Kamat

SCHEME OF INSTRUCTIONS AND EXAMINATION
For F. E. (Semester I and II)

Semester I (Civil, Mechanical, Electronics & Tele-Comm. and Computer Engg.)

Sr No.	Subject	Teaching Schedule: Deptartment to teach	L	T	P	Duration	Examination Scheme: Theory	Practical	TW or mk	Oral	TOTAL
1.	Applied Maths I	Mathematics	3	1	—	3	100	—	—	—	100
2.	Applied Physics	Physics	3	1	2	3	100	—	25	—	125
3.	Applied Chemistry	Chemistry	3	1	2	3	100	—	25	—	125
4.	Communication skills	English	1	—	3	2	75	—	25	—	100
5.	Engineering Graphics I	Mechanical	2	—	6	4	100	—	50	—	150
6.	Basic Electrical Engineering	Electrical	3	1	2	3	100	—	25	—	125
7.	Basic Civil Engineering	Civil	3	1	2	3	100	—	25	—	125
8.	Work Shop Practicals	Mech. Workshop	—	—	5	—	—	—	50	—	50
		Total	18	5	22		675	—	225	—	900

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2/1/14

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SCHEME OF INSTRUCTIONS AND EXAMINATION

For F. E. (Semester I and II)

Semester II (Civil, Mechanical, Electrical, Electronics & Tele-Comm. and Computer Engg.)

Sr No.	Subject	Teaching Schedule: Deptartment to teach	L	T	P	Duration	Examination Scheme: Theory	Practical	TW Oral	Oral	TOTAL
1.	Applied Maths II	Mathematics	3	1	—	3	100	—	—	—	100
2.	Engg. Mechanics	Civil	3	1	2	3	100	—	25	—	125
3.	Intr. to Computer Programming & Problem Solving	Computer	3	1	3	3	100	—	25	—	125
4.	Basic Mechanical Engg.	Mechanical	3	1	2	3	100	—	25	—	125
5.	Basic Electronics	Electronics & Telecomm.	3	1	2	3	100	—	25	—	125
6.	Engineering Graphics II	Mechanical	2	0	6	4	100	—	50	—	150
7.	Work shop Practice	Mech. workshop	—	0	6	—	—	—	50	—	50
		Total	17	5	21		600	—	200	—	800

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4062
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Gandhaji Nadkarni

ANNEXURE - II

SCHEME OF INSTRUCTIONS AND EXAMINATION

Second Year Bachelor's Degree Course in Computer Engineering

Third Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L	T	P	Duration in Hrs	EXAMINATION SCHEME Theory Marks	Practical Marks	Term Work Marks	Oral Marks	TOTAL Marks
		Periods/ week								
1.	Applied Mathematics III	4	1	--	3	100	---	---	---	100
2.	Analog Electronics	4	1	3	3	100	---	25	---	125
3.	Logic Design	4	--	3	3	100	---	25	50	175
4.	Digital Electronics	4	1	3	3	100	50	25	---	175
5.	Data Structures & Algorithms Using -C	4	1	3	3	100	50	25	---	175
6.	Electrical Technology	4	--	3	3	100	---	25	---	125
	Total	24	4	15	--	600	100	125	50	875

NOTE:
1. L : Lecture
2. T : Tutorial
3. P : Practical
4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

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SCHEME OF INSTRUCTIONS AND EXAMINATION

Second Year Bachelor's Degree Course in Computer Engineering

Fourth Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L	T	P	Periods/ week	EXAMINATION SCHEME Duration in Hrs.	Theory Marks	Practical Marks	Term work Marks	Oral Marks	TOTAL Marks
1.	Discrete Mathematical Structures	4	1	--		3	100	---	---	---	100
2.	Computer Organisation	4	--	3		3	100	---	25	50	175
3.	Electronic Instrumentation	4	1	3		3	100	---	25	50	175
4.	System Analysis & Design	4	1	3		3	100	50	25	---	175
5.	Principles of Programing Languages	4	--	3		3	100	---	25	50	175
6.	Computer Oriented Numerical Techniques	4	1	3		3	100	---	25	50	175
	Total	24	4	15		--	600	50	125	200	975

NOTE:
1. L : Lecture
2. T : Tutorial
3. P : Practical
4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

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SCHEME OF INSTRUCTIONS AND EXAMINATION
Third Year Bachelor's Degree Course in Computer Engineering

Fifth Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L	T	P	Periods/ week	EXAMINATION SCHEME Duration in Hrs	Theory Marks	Practical Marks	Term work Marks	Oral Marks	Total Marks
1.	Operation Research	4	--	--		3	100	---	---	---	100
2.	Microprocessor Based System Design	4	1	3		3	100	50	25	---	175
3.	Data Base Management systems	4	1	3		3	100	50	25	---	175
4.	Design and Analysis of Algorithm	4	--	3		3	100	--	25	---	125
5.	Computer Hardware Design	4	1	3		3	100	--	25	---	125
6.	System Programming	4	--	3		3	100	--	25	50	175
	Total	24	3	15		--	600	100	125	50	875
							360	60	75	30	525

NOTE:
1. L : Lecture
2. T : Tutorial
3. P : Practical
4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

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SCHEME OF INSTRUCTIONS AND EXAMINATION
Third Year Bachelor's Degree Course in Computer Engineering

Sixth Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L	T	P	Duration in Hrs	EXAMINATION SCHEME Theory Marks	Practical Marks	Term work Marks	Oral Marks	Total Marks
		Periods/ week								
1.	Principles of Data Communication	4	--	--	3	100	---	---	---	100
2.	Operating Systems	4	1	3	3	100	---	25	50	175
3.	Pheripheral Devices and Interfaces	4	1	3	3	100	---	25	50	175
4.	Object Oriented Programming	4	1	3	3	100	50	25	---	175
5.	Artificial Intelligence	4	1	3	3	100	--	25	50	175
6.	Computer graphics	4	1	3	3	100	50	25	---	175
	Total	24	5	15	--	600	100	125	150	975

NOTE:
1. L : Lecture
2. T : Tutorial
3. P : Practical
4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

SCHEME OF INSTRUCTIONS AND EXAMINATION
Final Year of Bachelor's Degree Course in Computer Engineering

Seventh Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L Periods/ week	T	P	EXAMINATION SCHEME Duration in Hrs	Theory Marks	Practical Marks	Term work Marks	Oral Marks	Total Marks
1.	Principles of Economics and Management	4	--	--	3	100	---	---	---	100
2.	Computer Network	4	1	3	3	100	---	25	50	175
3.	Compiler Construction	4	1	3	3	100	---	25	50	175
4.	PC System Maintenance & Trouble Shooting	4	--	4	3	100	---	25	50	175
5.	Elective - I	4	1	3	3	100	---	25	50	175
6.	Project	--	1	4	--	---	--- (Seminar)	--	50	50
	Total	20	4	17	--	500	---	100	250	850

NOTE: 1. L : Lecture 2. T : Tutorial
3. P : Practical 4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

Elective - I a) Digital Signal Processing b) Digital System Simulation
c) Distributed Computing d) Logic Programming

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SCHEME OF INSTRUCTIONS AND EXAMINATION
Final Year of Bachelor's Degree Course in Computer Engineering

Eighth Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L	T	P	Periods/ week	EXAMINATION SCHEME Duration in Hrs	Theory Marks	Practical Marks	Term work	Oral Marks	Total Marks
1.	Software Engineering	4	1	3		3	100	---	25	50	175
2.	Advance Computer Architectures	4	1	3		3	100	---	25	50	175
3.	Elective II	4	1	3		3	100	---	50	50	200
4.	Project	--	--	15		--	---	---	50	50	100
	Total	12	3	24		--	300	---	150	200	650

NOTE: 1. L : Lecture 2. T : Tutorial
3. P : Practical 4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

Elective - II
a) Image Processing & Pattern Recognition
b) Software Tools for CAD/CAM
c) Artificial Neural Networks and Fussy Logic
d) Robotics

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SCHEME OF INSTRUCTIONS AND EXAMINATION
For F. E. (Semester I and II)

Semester I (Civil, Mechanical, Electronics & Tele-Comm. and Computer Engg.)

Sr No.	Subject	Deptartment to teach	Teaching Schedule L	T	P	Duration	Examination Scheme Theory	Practical	TW or mk	Oral	TOTAL
1.	Applied Maths I	Mathematics	3	1	—	3	100	—	—	—	100
2.	Applied Physics	Physics	3	1	2	3	100	—	25	—	125
3.	Applied Chemistry	Chemistry	3	1	2	3	100	—	25	—	125
4.	Communication skills	English	1	—	3	2	75	—	25	—	100
5.	Engineering Graphics I	Mechanical	2	—	6	4	100	—	50	—	150
6.	Basic Electrical Engineering	Electrical	3	1	2	3	100	—	25	—	125
7.	Basic Civil Engineering	Civil	3	1	2	3	100	—	25	—	125
8.	Work Shop Practicals	Mech. Workshop	—	—	5	—	—	—	50	—	50
		Total	18	5	22		675	—	225	—	900

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SCHEME OF INSTRUCTIONS AND EXAMINATION

For F. E. (Semester I and II)

Semester II (Civil, Mechanical, Electrical, Electronics & Tele-Comm. and Computer Engg.)

Sr No.	Subject	Teaching Schedule: Deptartment to teach	L	T	P	Duration	Examination Scheme: Theory	Practical	TW or mk	Oral	TOTAL
1.	Applied Maths II	Mathematics	3	1	—	3	100	—	—	—	100
2.	Engg. Mechanics	Civil	3	1	2	3	100	—	25	—	125
3.	Intr. to Computer Programming & Problem Solving	Computer	3	1	3	3	100	—	25	—	125
4.	Basic Mechanical Engg.	Mechanical	3	1	2	3	100	—	25	—	125
5.	Basic Electronics	Electronics & Telecomm.	3	1	2	3	100	—	25	—	125
6.	Engineering Graphics II	Mechanical	2	0	6	4	100	—	50	—	150
7.	Work shop Practice	Mech. workshop	—	0	6	—	—	—	50	—	50
		Total	17	5	21		600	—	200	—	800

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Second Year of Degree Course in Computer Engineering (Revised)

Sr No.	Subject (Department to teach)	Scheme of Instruction * Periods/ week L	T	P	Duration of paper (hrs)	Scheme of Examination Theory	TW Term work	Practical	Oral	TOTAL
	Semester III (Revised)									
1.	Applied Mathematics III (Mathematics)	3	1	—	3	100	—	—	—	100
2.	Electronic Material Science (E and T)	4	1	—	3	100	—	—	—	100
3.	Analog Electronics (Computer)	4	1	3	3	100	25	—	—	125
4.	Logic Design (Computer)	4	1	3	3	100	25	—	—	125
5.	Data Structures (Computer)	4	1	4	3	100	25	—	—	125
6.	Electrical Technology (Electrical)	4	1	3	3	100	25	—	—	125
	Total	23	6	13		600	100	—	—	700

30/9/14

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Semester IV (Revised)

1.	Discrete Mathematical Structures (Mathematics)	3	1	—	3	100	—	—	—	100
2.	Signals and Systems (Computer)	3	1	3	3	100	25	—	—	125
3.	Electronic Instrumentation (E and T)	4	1	3	3	100	25	—	50	175
4.	Pulse and Digital Electronics (Computer)	4	1	3	3	100	25	50	—	175
5.	Computer Organisation (Computer)	4	1	3	3	100	25	—	50	175
6.	Data Processing and File Structures (computer)	3	1	3	3	100	25	50	—	175
	Total	21	6	15		600	125	100	100	925

* Duration of period - 45 minutes, L - Lectures, P - Practicals, T - Tutorial.

III 1 APPLIED MATHEMATICS - III

(Theory - 3 periods/week, Tutorial - 1 period/week, paper - 3hrs, 100 marks)

— Linear algebra : types of matrices, adjoint, inverse, elementary transformations, reduction to normal form - rank, linearly independent systems, homogeneous equations, latent roots/vectors, Cayley - Hamiton theorem, minimal equation, modal matrix, diagnalisation.

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Third Year of Degree Course in Computer Engineerir
(Revised)

Sr No.	Subject (Dept. to teach)	Scheme of Instruction * Periods/ week L	T	P	Duration of paper (hrs)	Scheme of Examinati Theory	TW Term Work	Practical	Oral	
	Semester V (Revised)									
1.	Principles of Economics & Management (Humanitics)	3	1	—	3	100	—	—	—	1
2.	Programming of Numerical Methods (Computer)	3	1	3	3	100	25	—	—	12
3.	Automata, Languages and Computation (Computer)	4	1	3	3	100	25	-	-	12
4.	Data Base Management systems	4	1	4	3	100	25	—	50	17
5.	Microprocessors - I (Computer)	4	1	3	3	100	25	—	50	17
6.	Computer Hardware Design (Computer)	4	1	3	3	100	25	—	50	175
	Total	22	6	16	—	600	125	—	150	875

Computer Engg

30/4/14

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Semester VI (Revised)

					Scheme of Examination					
					Theory					
					Tutorial	Practical	Oral	TOTAL		
1.	Operations Research (Mechanical)	3	1	—	3	100	—	—	—	100
2.	Microprocessors -II (Computer)	4	1	3	3	100	25	50	—	175
3.	Introduction to Systems Programming (Computer)	4	1	3	3	100	25	50	—	175
4.	Artificial Intelligence (Computer)	4	1	3	3	100	25	—	50	175
5.	Computer Graphics (Computer)	4	1	3	3	100	25	—	50	175
6.	Fundamentals of programming languages (Computer)	4	1	3	3	100	25	—	50	175
	Total	23	6	15		600	125	100	150	975

* Duration of period - 45 minutes, L - Lecture, P - Practical, T - tutorial

V. 1. PRINCIPLES OF ECONOMICS AND MANAGEMENT

(Theory : 3 periods/week, Tutorial - 1 period/week, paper - 3 hours, 100 marks)

— Nature and significance of economics. Science, Engineering and Technology - their relationship with economic development. Basic economic concepts — Demand, Supply. Elasticity of demand and supply. Money, Real and opportunity cost, concepts of profit and revenue, tax tariff and subsidies, wants and utility. Concepts of equilibrium and margin economic systems, capitalism, socialism and mixed economy.

Fourth and Final Year of Degree Course in Computer Engineering (Revised)

Sr No.	Subject (Deptt. to teach)	Scheme of Instruction * Periods/ week L	T	P	Duration of paper	Scheme of Examination Theory	TW Term work	Practical	Oral	TOTAL
Semester VII (Revised)										
1.	Principles of data Communication (E and TC)	4	1	—	3	100	—	—	—	100
2.	Peripheral Devices and Interfaces (computer)	4	1	3	3	100	25	—	50	175
3.	Compiler construction (Computer)	4	1	3	3	100	25	—	50	175
4.	Operating Systems (Computer)	4	1	3	3	100	25	—	50	175
5.	Elective I (Comp---uter)	4	1	3	3	100	50	—	50	200
6.	Project (Computer)			5					50 (Seminar)	50
	Total	20	5	17	—	500	125	—	250	875
Semester VIII (Revised)										
1.	Computer Networks (Computer)	4	1	4	3	100	25	—	50	175
2.	Advanced Computer Architectures (Computer)	4	1	4	3	100	25	—	50	175

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3.	Elective II (Computer)	4	1	4	3	100	50	—	50	200
4.	Project	—	—	15	—	—	50	—	50	100
	Total	12	3	27	—	300	150	—	200	650

* Duration of period - 45 minutes, L -Lecture, P - Practical T - Tutorial.

Elective - I (a) Digital Simulation and Modelling (b) Algorithm Analysis and Design (c) Software Engineering (d) information Systems Design (e) Logic Programming.

Elective - II (a) Software Tools for CAD / CAM (b) Distributed Computing (c) Image Processing (d) Robotics (e) VLSI Design

VII. 1. PRINCIPLES OF DATA COMMUNICATION

(Theory - 3 periods/week, Tutorial - 1 period/week, one paper - 3 hours, 100 marks)

— Communication concepts : overview of data communication systems, series/parallel, synchronous/asynchronous communication, terminology, maximum data rate.

— Fundamentals of data communication; band width limiting and Shannons maximum channel capacity theorem.

— Modulation : types of modulation, error probability; PSK, DPSK and FSK, Modulation & demodulation Techniques of these schemes and their composition.

— Data communication sub-systems; modems, RS - 232C interface, Use of telephone systems in data communication, frequency and time division multiplexing.

— Different types of codes, Error detection and correction, codes, such as Algebraic & Cyclic codes.

— Introduction to computer communications. Basic network protocols, Circuit packet switching, OSI levels, Local area networks & mid area networks. Transmission media & Parity checking & Hamming distance.

