database, HiveQL Querying Data, Sorting And Aggregating, Map Reduce Scripts, Joins & Sub queries, HBase concepts, Advanced Usage, Schema Design, Advance Indexing, PIG, Zookeeper , how it helps in monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.
UNIT-V: SPARK Introduction to Data Analysis with Spark, Downloading Spark and Getting Started, Programming with RDDs, Machine Learning with MLlib.
UNIT-VI: Data Base for the Modern Web Introduction to MongoDB key features, Core Server tools , MongoDB through the JavaScript's Shell, Creating and Querying through Indexes, Document- Oriented, principles of schema design, Constructing queries on Databases, collections and Documents , MongoDB Query Language.

RECOMMENDED BOOKS:

TEXT BOOK	1. Understanding Big data by Chris Eaton, Dirk deroos et al. McGraw Hill, 2012.
REFERENCE	1. Professional Hadoop Solutions by Boris lublinsky, Kevin t. Smith, AlexeyYakubovich, ", Wiley, 2015. 2. HADOOP: The definitive Guide by Tom White, O Reilly 2012. 3. Big Data Analytics with R and Haoop by Vignesh Prajapati, Packet Publishing 2013. 4. Big Data and Business analytics by Jy Liebowitz , CRC press, 2013. 5. MongoDB in Action by Kyle Banker,Piter Bakkum , Shaun Verch, Dream tech Press. 6. BIG Data and Analytics by Sima Acharya, Subhashini Chhellappan, Willey.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x	x	x		x
Quiz				x	
Assignment	x	x	x		x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	1,2	3	4	5						

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test		x			
Quiz	x		x		x
Assignment	x			x	x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	4	5	3	4	5					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – V (ELECTIVE – VI)

CRYPTOGRAPHY

L	T	P
4	0	0

MODULE CODE	CSEN3211
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to teach students how to preserve information properties through different techniques.

1. Recognize the need for security through cryptography
2. Identify the primitives of various cryptographic techniques and the related application areas.
3. Explore the various types of cryptography and the associated application areas
4. To understand practical concepts related to Cryptography.
5. To understand practical concepts related to Steganography.

LEARNING OUTCOMES:

Following this course, students will be able to:

1. Understand basic issues of security in communication and computing.
2. Learn basic approaches in solving security problems.
3. Identify different Cryptography techniques.
4. Compare and contrast Symmetric and Asymmetric encryption system and their vulnerability to attacks.
5. Understand different Steganographic Techniques.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

Unit I: Security Need of security: Security attacks: vulnerabilities, threats, types of attacks and controls; Security services; Security mechanisms; Model of network security.
Unit II: Cryptography: Concepts and Techniques Cryptography: plain text and cipher text, substitution techniques, transposition techniques; Substitution techniques: caesar cipher, modified version of caesar cipher, mono-alphabetic cipher, homophonic substitution cipher, polygram substitution cipher, polyalphabetic substitution cipher, hill cipher; Transposition techniques: rail fence technique, simple columnar transposition technique, vernam cipher, block cipher; Encryption and decryptionders(ISPs), Internet address, standard address, domain name, DNS, IP.v6, Modems and time continuum, communications software; internet tools.
Unit III: Symmetric Key Cryptography Symmetric key cryptography: algorithm types and modes, an overview of symmetric key cryptography, data encryption standard, variations of data encryption standard (DES), international data encryption algorithm(IDEA),RC4,RC5, advanced encryption standard (AES).
Unit IV: Asymmetric Key Cryptography Asymmetric key cryptography: history of asymmetric key cryptography, an overview of asymmetric key cryptography, rivest-shamir-adelman (RSA) algorithm; symmetric versus asymmetric key cryptography.
Unit IV: Cryptographic Hash Functions Applications of cryptographic hash functions, Secure hash algorithm, Message authentication codes- Message authentication requirements and functions, HMAC, Digital signature, Digital signature Schemes, Digital signature standards.
Unit VI: Steganography Techniques Steganography, least significant bit method and message hidden in 6^{th} and 7^{th} bit method. Spatial Domain and Transform Domain Techniques, Latest Steganography algorithms.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Cryptography and network security by Atul Kahate by Tata McGraw Hill, New Delhi. 2. Cryptography and networks security principles and practice by William stalling Prentice Hall, India
REFERENCE	1. Information and communication security by Hans Springer. 2. Network security by Simonds, McGraw Hill, 1998. 3. Internet Security by Derek Atkins Techmedia, 1998.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x		x
Quiz			x		x
Assignment	x	x		x	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	5	2	4	3		1	5	3			

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - V

Mobile Computing

L	T	P
4	0	0

MODULE CODE	CSEN3212
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to teach students an understanding of mobile computer systems particularly in the context of wireless network systems such as 2G/3G/4G mobile telephony, data networks, and other wireless networks and infrastructure.

1. Understand the basic concepts of mobile computing.
2. Be familiar with the network protocol stack.
3. Learn the basics of mobile telecommunication system.
4. Be exposed to Ad-Hoc networks.
5. Gain knowledge about different mobile platforms and application development.

