P = Practical, **IA**=Internal Assessment,
ETE=End Term Exam, **Cr**=Credits

Teaching and Examination Scheme

II Semester: B.Tech. 2018-19
Common to all branches of UG Engineering & Technology

SN	Category	Course Code	Course Title	Hours			Marks			Cr
				L	T	P	IA	ETE	Total	
1	BSC	2FY2-01	Engineering Mathematics-II	3	1	-	40	160	**200**	**4**
2	BSC	2FY2-03/ 2FY2-02	Engineering Chemistry/ Engineering Physics	3	1	-	40	160	**200**	**4**
3	HSMC	2FY1-05/ 2FY1-04	Human Values/ Communication Skills	2	-	-	20	80	**100**	**2**
4	ESC	2FY3-07/ 2FY3-06	Basic Mechanical Engineering/ Programming for Problem Solving	2	-	-	20	80	**100**	**2**
5	ESC	2FY3-09/ 2FY3-08	Basic Civil Engineering/ Basic Electrical Engineering	2	-	-	20	80	**100**	**2**
6	BSC	2FY2-21/ 2FY2-20	Engineering Chemistry Lab/Engineering Physics Lab	-	-	2	30	20	**50**	**1**
7	HSMC	2FY1-23/ 2FY1-22	Human Values Activities/ Language Lab	-	-	2	30	20	**50**	**1**
8	ESC	2FY3-25/ 2FY3-24	Manufacturing Practices Workshop/ Computer Programming Lab	-	-	3	45	30	**75**	**1.5**
9	ESC	2FY3-27/ 2FY3-26	Basic Civil Engineering Lab/Basic Electrical Engineering Lab	-	-	2	30	20	**50**	**1**
10	ESC	2FY3-29/ 2FY3-28	Computer Aided Machine Drawing/ Computer Aided Engineering Graphics	-	-	3	45	30	**75**	**1.5**
11	SODE CA	1FY8-00							**25**	**0.5**
								Total	**1025**	**20.5**

L = Lecture, **T** = Tutorial,
P = Practical,**IA**=Internal Assessment,
ETE=End Term Exam, **Cr**=Credits

Teaching and Examination Scheme

I Semester: B.Tech 2018-19
Common to all branches of UG Engineering & Technology

SN	Category	Course Code	Course Title	Hours			Marks			Cr
				L	T	P	IA	ETE	Total	
1	BSC	1FY2-01	Engineering Mathematics-I	3	1	-	40	160	**200**	4
2	BSC	1FY2-02/ 1FY2-03	Engineering Physics/ Engineering Chemistry	3	1	-	40	160	**200**	4
3	HSMC	1FY1-04/ 1FY1-05	Communication Skills/ Human Values	2	-	-	20	80	**100**	2
4	ESC	1FY3-06/ 1FY3-07	Programming for Problem Solving/ Basic Mechanical Engineering	2	-	-	20	80	**100**	2
5	ESC	1FY3-08/ 1FY3-09	Basic Electrical Engineering/ Basic Civil Engineering	2	-	-	20	80	**100**	2
6	BSC	1FY2-20/ 1FY2-21	Engineering Physics Lab/ Engineering Chemistry Lab	-	-	2	30	20	**50**	1
7	HSMC	1FY1-22/ 1FY1-23	Language Lab/ Human Values Activities	-	-	2	30	20	**50**	1
8	ESC	1FY3-24/ 1FY3-25	Computer Programming Lab/ Manufacturing Practices Workshop	-	-	3	45	30	**75**	1.5
9	ESC	1FY3-26/ 1FY3-27	Basic Electrical Engineering Lab/ Basic Civil Engineering Lab	-	-	2	30	20	**50**	1
10	ESC	1FY3-28/ 1FY3-29	Computer Aided Engineering Graphics/ Computer Aided Machine Drawing	-	-	3	45	30	**75**	1.5
11	SODECA	1FY8-00							**25**	0.5
								Total	**1025**	20.5

L = Lecture, **T** = Tutorial,

DEPARTMENT OF HUMANITIES & APPLIED SCIENCE

List Of Program Education Objectives and Outcomes

I. **Preparation**: To prepare undergraduate students with appropriate blend of theoretical foundations, experimentation & technical implementation to comprehend and pinpoint problems in the field of Engineering to excel in postgraduate programs or to succeed in industry / technical profession.