Ref No.: GU/III/Dean-Engg/07/52 dated 24/05/07

SUBJECT:-Minutes of the meeting of Chairmen of the Board of Studies in faculty of Engineering

ANNEXURE - I

GOA UNIVERSITY

FIRST YEAR OF BACHELOR'S DEGREE COURSE IN ENGINEERING (Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER I (Common for all branches of Engineering)

Sub code	Subjects	Scheme Of Instruction Hrs/Week			Scheme Of Examination					
					Th. Dur (Hrs)	Marks				
		L	T	P		Th	S	P	O	Total
1.1	Applied Mathematics I	4	-	-	3	100	25	-	-	125
1.2	Applied Sciences - I (Physics & Chemistry)	4	-	2	3	100	50	-	-	150
1.3	Basic Civil Engineering and Engineering Mechanics.	4	-	2	3	100	25	-	-	125
1.4	Basic Electrical Engineering	3	-	2	3	100	25	-	-	125
1.5	Engineering Graphics	2	-	4	4	100	50	-	-	150
1.6	Communication Skills	3	-	-	3	100	25	-	-	125
1.7	Workshop Practice - I	-	-	4	-	-	50	-	-	50
	TOTAL	20		14		600	250			850

L : Lectures, T : Tutorials, P : Practicals.
Th. Dur. : Duration of Theory Paper
Th : Theory, S : Sessional, P : Practical, O : Oral

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GOA UNIVERSITY

FIRST YEAR OF BACHELOR'S DEGREE COURSE IN ENGINEERING (Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER II: (Common for all branches of Engineering)

Sub code	Subjects	Scheme Of Instruction Hrs/Week			Scheme Of Examination					
					Th. Dur (Hrs)	Marks				
		L	T	P		Th.	S	P	O	Total
2.1	Applied Mathematics II	4	-	-	3	100	25	-	-	125
2.2	Applied Sciences - II (Physics & Chemistry)	4	-	2	3	100	50	-	-	150
2.3	Information Technology	4	-	2	3	100	25	-	-	125
2.4	Basic Mechanical Engineering	3	-	2	3	100	25	-	-	125
2.5	Basic Electronic Engineering	3	-	2	3	100	25	-	-	125
2.6	Environmental and Social Sciences	4	-	-	3	100	50	-	-	150
2.7	Workshop Practice - II Modern	-	-	4	-	-	50	-	-	50
	TOTAL	22		12	-	600	250	-	-	850

L : Lectures, T : Tutorials, P : Practicals.
Th. Dur. : Duration of Theory Paper
Th : Theory, S : Sessional, P : Practical, O : Oral

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GOA UNIVERSITY

SECOND/THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER III

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Tota
CE3.1 AM3	Applied Mathematics-III	3	1	0	3	100	20+5	-	-	125
CE3.2BC++	Basics of C++	3	1	2	3	100	20+5	50	-	175
CE3.3PPL	Principles of Programming Languages	3	0	2	3	100	20+5	-		125
CE3.4CONT	Computer Oriented Numerical Techniques	3	1	2	3	100	20+5	-	-	125
CE3.5LD	Logic Design	3	1	2	3	100	20+5	50	-	175
CE3.6IE	Integrated Electronics	3	1	2	3	100	20+5	-	-	125
TOTAL		18	05	10	-	600	150	100	0	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P:Practical,O: Oral

25 Sessional marks will be split as follows:
20 marks are for the Internal Test.
5 marks are for continuous evaluation of Practicals/Assignments

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GOA UNIVERSITY

SECOND/THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER IV

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE4.1 DM3	Discrete mathematical Structures	3	1	0	3	100	20+5	-	-	125
CE4.2DS	Data Structure	3	1	2	3	100	20+5	50	-	175
CE4.3CO	Computer Organization	3	1	2	3	100	20+5	-		125
CE4.4EM	Electronic Measurements	3	1	0	3	100	20+5	-	-	125
CE4.5SAD	System Analysis and Design	3	1	2	3	100	20+5	-	-	125
CE4.6OOPC	Object Oriented Programming And Design Using C++	3	1	2	3	100	20+5	50	-	175
TOTAL		18	06	8	-	600	150	100	0	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P: Practical,O: Oral

25 Sessional marks will be split as follows:
20 marks are for the Internal Test.
5 marks are for continuous evaluation of Practicals/Assignments

29/4/14

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GOA UNIVERSITY

SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER V

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Tota
CE 5.1	Organizational Behaviour and Cyber Law	3	0	0	3	100	20+5	-	-	125
CE 5.2	Automata Language and Computation	3	0	2	3	100	20+5	-	-	125
CE 5.3	Microprocessors and Microcontrollers	3	1	2	3	100	20+5	50		175
CE 5.4	Computer Hardware Design	3	1	2	3	100	20+5	-	-	125
CE 5.5	Database Management System	3	1	2	3	100	20+5	50	-	175
CE 5.6	Operating Systems	3	1	2	3	100	20+5	-	-	125
TOTAL		18	04	10	-	600	150	100	-	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P: Practical, O: Oral

25 Sessional marks will be split as follows:
20 marks are for the Internal Test.
5 marks are for continuous evaluation of Practicals/Assignments

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GOA UNIVERSITY

THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER VI

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 6.1	Modern Algorithm Design Foundation	3	0	0	3	100	20+5	-	-	25
CE 6.2	Object Oriented Software Engineering	3	0	2	3	100	20+5	-	-	12[illegible]
CE 6.3	Artificial Intelligence	3	1	2	3	100	20+5	50		175
CE 6.4	Computer Graphics	3	1	2	3	100	20+5	50	-	175
CE 6.5	Device Interface and PC Maintenance	3	1	2	3	100	20+5	-	-	125
CE 6.6	Data Communications	3	1	2	3	100	20+5	-	-	125
TOTAL		18	04	10	-	600	150	100	-	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P: Practical, O: Oral.

25 Sessional marks will be split as follows:
20 marks are for the Internal Test.
5 marks are for continuous evaluation of Practicals/Assignments

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FINAL YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER VII

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 7.1LT	Language Translators	3	1	2	3	100	25	-	25	150
CE 7.2CN	Computer Networks	3	1	2	3	100	25	-	25	150
CE 7.3DSP	Digital Signal Processing	3	1	2	3	100	25	-	50	175
CE 7.4	Elective I	3	1	2	3	100	25	-	50	175
CE 7.5	Elective II	3	1	0	3	100	25	-	-	125
CE 7.6	Project	-	-	4	-	-	25	-	50*	75
TOTAL		15	05	12	-	500	150	-	200	850

***25 Sessional marks will be split as follows:**

20 marks are for the Internal Test

5 marks are for continuous evaluation of Practicals/Assignments

***Seminar & Project Oral**

Electives: A student must take One Elective from each Group.

Group I: Subjects for CE 7.4

a) VLSI Design
b) Software Development ~~Systems~~.
Frameforks (J2EE/NET)
c) Fuzzy Logic and Neural Networks
d) Web Technologies ~~Quality~~

Group II: Subjects for CE 7.5

a) Data Compression
b) Geographical Information System
c) Bio Informatics
d) Project Management and Quality Assurance

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FINAL YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER VIII

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 8.1ADSA	Advanced Data Structures and Algorithms	3	1	2	3	100	25	-	50	175
CE 8.2CCNS	Computer Cryptography and Network Security	3	1	2	3	100	25	-	50	175
CE 8.3	Elective III	3	1	2	3	100	25	-	50	175
CE 8.4	Elective IV	3	1	2	3	100	25	-	50	175
CE 8.5	Project	-	-	8	-	-	50	-	100*	150
TOTAL		12	04	16	-	400	150	-	300	850

***25 Sessional marks will be split as follows:**

20 marks are for the Internal Test

5 marks are for continuous evaluation of Practicals/Assignments

***Seminar & Project Oral**

Electives: A student must take One Elective from each Group.

Group III: Subject for CE 8.3

a) Embedded System Design
b) Multimedia Systems
c) Distributed Operating System
d) Data Mining
e) Web Services

Group VI: Subject for CE 8.4

a) Genetic Algorithms
b) Image Processing
c) Mobile Computing
d) Machine Vision and Learning

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Ref No.: GU/III/Dean-Engg/07/52 dated 24/05/07

SUBJECT: Minutes of the meeting of Chairmen of the Board of Studies in faculty of Engineering.

ANNEXURE - I

GOA UNIVERSITY

FIRST YEAR OF BACHELOR'S DEGREE COURSE IN ENGINEERING (Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER I (Common for all branches of Engineering)

Sub Code	Subjects	Scheme Of Instruction Hrs/Week			Scheme Of Examination					
					Th Dur (Hrs)	Marks				
		L	T	P		Th	S	P	O	Total
1.1	Applied Mathematics I	4	-	-	3	100	25	-	-	125
1.2	Applied Sciences - I (Physics & Chemistry)	4	-	2	3	100	50	-	-	150
1.3	Basic Civil Engineering and Engineering Mechanics.	4	-	2	3	100	25	-	-	125
1.4	Basic Electrical Engineering	3	-	2	3	100	25	-	-	125
1.5	Engineering Graphics	2	-	4	4	100	50	-	-	150
1.6	Communication Skills	3	-	-	3	100	25	-	-	125
1.7	Workshop Practice - I	-	-	4	-	-	50	-	-	50
	TOTAL	**20**		**14**		**600**	**250**			**850**

L : Lectures, T : Tutorials, P : Practicals.
Th. Dur. : Duration of Theory Paper
Th : Theory, S : Sessional, P : Practical, O : Oral

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Dr. J. A. LAXMINA...
PROFESSOR IN COMPUTER
GOA COLLEGE OF ENG.
FARMAGUDI - PONDA GOA

K-IT

GOA UNIVERSITY

FIRST YEAR OF BACHELOR'S DEGREE COURSE IN ENGINEERING (Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER II: (Common for all branches of Engineering)

Sub code	Subjects	Scheme Of Instruction Hrs/Week			Scheme Of Examination					
					Th. Dur (Hrs)	Marks				
		L	T	P		Th.	S	P	O	Total
1	Applied Mathematics II	4	-	-	3	100	25	-	-	125
2.2	Applied Sciences - II (Physics & Chemistry)	4	-	2	3	100	50	-	-	150
2.3	Information Technology	4	-	2	3	100	25	-	-	125
2.4	Basic Mechanical Engineering	3	-	2	3	100	25	-	-	125
2.5	Basic Electronic Engineering	3	-	2	3	100	25	-	-	125
2.6	Environmental and Social Sciences	4	-	-	3	100	50	-	-	150
2.7	Workshop Practice - II Modern	-	-	4	-	-	50	-	-	50
	TOTAL	22		12	-	600	250	-	-	850

, : Lectures, T : Tutorials, P : Practicals.
h. Dur. : Duration of Theory Paper
h : Theory, S : Sessional, P : Practical, O : Oral

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Dr. J. A. LAXMINARAYANA
PROFESSOR IN COMPUTER ENGINEERING,
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FARMAGUDI - PONDA - 403 401

Principal
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GOA UNIVERSITY

SECOND/THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER III

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE3.1 AM3	Applied Mathematics-III	3	1	0	3	100	20+5	-	-	125
CE3.2BC++	Basics of C++	3	1	2	3	100	20+5	50	-	175
CE3.3PPL	Principles of Programming Languages	3	0	2	3	100	20+5	-		125
CE3.4CONT	Computer Oriented Numerical Techniques	3	1	2	3	100	20+5	-	-	125
CE3.5LD	Logic Design	3	1	2	3	100	20+5	50	-	175
CE3.6IE	Integrated Electronics	3	1	2	3	100	20+5	-	-	125
TOTAL		18	05	10	-	600	150	100	0	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P:Practical,O: Oral

25 Sessional marks will be split as follows:
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5 marks are for continuous evaluation of Practicals/Assignments

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GOA UNIVERSITY

SECOND/THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER IV

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE4.1 DM3	Discrete mathematical Structures	3	1	0	3	100	20+5	-	-	125
CE4.2DS	Data Structure	3	1	2	3	100	20+5	50	-	175
CE4.3CO	Computer Organization	3	1	2	3	100	20+5	-		125
CE4.4EM	Electronic Measurements	3	1	0	3	100	20+5	-	-	125
CE4.5SAD	System Analysis and Design	3	1	2	3	100	20+5	-	-	125
CE4.5OOPC	Object Oriented Programming And Design Using C++	3	1	2	3	100	20+5	50	-	175
TOTAL		**18**	**06**	**8**	**-**	**600**	**150**	**100**	**0**	**850**

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P: Practical,O: Oral

25 Sessional marks will be split as follows:
20 marks are for the internal Test.
5 marks are for continuous evaluation of Practicals/Assignments

25/4/14

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GOA UNIVERSITY

SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER V

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 5.1	Organizational Behaviour and Cyber Law	3	0	0	3	100	20+5	-	-	125
CE 5.2	Automata Language and Computation	3	0	2	3	100	20+5	-	-	125
CE 5.3	Microprocessors and Microcontrollers	3	1	2	3	100	20+5	50		175
CE 5.4	Computer Hardware Design	3	1	2	3	100	20+5	-	-	125
CE 5.5	Database Management System	3	1	2	3	100	20+5	50	-	175
CE 5.6	Operating Systems	3	1	2	3	100	20+5	-	-	125
TOTAL		18	04	10	-	600	150	100	-	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P: Practical, O: Oral

25 Sessional marks will be split as follows:
20 marks are for the Internal Test.
5 marks are for continuous evaluation of Practicals/Assignments

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GOA UNIVERSITY

THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER VI

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 6.1	Modern Algorithm Design Foundation	3	0	0	3	100	20+5	-	-	125
CE 6.2	Object Oriented Software Engineering	3	0	2	3	100	20+5	-	-	12[illegible]
CE 6.3	Artificial Intelligence	3	1	2	3	100	20+5	50		175
CE 6.4	Computer Graphics	3	1	2	3	100	20+5	50	-	175
CE 6.5	Device Interface and PC Maintenance	3	1	2	3	100	20+5	-	-	125
CE 6.6	Data Communications	3	1	2	3	100	20+5	-	-	125
TOTAL		18	04	10	-	600	150	100	-	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P: Practical, O: Oral.

25 Sessional marks will be split as follows:
20 marks are for the internal Test.
5 marks are for continuous evaluation of Practicals/Assignments

25/4/14
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FINAL YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER VII

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 7.1LT	Language Translators	3	1	2	3	100	25	-	25	150
CE 7.2CN	Computer Networks	3	1	2	3	100	25	-	25	150
CE 7.3DSP	Digital Signal Processing	3	1	2	3	100	25	-	50	175
CE 7.4	Elective I	3	1	2	3	100	25	-	50	175
CE 7.5	Elective II	3	1	0	3	100	25	-	-	125
CE 7.6	Project	-	-	4	-	-	25	-	50*	75
TOTAL		15	05	12	-	500	150	-	200	850

***25 Sessional marks will be split as follows:**

20 marks are for the Internal Test

5 marks are for continuous evaluation of Practicals/Assignments

***Seminar & Project Oral**

Electives: A student must take One Elective from each Group.

Group I: Subjects for CE 7.4

a) VlSI Design
b) Software Development ~~Systems~~ Frameforks (J2EE/NET)
c) Fuzzy Logic and Neural Networks
d) Web Technologies ~~Quality~~

Group II: Subjects for CE 7.5

a) Data Compression
b) Geographical Information System
c) Bio Informatics
d) Project Management and Quality Assurance

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FINAL YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER VIII

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 8.1ADSA	Advanced Data Structures and Algorithms	3	1	2	3	100	25	-	50	175
CE 8.2CCNS	Computer Cryptography and Network Security	3	1	2	3	100	25	-	50	175
CE 8.3	Elective III	3	1	2	3	100	25	-	50	175
CE 8.4	Elective IV	3	1	2	3	100	25	-	50	175
CE 8.5	Project	-	-	8	-	-	50	-	100*	150
TOTAL		12	04	16	-	400	150	-	300	850

***25 Sessional marks will be split as follows:**

20 marks are for the Internal Test

5 marks are for continuous evaluation of Practicals/Assignments

***Seminar & Project Oral**

Electives: A student must take One Elective from each Group.

Group III: Subject for CE 8.3

a) Embedded System Design
b) Multimedia Systems
c) Distributed Operating System
d) Data Mining
e) Web Services

Group VI: Subject for CE 8.4

a) Genetic Algorithms
b) Image Processing
c) Mobile Computing
d) Machine Vision and Learning

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SCHEME OF INSTRUCTIONS AND EXAMINATION
For F. E. (Semester I and II)

Semester I (Civil, Mechanical, Electronics & Tele-Comm. and Computer Engg.)

Sr No.	Subject	Deptartment to teach	Teaching Schedule L	T	P	Duration	Examination Scheme Theory	Practical	TWork	Oral	TOTAL
1.	Applied Maths I	Mathematics	3	1	—	3	100	—	—	—	100
2.	Applied Physics	Physics	3	1	2	3	100	—	25	—	125
3.	Applied Chemistry	Chemistry	3	1	2	3	100	—	25	—	125
4.	Communication skills	English	1	—	3	2	75	—	25	—	100
5.	Engineering Graphics I	Mechanical	2	—	6	4	100	—	50	—	150
6.	Basic Electrical Engineering	Electrical	3	1	2	3	100	—	25	—	125
7.	Basic Civil Engineering	Civil	3	1	2	3	100	—	25	—	125
8.	Work Shop Practicals	Mech. Workshop	—	—	5	—	—	—	50	—	50
		Total	18	5	22		675	—	225	—	900

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SCHEME OF INSTRUCTIONS AND EXAMINATION

For F. E. (Semester I and II)

Semester II (Civil, Mechanical, Electrical, Electronics & Tele-Comm. and Computer Engg.)

Sr No.	Subject	Deptartment to teach	Teaching Schedule L	T	P	Duration	Examination Scheme Theory	Practical	TWorrmk	Oral	TOTAL
1.	Applied Maths II	Mathematics	3	1	—	3	100	—	—	—	100
2.	Engg. Mechanics	Civil	3	1	2	3	100	—	25	—	125
3.	Intr. to Computer Programming & Problem Solving	Computer	3	1	3	3	100	—	25	—	125
4.	Basic Mechanical Engg.	Mechanical	3	1	2	3	100	—	25	—	125
5.	Basic Electronics	Electronics & Telecomm.	3	1	2	3	100	—	25	—	125
6.	Engineering Graphics II	Mechanical	2	0	6	4	100	—	50	—	150
7.	Work shop Practice	Mech. workshop	—	0	6	—	—	—	50	—	50
		Total	17	5	21		600	—	200	—	800

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ANNEXURE - II

SCHEME OF INSTRUCTIONS AND EXAMINATION

Second Year Bachelor's Degree Course in Computer Engineering

Third Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L	T	P	EXAMINATION SCHEME Duration in Hrs	Theory Marks	Practical Marks	Term Work Marks	Oral Marks	TOTAL Marks
		Periods/ week								
1.	Applied Mathematics III	4	1	--	3	100	---	---	---	100
2.	Analog Electronics	4	1	3	3	100	---	25	---	125
3.	Logic Design	4	--	3	3	100	---	25	50	175
4.	Digital Electronics	4	1	3	3	100	50	25	---	175
5.	Data Structures & Algorithms Using -C	4	1	3	3	100	50	25	---	175
6.	Electrical Technology	4	--	3	3	100	---	25	---	125
	Total	24	4	15	--	600	100	125	50	875

NOTE:
1. L : Lecture
2. T : Tutorial
3. P : Practical
4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

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SCHEME OF INSTRUCTIONS AND EXAMINATION
Second Year Bachelor's Degree Course in Computer Engineering

Fourth Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L T P Periods/ week			EXAMINATION SCHEME Duration in Hrs.	Theory Marks	Practical Marks	Term work Marks	Oral Marks	TOTAL Marks
1.	Discrete Mathematical Structures	4	1	--	3	100	---	---	---	100
2.	Computer Organisation	4	--	3	3	100	---	25	50	175
3.	Electronic Instrumentation	4	1	3	3	100	---	25	50	175
4.	System Analysis & Design	4	1	3	3	100	50	25	---	175
5.	Principles of Programing Languages	4	--	3	3	100	---	25	50	175
6.	Computer Oriented Numerical Techniques	4	1	3	3	100	---	25	50	175
	Total	24	4	15	--	600	50	125	200	975

NOTE:
1. L : Lecture
2. T : Tutorial
3. P : Practical
4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

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SCHEME OF INSTRUCTIONS AND EXAMINATION
Third Year Bachelor's Degree Course in Computer Engineering

Fifth Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L T P Periods/ week			EXAMINATION SCHEME Duration in Hrs	Theory Marks	Practical Marks	Term work Marks	Oral Marks	Total Marks
1.	Operation Research	4	--	--	3	100	---	---	---	100
2.	Microprocessor Based System Design	4	1	3	3	100	50	25	---	175
3.	Data Base Management systems	4	1	3	3	100	50	25	---	175
4.	Design and Analysis of Algorithm	4	--	3	3	100	--	25	---	125
5.	Computer Hardware Design	4	1	3	3	100	--	25	---	125
6.	System Programming	4	--	3	3	100	--	25	50	175
	Total	24	3	15	--	600	100	125	50	875
						360	60	75	30	525