LEARNING OUTCOMES:

Following this course, students will be able to:

1. Explain the basics of mobile telecommunication system.
2. Choose the required functionality at each layer for given application.
3. Identify solution for each functionality at each layer.
4. Use simulator tools and design Ad hoc networks.
5. Develop a mobile application.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

UNIT-I: Introduction Mobile Computing, Mobile Computing Vs wireless Networking, Mobile Computing Applications, Characteristics of Mobile computing, Structure of Mobile Computing Application. MAC Protocols, Wireless MAC Issues, Fixed Assignment Schemes, Random Assignment Schemes, Reservation Based Schemes.
UNIT-II: Mobile Internet Protocol And Transport Layer Overview of Mobile IP, Features of Mobile IP, Key Mechanism in Mobile IP, route Optimization, overview of TCP/IP, Architecture of TCP/IP, Adaptation of TCP Window, and Improvement in TCP Performance.
UNIT-III: Mobile Telecommunication System Global System for Mobile Communication (GSM), General Packet Radio Service (GPRS), Universal Mobile Telecommunication System (UMTS).
UNIT-IV: Mobile Ad-Hoc Networks Ad-Hoc Basic Concepts, Characteristics – Applications, Design Issues, Routing, Essential of Traditional Routing Protocols, Popular Routing Protocols, Vehicular Ad Hoc networks (VANET), MANET Vs VANET, and Security.
UNIT-V: Mobile Platforms And Applications Mobile Device Operating Systems, Special Constrains & Requirements, Commercial Mobile Operating Systems, Software Development Kit: iOS, Android, BlackBerry, Windows Phone, MCommerce, Structure, Pros & Cons, Mobile Payment System, Security Issues.
UNIT-VI: Third Generation (3G) Mobile Services and Wireless Enterprise Networks Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G. Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols.

RECOMMENDED BOOKS:

TEXT BOOK	1. Fundamentals of Mobile Computing by Prasant Kumar Pattnaik, Rajib Mall, PHI Learning Pvt. Ltd, New Delhi – 2012. 2. Wireless and Mobile Networks Architectures by Yi-Bing Lin & ImrichChlamtac, John Wiley & Sons, 2001
REFERENCE	1. Mobile Communications by Jochen H. Schller, Second Edition, Pearson Education, New Delhi, 2007. 2. Introduction to Wireless and Mobile systems by Dharma Prakash Agarval, Qing and An Zeng, Thomson Asia Pvt Ltd, 2005. 3. Mobile Cellular Telecommunications-Analog and Digital Systems by William.C.Y.Lee, Second Edition, Tata McGraw Hill Edition, 2006. 4. AdHoc Mobile Wireless Networks by C.K.Toh, First Edition, Pearson Education, 2002.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x		x		x
Quiz			x		x
Assignment	x	x		x	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1,4	1,2	2,4	3	1,3	5	4		1		

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - V

Image Processing

L	T	P
4	0	0

MODULE CODE	CSEN3213
CREDIT POINTS	4
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

The aim of this subject is to provide understanding of Digital Image Processing and Image degradation or restoration process.

1. Understand concept of image processing and Image enhancement.
2. To do image enhancement in spatial domain and frequency domain.
3. Understanding of image compression and segmentations.
4. Develop the understanding of Image restoration.

LEARNING OUTCOMES

Following this course, students will be able to:

1. Learn fundamentals of digital image processing.
2. Understand Spatial and frequency domains.
3. Learn Image compression models and techniques.
4. Demonstrate color image processing.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT:

Unit I: Fundamentals of digital image processing Digital image processing concepts: origin of digital image processing, examples, fundamental steps in digital image processing, components of digital image processing system; Digital image fundamentals: image sensing and acquisition, image sampling and quantization, basic relationship between pixels.
Unit II: Image Enhancement in the Spatial Domain Background; Basic gray level transformation; Histogram processing; Enhancement using arithmetic/logic operations; Basics of spatial filtering, Smoothing spatial filters and sharpening spatial filters.
Unit III: Image Enhancement in the Frequency Domain Background; Fourier transform and the frequency domain; Smoothing frequency-domain filters; Shaping frequency domain filters; Homomorphic filtering.
Unit IV: Image Restoration Image degradation/restoration process; Noise models; Types of filtering; Inverse filtering; Minimum mean square filtering; Geometric mean filter; Geometric transformations.
Unit V: Color Image Processing Color fundamentals, color models; Color image processing: pseudocolor image processing, full-color image processing; Color transformations; Smoothing and sharpening; Noise in color images; Color image compression.
Unit VI: Image Compression & Segmentation Image Compression: fundamentals, image compression models, error free compression, lossy compression; Image segmentation: detection of discontinuities, edge linking and boundary detection, thresholding, region oriented segmentation.

RECOMMENDED BOOKS:

TEXT BOOK	Digital Image Processing by Rafael C. Gonzalez & Richard E.Woods, Pearson Education.
REFERENCE	1. Digital Image Processing by A.K.Jain, PHI. 2. Digital Image Processing by Abhishek Yadav, Poonam Yadav, University Science Press. 3. Digital Image Processing by Dr. Shashi Kumar Singh, University Science Press.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type Of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4
Class Test	x	x		X
Quiz	x		x	
Assignment		x	x	

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	I	j	k
Course Learning Outcomes	1	1,4	3	1	2		3		1		

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - V

Professional Communication II

SUBJECT CODE	VALU0140
CREDIT POINTS	2
FORMATIVE ASSESMENT MARKS	
SUMMATIVE ASSESMENT MARKS	
END SEMESTER EXAM DURATION	
LAST REVISION DATE	

INSTRUCTIONS : The question paper will consist of ten questions distributed over three sections A, B and C Section A comprise of one question carrying very short answer type questions and is compulsory, Section B comprise of two short answer type questions and Section C comprises of five long answer type questions These sections will also have internal choices of questions.