II. **Core competence**: To provide students with a solid foundation in mathematical, scientific and engineering fundamentals required to solve engineering problems and also to pursue higher studies. Student will be able to employ his knowledge along with necessary techniques & tools for modern engineering applications.

III. **Breadth**: To train students with good scientific and engineering breadth so as to comprehend, analyze, design, and create novel products and solutions for the real life problems in the present electrical system.

IV. **Professionalism:** To inculcate in student's professional and ethical attitude, Communication Skills, teamwork Skills, programming skill and an ability to relate ~~electrical~~ engineering issues to broader social context.

V. **Learning Environment**: To provide student with an academic environment aware of excellence, leadership, and the life-long learning needed for a successful professional career through independent studies, thesis, internships etc.

**List of Program Outcomes**	
PO-1	**Engineering Knowledge**: Apply knowledge of mathematics and science, with fundamentals of Engineering to be able to solve complex engineering problems.
PO-2	**Problem Analysis**: Identify, Formulate, review research literature and analyze complex engineering problems and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO-3	**Design/Development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.
PO-4	**Conduct Investigations of Complex problems**: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO-5	**Modern Tool Usage**: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to computer science related complex engineering activities with an understanding of the limitations.
PO-6	**The Engineer and Society**: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO-7	**Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
PO-8	**Ethics**: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO-9	**Individual and Team Work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.
PO-10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO-11	**Project Management and Finance**: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.
PO-12	**Life-Long Learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Program Specific Outcome

Department has specifically defined few objectives of this program which make students realize the fact that the knowledge and techniques learnt in this course has direct implication for the betterment of society and its sustainability.

PSO.1 Graduates will understand the design building blocks of real time applications and automations by using modern engineering tools and multidisciplinary concepts.

PSO.2 Graduates will adopt the new methodologies as smart grid to resolve power system complexities, which can improve the efficiency of the power system

MAPPING OF PROGRAM OBJECTIVE WITH PROGRAM OUTCOMES ANS PSO

PEO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
						PROGRAM OUTCOME							PSO	
I	3	3	2	3	2						1	2	1	1
II	3	3	3	3	3	1	1					2	2	2
III	3	3	3	3	3		1			1		1	3	3
IV						2	1	3	3	3	3	3		
V	1		1	1		3	3	2	3	2	2	3		

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 1FY2-01/Engineering Mathematics I

List of Course Outcomes	
CO-1	Interpret the area enclosed between curves as a definite integral and compute its value.
CO-2	Use comparison with a corresponding integral with other series to decide whether infinite series (including p-series) converge or diverge.
CO-3	Represent continuous-time periodic signals using Fourier series.
CO-4	Manipulate vectors to perform geometrical calculations in three dimensions.
CO-5	Use Green's theorem and the Divergence theorem to compute integrals.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE ~~OBJECTIVE~~ OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1								1	2	1
III	2	1	3	3	1							1	2	1
IV	2				1						2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- 1FY2/2FY2-03/Engineering Chemistry

	After the completion of the course the students will be able :
CO-1	To define, determine, remove hardness & purify the water by applying suitable techniques.
CO-2	To determine, numerically calculate & analyze calorific value of different fuels. Also synthesize synthetic petrol through various methods. Identify instrumental techniques for analysis & analyze the quality parameters of chemical fuels
CO-3	To define & analyze engineering problems related to corrosion & solve the corrosion problems by different techniques & methods.
CO-4	To manufacture Cement & Glass by suitable technology. Identify & compare the materials like cement , glass best suited for construction
CO-5	To understand the reaction mechanism involved in the synthesis of various chemicals & drugs.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME		PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	2	1		2		1		1	1	1	2	2
II	1	2	1	2	1		1	2		1		1	2	1
III	2	1	3	2	1			2	1			1	2	1
IV	2			1		1		1			2	2	1	
V	2	1		1	2			1		1	1	2	2	1

Subject Code/Name:- 1FY2/2FY2-02/Engineering Physics

List of Course Outcomes	
CO-1	Graduates gain ability to knowledge of fundamental physics and basic electrical and/or mechanical engineering principles to include advanced knowledge in one or more engineering disciplines.
CO-2	Graduate will be able to identify, formulate, and solve engineering physics problems.
CO-3	Graduate will be able to apply the design process to engineering problems.
CO-4	Graduate will be able to formulate, conduct, analyze and interpret experiments in engineering physics.
CO-5	Graduate will be able to use modern engineering physics techniques and tools, including software and laboratory instrumentation.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- 1FY1/2FY1-04/Communication Skill