NOTE: 1. L : Lecture 2. T : Tutorial
3. P : Practical 4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

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SCHEME OF INSTRUCTIONS AND EXAMINATION
Third Year Bachelor's Degree Course in Computer Engineering

Sixth Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L	T	P	Duration in Hrs	EXAMINATION SCHEME Theory Marks	Practical Marks	Term work Marks	Oral Marks	Total Marks
		Periods/ week								
1.	Principles of Data Communication	4	--	--	3	100	---	---	---	100
2.	Operating Systems	4	1	3	3	100	---	25	50	175
3.	Pheripheral Devices and Interfaces	4	1	3	3	100	---	25	50	175
4.	Object Oriented Programming	4	1	3	3	100	50	25	---	175
5.	Artificial Intelligence	4	1	3	3	100	--	25	50	175
6.	Computer graphics	4	1	3	3	100	50	25	---	175
	Total	24	5	15	--	600	100	125	150	975

NOTE:
1. L : Lecture
2. T : Tutorial
3. P : Practical
4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

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SCHEME OF INSTRUCTIONS AND EXAMINATION

Final Year of Bachelor's Degree Course in Computer Engineering

Seventh Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L T P Periods/ week			EXAMINATION SCHEME Duration in Hrs	Theory Marks	Practical Marks	Term work Marks	Oral Marks	Total Marks
1.	Principles of Economics and Management	4	--	--	3	100	---	---	---	100
2.	Computer Network	4	1	3	3	100	---	25	50	175
3.	Compiler Construction	4	1	3	3	100	---	25	50	175
4.	PC System Maintenance & Trouble Shooting	4	--	4	3	100	---	25	50	175
5.	Elective - I	4	1	3	3	100	---	25	50	175
6.	Project	--	1	4	--	---	--- (Seminar)	--	50	50
	Total	20	4	17	--	500	---	100	250	850

NOTE:
1. L : Lecture
2. T : Tutorial
3. P : Practical
4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

Elective - I
a) Digital Signal Processing
b) Digital System Simulation
c) Distributed Computing
d) Logic Programming

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SCHEME OF INSTRUCTIONS AND EXAMINATION

Final Year of Bachelor's Degree Course in Computer Engineering

Eighth Semester (Further Revised)

Sr. No.	Subject	TEACHING SCHEME L T P Periods/ week			EXAMINATION SCHEME Duration in Hrs	Theory Marks	Practical Marks	Term work	Oral Marks	Total Marks
1.	Software Engineering	4	1	3	3	100	---	25	50	175
2.	Advance Computer Architectures	4	1	3	3	100	---	25	50	175
3.	Elective II	4	1	3	3	100	---	50	50	200
4.	Project	--	--	15	--	---	---	50	50	100
	Total	12	3	24	--	300	---	150	200	650

NOTE: 1. L : Lecture 2. T : Tutorial
3. P : Practical 4. Theory exam duration in hrs.
5. Period Duration is 45 minutes.

Elective - II
a) Image Processing & Pattern Recognition
b) Software Tools for CAD/CAM
c) Artificial Neural Networks and Fussy Logic
d) Robotics

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3. Periodic Tests : Starting on Wednesdays of 8, 12 and 16th academic weeks.
4. Practical/Oral Exams : Starting on 18th Wednesday.
5. Theory Exams : Starting on 20th Wednesday.
6. Vacation : Starting on 21st Wednesday.
7. Declaration of all examination results in the 26th week.

SEHEME OF INSTRUCTION & EXAMINATION

FIRST YEAR ENGINEERING

(Civil, Mechanical, Electrical & Electronics, Electronics & Telecommunication, & Computer Engineering)

SEMESTER I

No.	Subject	L	T	P	Duration of Theory Exam	Marks Alloted				Total
						TH	S	P	O	
1.1.	Applied Mathematics I	3	0	0	3	100	25	0	0	125
1.2	Applied Science I (Physics &Chemistry)	4	0	2	3	100	50	0	0	150
1.3	Basic Engineering-I ology - I (Civil & Mechanical Engg.)	4	0	2	3	100	50	0	0	150
1.4	Information Technology - I	3	0	2	3	100	50	0	0	150
1.5	Engineering Graphics	2	0	4	4	100	50	0	0	150
1.6	Communication Skills	2	0	0	0	0	50	0	0	50
1.7	Workshop Practice	0	0	4	0	0	50	0	0	50
	Total	18	0	14	-	500	325	0	0	825

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SCHEME OF INSTRUCTION & EXAMINATION

FIRST YEAR ENGINEERING

(Civil, Mechanical, Electrical & Electronics, Electronics & Telecommunication, & Computer Engineering)

SEMESTER II

No.	Subject	L	T	P	Duration of Theory Exam	Marks Alloted				Total
						TH	S	P	O	
2.1	Applied Mathematics II	3	0	0	3	100	25	-	-	125
2.2	Applied Science II (Physics & Chemistry)	4	0	2	3	100	50	-	-	150
2.3	Basic Engineering - II (Electrical & Electronics Engg.)	4	0	2	3	100	50	-	-	150
2.4	Information Technology - II (Problem Solving & Programming	3	0	2	3	100	50	0	0	150
2.5	Engineering Machanics	3	0	1	3	100	50	-	-	150
2.6	Social Sciences	2	0	0	0	0	50	-	-	50
2.7	Modern Workshop Practice	0	0	4	0	0	50	-	-	50
2.8	Computer Aided Drafting	0	0	2	0	0	50	-	-	50
	TOTAL	19	0	13	-	500	375	-	-	875

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GOA UNIVERSITY

SECOND YEAR OF BACHELOR'S DEGREE COURSE IN

COMPUTER ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER - III

SUB CODE	SUBJECT	Scheme of teaching (hrs/week)			Scheme of Examination					
		L	T	P	Dur. of Th/Pr (Hr)	MARKS Th	S	P	O	TOTAL
CE 3.1	Applied Mathematics -III	3	1	-	3	100	25	-	-	125
CE 3.2	Logic Design	3	1	2	3	100	25	-	50	175
CE 3.3.	Data Structures using C++	3	1	2	3	100	25	50	-	175
CE 3.4	Integrated Electronics	3	1	2	3	100	25	-	-	125
CE 3.5	Computer Oriented Numerical Techniques	3	-	2	3	100	25	-	-	125
CE 3.6	Electrical Technology	3	-	2	3	100	25	-	-	125
	Total	18	4	10		600	150	50	50	850

8/1/2014

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SEMESTER - IV

SUB CODE	Subject	Scheme of teaching (hrs/week)			Scheme of Examination					
		L	T	P	Dur. of Th/Pr (Hr)	MARKS				
						Th	S	P	O	TOTAL
CE 4.1	Discrete Mathematical Structures	3	1	-	3	100	25	-	-	125
CE 4.2	Principles of Programming Languages	3	-	2	3	100	25	-	-	125
CE 4.3	Computer Organisation	3	1	2	3	100	25	-	50	175
CE 4.4	Design & Analysis of Algorithms	3	-	2	3	100	25	-	-	125
CE 4.5	System Analysis and Design	3	1	2	3	100	25	50	-	175
CE 4.6	Electronic Instruentation	3	1	2	3	100	25	-	-	125
	TOTAL	**18**	**4**	**10**		**600**	**150**	**50**	**50**	**850**

L - Lecture, T - Tutorial, P - Practical, Th - Theory, S - Sessionals, O - Orals

Third year of Bachelors of Engineering Degree in Computer Engineering

Scheme of Instruction and Examination

8/1/2014

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SEMESTER - V

Subject Code	Subject	Scheme of instruction (hrs/Week)			Duration of Theory Paper (hrs)	Scheme of Examination marks				
		L	T	P		Th	S	Pr	O	Total
CE 5.1	Economics and Management	3	1	-	3	100	25	-	-	125
CE 5.2	Automata Languages and Computation	3	1	-	3	100	25	-	-	125
CE 5.3	Microprocessors	3	1	2	3	100	25	50	-	175
CE 5.4	Data Base Management Systems	3	1	2	3	100	25	-	-	125
CE 5.5	Operating Systems	3	1	2	3	100	25	-	50	175
CE 5.6	Computer Hardware Design	3	1	2	3	100	25	-	-	125
	TOTAL	18	6	8		600	150	50	50	850

8/1/2014
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SEMESTER - VI

Subject Code	Subject	Scheme of instruction (hrs/Week)			Duration of Theory Paper (hrs)	Scheme of Examination marks				
		L	T	P		Th	S	Pr	O	Total
CE 6.1	Operations Research	3	1	-	3	100	25	-	-	125
CE 6.2	Object Oriented Design and Programming	3	-	2	3	100	25	-	-	125
CE 6.3	Artificial Intelligence	3	-	2	3	100	25	-	-	125
CE 6.4	Computer Graphics	3	1	2	3	100	25	50	-	175
CE 6.5	Device Interfaces & PC Maintenance	3	1	2	3	100	25	-	50	175
CE 6.6	Computer Networks-1	3	1	2	3	100	25	-	-	125
	TOTAL	18	4	10		600	150	50	50	850

L-Lectures

T-Tutorial

P-Practical

Th-Theory

S-Sessional

Pr- Practical examination

O-Oral examination

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Fourth and Final year of Bachelors of Engineering Degree in Computer Engineering

Scheme of Instruction and Examination

SEMESTER VII

Sr.No.	Subject	Scheme of Teaching				Scheme				
		L	T	P	TD	TM	IA	PR	ORA	Total
			Hrs/Week		Hrs.		Mark			
7.1	Language Translators	3	1	2	3	100	25	-	-	125
7.2	Computer Communication Networks-II	3	1	2	3	100	25	-	50	175
7.3	Software engineering	3	1	-	3	100	25	-	50	175
7.4	Elective-I	3	1	2	3	100	25	-	50	175
7.5	Elective-II	3	1	2	3	100	25	-	50	175
7.6	Project	-	-	4	-	-	50*	-	-	50
	Total	15	5	12		500	175	-	200	875

* Project Seminar

Subjects for Elective I

a) Embedded systems
b) DSP
c) VLSI
d) Cryptography

Subjects for Elective II

a) Data Mining
b) Distributed Operating Systems
c) Multimedia systems
d) Fuzzy Logic and Neural Networks

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Semester – VIII

Sr.No.	Subject	Teaching				Scheme				
		L	T	P	TD	TM	IA	PR	ORA	Total
			Hrs/Week		Hrs.		Marks			
8.1	Advanced data structures and algorithms	3	1	2	3	100	25	-	50	175
8.2	Elective -III	3	1	2	3	100	25	-	50	175
8.3	Elective -IV	3	1	2	3	100	25	-	50	175
8.4	Project	-	-	10	-	-	50	-	50	100
	Total	9	3	16		300	125	-	200	625

Subjects for Elective III

a) Web Technologies
b) software tools for CAD/CAM
c) Robotics
d) Advanced Computer Architecture

*** Project Seminar**

Subjects for Elective IV

a) Image Processing
b) Digital Simulation Modeling
c) Natural Language Processing
d) Genetic Algorithms

TM-Max. marks for theory
IA-Max. marks for internal assesment
PR-Practical exam marks
ORA- Oral exam marks

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2006 Course

FIRST YEAR ENGINEERING
(CIVIL,MECHANICAL,ELECTRICAL & ELECTRONICS & TELECOMMUNICATION, & COMPUTER ENGINEERING)

SEMISTER I

NO	SUBJECT	L	T	P	DURATION OF THEORY EXAM	Marks Alloted				Total
						Th.	S	P	O	
1.1	Applied Mathematics I	3	0	0	3	100	25	0	0	125
1.2	Applied Sciences-I (Physics& Chemistry)	4	0	2~	3	100	50	0	0	150
1.3	Basic engineering-I (Civil & Mechanical Engg.)	4	0	2~	3	100	50	0	0	150
1.4	Information Technology-I	3	0	2	3	100	50	0	0	150
1.5	Engineering Graphics	2	0	4	4	100	50	0	0	150
1.6	Communication Skills	2	0	0	0	0	50	0	0	50
1.7	Workshop Practice	0	0	4	0	0	50	0	0	50
1.8	Environmental Studies	3	0	0	3	100	25	0	0	125
Total		21	0	14	-	600	350	0	0	950

SEMISTER

NO	SUBJECT	L	T	P	DURATION OF THEORY EXAM	Marks Alloted				Total
						Th.	S	P	O	
2.1	Applied Mathematics II	3	0	0	3	100	25	-	-	125
2.2	Applied Sciences-II (Physics& Chemistry)	4	0	2~	3	100	50	-	-	150
2.3	Basic engineering-II (Electrical & Electronics Engg.)	4	0	2~	3	100	50	-	-	150
2.4	Information Technology-II (Problem Solving and Programming)	3	0	2	3	100	50	-	-	150
2.5	Engineering Mechanics	3	0	1	3	100	50	-	-	150
2.6	Social Sciences	2	0	0	0	0	50	-	-	50
2.7	Modern Workshop Practice	0	0	4	0	0	50	-	-	50
2.8	Computer Aided Drafting	0	0	2	0	0	50	0	0	50
Total		19	0	13	-	500	375	-	-	875

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Computer Engineering Teaching Scheme

Third Semester

Sr.no	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	IA	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
1	Applied Maths-3	3	1	-	3	100	25	-	-	125
2	Logic design	3	1	2	3	100	25	-	50	175
3	Data Structures using C++	3	1	2	3	100	25	50	-	175
4	Integrated Electronics	3	1	2	3	100	25	-	-	125
5	Computer oriented Numerical Techniques	3	-	2	3	100	25	-	-	125
6	Electrical Technology	3	-	2	3	100	25	-	-	125
	Total	18	4	10		600	150	50	50	850

Fourth Semester

Sr.no	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	IA	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
1	Discrete Mathematical Structures	3	1	-	3	100	25	-	-	125
2	Principles of Programming Languages	3	-	2	3	100	25	-	-	125
3	Computer Organisation	3	1	2	3	100	25	-	50	175
4	Design And Analysis of Algorithms	3	-	2	3	100	25	-	-	125
5	System Analysis and Design	3	1	2	3	100	25	50	-	175
6	Electronic Instrumentation	3	1	2	3	100	25	-	-	125
	Total	18	4	10		600	150	50	50	850

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V

Sr.no	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	IA	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
1	Economics and Management	3	1	-	3	100	25	-	-	125
2	Automata languages and Computation	3	1	-	3	100	25	-	-	125
3	Microprocessors	3	1	2	3	100	25	50	-	175
4	Database management systems	3	1	2	3	100	25	-	-	125
5	Operating Systems	3	1	2	3	100	25	-	50	175
6	Computer hardware design	3	1	2	3	100	25	-	-	125
	Total	18	6	8		600	150	50	50	850

Sixth Semester

Sr.no	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	IA	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
1	Operations Research	3	1	-	3	100	25	-	-	125
2	Object Oreiented Design And Programming	3	-	2	3	100	25	-	-	125
3	Artificial Intelligence	3	-	2	3	100	25	-	-	125
4	Computer graphics	3	1	2	3	100	25	50	-	175
5	Device interfaces and PC maintainence	3	1	2	3	100	25	-	50	175
6	Computer Netwks-I	3	1	2	3	100	25	-	-	125
	Total	18	4	10		600	150	50	50	850

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Seventh Semester

Sr.no	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	IA	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
1	Language Translators	3	1	2	3	100	25	-	50	175
2	Computer Communication Networks-II	3	1	2	3	100	25	-	-	125
3	Software Engineering	3	1	-	3	100	25	-	-	125
4	Elect-I	3	1	2	3	100	25	-	50	175
5	Elect-II	3	1	2	3	100	25	-	50	175
6	Project	-	-	4	-	0	25	-	50	75
	Total	15	5	12		500	150		200	850

L: Lecture
T: Tutorial
P:Practical
TD: Duration of theory paper
TM: max Mks for theory
IA: max marks for internal assessment
Pr: Practical exam marks
ORA : Oral exam marks

→Elect -I Subjects:

1) VLSI Tchnology and Design
2) Digital Signal processing
3) Software Agents and embedded systems
4) Fuzzy Logic and Neural Networks

Elect II Subjects:

1) Data Mining
2) Distributed Operating Systems
3) Web Technologies
4) Digital Simulation and Modelling.

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Eigth Semester

Sr.no	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	IA	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
1	Advanced Data structures and algorithms	3	1	2	3	100	25	-	50	175
2	Elect-III	3	1	2	3	100	25	-	50	175
3	Elect-IV	3	1	2	3	100	25	-	50	175
4	Project	-	-	10	-	-	25	-	200	225
	Total	9	3	16		300	125		350	750

L: Lecture
T: Tutorial
P:Practical
TD: Duration of theory paper
TM: max Mks for theory
IA: max marks for internal assessment
Pr: Practical exam marks
ORA : Oral exam marks

→Elect -III Subjects:

1) Multimedia Systems
2) S/w Tools for CAD/CAM
3) Robotics
4) Advanced Computer Architecture

Elect IV Subjects:

1) image Processing and pattern Recognition
2) Cryptography and Network Security
3) Natural language processing
4) Genetic Algorithms

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Ref No.: GU/III/Dean-Engg/07/52 dated 24/05/07

SUBJECT: Minutes of the meeting of Chairmen of the Board of Studies in faculty of Engineering.