OBJECTIVE

1. To learn the fundamentals of different structures of English grammar
2. To calculate the structures and patterns of English Language and to use them correctly in speaking
3. To learn about the creative literature writings
4. To improve speaking and writing
5. To inculcate professional skills of presenting and working
6. To understand different types of literatures and background with critical insights
7. To make students aware of the detailed exposition of English Language

LEARNING OUTCOMES

Following this course students will be able to :-

1. Identify the different structures and patterns of English Language
2. To make students a good Public Speaker
3. To make students aware about different literature of the World
4. To make students speak well in Professional English Speaking and writing highly professional in particular
5. Know the process of Communication and its ethics
6. To make students write in professional manner

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MODULE CONTENT

UNIT : I COMMUNICATION AND THEORIES

- Nature of Communication Pitfalls/One-way versus Two ways communication/efficient and effective communication
- Tenses-formation/efficient and effective communication
- Paragraph writing and usages of Comma's
- Presentation Skills
    - Literary Works
- The Bluest Eyes by (Toni Morission)
- Untouchable by Mulk Raj Anand
- BuchiEmecheta (In the Ditch)

UNIT : II INTRODUCTION TO THE NOVELS AND SHORTS STORIES (GRAMMAR ETHICS)

- Adverbs and Formal Words
- Using Different Commas
- Noun and the Numbers
- Nouns and (Count and Uncountable Collective and Abstract)
    - Interview Skills
- Short Stories
    - Deliverance by Prem Chand
    - Joothan by Prem Chand
    - Great Expectation by Charles Dickens
    - DH Lawrence (Sons and Lovers)

UNIT : III BUSINESS COMMUNICATION

- Letter Writing – Formal and Informal
- Letters of inquiry & Complaint
- Job Application and Resume
- Bio-Data
- Report Writing (Preparation/Planning/Structure/Matter Cover/Frontispiece/Title Page/Copyright-Notice/Forwarding Letter/Preface/Acknowledgements/Table of Contents/List of Contents/List of illustration/Abstract and Summary
- Adjective and their usage in a Language
- Gustave Flaubert (Madame Bovery)
- Shashi Despande (That long silence)

UNIT : IV DIFFERENT STRUCTURES OF ENGLISH LANGUAGE AND THEIR PATTERN

- Introduction to Semantics (Synonyms/Antonyms/Homophones Form and function of words
- Linguistic (various scientific theories of language)
- Passive voice and random topic writing and effective writing skills
- Syntax/Infinitive/Gerund

- Degrees (positive) (Comparative) (Superlative)
- Literary Works
    - Virginia Wolf (To the light house)
    - AS Byatt (Virgin in the Garden)
    - Zora Neale (Their eyes were watching God)
    - Lawrence Hill (The Book of Negros)

UNIT : V DIFFERENT ASPECT OF ENGLISH LANGUAGE AND ITS USE IN PROFESSIONAL COMMUNICATION

- Formation of adjectives from Noun
- Formation of adjectives from Verbs
- Some foreign words and their usage
- American and British Language
- Meanings of has/have
- Public Communication
- Communication, Papers reading and errors commissions

LITERARY WORKS

a. Ian Mc Ewan :- Cement Garden
b. Martin Amiss :- London Fields
c. Murial Spark :- Prime of Mrs Jean Brodie
d. Angela Carter :- Magic Toyshop

UNIT : VI LINGUISTIC AND ENGLISH COMMUNICATION

- Paronyms
- Linguistic and various stylistic theories in writing
- Synthesis
- Phonetics
- Reading Comprehensive and interpretation
- Note – Taking/Making
- Summarizing

LITERACY WORKS

a. Noel Coward :- Private Lives
b. Arnold Wesker :- Chicken Soup with Barley

Recommended Books

TEXT BOOK	Essential of Communication by BR Sharma
Reference	Derrida (Semiotics and Sign Structure)

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MAPPING OF COURSE OBJECTIVES AGAINST STUDENTS LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e
Mapping of Course Objectives with Students Learning Outcomes	1, 2, 5	1, 2	2, 3, 5	2, 3, 4, 5	6, 7

METHODS OF TEACHING AND STUDENT LEARNING

The subjects is delivered through lectures, on-line support, text book/course material reading and practical exercises Some videos will be shown to demonstrate certain concepts and research areas will be discussed Resources material is provided with the help of PDM Educational Directory Services (PEDS)

ASSESSMENT METHODOLOGIES

This subject will be evaluated for a total of 75 marks for theory

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1	Class Text	4	05
2	Sessional Text	2	15
3	Group Discussion	4	05
4	End Semester Exam	1	75

EVALUATION

At the end of Semester Subject teacher will submit an evaluation report The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved The review report contains the following

- Approved refinement decisions due for implementation
- Actions taken based on previous subject review
- Problems encountered in the subject delivery
- Report discussed and analysed action taken as a result of this process and are communicated to the main stakeholders

SEMESTER - VI

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSIT3102	E	PC	SYSTEM AND NETWORK ADMINISTRATION	3	1	0	3.5	50	100	150
CSIT3103	E	PC	SYSTEM AND NETWORK ADMINISTRATION LAB	0	0	2	1	25	25	50
CSEN3116	E	PC	JAVA PROGRAMMING	3	0	0	3	25	75	100
CSEN3117	E	PC	JAVA PROGRAMMING LAB	0	0	3	1.5	25	50	75
CSEN3118	E	PC	SOFTWARE ENGINEERING & PROJECT MANAGEMENT	3	1	0	3.5	50	100	150
CSEN3119	E	PD	SPECIALIZED MINOR PROJECT (INDIVIDUAL)	0	0	8	4	100	100	200
	E	PE	ELECTIVE-VII	3	1	0	3.5	50	100	150
	E	GE	ELECTIVE-A	0	0	8	4	50	100	150
CSEN3120	P	CI	CREATIVITY AND INNOVATION	0	0	2	1	0	50	50
TOTAL				**16**	**3**	**15**	**25**	**375**	**700**	**1075**