	List of Course Outcomes
CO-1	Graduates gain ability to understand classes needed for the communication major and emphasis. They should become acquainted with practicums, internships and job opportunities.
CO-2	Graduate will be able to communicate effectively in both verbal and written form. They will develop a better, presentation skill on academic and personal grounds that will enhance their personality in all aspects.
CO-3	Graduate will be able to enhance reading and writing skills by analyzing various comprehensions.
CO-4	Graduate will be able to enhance reading and writing skills by analyzing various literary texts.They should be able to mould the fictious world to the real world.
CO-5	Graduate will be able to learn the use of poetic devices and they should enhance their style of writing.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1				.	2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 1FY1/2FY1-05/**Human Value**

	List of Course Outcomes
CO-1	Graduates gain ability to understand the Values needed to became good human being .Skill with Values makes the complete meaning of development and complement to each other.
CO-2	Graduate will be able to understand their goal by self-exploration and able to take Right Decision an every aspect of lifeenhances their personality in all aspects. With Right Understanding They can live balance of life , with true sense of PROSPERITY
CO-3	Graduate by learning not only in Professional life, all levels of Living/order enable to with Harmony. Harmony with Self along with Harmony of Family, Society and Nature.
CO-4	. Graduate by Learning of Values, able to become Self-confident, able to develop to judge the facts and take decision by Natural Acceptance not Merely by Imagination and Pre-condition.
CO-5	Graduate will be able to learn Professional Ethics and Code of Conduct to lead Discipline life and make Substantial growth both in Professional life and Personal Lofe.

MAPPING OF COURSE OUTCOMES WITH PROGRAMOUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2
I	3	1	1	1						1	1	1	2	
II	2	2	1								1	2	1	
III	2	1	3	3	1						1	2	1	
IV	2				1					2	2	1		
V	2	1		1						1	1	2	2	1

Subject Code/Name:- 1FY3/2FY3-06/Programming For Problem Solving

List of Course Outcomes	
CO-1	Graduates gain ability to understand the fundamental of computer architecture and stored programs. It provides the basic understanding of software used in the compilation process.
CO-2	Graduates will able to analyze and understand programming language in the context of basic structure of C programming, data types, operators, variable declaration and input/output function.
CO-3	Graduates gain ability to develop programs using the basic elements like control statements with conditional and iterative statements, arrays, strings and pointers.
CO-4	Graduates can understand the concept of effective usage of structures and functions to understand the memory management concepts. It elaborates the issues in file organization and the usage of file systems.
CO-5	Graduates gain ability to obtain the knowledge about the number systems which will be very useful for bitwise operations.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	1	1						1	1		2	
II	2	3	1								1		2	1
III		2	3	3	1						1		2	1
IV	2				1					2	2		1	
V	1	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 1FY3/2FY3-07/Basic Mechanical Engineering

	After the completion of the course the students will be able :
CO-1	Graduates understand fundamentals of mechanical engineering. Various classifications of boilers on the basis of direction of axis and flow which will help them to better understanding of boilers and with various accessories and mountings. They understand various steam turbines such as reaction and impulse turbine. they also learn different power plant such as Thermal, nuclear and hydro power plant.
CO-2	Graduates gain ability to understand the working of centrifugal and reciprocating pumps. They learn various aspects of four stroke and two stroke IC engines along with PV, TS and valve timing diagrams.
CO-3	Graduates understand about Refrigerants and their nomenclatures. Comparative study of vapour compression refrigeration system and vapour absorption refrigeration system clarify every minute difference between both systems. Graduates gain knowledge about various air conditioning also.
CO-4	Graduates differentiate and formulate various arrangements such as Open and cross belt drives. Study of rope drive , gear and design of belt for deriving the values of maximum power, tension ratio, velocity ratio, slip and length of belt generate ability to have problem solving approach in graduates.
CO-5	Graduates gain ability to understand various manufacturing processes such as Casting, forming and joining. Study of various engineering materials help them to know about various metallurgical properties and their proper implementation in engineering aspects. Graduates come to know that how the proper selection of heat treatments such as annealing, normalizing, tempering, hardening and quenching, reduce the dependency on expensive materials.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE		PROGRAM OUTCOME												PSO	
		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I		3	1					1						3	1
II		3	1					2						3	2
III		3	1	3	2									3	3
IV		3	1		2			1						3	2
V												2	3	3	2