ANNEXURE - I

GOA UNIVERSITY

FIRST YEAR OF BACHELOR'S DEGREE COURSE IN ENGINEERING (Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER I (Common for all branches of Engineering)

Sub code	Subjects	Scheme Of Instruction Hrs/Week			Scheme Of Examination					
					Th. Dur (Hrs)	Marks				
		L	T	P		Th.	S	P	O	Total
1.1	Applied Mathematics I	4	-	-	3	100	25	-	-	125
1.2	Applied Sciences - I (Physics & Chemistry)	4	-	2	3	100	50	-	-	150
1.3	Basic Civil Engineering and Engineering Mechanics.	4	-	2	3	100	25	-	-	125
1.4	Basic Electrical Engineering	3	-	2	3	100	25	-	-	125
1.5	Engineering Graphics	2	-	4	4	100	50	-	-	150
1.6	Communication Skills	3	-	-	3	100	25	-	-	125
1.7	Workshop Practice - I	-	-	4	-	-	50	-	-	50
	TOTAL	20		14		600	250			850

L : Lectures, T : Tutorials, P : Practicals.
Th. Dur. : Duration of Theory Paper
Th : Theory, S : Sessional, P : Practical, O : Oral

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Dr. J. A. LAXMINA...
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GOA UNIVERSITY

FIRST YEAR OF BACHELOR'S DEGREE COURSE IN ENGINEERING (Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER II: (Common for all branches of Engineering)

Sub code	Subjects	Scheme Of Instruction Hrs/Week			Scheme Of Examination					
					Th. Dur (Hrs)	Marks				
		L	T	P		Th.	S	P	O	Total
2.1	Applied Mathematics II	4	-	-	3	100	25	-	-	125
2.2	Applied Sciences - II (Physics & Chemistry)	4	-	2	3	100	50	-	-	150
2.3	Information Technology	4	-	2	3	100	25	-	-	125
2.4	Basic Mechanical Engineering	3	-	2	3	100	25	-	-	125
2.5	Basic Electronic Engineering	3	-	2	3	100	25	-	-	125
2.6	Environmental and Social Sciences	4	-	-	3	100	50	-	-	150
2.7	Workshop Practice - II Modern	-	-	4	-	-	50	-	-	50
	TOTAL	**22**		**12**	-	600	250	-	-	**850**

L : Lectures, T : Tutorials, P : Practicals.
Th. Dur. : Duration of Theory Paper
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Dr. J. A. LAXMINARAYANA
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GOA UNIVERSITY

SECOND/THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER III

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE3.1 AM3	Applied Mathematics-III	3	1	0	3	100	20+5	-	-	125
CE3.2BC++	Basics of C++	3	1	2	3	100	20+5	50	-	175
CE3.3PPL	Principles of Programming Languages	3	0	2	3	100	20+5	-		125
CE3.4CONT	Computer Oriented Numerical Techniques	3	1	2	3	100	20+5	-	-	125
CE3.5LD	Logic Design	3	1	2	3	100	20+5	50	-	175
CE3.6IE	Integrated Electronics	3	1	2	3	100	20+5	-	-	125
TOTAL		18	05	10	-	600	150	100	0	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P:Practical,O: Oral

25 Sessional marks will be split as follows:
20 marks are for the Internal Test.
5 marks are for continuous evaluation of Practicals/Assignments

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Assistant Registrar (Academic)
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GOA UNIVERSITY

SECOND/THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER IV

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	To
CE4.1 DM3	Discrete mathematical Structures	3	1	0	3	100	20+5	-	-	125
CE4.2DS	Data Structure	3	1	2	3	100	20+5	50	-	175
CE4.3CO	Computer Organization	3	1	2	3	100	20+5	-		125
CE4.4EM	Electronic Measurements	3	1	0	3	100	20+5	-	-	125
CE4.5SAD	System Analysis and Design	3	1	2	3	100	20+5	-	-	125
CE4.6OOPC	Object Oriented Programming And Design Using C++	3	1	2	3	100	20+5	50	-	175
	TOTAL	18	06	8	-	600	150	100	0	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P: Practical,O: Oral

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GOA UNIVERSITY

SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER V

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 5.1	Organizational Behaviour and Cyber Law	3	0	0	3	100	20+5	-	-	125
CE 5.2	Automata Language and Computation	3	0	2	3	100	20+5	-	-	125
CE 5.3	Microprocessors and Microcontrollers	3	1	2	3	100	20+5	50		175
CE 5.4	Computer Hardware Design	3	1	2	3	100	20+5	-	-	125
CE 5.5	Database Management System	3	1	2	3	100	20+5	50	-	175
CE 5.6	Operating Systems	3	1	2	3	100	20+5	-	-	125
TOTAL		18	04	10	-	600	150	100	-	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P: Practical, O: Oral

25 Sessional marks will be split as follows:
20 marks are for the Internal Test.
5 marks are for continuous evaluation of Practicals/Assignments

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GOA UNIVERSITY

THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER VI

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 6.1	Modern Algorithm Design Foundation	3	0	0	3	100	20+5	-	-	125
CE 6.2	Object Oriented Software Engineering	3	0	2	3	100	20+5	-	-	125
CE 6.3	Artificial Intelligence	3	1	2	3	100	20+5	50		175
CE 6.4	Computer Graphics	3	1	2	3	100	20+5	50	-	175
CE 6.5	Device Interface and PC Maintenance	3	1	2	3	100	20+5	-	-	125
CE 6.6	Data Communications	3	1	2	3	100	20+5	-	-	125
TOTAL		18	04	10	-	600	150	100	-	850

L-lecture, T: Tutorials, P-Practical
Th.Dur: Duration of the Paper
Th: Theory, S: Sessional, P: Practical, O: Oral.

25 Sessional marks will be split as follows:
20 marks are for the Internal Test.
5 marks are for continuous evaluation of Practicals/Assignments

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FINAL YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER VII

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 7.1LT	Language Translators	3	1	2	3	100	25	-	25	150
CE 7.2CN	Computer Networks	3	1	2	3	100	25	-	25	150
CE 7.3DSP	Digital Signal Processing	3	1	2	3	100	25	-	50	175
CE 7.4	Elective I	3	1	2	3	100	25	-	50	175
CE 7.5	Elective II	3	1	0	3	100	25	-	-	125
CE 7.6	Project	-	-	4	-	-	25	-	50*	75
	TOTAL	15	05	12	-	500	150	-	200	850

***25 Sessional marks will be split as follows:**

20 marks are for the Internal Test

5 marks are for continuous evaluation of Practicals/Assignments

*Seminar & Project Oral

Electives: A student must take One Elective from each Group.

Group I: Subjects for CE 7.4

a) VlSI Design
b) Software Development ~~Systems~~.
Frameforks (J2EE/NET)
c) Fuzzy Logic and Neural Networks
d) Web Technologies ~~Quality~~

Group II: Subjects for CE 7.5

a) Data Compression
b) Geographical Information System
c) Bio Informatics
d) Project Management and Quality Assurance

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FINAL YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(REVISED IN 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMISTER VIII

Sub Code	Subject	Scheme of Instruction Hrs/Week			Scheme Of Examination					
		L	T	P	Th.Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 8.1ADSA	Advanced Data Structures and Algorithms	3	1	2	3	100	25	-	50	175
CE 8.2CCNS	Computer Cryptography and Network Security	3	1	2	3	100	25	-	50	175
CE 8.3	Elective III	3	1	2	3	100	25	-	50	175
CE 8.4	Elective IV	3	1	2	3	100	25	-	50	175
CE 8.5	Project	-	-	8	-	-	50	-	100*	150
TOTAL		12	04	16	-	400	150	-	300	850

***25 Sessional marks will be split as follows:**

20 marks are for the Internal Test

5 marks are for continuous evaluation of Practicals/Assignments

***Seminar & Project Oral**

Electives: A student must take One Elective from each Group.

Group III: Subject for CE 8.3

a) Embedded System Design
b) Multimedia Systems
c) Distributed Operating System
d) Data Mining
e) Web Services

Group VI: Subject for CE 8.4

a) Genetic Algorithms
b) Image Processing
c) Mobile Computing
d) Machine Vision and Learning

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ANNEXTURE I
GOA UNIVERSITY
SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER III

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE3.1AM3	Applied Mathematics III	3	1	0	3	100	20+5	-	-	125
CE3.2BC++	Basics Of C++	3	1	2	3	100	20+5	50	-	175
CE3.3PPL	Principles of Programming Languages	3	0	2	3	100	20+5	-	-	125
CE3.4CONT	Computer Oriented Numerical Techniques	3	1	2	3	100	20+5		-	125
CE3.5LD	Logic Design	3	1	2	3	100	20+5	50		175
CE3.6IE	Integrated Electronics	3	1	2	3	100	20+5	-		125
	TOTAL	18	05	10	-	600	150	100	0	850

L-Lectures, T-Tutorials P-Practicals
Th-.Dur.- Duration of Theory paper
Th-Theory, S-Sessional, P-Practical, O-Oral.
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ANNEXTURE I
GOA UNIVERSITY
SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER IV

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE4.1DMS	Discrete Mathematical structures	3	1	0	3	100	20+5	-	-	125
CE4.2DS	Data Structures	3	1	2	3	100	20+5	50	-	175
CE4.3CO	Computer Organization	3	1	2	3	100	20+5	-	-	125
CE4.4EM	Electronic Measurements	3	1	0	3	100	20+5	-	-	125
CE4.5SAD	System Analysis and Design	3	1	2	3	100	20+5	-	-	125
CE4.6OOPC	Object Oriented Programming And Design using C++	3	1	2	3	100	20+5	50	-	175
	TOTAL	18	06	8	-	600	150	100	-	850

L-Lectures, T-Tutorials P-Practicals
Th-.Dur.- Duration of Theory paper
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Principal
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Ref No.: GU/III/Dean-Engg/07/52 dated 24/05/07

SUBJECT: Minutes of the meeting of Chairmen of the Board of Studies in faculty of Engineering.

ANNEXURE - I

GOA UNIVERSITY

FIRST YEAR OF BACHELOR'S DEGREE COURSE IN ENGINEERING (Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER I (Common for all branches of Engineering)

Sub code	Subjects	Scheme Of Instruction Hrs/Week			Scheme Of Examination					
					Th Dur (Hrs)	Marks				
		L	T	P		Th.	S	P	O	Total
1.1	Applied Mathematics I	4	-	-	3	100	25	-	-	125
1.2	Applied Sciences - I (Physics & Chemistry)	4	-	2	3	100	50	-	-	150
1.3	Basic Civil Engineering and Engineering Mechanics.	4	-	2	3	100	25	-	-	125
1.4	Basic Electrical Engineering	3	-	2	3	100	25	-	-	125
1.5	Engineering Graphics	2	-	4	4	100	50	-	-	150
1.6	Communication Skills	3	-	-	3	100	25	-	-	125
1.7	Workshop Practice - I	-	-	4	-	-	50	-	-	50
	TOTAL	20		14		600	250			850

L : Lectures, T : Tutorials, P : Practicals.
Th. Dur. : Duration of Theory Paper
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GOA UNIVERSITY

FIRST YEAR OF BACHELOR'S DEGREE COURSE IN ENGINEERING (Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER II: (Common for all branches of Engineering)

Sub code	Subjects	Scheme Of Instruction Hrs/Week			Scheme Of Examination					
					Th. Dur (Hrs)	Marks				
		L	T	P		Th.	S	P	O	Total
2.1	Applied Mathematics II	4	-	-	3	100	25	-	-	125
2.2	Applied Sciences - II (Physics & Chemistry)	4	-	2	3	100	50	-	-	150
2.3	Information Technology	4	-	2	3	100	25	-	-	125
2.4	Basic Mechanical Engineering	3	-	2	3	100	25	-	-	125
2.5	Basic Electronic Engineering	3	-	2	3	100	25	-	-	125
2.6	Environmental and Social Sciences	4	-	-	3	100	50	-	-	150
2.7	Workshop Practice - II Modern	-	-	4	-	-	50	-	-	50
	TOTAL	22		12	-	600	250	-	-	850

L : Lectures, T : Tutorials, P : Practicals.
Th. Dur. : Duration of Theory Paper
Th : Theory, S : Sessional, P : Practical, O : Oral

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ANNEXTURE I
GOA UNIVERSITY
SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER III

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE3.1AM3	Applied Mathematics III	3	1	0	3	100	20+5	-	-	125
CE3.2BC++	Basics Of C++	3	1	2	3	100	20+5	50	-	175
CE3.3PPL	Principles of Programming Languages	3	0	2	3	100	20+5	-	-	125
CE3.4CONT	Computer Oriented Numerical Techniques	3	1	2	3	100	20+5		-	125
CE3.5LD	Logic Design	3	1	2	3	100	20+5	50		175
CE3.6IE	Integrated Electronics	3	1	2	3	100	20+5	-		125
	TOTAL	18	05	10	-	600	150	100	0	850

L-Lectures, T-Tutorials P-Practicals
Th-.Dur.- Duration of Theory paper
Th-Theory, S-Sessional, P-Practical, O-Oral.
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for 10/11/14
Principal
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7/11/14
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ANNEXTURE I

GOA UNIVERSITY

SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING

(Revised in 2007-08)

SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER IV

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE4.1DMS	Discrete Mathematical structures	3	1	0	3	100	20+5	-	-	125
CE4.2DS	Data Structures	3	1	2	3	100	20+5	50	-	175
CE4.3CO	Computer Organization	3	1	2	3	100	20+5	-	-	125
CE4.4EM	Electronic Measurements	3	1	0	3	100	20+5	-	-	125
CE4.5SAD	System Analysis and Design	3	1	2	3	100	20+5	-	-	125
CE4.6OOPC	Object Oriented Programming And Design using C++	3	1	2	3	100	20+5	50	-	175
	TOTAL	18	06	8	-	600	150	100	-	850

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Th-.Dur.- Duration of Theory paper

Th-Theory, S-Sessional, P-Pracital, O-Oral.

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7/11/14

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ANNEXTURE I

GOA UNIVERSITY

SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING

(Revised in 2007-08)

SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER V

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 5.1	Organizational Behaviour and Cyber Law	3	0	0	3	100	20+5	-	-	125
CE 5.2	Automata Language and Computation	3	0	2	3	100	20+5	-	-	125
CE 5.3	Microprocessors and Microcontrollers	3	1	2	3	100	20+5	50	-	175
CE 5.4	Computer Hardware Design	3	1	2	3	100	20+5	-	-	125
CE 5.5	Database Management system	3	1	2	3	100	20+5	50	-	175
CE 5.6	Operating Systems	3	1	2	3	100	20+5	-	-	125
	TOTAL	18	04	10	-	600	150	100	-	850

L-Lectures, T-Tutorials P-Practicals

Th-.Dur.- Duration of Theory paper

Th-Theory, S-Sessional, P-Pratical, O-Oral.

25 Sessional marks will be split as follows:

20 marks are for the Internal Test

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GOA UNIVERSITY
THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER VI

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 6.1	Modern Algorithm Design Foundation	3	0	0	3	100	20+5	-	-	125
CE 6.2	Object Oriented Software Engineering	3	0	2	3	100	20+5	-	-	125
CE 6.3	Artificial Intelligence	3	1	2	3	100	20+5	50	-	175
CE 6.4	Computer Graphics	3	1	2	3	100	20+5	50	-	175
CE 6.5	Device Interface and PC Maintenance	3	1	2	3	100	20+5	-	-	125
CE 6.6	Data Communications	3	1	2	3	100	20+5	-	-	125
	TOTAL	18	04	10	-	600	150	100	-	850

L-Lectures, T-Tutorials P-Practicals
Th-.Dur.- Duration of Theory paper
Th-Theory, S-Sessional, P-Pratical, O-Oral.
25 Sessional marks will be split as follows:
20 marks are for the Internal Test
5 marks are for continuous evaluation of Practicals/Assignments

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for 10/11/14
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Annexture – I

GOA UNIVERSITY
FINAL YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER VII

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 7.1LT	Language Translators	3	1	2	3	100	25	-	25	150
CE 7.2CN	Computer Networks	3	1	2	3	100	25	-	25	150
CE 7.3DSP	Digital Signal Processing	3	1	2	3	100	25	-	50	175
CE 7.4	Elective I	3	1	2	3	100	25	-	50	175
CE 7.5	Elective II	3	1	0	3	100	25	-	-	125
CE 7.6	Project	-	-	4	-	-	25	-	50*	75
	TOTAL	15	05	12		500	150	-	200	850

***25 Sessional marks will be split as follows:**

20 marks are for the Internal Test

5 marks are for continuous evaluation of Practicals/Assignments

*Seminar & Project Oral

Electives: A student must take One Elective from each Group.

Group I: Subjects for CE 7.4

a) VLSI Design
b) Software Development Frameworks(J2EE/.NET)
c) Fuzzy Logic and Neural Networks
d) Web Technologies

Group II: Subjects for CE 7.5

a) Data Compression
b) Geographical Information Systems.
c) Bio Informatics
d) Project Management and Quality Assurance

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GOA UNIVERSITY
FINAL YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER VIII

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 8.1ADSA	Advanced Data Structures and Algorithms	3	1	2	3	100	25	-	50	175
CE 8.2CCNS	Computer Cryptography and Network Security	3	1	2	3	100	25	-	50	175
CE 8.3	Elective III	3	1	2	3	100	25	-	50	[illegible]
CE 8.4	Elective IV	3	1	2	3	100	25	-	50	175
CE 8.5	Project	-	-	8	-	-	50	-	100*	150
	TOTAL	12	04	16	-	400	150	-	300	850

25 Sessional marks will be split as follows:

20 marks are for the Internal Test

5 marks are for continuous evaluation of Practicals/Assignments

*Seminar, demonstration & Oral

Electives: A student must take One Elective from each Group.

Group III: Subjects for CE 8.3

a) Embedded System Design
b) Multimedia Systems
c) Distributed Operating Systems
d) Data Mining
e) Web Services

Group VI: Subjects for CE 8.4

a) Genetic Algorithms
b) Image Processing
c) Mobile Computing
d) Machine Vision and Learning

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Ref No.: GU/III/Dean-Engg/07/52 dated 24/05/07

SUBJECT: Minutes of the meeting of Chairmen of the Board of Studies in faculty of Engineering.

ANNEXURE - I

GOA UNIVERSITY

FIRST YEAR OF BACHELOR'S DEGREE COURSE IN ENGINEERING (Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER I (Common for all branches of Engineering)

Sub Code	Subjects	Scheme Of Instruction Hrs/Week			Scheme Of Examination					
					Th. Dur (Hrs)	Marks				
		L	T	P		Th.	S	P	O	Total
1.1	Applied Mathematics I	4	-	-	3	100	25	-	-	125
1.2	Applied Sciences - I (Physics & Chemistry)	4	-	2	3	100	50	-	-	150
1.3	Basic Civil Engineering and Engineering Mechanics.	4	-	2	3	100	25	-	-	125
1.4	Basic Electrical Engineering	3	-	2	3	100	25	-	-	125
1.5	Engineering Graphics	2	-	4	4	100	50	-	-	150
1.6	Communication Skills	3	-	-	3	100	25	-	-	125
1.7	Workshop Practice - I	-	-	4	-	-	50	-	-	50
	TOTAL	20		14		600	250			850

L : Lectures, T : Tutorials, P : Practicals.
Th. Dur. : Duration of Theory Paper
Th : Theory, S : Sessional, P : Practical, O : Oral

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GOA UNIVERSITY

FIRST YEAR OF BACHELOR'S DEGREE COURSE IN ENGINEERING (Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER II: (Common for all branches of Engineering)

Sub code	Subjects	Scheme Of Instruction Hrs/Week			Scheme Of Examination					
					Th. Dur (Hrs)	Marks				
		L	T	P		Th.	S	P	O	Total
2.1	Applied Mathematics II	4	-	-	3	100	25	-	-	125
2.2	Applied Sciences - II (Physics & Chemistry)	4	-	2	3	100	50	-	-	150
2.3	Information Technology	4	-	2	3	100	25	-	-	125
2.4	Basic Mechanical Engineering	3	-	2	3	100	25	-	-	125
2.5	Basic Electronic Engineering	3	-	2	3	100	25	-	-	125
2.6	Environmental and Social Sciences	4	-	-	3	100	50	-	-	150
2.7	Workshop Practice - II Modern	-	-	4	-	-	50	-	-	50
	TOTAL	22		12	-	600	250	-	-	850

L : Lectures, T : Tutorials, P : Practicals.
Th. Dur. : Duration of Theory Paper
Th : Theory, S : Sessional, P : Practical, O . Oral.