L = Lecture
T = Tutorial
P = Practical
C = Credit Point

PROGRAM ELECTIVES

MODULE CODE	MODULE
CSIT3204	STORAGE TECHNOLOGY FOUNDATION
CSEN3222	ADVANCED COMPUTER ARCHITECTURE
CSEN3223	CLOUD COMPUTING

GENERIC ELEECTIVE - Aψ

MODULE CODE	MODULE
SAPA0320	SAP-ABAP
SAPM0321	SAP-MM
SAPS0322	SAP-SD
	ONE/TWO MOOCS MODULES (Consisting 4 credits in total)

ψAdditional fee, if any, shall be borne by the student.
Note: Each student has to undergo practical training of 6 weeks during summer vacation and its evaluation shall be carried out in the VII semester.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – VI

System and Network Administration

L	T	P
3	0	0

MODULE CODE	CSIT3102
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

1. To learn how to manage users and groups, as well as best practices for supporting the users (customers) of an organization's computing infrastructure
2. To understand how to create and use Unix file systems
3. To appreciate the importance of ethics in system administration.
4. To understand and apply a set of ethical rules in management of a computer system.
5. To become familiar with a basic set of Unix operating commands and utilities.

LEARNING OUTCOME:

During the courses, students will:

1. Use multiple computer system platforms and understand the advantages of each.
2. Install and administer network services.
3. Protect and secure users' information on computer systems.
4. Use the command line interface for system administration.
5. Demonstrate strategies for planning/designing systems.
6. Install and manage disks and file systems.
7. Enable above learning outcomes in Windows and Linux environments.

MODULE CONTENT:

UNIT-I: Introduction to Systems and Network Administration: The Scope of Systems and Network Administration, The Goals of Systems and Network Administration, System Components and their Management: Operating Systems: Windows and Unix Variants, File Systems and Standards (UFS, NFS, NTFS), Processes and Job Control, Privileged, User and Group Accounts, Logs and Audits, Systems Performance Tuning:
UNIT-II: Host Management: Booting and Shutting down of an Operating System, Formatting, Partitioning and Building a File System, File System Layout, Concept of swap space, Cloning Systems, OS Installation, Installation and configuration of devices and drivers, Software Installation and Structuring Software, Open Source Software: The GNU Project, Superuser/Administrator Privileges, User Management, Adding/Removing users, Controlling User Resources, Disk Space Allocation and quotas.
UNIT-III: Process Management and Monitoring, Scheduling Processes, Killing/Stopping processes, Restarting a Process, Monitoring Process Activity, Maintaining Log Files, File System Repair, Backup and Restoration, , Handling Man Pages/Help System, Kernel Customization, Integrating Multiple Operating Systems, System Sharing, User IDs, Passwords and Authentication.
UNIT-IV: Network Administration: Introduction to Network Administration Approaches, Addressing and Subnetting: Fixed Vs Variable Masks, VLAN Principles and Configuration, Routing Concepts, Static and Dynamic Routing, Routing Protocols: RIP, OSPF, BGP.
UNIT-V: Network Address Translation (NAT), Configuring a Linux/Windows Box as a Router, Dial-up configuration and Authentication: PPP, Radius, RAS, Configuring a DNS Server, Configuring Send mail Service, Configuring a Web Server, Configuring a Proxy Server, TCP/IP Troubleshooting: ping, traceroute, ifconfig, netstat, ipconfig, Network Management.
UNIT-VI: JDBC Host and Network Security: Security Planning, Categories of Security: C1, C2, C3, C4, Password Security, Access Control and Monitoring: Wrappers, Firewalls: Filtering Rules, Detection and Prevention of Denial of Service (DOS) Attacks.

RECOMMENDED BOOKS

TEXT BOOK	1. "Principles of Network and System Administration", Mark Burgess, 2000, John Wiley and Sons Ltd.
REFERENCE	1. "TCP/IP Network Administration" (3rd Edition), Craig Hunt, O'Reilly and Associates Inc., 2002. 2. "Windows 2000 Administration", George Splading, 2000, McGraw-Hill. 3. "Linux Network Administrator's Guide", Olaf Kirch and Terry Dawson, (2nd Edition),O'Reilly and Associates Inc., 2000, (Shroff Publishers and Distributors, Culcutta), 4. Software Requirements : Microsoft Windows 2000, Linux, Perl/Python.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	15
2.	Sessional Test	2	15
3.	Group Discussion	4	20
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3
Class Test	x		x
Quiz	x	x	
Assignment	x		

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	3	1,3	4	5	1	1	2,4	4		5

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1	1	2	3						

EVALUATION

At the end of semester, course faculty will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,

- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - VI

System and Network Administration Lab

L	T	P
0	0	2

MODULE CODE	CSEN3117
CREDIT POINTS	1
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES

1. To learn how to manage users and groups, as well as best practices for supporting the users (customers) of an organization's computing infrastructure.
2. To understand how to create and use Unix file systems.
3. To appreciate the importance of ethics in system administration, and to understand and apply a set of ethical rules in management of a computer system.
4. To become familiar with a basic set of Unix operating commands and utilities.
5. To understand the importance of communication and documentation and use software tools to keep active documentation of system changes and to track and manage customer requests.
6. To understand the importance of automation, and be able to create scripts and use other tools to automate system management procedures

LEARNING OUTCOMES

Following this course, students will be able to:

1. To know some basic security measures to take in system administration.
2. To prepare for possible disasters, including an understanding of backup and restoration of file systems.
3. To know how to manage system resources, including methods for tracking system metrics.
4. To apply these skills in the administration of an actual computer system with actual users (customers).