Subject Code/Name:- 1FY3/2FY3-09/Basic Civil Engineering

List of Course Outcomes	
CO-1	Graduates gain to define the scope, Specialization and role of Civil Engineering along with the Impact of infrastructural development on economy of country.
CO-2	Graduates analyze and understand the field of surveying, its methods and the instruments used in the field to perform the survey work along with applications.
CO-3	Graduates gain ability to visualize the concept of building construction and can learn to understand the concept of RCC along with the importance of different factors required for building construction.
CO-4	Graduates can understand the concept of transportation and learn the various traffic signs along with the importance and measures for road safety.
CO-5	Graduates gain ability to understand the concept of environment engineering which include the concept of ecology and biodiversity, treatment of water, its usage and saving and be able to define and learn about the various environmental pollutions and factors such as global warming, greenhouse effect and climate change.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	2						2	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2				1						2	2	1	
V	2	1		2						1	1	2	2	1

Subject Code/Name:- 2FY2-01/ Engineering Mathematics II

List of Course Outcomes	
CO-1	Use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, orthogonality and diagonalization. (Computational and Algebraic Skills).
CO-2	Analyze real world scenarios to recognize when ordinary differential equations (ODEs) or systems of ODEs are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches, judge if the results are reasonable, and then interpret and clearly communicate the results.
CO-3	Use computational tools to solve problems and applications of Ordinary Differential Equations and Partial Differential Equations.
CO-4	Apply partial derivative equation techniques to predict the behaviour of certain phenomena.
CO-5	Use appropriate numerical methods to study phenomena modelled with partial derivative equations.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 1FY3/2FY3-08/Basic Electrical Engineering

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of Electrical DC circuits solving, and understand various DC circuit solving technique by learning theorems and Mathematical approach.
CO-2	Graduates analyze and understand the AC representation in single and tree phase, and its working and characteristics, and can analyze the behavior of Ac through Mathematical approach.
CO-3	Graduates gain ability to visualize and identify Electrical Machine. Learn the basic concept of Electrical machine such as Transformer, motor and generator and can learn to draw construction parts.
CO-4	Graduates can understand the Design of semiconductors. Understanding and analyzing of converter, inverter, rectifier and their practical application. Applications of these in projects and industries
CO-5	Graduates gain ability to understand the LT switchgears and their layout, configurations; they can also learn the different kind of switchgear and Earthing techniques.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	3						1	1	1	2	
II	3	2	1									1	2	1
III	2	2	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1	3	2		1				1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:

Scheme & Syllabus of Teaching & Examination for I year B. Tech.
I Semester Effective from the session: 2017-18

S.N	Subject Code	Course Title	L	T	P	IA	External	Total
						Marks		
						IA	External	Total
		Theory Papers						
1.	MA-101	Engineering Mathematics-I	3	1	0	20	80	100
2.	HU-101/ HU-103	Communication Skills / Human Values	3	0	0	20	80	100
3.	PY-101/ CY-101	Engineering Physics/ Engineering Chemistry	3	1	0	20	80	100
4.	CS-101	Computer Programming-I	3	0	0	20	80	100
5.	CE-101	Environmental Engineering and Disaster Management	3	0	0	20	80	100
		Total	15	2	0	100	400	500
		Practical						
6.	HU-102/ HU-104	Communication Skills Lab./ Human Values: Activities	0	0	2	45	30	75
7.	PY-102/ CY-102	Engineering Physics Lab/ Engineering Chemistry Lab	0	0	2	45	30	75
8.	CS-102	Computer Programming-I Lab.	0	0	2	60	40	100
9.	CE-102	Computer Aided Engineering Graphics	0	0	3	60	40	100
10.	ME-101	Mechanical Workshop Practice	0	0	2	60	40	100
11.		Discipline & Extra Curricular Activity	0	0	0	50	0	50
		Total	0	0	11	320	180	500
		Grand Total	15	2	11	**420**	**580**	**1000**

(Total **28** periods per week)
L = Lecture, **T** = Tutorial, **P** = Practical, **IA**=Internal Assessment

Scheme & Syllabus of Teaching & Examination for I year B. Tech.
II Semester Effective from the session: 2017-18