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ANNEXTURE I
GOA UNIVERSITY
SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER III

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE3.1 AM3	Applied Mathematics III	3	1	0	3	100	20+5	-	-	125
CE3.2 BC++	Basics Of C++	3	1	2	3	100	20+5	50	-	175
CE3.3 PPL	Principles of Programming Languages	3	0	2	3	100	20+5	-	-	125
CE3.4 CONT	Computer Oriented Numerical Techniques	3	1	2	3	100	20+5		-	125
CE3.5 LD	Logic Design	3	1	2	3	100	20+5	50		175
CE3.6 IE	Integrated Electronics	3	1	2	3	100	20+5	-		125
	TOTAL	18	05	10	-	600	150	100	0	850

L-Lectures, T-Tutorials P-Practicals
Th-.Dur.- Duration of Theory paper
Th-Theory, S-Sessional, P-Practical, O-Oral.
25 Sessional marks will be split as follows:
20 marks are for the Internal Test .
5 marks are for continuous evaluation of Practicals/Assignments

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ANNEXTURE I
GOA UNIVERSITY
SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER IV

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE4.1 DMS	Discrete Mathematical structures	3	1	0	3	100	20+5	-	-	125
CE4.2DS	Data Structures	3	1	2	3	100	20+5	50	-	175
CE4.3CO	Computer Organization	3	1	2	3	100	20+5	-	-	125
CE4.4EM	Electronic Measurements	3	1	0	3	100	20+5	-	-	125
CE4.5SAD	System Analysis and Design	3	1	2	3	100	20+5	-	-	125
CE4.6OOPC	Object Oriented Programming And Design using C++	3	1	2	3	100	20+5	50	-	175
	TOTAL	18	06	8	-	600	150	100	-	850

L-Lectures, T-Tutorials P-Practicals
Th-.Dur.- Duration of Theory paper
Th-Theory, S-Sessional, P-Pracital, O-Oral.

25 Sessional marks will be split as follows:

20 marks are for the Internal Test
5 marks are for continuous evaluation of Practicals/Assignments

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ANNEXTURE I
GOA UNIVERSITY
SECOND YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER V

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 5.1	Organizational Behaviour and Cyber Law	3	0	0	3	100	20+5	-	-	125
CE 5.2	Automata Language and Computation	3	0	2	3	100	20+5	-	-	125
CE 5.3	Microprocessors and Microcontrollers	3	1	2	3	100	20+5	50	-	175
CE 5.4	Computer Hardware Design	3	1	2	3	100	20+5	-	-	125
CE 5.5	Database Management system	3	1	2	3	100	20+5	50	-	175
CE 5.6	Operating Systems	3	1	2	3	100	20+5	-	-	125
	TOTAL	18	04	10	-	600	150	100	-	850

L-Lectures, T-Tutorials P-Practicals
Th-.Dur.- Duration of Theory paper
Th-Theory, S-Sessional, P-Pratical, O-Oral.
25 Sessional marks will be split as follows:
20 marks are for the Internal Test
5 marks are for continuous evaluation of Practicals/Assignments

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GOA UNIVERSITY
THIRD YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER VI

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 6.1	Modern Algorithm Design Foundation	3	0	0	3	100	20+5	-	-	125
CE 6.2	Object Oriented Software Engineering	3	0	2	3	100	20+5	-	-	125
CE 6.3	Artificial Intelligence	3	1	2	3	100	20+5	50	-	175
CE 6.4	Computer Graphics	3	1	2	3	100	20+5	50	-	175
CE 6.5	Device Interface and PC Maintenance	3	1	2	3	100	20+5	-	-	125
CE 6.6	Data Communications	3	1	2	3	100	20+5	-	-	125
	TOTAL	18	04	10	-	600	150	100	-	850

L-Lectures, T-Tutorials P-Practicals
Th-.Dur.- Duration of Theory paper
Th-Theory, S-Sessional, P-Pratical, O-Oral.
25 Sessional marks will be split as follows:
20 marks are for the Internal Test
5 marks are for continuous evaluation of Practicals/Assignments

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GOA UNIVERSITY
FINAL YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER VII

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Total
CE 7.1LT	Language Translators	3	1	2	3	100	25	-	25	150
CE 7.2CN	Computer Networks	3	1	2	3	100	25	-	25	150
CE 7.3DSP	Digital Signal Processing	3	1	2	3	100	25	-	50	175
CE 7.4	Elective I	3	1	2	3	100	25	-	50	175
CE 7.5	Elective II	3	1	0	3	100	25	-	-	125
CE 7.6	Project	-	-	4	-	-	25	-	50*	75
	TOTAL	15	05	12		500	150	-	200	850

*25 Sessional marks will be split as follows:

20 marks are for the Internal Test

5 marks are for continuous evaluation of Practicals/Assignments

*Seminar & Project Oral

Electives: A student must take One Elective from each Group.

Group I: Subjects for CE 7.4

a) VLSI Design
b) Software Development Frameworks(J2EE/.NET)
c) Fuzzy Logic and Neural Networks
d) Web Technologies

Group II: Subjects for CE 7.5

a) Data Compression
b) Geographical Information Systems.
c) Bio Informatics
d) Project Management and Quality Assurance

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GOA UNIVERSITY
FINAL YEAR OF BACHELOR'S DEGREE COURSE IN COMPUTER ENGINEERING
(Revised in 2007-08)
SCHEME OF INSTRUCTION AND EXAMINATION

SEMESTER VIII

Sub Code	Subjects	Scheme of Instruction Hrs/Week			Scheme of Examination					
		L	T	P	Th. Dur (Hrs)	Marks				
						Th.	S	P	O	Tot
CE 8.1ADSA	Advanced Data Structures and Algorithms	3	1	2	3	100	25	-	50	175
CE 8.2CCNS	Computer Cryptography and Network Security	3	1	2	3	100	25	-	50	175
CE 8.3	Elective III	3	1	2	3	100	25	-	50	[illegible]
CE 8.4	Elective IV	3	1	2	3	100	25	-	50	175
CE 8.5	Project	-	-	8	-	-	50	-	100*	150
	TOTAL	12	04	16	-	400	150	-	300	850

25 Sessional marks will be split as follows:

20 marks are for the Internal Test

5 marks are for continuous evaluation of Practicals/Assignments

*Seminar, demonstration & Oral

Electives: A student must take One Elective from each Group.

Group III: Subjects for CE 8.3

a) Embedded System Design
b) Multimedia Systems
c) Distributed Operating Systems
d) Data Mining
e) Web Services

Group VI: Subjects for CE 8.4

a) Genetic Algorithms
b) Image Processing
c) Mobile Computing
d) Machine Vision and Learning

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Second Year of Degree Course in Computer Engineering (Revised)

Sr No.	Subject (Department to teach)	Scheme of Instruction * Periods/ week L	T	P	Duration of paper (hrs)	Scheme of Examination Theory	TW or Term work	Practical	Oral	TOTAL
Semester III (Revised)										
1.	Applied Mathematics III (Mathematics)	3	1	—	3	100	—	—	—	100
2.	Electronic Material Science (E and T)	4	1	—	3	100	—	—	—	100
3.	Analog Electronics (Computer)	4	1	3	3	100	25	—	—	125
4.	Logic Design (Computer)	4	1	3	3	100	25	—	—	125
5.	Data Structures (Computer)	4	1	4	3	100	25	—	—	125
6.	Electrical Technology (Electrical)	4	1	3	3	100	25	—	—	125
	Total	23	6	13		600	100	—	—	700

Semester IV (Revised)

1.	Discrete Mathematical Structures (Mathematics)	3	1	—	3	100	—	—	—	100
2.	Signals and Systems (Computer)	3	1	3	3	100	25	—	—	125
3.	Electronic Instrumentation (E and T)	4	1	3	3	100	25	—	50	175
4.	Pulse and Digital Electronics (Computer)	4	1	3	3	100	25	50	—	175
5.	Computer Organisation (Computer)	4	1	3	3	100	25	—	50	175
6.	Data Processing and File Structures (computer)	3	1	3	3	100	25	50	—	175
	Total	21	6	15		600	125	100	100	925

* Duration of period - 45 minutes, L - Lectures, P - Practicals, T - Tutorial.

III 1 APPLIED MATHEMATICS - III

(Theory - 3 periods/week, Tutorial - 1 period/week, paper - 3hrs, 100 marks)

— Linear algebra : types of matrices, adjoint, inverse, elementary transformations, reduction to normal form - rank, linearly independent systems, homogeneous equations, latent roots/vectors, Cayley - Hamiton theorem, minimal equation, modal matrix, diagnalisation.

— Statistics and probability : measure of central tendency, dispersion, slewmess and kutosis, axiomatic/empirical probability, addition and multiplication theorem, discrete/continuous distributions, expection, density, functions, the t,f and Chi square distributions, correlation/regression.

REFERENCE BOOKS

1. Kreysig, Advanced Engineering Mathematics, Wiley Eastern.
2. Gupta S. P., Statistical Methods, S. Chand and Sons.
3. Scheid F., Numerical Analysis, Schaum Series.

III 2 ELECTRONIC MATERIAL SCIENCE

(Theory - 4 periods/week, tutorial - 1 period/week, paper - 3 hrs., 100 marks)

— Insulators, dielectric properties of insulators in static fields, behaviour of dielectric in alternating fields.

— Magnetic materials and properties, Ferrites.

— Conduction through metals and super-conductivity.

— Lasers, stimulated emission, ruby lasers, gas lasers and rare earth lasers.

— Semiconductors : mechanism of conduction, semiconductor technology, techniques of characterisation of electronic materials, semiconductor measurements, crytallographic defects in semiconductor.

— Ceramics in electronics.

REFERENCE BOOKS

1. B. G. Streetman, Solid State Electronic Devices, PHI.
2. A. Dakker, Electrical Engineering Materials, PHI.
3. Charles Kittel, Introduction to Solid State Physics, Wiley Eastern.
4. W. R. Runyan, Semiconductor Measurements and Instrumentation. McGraw Hill.
5. F. F. Mazda, discrete Electronic Components, Cambridge, Univ. Press.

III. 3 ANALOG ELECTRONICS

(Theory - 4 periods/week, One paper, 3 hrs. 100 marks, Practical - 3 periods/week, Tutorial 1 period/week, Term work - 25 marks)

— Review of transistor amplifiers and oscillators, design examples.

— Operational amplifiers : the basic operational amplifier, the differential amplifier, transfer characteristics, operational amplifier design techniques, offset errors, frequency response of operational amplifiers, lag-lead compensation.

— Operational amplifier systems and applications.

— Comparators : comparators, wave shaping and wave form generators.

— Thyristors : SCR, Triac : Construction characteristics, Firing circuits, some simple applications of thyristers.

— Regulated power supplies and voltage regulator Ics.

Term Work

The term work shall consist of the report of laboratory experiments based on the above syllabus. The report shall be duly graded and certified by the teacher.

REFERENCE BOOKS

1. Electronic Devices and circuits - by A. Mottershead; Prentice-Hall.
2. Integrated Electronics - by Millman and Halkias, McGraw Hill.
3. Micro-electronics - by Millman, McGraw Hill.
4. Analysis and Design of Analog Intergrated Circuits- by Grey and Meyer, Wiley.
5. Functional Electronics -by K.V. Ramanan, Tata McGraw Hill.
6. Introduction to Intergrated Circuits - Grinich and Jackson, McGraw Hill.

III. 4 LOGIC DESIGN

(Theory - 4 periods/week, One paper - 3 hrs., 100 marks, Practical - 3 periods/week, Tutorial -1 period/week, Term work -25 marks)

— Switching Algebra and Switching Functions : Concepts of AND OR and NOT operators, Basic gates - symbols and their thruth tables, Boolean algebra, switching algebra, De-Morgan's theorems, evalution of logic expressions, implementation of boolean functions using gates, circuits equivalence, simplification of logic expressions, Karnough method, Quine Mc

clusckey's method.

— Combinational logic design : Number systems and their conversions, basic binary adders and substractors, carry look ahead address, representation and addition of signed bianry numbers, adders and substractors using signed number systems, codes for decimal numbers and their conversions, code converters, decimal adders and substractors, error detection and correction, parity generators.

— Sequential logic circuits : Difference between combinational and sequenctial circuits.

— Latches and flipflops, D and S-R flipflops, J-K flipflops, master slave flipflops, construction of clocked J-K, D and T types of flipflops from clocked S-R flipflops.

Counters : Ripple counters, asynchronous counters with feed back, parallel counters, binary decade counter, higher modulus counters.

Shift registers : Classification of shift registers, operation of shift registers, ring counters, shift counters and up-down counters.

— Analysis and synthesis of synchronous and asynchronous sequential circuits.

Term Work

The term work shall consist of a report of laboratory experiments/assignments based on the above syllabus. The report shall be duly certified and graded by the concerned teacher.

REFERENCE BOOKS

1. Z. Kohavi, Switching and finite automata methods, Tata McGraw Hill.

2. D. G. Green, Modern Logic Design, Addison Wesley.
3. A. P. Malvino and D. P. Leach, Degital Principles and Application Tata McGraw Hill, ND.
4. T. Nagle, B. D. Carrol and J. D. Irwin, An Introduction to Computer Logic, Prentice-Hall, Englewood Cliffs, NJ.
5. J. C. Boyce, digital Logic Operation and Analysis, Prentice Hall, Englewood Cliffs, NJ.
6. S. H. Ungar, Essence of Logic Circuits, Prentice Hall.

III. 5 DATA STRUCTURES

(Theory 4 periods/week; One paper -3 hours, 100 marks)
(Practical - 4 periods/week, Tutorial - 1 Period/week. term work - 25 marks)

— Introduction to data structures.

— Arrays : axiomatization, ordered lists, sparse matrices, representation of arrays.

— Stacks and Queues : fundamentals, mazing problem, evaluation of expressions, multiple stacks and queues.

— Linked Lists : single linked lists, linked stacks and queues, storage pool, polynomial addition, equivalence relations, doubly linked lists and dynamic storage management, generalised lists, garbage collection and compaction, strings, implementing node structures.

— Trees : basic terminology, binary trees, applications of binary trees, counting binary trees.

— Graphs : terminology and representations, traversals, connected components and spanning trees, shortest paths and

transitive closure, activity networks, topological sort and critical paths.

— Symbol tables : static and dynamic tree tables, hash tables.

— Features of Pascal and programming in pascal language.

Term Work

The term work shall consist of a report of programs/ assignments based on the above sysllabus. The report shall be duly certified and graded by the teacher.

REFERENCE BOOKS

1. Ellis Horwitz and Sartaj Shani, Fundamentals of data structures, Galgotia Publications.
2. Nell Dale and Susan C. Lilly, Pascal Plus Data Structures, Tata McGraw Hill.
3. N. Wirth, Algorithms + Data Structures = Programs, Prentice Hall, Englewood Cliffs, NJ.
4. A. M. Tanenbaum and M. J. Augenstein, Data Structures using Pascal, Prentice Hall.
5. Alfred V. Aho, John E. Hopcroft and J.D. Ullman, Data Structures and Algorithms, Addision Wesley.
6. Robort L. Kruse, Data Structures and Program Design, Prentice Hall.

III. 6 ELECTRICAL TECHNOLOGY

(Theory lecturers - 4 periods/week, One paper - 3hrs. 100 marks)

(Practical - 3 periods/week, Tutorial - 1 period/week, Termwork - 25 marks).

— Circuits : Transients - step response - damped and sustained oscillations in RLC circuits.

— Principles of electromagnetic energy conversion; Three phase induction motor, construction, Principle of operation, starting and control of speed. Single phase induction motors, AC servo motor, synchros, stepper motor, principles of operation and applications, DC machines and speed control of DC motors.

— Measurements of RLC parameters, measurement of low, medium and high resistances, Kelvin's bridge, Megger, AC bridge circuits for measurement of inductance, capacitance Q factor, Schearing bridge. Principles of simple DC and AC potentiometer potentiometers and their applications.

— Measuring instruments - Construction and principle of operation, ammeter, voltmeter, wattmeter, energy meter. Use of current and voltage transformers.

Term Work

The term work shall consist of a report of the experiments based on the above syllabus. The report shall be graded and duly certified by the concerned teacher.

REFERENCE BOOKS

1. Principles of Electrical Engineering - by V. Deltoro, Prentice Hall.
2. Electrical and Electronics Engineering Fundamentals - By A. E. Fitzgerald and E. Higgin Botham, Mc Graw Hill.
3. Electrical Measurements - by Buckingham and Price.
4. Electrical Measurement and Measuring Instruments - by Golding, Wheeler.
5. Basic Electrical Measurements - by Stout, Prentice Hall of India.

IV. I DISCRETE MATHEMATICAL STRUCTURES

(Theory - 3 periods/week, Tutorial - 1 period/week, Paper - 3 hours, 100 marks)

Set theory, relations, equivalence, partial ordering - functions, injection, bijection - definition and elementory properties of algebraic structures - monoids groups, rings, fields, vector spares - mathematical reasoning - notions of interpretation, validity, consistancy and completeness - counting techniques - induction and pigeon hole principles - recurrence equations - generating functions - elementory graph theory.

REFERENCE BOOKS

1. S. Sahani, Concepts in Discrete Mathematics, Narosa Pub, Delhi.

2. F. R. Norris, Discrete Structures : An Introduction to Mathematics for Computer Science, Prentice Hall.
3. C. L. Liu, Elements of discrete mathematics, McGraw Hill NY.
4. J. P. Tremblay and R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw Hill, NY.
5. M. A. Arbib, A. J. Kfowry and R. N. Moll, A Basis for Theoretical Computer Science, Springer - Verlag, Berlin.
6. D. F. Stanat and D. F. McAllister, Discrete Mathematics in Computer Science, Prentice-Hall, Englewood Cliffs, NJ.

IV. 2 SIGNALS AND SYSTEMS

(Theory - 3 periods/week, Tutorial - 1 period/week, One paper, 3 hrs., 100 marks, Practical - 3 period/week, term work - 25 marks)

Classification of signals and systems; dynamic representation of systems (such as in state-space) in continuous and discrete time. Fourier series; Fourier transforms and their applications to system analysis, Laplace transforms. Applications of Laplace transforms to system analysis. Convolution and superposition integrals and their applications. Z-transforms and their applications to the analysis and characterisation of discrete time systems. Random signals and probability. Correlation functions; spectral density. Response of linear system to random inputs.