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

1.	Management of the users & the domain.
2.	Configuring DHCP.
3.	Setting up the local security policy.
4.	Start and stop services from user window and command prompt.
5.	Use of event viewer.
6.	Use of the performance monitor.
7.	Management of the IIS and FJP server.
8.	Setting up of local area network.
9.	Setting up of router in Window 2000 server.
10.	Use of utilities (a) Ping (b) Trocert (c) netstat (d) net (e) IP configuration (f) Path ping
11.	Use of network monitor.
12.	Setting up of a DNS.
Experiments based on advanced topics:	
13.	Setting up and use “Terminal Client Services”.

Note: At least 12 Experiments out of the list must be done in the semester.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 50 marks for practical.

Practical:

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	25

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	2	2,6	5	4	2	6	3,4	6		

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – VI

Java Programming

L	T	P
3	0	0

MODULE CODE	CSEN3116
CREDIT POINTS	3
FORMATIVE ASSESMENT MARKS	25
SUMMATIVE ASSESMENT MARKS	75
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

The aim of this subject is to provide good knowledge of java. It will also enable students to develop different application based on Java.

1. Learn the java programming language: its syntax, idioms, patterns, and styles.
2. Learn object-oriented features of the Java language, such as encapsulation, inheritance and polymorphism; use data types, arrays and other data collections; implement error-handling techniques using exception handling, create and event-driven GUI using Swing components; and implement I/O functionality to read from and write to text files.
3. Introduce event driven graphical user interface programming
4. Retrieve data from a relational database with database
5. Develop platform –independent GUI

LEARNING OUTCOME:

1. Design and develop powerful GUI based components.
2. Create animation using applet, thread and awt controls.
3. Develop database applications.

MODULE CONTENT:

UNIT-I: Java Fundamentals Features of Java OOPs concepts Java virtual machine Reflection byte codes Byte code interpretation Data types, variable, arrays, expressions, operators, and control structures Objects and classes Java Classes: Abstract classes, Static classes, Inner classes, Packages, Wrapper classes, Interfaces, This, Super.
UNIT-II: Exception handling & Inheritance Exception as objects, Exception hierarchy, Try catch finally, Throw, throws, Basics of Inheritance, Types of inheritance: single, multiple, multilevel, hierarchical and hybrid inheritance.
UNIT-III: IO package Input streams, Output streams, Object serialization, Deserialization, file handling. Multi-threading: Thread Life cycle Multi-threading advantages and issues, Thread synchronization.
UNIT-IV: Applet class Applet life-cycle Passing parameters embedding in HTML. Swing: Basics of Swing, Button, Radio Button, Text Area, Combo Box, Table, list, tree, progress indicator.
UNIT-V: AWT Overview, Controls, Event Handling, Event Classes, Event Listeners, Layouts, Containers, Menu, Graphics, shape, areas, stroke, paint, image manipulation.
UNIT-VI: JDBC The Design of JDBC. The Structured Query Language, JDBC Installation, Basic JDBC Programming Concepts, Query Execution, Scrollable and Updatable Result Sets, Metadata, Row Sets, Transactions, JNDI, Introduction of LDAP.

RECOMMENDED BOOKS

TEXT BOOK	1. The complete reference JAVA2 by Herbert schildt. TMH
REFERENCE	1. Programming with Java A Primer by E. Balaguruswamy Tata McGraw Hill Companies. 2. Java How to Program by H.M.Dietel and P.J.Dietel, Pearson Education/PHI, Sixth Edition. 3. Core Java 2, Vol 1, Fundamentals by Cay.S.Horstmann and Gary Cornell, Pearson Education, Seventh Edition. 4. Core Java 2, Vol 2, Advanced Features by Cay.S.Horstmann and Gary Cornell, Pearson Education, Seventh Edition.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES

This subject will be evaluated for a total of 100 marks for theory.

Theory:

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	5
2.	Sessional Test	2	15
3.	Group Discussion	4	5
4.	End Semester Exam	1	75

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3
Class Test	x		x
Quiz	x	x	
Assignment	x		

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	3	1,3	4	5	1	1	2,4	4		5

Program Outcomes	a	b	C	d	e	f	g	h	i	j	k
Course Learning Outcomes		1	1	2	3						

EVALUATION

At the end of semester, course faculty will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - VI

Java Programming Lab

L	T	P
0	0	3

MODULE CODE	CSEN3117
CREDIT POINTS	1.5
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	50
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

OBJECTIVES

1. To learn the syntax and different data types of Java programming language.
2. To learn object-oriented features of the Java language such as encapsulation, inheritance and polymorphism, arrays and other data collections.
3. To implement error-handling techniques using exception handling.
4. To create event-driven GUI using Swing components and implement I/O functionality to read from and write to text files.
5. To introduce event driven graphical user interface programming.
6. To develop platform independent GUI.