S.N	Subject Code	Course Title	L	T	P	IA	External	Total
		Course Title	L	T	P	**Marks**		
						IA	External	Total
		Theory Papers						
1.	MA-102	Engineering Mathematics-II	3	1	0	20	80	100
2.	HU-103/ HU-101/	Human Values/ Communication Skills	3	0	0	20	80	100
3.	CY-101/ PY-101	Engineering Chemistry/ Engineering Physics	3	1	0	20	80	100
4.	CS-103	Computer Programming-II	3	0	0	20	80	100
		Elective (any two)*						
5.	EE-101	Basic Electrical and Electronics Engineering	3	0	0	20	80	100
6.	CE-103	Basic Civil Engineering						
7.	ME-102	Basic Mechanical Engineering	3	0	0	20	80	100
8.	OE-101	Engineering Mechanics						
		Total	18	2	0	120	480	600
		Practical						
9.	HU-104/ HU-102	Human Values: Activities Communication Skills Lab.	0	0	2	45	30	75
10.	CY-102/ PY-102	Engineering Chemistry Lab/ Engineering Physics Lab	0	0	2	45	30	75
11.	CS-104	Computer Programming-II Lab	0	0	2	60	40	100
12.	ME-104	Computer Aided Machine Drawing	0	0	3	60	40	100
13.		Discipline & Extra Curricular Activity	0	0	0	50	0	50

		Total	0	0	9	260	140	400
		Grand Total	**18**	**2**	**9**	**380**	**620**	**1000**

(Total **29** periods per week)

L = Lecture, **T** = Tutorial, **P** = Practical, **IA**=Internal Assessment

Subject Code/Name:- HU-101/Communication Skill

List of Course Outcomes	
CO-1	Graduates gain ability to understand classes needed for the communication major and emphasis. They should become acquainted with practicums, internships and job opportunities.
CO-2	Graduate will be able to communicate effectively in both verbal and written form. They will develop a better, presentation skill on academic and personal grounds that will enhance their personality in all aspects.
CO-3	Graduate will be able to enhance reading and writing skills by analyzing various comprehensions.
CO-4	Graduate will be able to enhance reading and writing skills by analyzing various literary texts.They should be able to mould the fictious world to the real world.
CO-5	Graduate will be able to learn the use of poetic devices and they should enhance their style of writing.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- MA-101/Engineering Mathematics I

	List of Course Outcomes
CO-1	Interpret the area enclosed between curves as a definite integral and compute its value.
CO-2	Use comparison with a corresponding integral with other series to decide whether infinite series (including p-series) converge or diverge.
CO-3	Represent continuous-time periodic signals using Fourier series.
CO-4	Manipulate vectors to perform geometrical calculations in three dimensions.
CO-5	Use Green's theorem and the Divergence theorem to compute integrals.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- MA-102/ Engineering Mathematics II

List of Course Outcomes	
CO-1	Use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, orthogonality and diagonalization. (Computational and Algebraic Skills).
CO-2	Analyze real world scenarios to recognize when ordinary differential equations (ODEs) or systems of ODEs are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches, judge if the results are reasonable, and then interpret and clearly communicate the results.
CO-3	Use computational tools to solve problems and applications of Ordinary Differential Equations and Partial Differential Equations.
CO-4	Apply partial derivative equation techniques to predict the behaviour of certain phenomena.
CO-5	Use appropriate numerical methods to study phenomena modelled with partial derivative equations.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1								1	2	1	
III	2	1	3	3	1						1	2	1	
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- PY-101/Engineering Physics

List of Course Outcomes	
CO-1	Graduates gain ability to knowledge of fundamental physics and basic electrical and/or mechanical engineering principles to include advanced knowledge in one or more engineering disciplines.
CO-2	Graduate will be able to identify, formulate, and solve engineering physics problems.
CO-3	Graduate will be able to apply the design process to engineering problems.
CO-4	Graduate will be able to formulate, conduct, analyze and interpret experiments in engineering physics.
CO-5	Graduate will be able to use modern engineering physics techniques and tools, including software and laboratory instrumentation.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1								1	2	1	
III	2	1	3	3	1							1	2	1
IV	2				1						2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- CY-101/Engineering Chemistry