REFERENCE BOOKS

1. Signal Analysis, A Papoulis, McGraw Hill, ISE.

2. System and Signal Analysis, Chi-Tsong Chen. Holt Rinehart and winston Inc., ISE.

3. Linear System in Communication and Control, Fredric and Carlson, John Wiley.

4. Linear systems Analysis, Cooper and McGillan, Holt, Reinhart and Winston.

5. I. J. Nagrath and M. Gopal, Modelling and Analysis, Tata McGraw Hill.

6. R. A. Gabel and R. A. Roberts, Signals and linear systems, John Wiley.

IV. 3 ELECTRONIC INSTRUMENTATION

(Theory lecturers : 4 periods/week; One paper — Three hours, 100 marks, Practical - 3 periods/week, Tutorial : 1 period/ week; Term work : 25 marks, oral - 50 marks)

— Measurement concepts, errors & standards of measurements.

— Transducers : Classification, Transducers for different physical quantities like temperature, pressure, liquid flow etc. Construction and principle of operation.

— General instrumentation systems and characteristics.

— Instrumentation amplifiers, signal generation and processing, filtering and signal analysis, data acquisition and conversion.

— General purpose test instruments : oscilloscope, signal/ function generators, electronic voltmeter and multimeter; their block diagrams, principle of operation, panel layout, implementation of controls and applications.

Term Work

The term work shall consist of a report of the experiments/ assignments based on the above syllabus. The report shall be duly graded and certified by the concerned teacher.

REFERENCE BOOKS

1. 'Electronic instruments, measurements and measuring techniques' by W. D. Cooper, Prentice Hall of India.

2. 'Measurement Systems' by E. O. Deetilin, McGraw Hill.

3. 'Electronic Measurements and Instrumentation' by Oliver and Cage, McGraw Hill.

4. 'Instrumentation' by Malvino, Prentice Hall.

5. 'Electrical Instrumentation' by Preskey, Prentice Hall.

IV. 4 PULSE AND DIGITAL ELECTRONICS

(Theory : 4 periods/week; One paper; Three hours, 100 marks, Practical - 3 periods/week, Tutorial : 1 period/week, term work: 25 marks; Practical exam : 50 marks)

— Review of solid state switching devices - Clipping and clamping circuits.

— Multivibrators : Astable, Monostable and Bistable Multivibrators, analysis and design of Schmitt Trigger.

— Voltage and current sweep generators.

— Realisation of Logic functions, gates, Characteristics and

comparison of major logic families - TTL, STTL, LSTTL, CMOS, ECL etc. Analysis of basic circuits in these families.

— Designing with TTL MSI and LSI circuits : storage elements, buffers, flip-flops, registers, latches and shift registers, Design of sequential and combinational logic functions with MSI and LSI components.

Term Work

The term work shall consist of a report of the experiments based on the above syllabus. The report shall be duly graded and certified by the teacher.

REFERENCE BOOKS

1. 'Digital Integrated electronics' by T.H. Schilling, McGraw Hill.
2. 'Design with Standard LSI and MSI by T, R. Blackskey, John Wiley.
3. 'Digital concepts and Standard Integrated Circuits' by R. S. Sandige, McGraw Hill.
4. 'Designing with TTL Circuits' by Morris and Miller, Jackson, McGraw Hill.
5. 'Introduction to Intrigrated Cicuits' by Grinich and Jackson, McGraw Hill.
6. 'Introduction to System Design using Integrated Circuits' by B. S. Sonde, Wiley Eastern.

IV. 5 COMPUTER ORGANISATION

(Theory - 4 periods/week; One paper 3 hours. 100 marks Practical - 3 periods/week, Tutorial - 1 period/week, Term work - 25 marks, Oral examination - 50 marks).

— Introduction to the organisation of a computer.

— Central processing unit : Functional black diagram of a CPU, memory interface, execution of instruction, representation of numbers and arthemetic in computers, instruction formats, addressing modes, instruction types, program sequencing, traps and interrupts.

— Introduction to assembly language, assembly language programming, assembler, macros and sub-programs, linking and loading.

— Input output sections : Different input output and secondary storage devices, character codes, data transfer using software and hardware controls, DMA, I/O channels and I/O processors.

— Memory organisation : Basic concepts, different types of semiconductor memories, static and dynamic memories, linear - two dimentional and multiple module memories, cache memory, virtual memory and memory interleaving.

— Introduction to multi-programmimg, multi-processor and time sharing systems, typical examples of main frame, mini and micro computer systems.

Term Work

The term work shall consist of a report of assignments/ exercises based on the above syllabus. The report shall be duly certified and graded by the teacher.

REFERENCE BOOKS

1. Andrew S. Tanenbaum, Structured computer organisation, Prentice Hall.

2. V. C. Hamacher, Z. G. Vranesic S. G. Zaky, Computer Organisation, McGraw Hill International Students Edition.

3. C. W. Gear, Computer Organisation and Programming, McGraw Hill. International Students Edition.

4. M. R. Bhujade, Digital Computer Principles, Pitamber Publishing Co.

5. M. Morris Mano, Computer system architecture, Prentice Hall of India.

6. Schneider, The Principles of Computer Organisation, Wiley.

IV. 6 DATA PROCESSING AND FILE STRUCTURES

(Theory - 3 periods/week, paper - 3 hrs. 100 marks, Tutorials - 1 period/week, practical - 3 periods/week, termwork - 25 marks, practical examination - 50 marks)

— Introduction to data processing, review of characteristics of secondary storage devices.

— File organisation : sequential, indexed sequential and direct files, B tree, inverted, multi-indexed and multi ring files with examples.

— Use of these files in data processing, examples from pay rolls, inventory control, University course management etc.

— Cobol language : features of cobol language including divisions, editing and file control, programming in Cobol.

— Introduction to Data Bases.

Term Work

The term work shall consist of a report of programs/ assignments based on the above syllabus. The report shall be duly certified and graded by the concerned teacher.

RECOMMENDED BOOKS

1. W. T. Price, Introduction to Computer Data Processing, CBS.

2. J. Martin, Computer data Base Organisation, PHI.

3. Phillipakis and L J. Kazmier, Information System Design Through Cobol, McGraw Hill.

4. Wiederhold, Database Design, Kogakusha - McGraw Hill, ISE.

5. R. J. Condon, Data Processing System Analysis and Design, PHI.

6. N. L. Sarda, Structured Cobol Programming, Pitamber Pub. Co.

Third Year of Degree Course in Computer Engineering (Revised)

Sr No.	Subject (Dept. to teach)	Scheme of Instruction * Periods/ week L	T	P	Duration of paper (hrs)	Scheme of Examination Theory	TW Term work	Practical	Oral	TOTAL
	Semester V (Revised)									
1.	Principles of Economics & Management (Humanitics)	3	1	—	3	100	—	—	—	100
2.	Programming of Numerical Methods (Computer)	3	1	3	3	100	25	—	—	125
3.	Automata, Languages and Computation (Computer)	4	1	3	3	100	25	-	-	125
4.	Data Base Management systems	4	1	4	3	100	25	—	50	175
5.	Microprocessors - I (Computer)	4	1	3	3	100	25	—	50	175
6.	Computer Hardware Design (Computer)	4	1	3	3	100	25	—	50	175
	Total	22	6	16	—	600	125	—	150	875

	Semester VI (Revised)									
1.	Operations Research (Mechanical)	3	1	—	3	100	—	—	—	100
2.	Microprocessors -II (Computer)	4	1	3	3	100	25	50	—	175
3.	Introduction to Systems Programming (Computer)	4	1	3	3	100	25	50	—	175
4.	Artificial Intelligence (Computer)	4	1	3	3	100	25	—	50	175
5.	Computer Graphics (Computer)	4	1	3	3	100	25	—	50	175
6.	Fundamentals of programming languages (Computer)	4	1	3	3	100	25	—	50	175
	Total	23	6	15		600	125	100	150	975

* Duration of period - 45 minutes, L -Lecture, P - Practical, T - tutorial

V. 1. PRINCIPLES OF ECONOMICS AND MANAGEMENT

(Theory : 3 periods/week, Tutorial - 1 period/week, paper - 3 hours, 100 marks)

— Nature and significance of economics. Science, Engineering and Technology - their relationship with economic development. Basic economic concepts — Demand, Supply. Elasticity of demand and supply. Money, Real and opportunity cost, concepts of profit and revenue, tax tariff and subsidies, wants and utility. Concepts of equilibrium and margin economic systems, capitalism, socialism and mixed economy.

Factors of production. Introduction to micro and macro economics and price theory.

— Money, banking and trade. Nature and functions of money. Commercial and Central banking. Problem of foreign exchange and implications of currency devaluation.

— Economic development of India, Structure and features of Indian Economy. Industrialisation of India. Economics of large and small scale production. Growth of public sector in India. Industrial dispute in India. Recent trends in labour movement in India. Role of agriculture and modernisation of Indian agriculture. The concept of under-development. Meaning and tools of economic planning. A study of the Five Year Plans in India.

— Management Principles. Management and engineering studies. Meaning and types of management. The concept of scientific management.

— Financial and accounts management. Source of industrial finance, financing of large and small scale industries. Institutional financing. Principles of accounting. Management accounting. Preparation of account.

— Sales and marketing management, production management. Production planning and management. Management and productivity.

RECOMMENDED BOOKS

1. McConnel C. R. and Gupta. H. C., 'Economics : Principles, Problems and policies', Tata McGraw Hill.

2. Samuelson. P. A., 'Economics', Ed. 10, McGraw Hill Kogakusha.

3. Dale, E. 'Management : Theory and practice', Ed 3 McGraw Hill, Kogakusha.

4. Koontz, H., and O'Donnel, C., 'Principles of management : An analysis of managerial functions' Ed 5 McGraw Hill Kogakusha.

5. Newman, W. H., Summer, C. E. and Garren, E. K. 'The process of management', Ed 3 Prentice Hall of India.

6. Robbins, S. P. 'The administrative process - Integrating theory and practice', Prentice Hall of India.

V. 2. PROGRAMMING OF NUMERICAL METHODS

(Theory lecturers - 3 periods/week, One paper, 3 hrs., 100 marks)
(Tutorial - 1 and Practical - 3 period/week, Termwork - 25 marks)

— Numerical computations and errors, machine epsilon and operators, sensitivity of certain alogorithms and numerical instability, solution of linear difference equations.

— Numerical integration and differentiation, interpolation : Newton and Lagrange formulae.

— Numerical solution of linear algebraic eqautions : forward and backward substitution method, matrix inversion iterative methods.

— Numerical solution of non-linear algebraic eqautions : Regula - falsi, Newton - Raphson and Secant methods.

— Numerical solutions of differential equations : Eular, Runge Kutta and predictor - corrector methods.

— Review of FORTRAN language and programming of the above methods.

Term Work

Term work shall consist of at least six FORTRAN based programme on the above syllabus. The report will be duly certified and graded by the teacher.

RECOMMENDED BOOKS

1. Computer Oriented Numerical Methods -by V. Rajaram, PHI.
2. First Course in Numerical Methods - by A. Ralston, McGraw Hill.
3. Numerical Mathematical Analysis - by J. B. Scarborough, Oxford and India Book House.
4. Computational Mathematics - by B. P. Demnidovich and I. A. Marom.
5. Numerical Methods for Science and Engineering - by R. G. Stanton.
6. Computer Based Numerical Methods - by Krishnamurthy and Sen, EWP.

V. 3 AUTOMATA, LANGUAGES AND COMPUTATION

(Theory - 4 periods/week Paper - 3 hrs. and 100 marks; Tutorial - 1 and Practical - 3 periods/week, term work - 25 marks)

— Preliminaries, finite state machine, state tables, diagrams, transition graphs, Moore and Mealy models, deterministic and non deterministic FSM, state equivelence and machine minimisation, regular sets and expressions - properties and limitations.

— Context free grammers and push down automata.

— Turing machines - definition, powers of TM, composite, iterated and Universal TMS, complexity, limitations and halting problem.

— The Chamsky hierarchy, overview of languages.

— Notion about undecidability and unsolvability of problems.

Term Work

The term work shall consist of report of assignments based on the above syllabus. The term work shall be graded and certified by the concerned teacher.

RECOMMENDED BOOKS

1. Hopcrafts and Ullman, Introduction to Aotomata Theory, Languages and Compution, Narosa Publishing House.
2. E. V. Krishna Murthy, Introductory Theory of Computer Science, AWEP.
3. Z. Kohavi, Switching and finite Automata Theory, Tata McGraw Hill.
4. Lewis and papadmitriou, Elements of theory computation, Prentice Hall.
5. Brady, Theory of Computer Science, Mc Graw Hill.
6. Minsky, Computations : Finite and Infinite Machines, Prentice Hall.

V. 4 DATA BASE MANAGEMENT SYSTEMS

(Theory : 4 periods/week, one paper 100 marks, 3 hours duration) (Practical - 4 and Tutorial - 1 Periods/week, Term work - 25 marks and oral examination - 50 marks)

— Introduction to data base system concepts, review of file organisation and data models.

— Network data model, DBTG proposals, Hierarchial data model.

— The relational model : storage organisation for relations, relational algebra and relational calculus, comparison with other models, relational query languages.

— Design theory for relational data bases : functional dependencies, decomposition, normal forms, multivalued dependencies and other kinds of dependencies.

— Query optimisation, protection of a database against misuse, a case study, introduction to distributed data base.

Term Work

The term work shall consist of a report of programs/ assignments based on the above syllabus. The term work shall be dully certified and graded by the teacher.

RECOMMENDED BOOKS

1. J. D. Ullman, 'Principles of data base systems', Galgotia Publications, New Delhi.

2. C. J. Date, An Introduction to Data Base Systems, Addison Wesley, third edition.

3. S. Atre, Data base, structure techniques for design, performance and management, John Wiley International Edition.

4. Novin Prakash, 'Data Base Management', McGraw Hill.

5. Mani and Nawathe, fundamentals of Data Base Systems, Benjamin/Cummings Pub. Co. Inc.

6. Kroth and Silberchatz, Data Base Systems Concepts, McGraw Hill.

V. 5 MICROPROCESSORS - I

(Theory - 4 periods/week, One paper - 3 hrs. 100 marks, Tutorial - 1 and practical - 3 periods/week, termwork - 25 marks, oral - 50 marks)

— Introduction to microprocessors, architecture and assembly language programming of Intel 8085.

— Intel 8086/8088 architecture, execution of instructions.

— Instruction set and assembly language programming featuring linking, relocation, stacks, procedures, interrupts, macros, Byte and string manipulations and I/O programming.

— Basic 8086/8088 configurations and system in minimum mode.

— I/O interfaces : analog and digital converters, serial, communication interface, parallel communication interface, programmable timers and event counters, keyboard and display interface.

— Simple design of 8085 and 8086/8088 systems illustrating interfaces with memory and I/O devices like key board and LED segment displays.

— applications of microprocessors.

Term Work

The term work shall consist of a report of laboratory experiments based on the above syllabus. The laboratory report will be duly certified and graded by the teacher.

RECOMMENDED BOOKS

1. Microprocessor Architecture : Programming and Applications, by R. Gaonkar Wiley Eastern.
2. Microprocessor Systems : The 8086/88 Family, Architecture, Programming and Design by Ye Cheng Liu and Glenn A. Gibson, PHI.
3. Microprocessor and Interfacing : Programming and hardware by D. V. Hall, McGraw Hill.
4. Introduction to Microprocessors by Aditya Mathur, third edition, Tata Mc Graw Hill.
5. Microprocessor and Microcomputer Bases Systems, by T. M. Rafiguzzaman, Harper and Row Pub.
6. Micro-Computer based design by Pitman, McCraw Hill.

V. 6 COMPUTER HARDWARE DESIGN

(Theory - 4 periods/week, One paper - 3 hrs., 100 marks, Tutorial - 1 period/week and practical - 3 periods/week, Termwork - 25 marks, Oral - 50 marks)

— Design methodology : System modelling, design levels, review of system building blocks, loading rules, noise immunity and speed constraints, design convertions.

— Introduction to hardware programming language (AHPL) : oprend, operators, modules, statements, combinational logic unit descrption, handling of memory array in AHPL. Hardware realisation of high speed addition, multiplication,

division and floating point arithmatic with hard wired control.

— Machine organisation and hardware programs : review of basic organisation of an RIC (representative instructional computer), register transfers, execution of instructions, multiple cycle instructions, functioning in terms of AHPL control sequence.

— Control design : Instruction sequencing and instruction interpretation, hardwired control, design methods, CPU control unit, microprogrammed control; basic concept, minimisation of microinstruction size, microprogrammed control unit.

— Case study of a small instructional computer.

Term Work

The term work shall consist of the report of the laboratory experiments/assignments based on the above syllabus. The term work shall be duly graded and certified by the teacher concerned.

RECOMMENDED BOOKS

1. Hill and Peterson - Digital Systems, Hardware organisation and design Third edition - Wiley.
2. J. P. Hayes - computer Architecture and organisation - Mc Graw Hill.
3. Morris Mano - Computer Engineering hardware Design, Prentice Hall.
4. J. B. Peatman - The Design of Digital systems - McGraw Hill, ISE.

5. Abd - Alla and Meltzer - Principles of Digital Computer Design, PH.

6. Rajaraman and Radhakrishna, An Introduction to Digital Computer Design, Prentice Hall of India.

VI. 1 OPERATIONS RESEARCH

(Theory - 3 periods/week, Tutorial - 1 period/week, one paper - 3 hrs., 100 marks)

— Introduction and decision making in operations research.

— Linear programming : LP formulation, simplex method, duality and sensitivity analysis.

— Transportation model, assignment problem and network flows.

— Dynamic programming.

— Review of probability theory, project scheduling by PERT - CPM methods.

— Simple inventory models.

RECOMMENDED BOOKS

1. Hamdy A. Taha, Operation Research : An Introduction, Macmillan Publishing Co.

2. Phillips, Ravindran and Solbery, Operations Research, Wiley.

3. S. I. Gass, Linear Programming, McGraw Hill.

4. J. E. Shamblin and G. T. Stevens, Operations Research, Mc Graw Hill International Students Edition.

5. J. D. Wiest and F. K. Levy, A Management Guide to PERT/CPM, Prentice - Hall.

VI 2 MICROPROCESSOR - II

(Theory : 4 periods/week; one paper - 3 hours, 100 marks) (Practical 3 and Tutorial : 1 periods/week; termwork - 25 marks and practical exam - 50 marks)

— Review of 8086/88 microprocessor.

— 8086/88 Multiprocessor configurations : que status and lock facility closely and loosely coupled configurations, 8087 Co-processor : architecture and instruction set and programming.

— Brief introduction to the additional features of 80286.

— Architecture and assembly language programming of M 68000, Bus structure & timings, Exception handling & typical M68000 based Minoprocessor System.

— Principles of Microprocessor system development, hardware and software aids. Building a microprocessor based system.