LEARNING OUTCOMES

Following this course, students will be able to:

1. Gain knowledge of the structure and model of the Java programming language.
2. Design and develop powerful GUI based components.
3. Create animation using applet, thread and AWT controls.
4. Develop database applications.
5. Develop software in the Java programming language.
6. Debug a software application written in the Java programming language.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

1.	a) Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer. b) Write a Java program to multiply two given matrices. c) Write a program to demonstrate wrapper classes. d) Write a program to add a Class to a package.
2.	a) Write a program to show How Exception Handling is done in Java. b) Write a program to show Inheritance. c) Write a program to show polymorphism.
3.	Write a Java program to show input/output handling.
4.	Write a program to demonstrate multithreading using Java.
5.	Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.
6.	Write an applet program to display moving banner.
7.	Write a Java program to demonstrate the use of Java Swing components namely buttons, text boxes, lists/combos, menus etc.
8.	Write a java program to demonstrate List, Tree and Table in Swing.
9.	Write a program to demonstrate shape, areas, stroke,paint and image manipulation using AWT.
10.	Write a Java program to make calculator.
11.	Write a Java program to store, delete and update data in a database with the support of JDBC-ODBC connectivity.
12.	Write a Java program that prints the meta-data of a given table.
Experiments based on advanced topics:	
13.	Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with “stop” or “ready” or “go” should appear above the buttons in a selected color. Initially there is no message shown.
14.	Develop a mini project using Java- a) Game b) Text Editor c) Library Management System d) On-line Examination System

Note: At least 12 Experiments out of the list must be done in the semester.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 75 marks for practical.

Practical:

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1	Internal Assessment	2	25
2	External Assessment	1	50

MAPPING OF COURSE LEARNING OUTCOMES

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	2	2,6	5	4	2	6	3,4	6		

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - VI

Software Engineering & Project Management

L	T	P
3	1	0

MODULE CODE	CSEN3118
CREDIT POINTS	3.5
FORMATIVE ASSESSMENT MARKS	50
SUMMATIVE ASSESSMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to teach students discipline of Software Engineering and to incorporate detailed knowledge of techniques for analysis & design of complex software intensive systems.

1. To make students aware of the evolution of computers in different generations including its classification in different categories based on its capabilities.
2. To acquire knowledge on major components of computers hardware, software, data and processes.
3. To get familiar with concepts of microprocessor interfacing and its applications.
4. To achieve an understanding on basic concepts of operating system and networking.
5. To demonstrate the working of system software.
6. To understand syntax and semantics of ‘C’ programming language.
7. To enable learner to build logic for a given problem and finally develop programs.

LEARNING OUTCOMES:

1. To introduce software engineering and to explain its importance in building large programs.
2. To understand the process of developing new technology and the role of experimentation.
3. To set out the answers to key questions about software engineering.
4. To develop skills that will enable students to construct software of high quality.
5. To introduce ethical and professional issues and to explain why they are of concern to software engineers.

MODULE CONTENT:

UNIT-1: Introduction to Software and Software Project Management Emergence of Software Engineering, Software life cycle models; Software Project Management: project management concepts, software process and project metrics, project planning, project size estimation metrics, project estimation techniques, Empirical estimation techniques, COCOMO- A Heuristic estimation technique, staffing level estimation, team structures, staffing, risk analysis and management, project scheduling and tracking.
UNIT-2: Requirements Analysis and Specification Types of Requirement, Feasibility Study, Requirement Analysis and Design: DFD, Data Dictionary, HIPO Chart, Warnier Orr Diagram, Requirement Elicitation: Interviews, Questionnaire, Brainstorming, Facilitated Application Specification Technique (FAST), Use Case Approach.
UNIT-3: System Design Design concepts and principles: The design process, Design and software quality, Design concepts: Abstraction, refinement, modularity, software architecture, Effective modular design: Functional independence, Cohesion, Coupling; Design Heuristics for effective modularity. Architectural Design: Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, analysing alternative architectural designs, architectural complexity; Mapping requirements into a software architecture; Transform flow, Transaction flow; Transform mapping: Refining the architectural design.
Unit-4: Testing and Maintenance Software Testing Techniques, software testing fundamentals, white box testing, basis path testing, Black box testing, testing for specialized environments, architectures and applications. Software Testing Strategies: Verification and validation, Unit testing, Integration testing, Validation testing, alpha and beta testing; System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging: debugging approaches.
Unit-5: Activity planning Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, shortening project, precedence networks Project Evaluation: Cost benefit analysis, cash flow forecasting, Cost Benefit evaluation techniques, Risk Evaluation.
Unit-6: Risk Management Introduction: Nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values. Software quality: Introduction, the place of software quality in project planning, the importance of software quality, defining software quality, McCalls Quality Model, Practical software quality measures, product versus process quality management, techniques to help enhance software quality.

RECOMMENDED BOOKS:

TEXT BOOKS	1. Software Engineering – A Practitioner's approach by Roger S. Pressman (5th edition), 2001, MGH. 2. Software Project Management (2nd Edition) by Bob Hughes and Mike Cotterell, 1999, TMH.
REFERENCE BOOKS	1. Fundamentals of Software Engineering by Rajib Mall, PHI 2. Software Engineering by Ian Sommer ville by Pearson Edu, 5 edition, 1999 3. Software Project Management by Bharat Bhusan Agarwal, Shivangi Dhall, University Science Press.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	x	x			
Quiz	x		x	x	
Assignment	x			x	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	2	1,4	2	1,2	1,3	1	2,5	5		

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER - VI

Wireless Sensor Networks

L	T	P
3	1	0

MODULE CODE	CSEN3221
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES:

The aim of this subject is to develop an understanding of sensor network technologies from three different perspectives: sensing, communication, and computing (including hardware, software, and algorithms) and their applications.

1. To learn different communication protocols employed in WSNs
2. To understand and analyse usefulness of OSI model for Communication System Design.
3. To learn an optimized selection of a WSN.
4. To make students familiar with the selection of the appropriate a WSN technology.
5. To make students familiar with the designing of a WSN.