	After the completion of the course the students will be able :
CO-1	To define, determine, remove hardness & purify the water by applying suitable techniques.
CO-2	To determine, numerically calculate & analyze calorific value of different fuels. Also synthesize synthetic petrol through various methods. Identify instrumental techniques for analysis & analyze the quality parameters of chemical fuels
CO-3	To define & analyze engineering problems related to corrosion & solve the corrosion problems by different techniques & methods.
CO-4	To manufacture Cement & Glass by suitable technology. Identify & compare the materials like cement , glass best suited for construction
CO-5	To understand the reaction mechanism involved in the synthesis of various chemicals & drugs.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	2	1		2		1		1	1	1	2	2
II	1	2	1	2	1		1	2		1		1	2	1
III	2	1	3	2	1			2	1			1	2	1
IV	2			1		1		1			2	2	1	
V	2	1		1	2			1		1	1	2	2	1

Subject Code/Name:- CE-101/Environmental Engineering & Disaster Management

	After the completion of the course the students will be able :
CO-1	Graduates will understand the importance of environment and it's effect on different aspects of life. It helps to learn about the various environmental pollutions factors.
CO-2	To understand disaster management and various factors about disasters like earthquakes etc. It also covers impact and effects of these phenomenon.
CO-3	Graduates gain ability to understand the concept of environment engineering which includes the concept of ecology and biodiversity, treatment of water, its usage.
CO-4	Graduates will be able to define and learn about the various environmental pollutions and factors such as global warming, greenhouse effect and climate change.
CO-5	Graduates gain ability to understand the concept of environment engineering which include the concept of ecology and biodiversity, saving and be able to define and learn about the various environmental pollutions and factors such as global warming, greenhouse effect and climate change.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	2	1		2		1		1	1	1	2	2
II	1	2	1	2	1		1	2		1		1	2	1
III	2	1	3	2	1			2	1			1	2	1
IV	2			1		1		1			2	2	1	
V	2	1		1	2			1		1	1	2	2	1

Subject Code/Name:- EE-101/Basic Electrical & Electronics Engineering

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of Electrical DC circuits solving, and understand various DC circuit solving technique by learning theorems and Mathematical approach.
CO-2	Graduates analyze and understand the AC representation in single and tree phase, and its working and characteristics, and can analyze the behavior of Ac through Mathematical approach.
CO-3	Graduates gain ability to visualize and identify Electrical Machine. Learn the basic concept of Electrical machine such as Transformer, motor and generator and can learn to draw construction parts.
CO-4	Graduates can understand the Design of semiconductors. Understanding and analyzing of converter, inverter, rectifier and their practical application. Applications of these in projects and industries
CO-5	Graduates gain ability to understand the LT switchgears and their layout, configurations; they can also learn the different kind of switchgear and Earthing techniques.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	3						1	1	1	2	
II	3	2	1								1	2	1	
III	2	2	3	3	1						1	2	1	
IV	2				1					2	2	1		
V	2	1	3	2	1				1	1	2	2	1	

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- OE-101/Engineering Mechanics

	After the completion of the course the students will be able :
CO-1	Graduates understand Fundamental laws of mechanics and different type of system of forces, Resultant force, Resolution of force, Moment and Couples, Resolution of a force into a force and a couple.
CO-2	Graduates gain ability to understand the working of centrifugal and reciprocating pumps. They learn various aspects of four stroke and two stroke IC engines along with PV, TS and valve timing diagrams.
CO-3	Graduates differentiate and formulate various arrangements such as Open and cross belt drives. Study of rope drive , gear and design of belt for deriving the values of maximum power, tension ratio, velocity ratio, slip and length of belt generate ability to have problem solving approach in graduates.
CO-4	Graduates understand kinamatics of particles & rigid body. They can understand types of motion and effects of velocity & acceleration on the body. It also covers kinetics of particles and rigid body.
CO-5	Graduates gain ability to understand various manufacturing processes such as Casting, forming and joining. Study of various engineering materials help them to know about various metallurgical properties and their proper implementation in engineering aspects. Graduates come to know that how the proper selection of heat treatments such as annealing, normalizing, tempering, hardening and quenching, reduce the dependency on expensive materials.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE		PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1					1						3	1
II	3	1					2						3	2
III	3	1	3	2									3	3
IV	3	1		2			1						3	2
V											2	3	3	2