— Trouble - shooting techniques, logic analyser etc.

— Single chip Microcontroller and its applications.

Term work

The term work shall consist of a report of the laboratory experiments/assignments based on the above syllabus. The report shall be duly graded and certified by the concerned teacher.

RECOMMENDED BOOKS

1. 'Microprocessor Systems : The 8086/8088 family' Architecture, programming and Design by Yu cheng Liu and Glenn A. Gibson : Prentice Hall.

2. 'Microprocessor and Interfacing : Programming and Hardware' by Hall McGraw Hill.

3. '68000 Assembly language programming' by G. Kane, D. Hawkins and L. Leventhol, Mc Graw Hill.

4. 'MCS 51 Handbook' Intel Corporation U.S.A.

5. 'The Motorola 68000, An Introduction to Processor, Memory and Interfacing' by Jean Becon, Prentice Hall International.

6. 'Microprocessor and Microcomputer Based Systems, by M. Refiguzzman Harper and Row Pub.

VI. 3 INTRODUCTION TO SYSTEM PROGRAMMING

(Theory - 4 periods/week, One paper 3 hrs, 100 marks)
(Practical - 3 and Tutorial - 1 period/week, termwork - 25 marks Practical Exam - 50 marks)

— Introduction to system software and software processors.

— Assemblers : elements of assembly language programming and assembly process, design of single pass and two pass assemblers, case studies.

— Macros, macro processors and macro assemblers.

— Loaders and linkage editors : loading, linking and relocation, program relocability, linkage editing, linkage editor and case studies.

— Introduction to compilers and compiling process, principles of complier design.

— Interactive computing and program development, interpreters and incremental compilers.

— Software tools for program entry and text editors.

Term Work

The term work shall consist of a report of the programs/ assignment based on the above syllabus. The report shall be duly certified and graded by the concerned teacher.

RECOMMENDED BOOKS

1. J. D. Ullman, Fundamental Concepts of Programming Systems, Addison - Wesley.

2. D. M. Dhamdhere, Introduction to System software, Tata Mc Graw Hill.

3. D. W. Barron, Assemblers and Loaders, Macdonald and Jane's London, 3rd edition.

4. L. L. Beck, System Software : An Introduction to System Programming, Addision Wesley.

5. Welsh and McKeag, Structured System Programming, PHI.

VI. 4 ARTIFICIAL INTELLIGENCE

(Theory : 4 periods/week, 3 hours paper, 100 marks)
(Practical - 3 and Tutorial - 1 periods/week, termwork - 25 marks, Oral - 50 marks)

— Introduction to AI, definitions : data, information and knowledge, applications of AI.

— Approach to AI : state space search and game tree search and other search statagies.

— Knowledge representation :prapositional logic, predicate logic question answering, non-monotonic reasoning, fuzzy logic.

— Knowledge structures : semantic networks, frames scripts, conceptual dependancy, learning, knowledge acquisition, different methods of learning.

— Knowledge engineering and Expert Systems - structure of an expert system, distinctive features, case study from natural language processing and /or computer vision.

— Features of a Programming language for AI & programming.

Term Work

The term work shall consist of a report of programs/ assignments based on the above syllabus. The report should be duly certified and graded by the teacher.

RECOMMENDED BOOKS

1. Rich E., Artificial Intelligence, McGraw Hill Book Company.
2. Nilson N. J., Problem Solving Methods in Artificial Intelligence, Mc Graw Hill.

3. Winston P. H., Artificial Intelligence, Academic Press.
4. Barr. Cohen and Feienbaum, Hand book of Artificial Intelligence.
5. P. H. Winston, LISP, Addison Wesley.
6. P. H. Winston, Artificial intelligence, Addison Wesley.

VI. 5 COMPUTER GRAPHICS

(Theory : 4 periods/week, one paper of 3 hours, 100 marks, Practical 3 and tutorial : 1 periods/week, term work - 25 marks, Oral - 50 marks)

— Basic concepts in Computer graphics : Point plotting techniques, line drawing displays, two dimensional transformations, clipping and windowing.

— Graphics software : elements of graphic software design, Sagmented display files, geometric models and picture structure.

— Interactive graphics : Graphical input devices, graphical input techniques.

— Three dimensional graphics : Curves and surfaces, three dimensional transformation and perspective, hidden surface illumination.

— Picture animation : raster and scan graphics, system design for raster scan graphics.

Term Work

The term work shall consist of a report of programs/ assignments based on the above syllabus. The term work should be duly certified and graded by the teacher.

RECOMMENDED BOOKS

1. Principles of interactive graphics, Newman and Sproull, McGraw Hill International Student Edition
2. Interactive Computer Graphics : Data Structures, Algorithms, Languages, Giloi, Prentice Hall.
3. Computer Graphics - Programming Approach, S. Harrigton, McGraw Hill, ISE.
4. Fundamentals of Interactive Graphics by Foley and Van Dam, Addison Wesley.
5. Procedural elements for Computer Graphics - by D. F. Rogers, M. Hill.
6. Mathematical elements for Computer Graphics - by D. F. Rogers, M. Hill.

VI. 6 FUNDAMENTALS OF PROGRAMMING LANGUAGES

(Theory - 4 periods/week, paper - 3 hrs., marks - 100 Practical - 3 and Tutorial - 1 periods/week, Termwork - 25 marks, Oral - 50 marks)

— Evolution of programming languages, terminology of programming, design principles and criteria for language design.

— Feature of a programming language : formal syntax schemes, data and storage, control structures, binding, procedural abstraction, definitions and blocks, types, exception handling

and concurrency; comparison of different languages.

— Communicating sequencial processes and functional programming.

— Concepts from ADA : types, packages, concurrency and tasks

— Introduction to applicative languages : study of LISP., programming style in LISP, various types of lists.

— Study of other contemporary languages such as PROLOG and Snobol; features and design aspects.

Term Work

The term work shall consist of a report of programs based on the above syllabus. The termwork shall be graded and certified by the concerned teacher.

RECOMMENDED BOOKS

1. Fundamentals of Programmig Languages, by Horouitz E., Galgotia Pub.
2. Principles of Programming Languages, by Tennet R. D., Prentice Hall.
3. Programming Languages, by Tucker A. B., ISE McGraw Hill.
4. Programming languages : Design and Implementation, by Pratt, PHI.
5. LISP, by winston P. H., addison Wesley.
6. Programming Language Concepts, Ghezzic and Jazayeri, wiley.

Fourth and Final Year of Degree Course in Computer Engineering (Revised)

Sr No.	Subject (Deptt. to teach)	Scheme of Instruction * Periods/ week L	T	P	Duration of paper	Scheme of Examination Theory	TW	Practical	Oral	TOTAL
Semester VII (Revised)										
1.	Principles of data Communication (E and TC)	4	1	—	3	100	—	—	—	100
2.	Peripheral Devices and Interfaces (computer)	4	1	3	3	100	25	—	50	175
3.	Compiler construction (Computer)	4	1	3	3	100	25	—	50	175
4.	Operating Systems (Computer)	4	1	3	3	100	25	—	50	175
5.	Elective I (Comp---uter)	4	1	3	3	100	50	—	50	200
6.	Project (Computer)			5					50 (Seminar)	50
	Total	20	5	17	—	500	125	—	250	875
Semester VIII (Revised)										
1.	Computer Networks (Computer)	4	1	4	3	100	25	—	50	175
2.	Advanced Computer Architectures (Computer)	4	1	4	3	100	25	—	50	175
3.	Elective II (Computer)	4	1	4	3	100	50	—	50	200
4.	Project	—	—	15	—	—	50	—	50	100
	Total	12	3	27	—	300	150	—	200	650

* Duration of period - 45 minutes, L -Lecture, P - Practical T - Tutorial.

Elective - I (a) Digital Simulation and Modelling (b) Algorithm Analysis and Design (c) Software Engineering (d) information Systems Design (e) Logic Programming.

Elective - II (a) Software Tools for CAD / CAM (b) Distributed Computing (c) Image Processing (d) Robotics (e) VLSI Design

VII. 1. PRINCIPLES OF DATA COMMUNICATION

(Theory - 3 periods/week, Tutorial - 1 period/week, one paper - 3 hours, 100 marks)

— Communication concepts : overview of data communication systems, series/parallel, synchronous/asynchronous communication, terminology, maximum data rate.

— Fundamentals of data communication; band width limiting and Shannons maximum channel capacity theorem.

— Modulation : types of modulation, error probability; PSK, DPSK and FSK, Modulation & demodulation Techniques of these schemes and their composition.

— Data communication sub-systems; modems, RS - 232C interface, Use of telephone systems in data communication, frequency and time division multiplexing.

— Different types of codes, Error detection and correction, codes, such as Algebraic & Cyclic codes.

— Introduction to computer communications. Basic network protocols, Circuit packet switching, OSI levels, Local area networks & mid area networks. Transmission media & Parily checking & Hamming distance.

RECOMMENDED BOOKS

1. A. S. Tanenbaum, "Computer Networks" Prentice Hall.
2. S. Haykin, "digital Communication" John wiley and Sons.
3. K. S. Shanmugam, "Digital and Analog Communication System" Wiley.
4. W. Sinnema, "Digital & Analog Data Communication" Beston.
5. J. Fitzgerald and T. S. Eason, 'Fundamentals of Data communication' John Wiley.
6. Lucky, Zaliz and Weldon, 'Principles of Communication' McGraw Hill.

VII. 2 PERIPHERAL DEVICES & INTERFACES

(Theory : 4 periods/week, Paper of 3 hours duration, 100 marks) (Practical - 3 and Tutorial - 1 period/week, Term work - 25 marks, Oral - 50 marks)

— Secondary storage devices; recording on magnetic surfaces, magnetic tapes; magnetic discs; storing and accessing data on discs, floppy discs, winchester disc.

— Input peripheral devices : Key boards, joy-stick, light pen, digitizer, microphone, digitizing pad, mouse, constructional details and principles of operation.

— Output devices : constructional details and operation of a VDU, graphic terminal and adopter cards, printers: Printing mechanisms, constructional details and operation of dot matrix printers, daisy wheel printer, line printer, thermal Printer, laser printer, plotter.

— Standards - Centronics, IEEE 488, RS - 422C, S - 100 Bus, VME, MULTIBUS.

— Micro processor interfacing using VLSI Intel chips : CRT controller, floppy disc controller, key board controller, Printer interface, interrupt controller, DMA controller, USART and communication processors, interfacing design examples.

— Analog Interfacing.

Term Work

The term work shall consist of a report of laboratory experiments or assignments based on the above syllabus. The report shall be duly certified and graded by the concerned teacher.

REFERENCE BOOKS

1. Microprocessor and Interfacing : Programming and Hardware, Hall, McGraw Hill.
2. Microprocessor Data Handbook : BPB Publication.
3. Peripheral Design Handbook, Intel Corporation, USA.
4. Peripheral Devices, I. Flores, Prentice Hall.
5. Microprocessor Interfacing : Programming and Hardware, B. A. Artwick, McGraw Hill.
6. Microprocessor Interfacing Techniques, Zaks, Sybex.

VII. 3 COMPILER CONSTRUCTION

(Theory : 4 periods/week, One paper - 3 hours, 100 marks) (Practical : 3 and Tutorial : 1 period/week, Term work - 25 marks, Oral - 50 marks)

— Introduction to compilers : structure - bootstrapping. Overview of system software and programming languages.

— Lexical analysis : role of lexical analyser, design of a lexical analyser, overview of automata and languages.

— Parsing techniques : shift-reduce, operator-precedence, topdown and predictive parsers, LR, SLR, LALR parsers.

— Syntax directed translation : schemes - intermediate code - postfix - triples - quadruples - translation of assignment statement and control flow statements - translation of array references and procedure calls.

— Symbol table management, runtime storage administration.

— Error detection and recovery - code optimization - code generation.

Term work

The term work shall consist of a report of laboratory programs/assignments based on the above syllabus. The term work will be duly certified and graded by the teacher.

REFERENCE BOOKS

1. A. V. Aho and J. D. Ullman; Principles of Compiler Design, Addison Wesley.
2. J. P. Trembley and P. G. Sorenson; The theory and Practice of Compiler Writing, McGraw Hill.
3. D. M. Dhamdhere; compiler Construction - Principles and Practice, McMillan India Ltd.
4. W. A. Barret; Compiler Construction Theory and Practice, Galgotia Pub, New Delhi.
5. D. Gries; compiler Construction for Digital computers, John Wiley, ISE.

VII. 4 OPERATING SYSTEMS

(Lectures:4 periods/week; Paper of 3 hours duration & 100 marks)

(Practical : 3 and Tutorial : 1 period/week, Term work - 25 marks, oral - 50 marks)

— Introduction to operating system, historical perspective - batch processing, multiprogramming, time sharing system; functions and components of an operating system.

— File system : review of device drives, file system, directory structure, gaining access to files and basic file system calls.

— Processor management - interrupt mechanism, concurrent processes, mutual exclusion, synchronisation, process management, switching, scheduling, process communication & deadlocks - Memory management - swapping, segmentation, paging, virtual memory, page replacement and space allocation policies - segmented paging, dynamic linking - caching of secondary storage information.

— I/O management - I/O programming concepts, interrupt handlers, techniques of device management, I/O schedules and device handlers, spooling.

— Case study of UNIX or any othe multiuser operating system.

Term work

The term work shall consist of a report of programs/assignments based on the above syllabus. The report shall be duly signed and graded by the teacher concerned.

REFERENCE BOOKS

1. Tenanbaum, The Minix Operating System, PHI.

2. Milan Milankovie, Operating systems, Concepts and Design, McGraw Hill, ISE.

3. P. Brinch Hansen, Operating System Principles, Prentice Hall of India.

4. H. M. Deitel, Operating System Principles, Addison Wesley.

5. M. J. Bach, The Design of Unix Operating System, Prentice Hall.

6. A. C. Shaw, The logical Design of Operating Principles, Prentice Hall.

VII . 5 Elective I (a) DIGITAL SIMULATION & MODELLING

(Theory - 4 periods/week; paper - 100 marks, 3 hours)
(Practical : 3 & Tutorial : 1 period/week; Term work - 50 marks, Oral : 50 marks)

— Role of simulation in system studies, role of models in simulation.

— Models for continuous simulation state space approach, state transition matrix, simulation of continuous systems, comparison of different integration techniques.

— Dicrete system simulation : fixed time step and event to event model, random number generation, simulation of queing system, PERT network and inventory control systems.

— Simulation languages : CSMP, GPSS, SIMSCRIPT AND SIMULA.

Term work

The term work shall consist of the report of programs/ assignments based on the above syllabus. The term work shall be duly graded and certified by the concerned teacher.

REFERENCE BOOKS

1. G. S. Fishman, Concepts and Methods in Discrete Event Digital Simulation, John Wiley, NY.

2. T. M. Donovan, GPSS Simulation Mode Simple, John wiley, NY.

3. G. Gordon, System Simulation, Prentice Hall, Eaglewood Cliffs, NY.

4. N. Deo, System Simulation with Digital Computer, Prentice Hall of India.

5. A. M. Law and W. D. Kelton, Simulation and Modelling analysis, McGraw Hill.

VII. 5 Elective I (b) ALGORITHM ANALYSIS & DESIGN

(Theory - 4 periods/week, Paper - 3 hrs., 100 marks)
(Practical : 3 and Tutorial : 1 period/week, Term work - 50 marks, Oral - 50 marks)

— Introduction to the subject, review of data structures.

— Concepts in algorithm analysis and complexity, dynamic storage management and garbage collection, recursion.

— Domain dependent techniques for algorithm design : divide

and conquer greedy algorithms, graph theoritic algorithms, search techniques, back tracking and dynamic programming.

— Set manipulation, lower bound theory, text processing and pattern matching, NP hard and NP complete problems.

Term work

The term work shall consist of a report of programs/assignments based on the above syllabus. The term work shall be duly graded by the concerned teacher.

RECOMMENDED BOOKS

1. E. Horowitz and S. Sahani, Fundamentals of Computer Algorithms, Galgotia Publications.
2. Aho, Hopcraft and Ullman, The Design and analysis of Computer Algorithms, Addison Wesley.
3. Robert Sedgewick, Algorithms, Addison Wesley.
4. D. E. Knuth, The Art of Computer Programming, Vol. 1-3, Addison Wesley.
5. K. Mebhorn, Data Structures and Algorithms, Vol. 1 & 2, Springer and Verlag.

VII. 5 Elective I (c) SOFTWARE ENGINEERING

(Theory - 4 periods/week, One paper 3 hours, 100 marks)
(Practical : 3 & Tutorial : 1 period/week, Term work - 50 marks, Oral - 50 marks)

— Introduction to software engineering; specification of problems, software planning, software requirement analysis, software design tools and techniques, characteristics of good software.

* — Software life cycle - Important steps and effort distribution. Aspects of estimation and scheduling.

— * Software evaluation techniques modular design, software complexity measures.

— Storage and processing time analysis; software reliability, feasibility analysis.

— Data flow and data structure oriented design strategies.

— Software development, coding verification and integration.

— Project management, team structure scheduling, software quality assurance.

Term work

The term work shall consist of assignments/programs based on the above syllabus. The term work shall be duly certified and graded by the concerned teacher.

RECOMMENDED BOOKS

1. M. L. Shooman, software Engineering, McGraw Hill, ISE.
2. R. S. Pressman, Software Engineering : A Practitioner's Approach, McGraw Hill, International Students Edition.
3. Fairley, Software Engineering Concepts, McGraw Hill.
4. R. C. Transworthe, Standardised Development of Computer Software, part I - II, Prentice Hall.
5. G. J. Myers, Software Reliability, Wiley Interscience.
6. R. C. Gunther, Management and Methodology for Software Product Engineering, Wiley Interscience.

VII. 5 Elective I (d) INFORMATION SYSTEMS DESIGN

(Theory - 4 periods/week; One paper - 100 marks, 3 hours duration)
(Practical - 3 and Tutorial : 1 period/week; Term work - 50 marks and Oral - 50 marks)

— Introduction to system concepts and information system environment, system development life cycle.

— System analysis : system planning and initial investigation, information gathering, tools for structured analysis, feasibility study, cost benefit analysis.

— System design : The process and stages of system design, input, output and form design, selection of file organisation and database design.

— System implementation : System testing and quality assurance, implementation and software maintainance, project scheduling of software, security and integrity in system development.

— Management information system : organisational structure, characterisitcs of MIS, business models, managing system design projects, management tasks, project scheduling technical management.

— Example form production, inventory management, ordering and invoicing, university and other organisations.

Term work

The term work shall consist of a report of programs/assignments based on the above syllabus. The term work shall be duly signed and graded by the concerned teacher.