LEARNING OUTCOMES:

Following this course students will be able to:

1. Architect sensor networks for various application setups.
2. Assess coverage and conduct node deployment planning.
3. Determine suitable medium access protocols and radio hardware.
4. Prototype sensor networks using commercial components.
5. Evaluate the performance of sensor networks and identify bottlenecks.

MODULE CONTENT:

UNIT-I: Introduction Introduction to Sensor Networks, Unique constraints and challenges, Advantage of Sensor Networks, Applications of Sensor Networks, Mobile AdhocNETworks (MANETs) and Wireless Sensor Networks, Enabling technologies for Wireless Sensor Networks.
UNIT-II: Sensor Node Hardware and Network Architecture Single-node Architecture, Hardware components & design constraints, Operating systems and execution environments, introduction to TinyOS and nesC, Network architecture, Optimization goals and figures of merit, Design principles for WSNs, Service interfaces of WSNs, Gateway concepts.
UNIT-III: Deployment and Configuration Localization and Positioning, Coverage and connectivity, Single-hop and multi-hop localization, self-configuring localization systems, sensor management.
UNIT-IV: Network Protocols Issues in designing MAC protocol for WSNs, Classification of MAC Protocols, S-MAC Protocol, B-MAC protocol, IEEE 802.15.4 standard and Zig Bee, Dissemination protocol for large sensor network.
UNIT-V: Routing protocols Issues in Designing Routing Protocols, Classification of Routing Protocols, Energy-efficient routing, Unicast, Broadcast and multicast, Geographic routing.
UNIT-VI: Data Storage and Manipulation Data centric and content based routing, storage and retrieval in network, compression technologies for WSN, Data aggregation technique, Applications: Detecting unauthorized activity using a sensor network, WSN for Habitat Monitoring.

RECOMMENDED BOOKS:

TEXT BOOK	1. Wireless Sensor Network by Raghavendra, Cauligi S, Sivalingam, Krishna M., Zanti Taieb, Springer 1st Ed. 2004. 2. Protocols and Architectures for Wireless Sensor Network by Holger Kerl, Andreas Willig, JohnWiley and Sons, 2005.
REFERENCE	1. Wireless Sensor Network: Technology, Protocols and Application by Kazem, Sohraby, Daniel Minoli, Taieb Zanti, John Wiley and Sons 1st Ed., 2007. 2. Networking Wireless Sensors by B. Krishnamachari, Cambridge University Press. 3. Wireless Sensor Network by Feng Zhao, Leonidas Guibas, Elsevier, 1st Ed. 2004.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES:

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test			x	x	
Quiz		x	x		x
Assignment	x			x	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes	1	3	4	5	2	4					

EVALUATION

At the end of semester, course faculty will submit an evaluation / review report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the course with respect to its strengths as well as those areas which could be improved. The review report contains the following areas:

- Problems encountered in the content delivery;
- Suggested remedies / corrective measures;
- Approved refinement decisions due for implementation;
- Actions taken based on previous course review; and
- Report discussed and analysed; actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – VI

Advanced Computer Architecture

L	T	P
3	1	0

MODULE CODE	CSEN3222
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

1. Students will understand the Nature and characteristics of modern day computer systems.
2. To make student understand the tremendous variety exists from single chip microprocessors to super computers.
3. To teach the impact of rapid pace of change covering all aspects of computer technology from underlying integrated circuit.
4. To teach the complete knowledge of advanced computer architecture and make students familiar with internal structure of advanced architecture.
5. To teach the internal concept of memory and their types.

LEARNING OUTCOMES

On successful completion of this course you will be able to:

1. Describe the principles of computer design.
2. Classify instruction set architectures.
3. Describe the operation of performance enhancements such as pipelines, dynamic scheduling, branch prediction, caches, and vector processors.
4. Describe the operation of virtual memory.
5. Describe modern architectures such as RISC, Super Scalar, VLIW (Very Large Instruction word), and multicore and multi-CPU systems.
6. Compare the performance of different architectures.

MODULE CONTENT:

Unit-I: Architecture and Machines Some definition and terms, interpretation and microprogramming, The instruction set, Basic data types, Instructions, Addressing and Memory. Virtual to real mapping. Basic Instruction Timing, Time, Area and Instruction Sets.
Unit-II: Cost and area Time, cost-area, and technology state of the Art, The Economics of a processor project: A study, Instruction sets, Professor Evaluation Matrix.
Unit-III: Cache Memory Notion Basic Notion, Cache Organization, Cache Data, adjusting the data for cache organization, write policies, strategies for line replacement at miss time, Cache Environment, other types of Cache. Split I and D-Caches, on chip caches, Two level Caches, write assembly Cache, Cache references per instruction, technology dependent Cache considerations, virtual to real translation, overlapping the T-cycle in V-R Translation, studies. Design summary.
Unit-IV: Pipelining Linear pipeline processor, nonlinear pipeline processor, Instruction pipeline Design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch Handling techniques, branch prediction, Arithmetic Pipeline Design, Computer arithmetic principles, Static Arithmetic pipeline, Multifunctional arithmetic pipelines.
Unit-V: Concurrent Processors Vector Processors, Vector Memory, Multiple Issue Machines, Comparing vector and Multiple Issue processors.
Unit-VI: Shared Memory Multiprocessors Basic issues, partitioning, synchronization and coherency, Type of shared Memory multiprocessors, Memory Coherence in shared Memory Multiprocessors.