RECOMMENDED BOOKS

1. Lee, Introduction System Analysis and Design Vol. I and II, Galgotia.
2. Rajan et. at., Management Information Systems, Galgotia.
3. Cougher, Information to Computer Based Systems.
4. Philippakis, Information System through COBOL, McGraw Hill, International Student Edition.
5. Cashman, Essentials of Information Processing, Harper.
6. Elements of Systems Analysis - Marvin Gore and John Stubbe - Wan C. Brown Company Publishers - Galgotia Book Dubeque, Iows.

VIII. 5 Elective I (e) LOGIC PROGRAMMING

(Theory - 4 periods/week; One paper - 100 marks, 3 hours duration)
(Practical - 3 and Tutorial : 1 period/week, Term Work - 50 marks and Oral - 50 marks)

— Review of classical logic, functional completeness, decision methods, proof calculi.

— Propositional functions, quantifiers and their interpretations. Negation of quantitified sentences, quantified rules.

— Many-valued logic : historical remarks, formal formulations and applications. Undecidability.

— Relevance logic : criteria of relevance, axiomatics, semantics, applications.

* — Tense logic : basic formulation scheme, decidability, applications.

— * Dynamic logic : extension of modal logic, syntex and semantics, decidability, completeness, compactness and applications.

— Programming in logic : logic programming and languages Theorem proving and resolution, soundness and completeness, declarative semantics, procedural semantics, negation

Term work

The term work shall consist of a report of programs/assignments based on the above syllabus. The term work shall be duly certified and graded by the concerned teacher.

RECOMMENDED BOOKS

1. C. J. Hogger, Introduction to Logic Programming, Academic Press.
2. J. W. Lloyd, foundations of Logic Programming, Springer.
3. R. H. Thomson, Symbolic Logic : An Introduction, MacMillan
4. S. Haack, Philosophy of Logics, Cambridge University Press
5. Kowalski R. A., Logic for Problem Solving, Elsavier - North Holland.

VIII. 1 COMPUTER NETWORK

(Theory lectures - 4 periods/week, One paper - 3 hrs., 100 marks) (Practical : 4 and Tutorial : 1 period/week, Term work - 25 marks, Oral - 50 marks)

— Network goals and applications, network architecture, protocol hierarchies, ISO reference model and layers, network topology design considerations.

— Physical layer : review of data transmission, circuit switching and packet switching, terminal handling : polling, multiplexing v/s concentration.

— Data link, network, transport and higher level layered concepts and protocols.

— Local area network : transmission media, local area network protocol, network architecture, network components and network software.

— Network services : file transfer, access and management; electronic mail, virtual terminals etc.

— Satellite and packet radio networks.

— Introduction to distributed systems.

Term Work

The term work shall consist of a report of experiments/assignments based on the above syllabus. The term work shall be duly certified and graded by the concerned teacher.

RECOMMENDED BOOKS

1. A. S. Tanenbaum, Computer Networks, Prentice Hall.
2. James Martin, Computer Networks and Distributed Processing : Software Techniques & Architecture, Prentice Hall of India.
3. D. W. Davies, D. L. A. Barber, W. L. Price and C. M. Solononies; computer Networks and Their Protocols, John Wiley.
4. Abramson and Kuo, Computer Communications Networks, Prentice Hall.
5. W. Chou, Computer communications : Vol I Principles and Examples, Prentice Hall.
6. W. Stallings, Data and Computer Communications, McGraw Hill.

VIII. 2 ADVANCED COMPUTER ARCHITECTURES

(Theory - 4 periods/week, One paper - 3 hrs., 100 marks)
(Practical : 4 and Tutorial : 1 period/week, Term work - 25 marks, Oral - 50 marks)

— Impact of operating system and programming languages on computer architecture.
— Introduction to parallel processing : parallelism in uniprocessor system, parallel computer structures, parallel processing application.
— Principles of pipelining, principles of pipeline processors, pipeline computers.
— Array processors and SMID computers : Interconnection network, parallel algorithms & associative array processing.
— Multiprocessor architectures, performance enhancement and algorithms.
— Data flow computers : data driven computing and languages, data flow computer architectures.
— Performance evaluation of systems and comparison of different architectures.

Term Work

The term work shall consist of experiments/assignments based on the above syllabus. The term work shall be duly certified and graded by the concerned teacher.

RECOMMENDED BOOKS

1. K. Hwang & A. Briggs : Computer Architecture & Parallel Processing, McGraw Hill.
2. R. N. Ibbett : The Architecture of High Performance Computers, Springer Verlag.
3. P. Enalow, Microprocessors and Parallel Processing Systems, John Wiley.
4. Hockney, Parallel Computer Algorithms.
5. Herald Stone, High Performance Computers, Addison Wesley.
6. Siewiorek, Bell and Newell; computer Structures : Principles and Examples, McGraw Hill.

VIII. 3 Elective II (a) SOFTWARE TOOLS FOR CAD/CAM

(Theory - 4 periods/week, One paper - 3 hours, 100 marks)
(Practical : 4 and Tutorial : 1 period/week, Term work - 50 marks, Oral - 50 marks)

— Introduction to CAD/CAM, basic concepts of integrated CAD/CAM.
— Review of interactive graphics, design specifications of interactive packages in drafting, designing and manufacturing, design and development of algorithms.
— Methodologies of CAD/CAM, techniques of displaying models using computer optimisation, data representation in CAD/CAM.
— The APT systems : symbols & words, Geometric definitions, Motion statements, CAD/CAM Systems, use of Micro computers in CAD/CAM systems, software for CAD/CAM systems. Brief introduction to CNC Machine.

Term Work

The term work shall consist of a report of laboratory programs/assignments based on the above syllabus. The term work shall be duly certified and graded by the concerned teacher.

RECOMMENDED BOOKS

1. Computer Aided Design & Manufacture - 3rd Edition, C. B. Basant & C. W. K. Lui-Ellishorwood Ltd., John wiley & sons.
2. CAD/CAM Techniques - Michael F. Hordiski - Reston Publishing Co. Ph Company.
3. Introduction to Computer Aided Draughting - Donald D. Voisinct - MGH.
4. Computer Aided Design & Manufacturing - Mickell P. Gover & Emury W. Zimmerman PHI.

VIII. 3 Elective II (b) DISTRIBUTED COMPUTING

(Theory - 4 periods/week; One paper, 1oo marks, 3 h duration)
(Practical : 4 and Tutorial : 1 period/week, Term work - 50 ma Oral - 50 marks)

— Distributed computing - application areas and goal characterisation of distributed systems - architecture a models - interconnection technology - distributed con and interprocessors communication - distributed algorith and database - languages for distributed programmin naming - synchronisation machanism - termination.

Term Work

The term work shall consist of a report of laborato programs/assignments based on the above syllabus. The te work shall be duly certified and graded by the concerned teach

RECOMMENDED BOOKS

1. Parkar Y. and J. P. Verjus, Distributed Computing Syste Synchronisation, control & Communication, Academic Pre
2. Ceri and Pelegatti, Distributed Data Bases, McGraw Hill
3. D. W. Lampson, (Ed.), Distributed Systems; Architectur Design and Implementation, Springer-Verlag, Lecture No Series.

VIII. 3 Elective II (c) IMAGE PROCESSING

(Theory - 4 periods/week; One paper 100 marks, 3 hours duration)
(Practical : 4; Tutorial : 1 period/week; Term work - 50 marks Oral - 50 marks)

- Image representation - digitisation, quantisation - image compression, and coding problems - data structures for picture representation, quad trees spatial smooting, template matching, region analysis - contour following - frequency domain operations - one dimensional linear processing of Images.
- Image Enhancement and coding, restoration and image analysis techniques - Basic concepts.
- Description of line and shapes, statistical and syntatic models for picture classification.
- Applications of Digital Image Processing.

Term Work

The term work shall consist of the report of the laboratory programs/assignments based on the above syllabus. The term work shall be duly graded and certified by the teacher concerned.

RECOMMENDED BOOKS

1. A. Rosenfed and A. Kak, Digital Picture Processing, Academic Press.
2. R. E. Duda and P. E. Hart, Pattern Classification and Scene Analysis, John wiley, NY.
3. Pavlidas, Algorithms for Graphics and Image Processing, Springer Verlag, Berlin.
4. P. Winston, The Psychology of Computer Vision, McGraw Hill, NY.
5. Anil K. Jain, Fundamentals of Digital Image Processing, Prentice Hall.
6. R.C. Gonzalez & Paul Wintz, Digital Image Processing 2nd Edition Addison-Wesley.

VIII. 3 Elective II (d) ROBOTICS

(Theory - 4 periods/week; paper 100 marks, 3 hours)
(Practical : 4 and Tutorial : 1 period/week; Term work - 50 marks, Oral 50 marks)

— Basic robot elements, Mechanical structure elements, elements of a manipulator, types of robots, geometry or motion nature of the control system.

— Types of industrial robots, the robot controller, Assembly robots, structure, mechanical structure, arm control, control of the end effector - Robot Controller. Trajector Planner, Co ordinate transformation, dynamic word processing.

— robot vision and effects of sensors, visual processing techniques, sensor systems, Programming of robots, Problems, robot programming systems automatic robot programming, computing safe positions, dealing with uncertainity.

— Application of robots in material transfer, machine loading, assembly, inspection, automotive industry etc.

Term Work

The term work shall consist of a report of the labortary programs/assignments based on the above syllabus. The term work shall be duly certified and graded by the concerned teacher.

RECOMMENDED BOOKS

1. Introduction to Robot Programming in Basic - Peter R. Rony, Karl E. Rony & Paul A. Rony Riston Publishing Company, PH Co.

2. Computer Aided Design and Manufacturing - C. B. Basant and C. W. K. Levi - Ellisharwood Ltd. - John wiley & Sons.

VIII. 3 Elective II (e) VLSI SYSTEM DESIGN

(Theory - 4 periods/week; One paper - 100 marks, 3 hours duration)
(Practical - 4 and Tutorial : 1 period/week, Term work - 50 marks and Oral - 50 marks)

— Introduction to VLSI technology. Choice of technology for a particular application. Complexity of design and need for automation.

— Basic building blocks in NMOS and CMOS technologies, their analysis and Design. Static and dynamic logic, Passe transistor logic.

— Top down and bottom up design system partitioning. Simulation and analysis of subsystems using software packages like SPICE, MSINC, etc.

— System design and layout using CAD tools. Design rule checking, Simulation, testing for testability.

— Device scaling techniques for VLSI and technology limitations. Short channel effects. Subthreshold conduction. Problems of inter connections. Packaging trends. Limitations of chip area, power, pin count.

— Reliability and yield analysis.

Term Work

The term work shall consist of report of experiments/assignments based on the above syllabus. The term work shall be duly certified and graded by the concerned teacher.

RECOMMENDED BOOKS

1. Introduction to VLSI Systems by C. A. Mead and L. A. Conway, Addison Wesley.
2. Computational Aspects of VSLI, by J. D. Ullman, computer Science Press.
3. VLSI Circuit Layout; Theory and Design by T. C. Hu, E. S. Kuh, IEEE Press.
4. Advanced in CAD for VLSI Vol. 2-7, T. Ohtsuki Series Edn. North Holland.
5. Design Automation of Digital Systems, by M. A. Breuer, Prentice Hall.

FIRST YEAR ENGINEERING
(CIVIL,MECHANICAL,ELECTRICAL & ELECTRONICS & TELECOMMUNICATION, & COMPUTER ENGINEERING)

SEMISTER I

NO	SUBJECT	L	T	P	DURATION OF THEORY EXAM	Marks Alloted				Total
						Th.	S	P	O	
1.1	Applied Mathematics I	3	0	0	3	100	25	0	0	125
1.2	Applied Sciences-I (Physics& Chemistry)	4	0	2~	3	100	50	0	0	150
1.3	Basic engineering-I (Civil & Mechanical Engg.)	4	0	2~	3	100	50	0	0	150
1.4	Information Technology-I	3	0	2	3	100	50	0	0	150
1.5	Engineering Graphics	2	0	4	4	100	50	0	0	150
1.6	Communication Skills	2	0	0	0	0	50	0	0	50
1.7	Workshop Practice	0	0	4	0	0	50	0	0	50
1.8	Environmental Studies	3	0	0	3	100	25	0	0	125
Total		21	0	14	-	600	350	0	0	950

SEMISTER II

NO	SUBJECT	L	T	P	DURATION OF THEORY EXAM	Marks Alloted				Total
						Th.	S	P	O	
2.1	Applied Mathematics II	3	0	0	3	100	25	-	-	125
2.2	Applied Sciences-II (Physics& Chemistry)	4	0	2~	3	100	50	-	-	150
2.3	Basic engineering-II (Electrical & Electronics Engg.)	4	0	2~	3	100	50	-	-	150
2.4	Information Technology-II (Problem Solving and Programming)	3	0	2	3	100	50	-	-	150
2.5	Engineering Mechanics	3	0	1	3	100	50	-	-	150
2.6	Social Sciences	2	0	0	0	0	50	-	-	50
2.7	Modern Workshop Practice	0	0	4	0	0	50	-	-	50
2.8	Computer Aided Drafting	0	0	2	0	0	50	0	0	50
Total		19	0	13	-	500	375	-	-	875

15/9/14

Principal
Goa College of Engineering (Govt. of Goa)
Farmagudi, Ponda-Goa - 403 401

Assistant Registrar (Academic)
Goa College of Engineering (Govt. of Goa)
Farmagudi, Ponda-Goa-403 401.

Goa University
Second year of Bachelors of Engineering Degree in Computer Engineering
Scheme of instruction and Examination

SEMESTER – III

Sub. Code	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	S	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
3.1	Applied Mathematics – III	3	1	-	3	100	25	-	-	125
3.2	Logic Design	3	1	2	3	100	25	-	50	175
3.3	Data Structures using C++	3	1	2	3	100	25	50	-	175
3.4	Integrated Electronics	3	1	2	3	100	25	-	-	125
3.5	Computer Oriented Numerical Techniques	3	-	2	3	100	25	-	-	125
3.6	Electrical Technology	3	-	2	3	100	25	-	-	125
	TOTAL	18	4	10		600	150	50	50	850

SEMESTER – IV

Sub. Code	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	S	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
4.1	Discrete Mathematical structures	3	1	-	3	100	25	-	-	125
4.2	Principles of Programming languages	3	-	2	3	100	25	-	-	125
4.3	Computer Organization	3	1	2	3	100	25	-	50	175
4.4	Design and Analysis of Algorithms	3	-	2	3	100	25	-	-	125
4.5	System Analysis & Design	3	1	2	3	100	25	50	-	175
4.6	Electronic Instrumentation	3	1	2	3	100	25	-	-	125
	TOTAL	18	4	10		600	150	50	50	850

Legend:
L - Lectures
T - Tutorials
P - Practicals
TD - Duration of Theory Exam

TM - Max. Marks for Theory
S – Max. Marks for Sessionals
PR – Max Marks for Practicals
ORA – Max Marks for Orals

15/9/14

Principal
Goa College of Engineering (Govt. of Goa)
Farmagudi, Ponda-Goa - 403 401

Assistant Registrar (Academic)
Goa College of Engineering (Govt. of Goa)
Farmagudi, Ponda-Goa

Goa University
Third year of Bachelors of Engineering Degree in Computer Engineering
Scheme of instruction and Examination

SEMESTER – V

Sub. Code	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	S	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
5.1	Economics and Management	3	1	-	3	100	25	-	-	125
5.2	Automata Languages and Computation	3	1	-	3	100	25	-	-	125
5.3	Microprocessors	3	1	2	3	100	25	50	-	175
5.4	Database Management Systems	3	1	2	3	100	25	-	-	125
5.5	Operating Systems	3	1	2	3	100	25	-	50	175
5.6	Computer Hardware Design	3	1	2	3	100	25	-	-	125
	TOTAL	18	4	8		600	150	50	50	850

SEMESTER – VI

Sub. Code	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	S	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
6.1	Operation Research	3	1	-	3	100	25	-	-	125
6.2	Object Oriented Design and Programming	3	1	2	3	100	25	-	-	125
6.3	Artificial Intelligence	3	-	2	3	100	25	-	-	125
6.4	Computer Graphics	3	1	2	3	100	25	50	-	175
6.5	Device Interfaces and PC Maintenance	3	1	2	3	100	25	-	50	175
6.6	Computer Networks I	3	1	2	3	100	25	-	-	125
	TOTAL	18	4	10		600	150	50	50	850

Legend:
L – Lectures
T – Tutorials
P – Practicals
TD – Duration of Theory Exam

TM - Max. Marks for Theory
S – Max. Marks for Sessionals
PR – Max Marks for Practicals
ORA – Max Marks for Orals

15/9/14

Principal
Goa College of Engineering (Govt. of Goa)
Farmagudi, Ponda-Goa - 403 401

Assistant Registrar (Academic)
Goa College of Engineering (Govt. of Goa)
Farmagudi, Ponda-Goa-403 401.

Goa University
Fourth year of Bachelors of Engineering Degree in Computer Engineering
Scheme of instruction and Examination

SEMESTER – VII

Sub. Code	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	S	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
7.1	Language Translators	3	1	2	3	100	25	-	50	175
7.2	Computer Communication Networks II	3	1	2	3	100	25	-	-	125
7.3	Software Engineering	3	1	-	3	100	25	-	-	125
7.4	Elective I	3	1	2	3	100	25	-	50	175
7.5	Elective II	3	1	2	3	100	25	-	50	175
7.6	Project		-	4	-	-	25	-	50*	75
	TOTAL	15	5	12		500	150	-	200	850

* Project Seminar

Subjects for Elective I
a) VLSI Technology and Design
b) Digital Signal Processing
c) Software Agents and Embedded Systems
d) Fuzzy Logic and Neural Networks

Subjects for Elective II
a) Data Mining
b) Distributed Operating Systems
c) Web Technologies
d) Digital Simulation and Modeling

SEMESTER – VIII

Sub. Code	Subject	Teaching Scheme			Examination Scheme					
		L	T	P	TD	TM	S	PR	ORA	Total
		Hrs/Week			Hrs	Marks				
8.1	Advanced Data Structures and Algorithms	3	1	2	3	100	25	-	50	175
8.2	Elective III	3	1	2	3	100	25	-	50	175
8.3	Elective IV	3	1	2	3	100	25	-	50	175
8.4	Project	-	-	10	-	-	25	50*	50	125
	TOTAL	9	3	16		300	100	50	200	650

* Project Report

Subjects for Elective III
a) Multimedia Systems
b) Software tools for CAD/CAM
c) Robotics
d) Advanced Computer Architecture

Subjects for Elective IV
a) Image Processing and Pattern Recognition
b) Cryptography and Network security
c) Natural Language Processing
d) Genetic Algorithms

Legend:
L – Lectures
T – Tutorials
P – Practicals
TD – Duration of Theory Exam

TM - Max. Marks for Theory
S – Max. Marks for Sessionals
PR – Max Marks for Practicals
ORA – Max Marks for Orals

15/9/14

Principal
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