RECOMMENDED BOOKS

TEXT BOOK	1. Advanced computer architecture by Kai Hwang, 2000, TMH. 2. Pipelined and Parallel processor design by Michael J. Flynn – 1995, Narosa.
REFERENCE BOOK	3. Computer Architecture and Organization by J.P. Hayes, 1998, MGH. 4. Computer Architecture:A quantitative approach by D.A.Patterson, J.L.Hennessy,2002, Morgan Kauffmann. 5. Advanced computer architecture by Hwang &Briggs, 1993, TMH.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5	6
Class Test		x	x	x	x	
Quiz					x	x
Assignment	x		x	x	x	x

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	C	d	e	f	g	h	i	j	k
Course Learning Outcomes		1	1	2	2,5	4				5	6

EVALUATION

At the end of semester, Subject teacher will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and
- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.

PDM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEMESTER – VI

Cloud Computing

L	T	P
3	1	0

MODULE CODE	CSEN3223
CREDIT POINTS	3.5
FORMATIVE ASSESMENT MARKS	50
SUMMATIVE ASSESMENT MARKS	100
END SEMESTER EXAM DURATION	3 hrs
LAST REVISION DATE	

INSTRUCTIONS: In total EIGHT questions will be set. Question ONE will be compulsory and will cover all units. Remaining seven questions are to be set taking at least one question from each unit. The students are to attempt five questions in total, first being compulsory.

OBJECTIVES

1. To introduce the broad perceptive of cloud architecture and model.
2. To understand the concept of Virtualization.
3. To understand the features of cloud simulator.
4. To apply different cloud programming model as per need.
5. To be able to set up a private cloud.
6. To understand the design of cloud Services.

LEARNING OUTCOMES

Following this course, students will be able to:

1. Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing.
2. Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
3. Explain the core issues of cloud computing such as security, privacy, and interoperability.
4. Identify problems, and explain, analyse, and evaluate various cloud computing solutions.
5. Attempt to generate new ideas and innovations in cloud computing.

MODULE CONTENT:

UNIT-I: Introduction Foundations: Introduction to Cloud Computing, migrating into a cloud, enriching the 'Integration as a Service' paradigm for the cloud era. The enterprise cloud computing paradigm.
UNIT-II: Cloud Architecture and Model Technologies for Network-Based System: system models for distributed and cloud computing, NIST cloud computing reference architecture; Cloud Models: characteristics, cloud Services, cloud models (IaaS, PaaS, SaaS), public vs private cloud; Cloud solutions, cloud ecosystem, service management, computing on demand.
UNIT-III: Virtualization Basics of Virtualization, types of virtualization, implementation levels of virtualization, virtualization structures, tools and mechanisms, virtualization of CPU, memory, I/O devices, virtual clusters and resource management, virtualization for Data-center Automation.
UNIT-IV: Cloud Infrastructure Architectural design of compute and storage clouds, layered cloud architecture development, design challenges, inter cloud resource management, resource provisioning and platform deployment, global exchange of cloud resources.
UNIT-V: Programming Model Parallel and distributed programming paradigms. MapReduce, Twister and Iterative MapReduce, Hadoop Library from Apache, mapping applications, programming support, Google App Engine, Amazon AWS, cloud software environments, Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim.
UNIT-VI: Security in the Cloud Security overview, cloud security challenges and risks, software-as-a-service security, security governance, risk management, security monitoring, Security Architecture Design, data security, application security, virtual machine security, identity management and access control, autonomic security.

RECOMMENDED BOOKS

TEXT BOOK	1. Cloud Computing: Principles and Paradigms by Rajkumar Bi.
REFERENCE	1. Distributed and Cloud Computing, From Parallel Processing to the Internet of Things by Kal Hwang. Geoffeiy C.Fox. Jack J.Dongarra, Morgan Kaufmann Publishers, 2012 2. Cloud Computing: Implementation, Management, and Security by John W.Rittinghouse and James F.Ransome, CRC Press, 2010 3. Cloud Computing, A Practical Approach by Toby Velte, Anthony Velte, Robert Elsenpeter, TMH, 2009. 4. Cloud Computing – insights into New-Era Infrastructure by Kumar Saurabh, Wiley India,2011.

METHODS OF TEACHING AND STUDENT LEARNING

The subject is delivered through lectures, on-line support, text book / course material reading and practical exercises. Some videos will be shown to demonstrate certain concepts and research areas will be discussed. Resource material is provided with the help of PDM Educational Directory Services (PEDS).

ASSESSMENT METHODOLOGIES

This subject will be evaluated for a total of 150 marks for theory.

Theory:

Assessment #	Type of Assessment	Per Semester	Maximum Mark
1.	Class Test	4	10
2.	Sessional Test	2	30
3.	Group Discussion	4	10
4.	End Semester Exam	1	100

MAPPING OF ASSESSMENT METHODS AGAINST THE LEARNING OUTCOMES

Theory:

Assessments	1	2	3	4	5
Class Test	X	x			x
Quiz	X		x		
Assignment	X		x	x	

MAPPING OF COURSE LEARNING OUTCOMES

Program Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Learning Outcomes		1	1	2	2,5	4				5	

EVALUATION

At the end of semester, course faculty will submit an evaluation report. The purpose of this report is to identify aspects that will be highlighted by students and faculty's feedback for the subject with respect to its strengths as well as those areas which could be improved. The review report contains the following:

- Approved refinement decisions due for implementation,
- Actions taken based on previous subject review,
- Problems encountered in the subject delivery,
- Suggested remedies / corrective measures, and

- Report discussed and analysed, actions taken as a result of this process and are communicated to the main stakeholders.