Subject Code/Name:- CS-101/Computer Programming-I

	List of Course Outcomes
CO-1	Graduates gain ability to understand the fundamental of computer architecture and stored programs. It provides the basic understanding of software used in the compilation process.
CO-2	Graduates will able to analyze and understand programming language in the context of basic structure of C programming, data types, operators, variable declaration and input/output function.
CO-3	Graduates gain ability to develop programs using the basic elements like control statements with conditional and iterative statements, arrays, strings and pointers.
CO-4	Graduates can understand the concept of effective usage of structures and functions to understand the memory management concepts. It elaborates the issues in file organization and the usage of file systems.
CO-5	Graduates gain ability to obtain the knowledge about the number systems which will be very useful for bitwise operations.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	1	1						1	1		2	
II	2	3	1									1	2	1
III		2	3	3	1							1	2	1
IV	2					1					2	2	1	
V	1	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- HU-103/Human Value

	List of Course Outcomes
CO-1	Graduates gain ability to understand the Values needed to became good human being .Skill with Values makes the complete meaning of development and complement to each other.
CO-2	Graduate will be able to understand their goal by self-exploration and able to take Right Decision an every aspect of lifeenhances their personality in all aspects. With Right Understanding They can live balance of life , with true sense of PROSPERITY
CO-3	Graduate by learning not only in Professional life, all levels of Living/order enable to with Harmony. Harmony with Self along with Harmony of Family, Society and Nature.
CO-4	. Graduate by Learning of Values, able to become Self-confident, able to develop to judge the facts and take decision by Natural Acceptance not Merely by Imagination and Pre-condition.
CO-5	Graduate will be able to learn Professional Ethics and Code of Conduct to lead Discipline life and make Substantial growth both in Professional life and Personal Lofe.

MAPPING OF COURSE OUTCOMES WITH PROGRAMOUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1								1	2	1	
III	2	1	3	3	1						1	2	1	
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- CS-103/Computer Programming-II

	List of Course Outcomes
CO-1	Graduates gain ability to understand the fundamental of computer architecture and stored programs. It provides the basic understanding of User defined functions.
CO-2	Graduates will able to analyze and understand programming language in the context of basic structure of C programming with array, pointers ,structure & dynamic allocation.
CO-3	Graduates gain ability to develop programs using the basic elements like number system of digital computer. It will also help to analyze importance of number system.
CO-4	Graduates can understand the concept of effective usage of structures and functions to understand the memory management concepts. It elaborates the issues in file organization and the usage of file systems.
CO-5	Graduates gain ability to obtain the knowledge about drawing of different shapes with graphics using C programming.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	1	1						1	1		2	
II	2	3	1									1	2	1
III		2	3	3	1							1	2	1
IV	2					1					2	2	1	
V	1	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- CE-103/Basic Civil Engineering

	List of Course Outcomes
CO-1	Graduates gain to define the scope, Specialization and role of Civil Engineering along with the Impact of infrastructural development on economy of country.
CO-2	Graduates analyze and understand the field of surveying, its methods and the instruments used in the field to perform the survey work along with applications.
CO-3	Graduates gain ability to visualize the concept of building construction and can learn to understand the concept of RCC along with the importance of different factors required for building construction.
CO-4	Graduates can understand the concept of transportation and learn the various traffic signs along with the importance and measures for road safety.
CO-5	Graduates gain ability to understand the concept of environment engineering which include the concept of ecology and biodiversity, treatment of water, its usage and saving and be able to define and learn about the various environmental pollutions and factors such as global warming, greenhouse effect and climate change.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	2						2	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2				1						2	2	1	
V	2	1		2						1	1	2	2	1

Scheme of Teaching & Examination for I year B.Tech.
I Semester Effective from the Session: 2016 – 2017
(Common to all branches of Engineering)

Sub Code	Subject	Number of Teaching Hours			Duration of Theory Paper (Hours)	Marks Allocation				
		L	T	P		Theory	Term Test	Sessional	Prac. Exam	Total
101	Communicative English	3	1	-	3	80	20			100
102	Engineering Mathematics-I	3	1	-	3	80	20			100
103	Engineering Physics-I	3	1	-	3	80	20			100
104	Engineering Chemistry	3	1	-	3	80	20			100
105	Basic Electrical & Electronics Engineering	3	-	-	3	80	20			100
	Total	**15**	**04**	**-**	**-**	**400**	**100**			**500**
106	Engineering Physics Lab-I	-	-	2		-		45	30	75
107	Engineering Chemistry Lab			2				45	30	75
108	Electrical & Electronics Lab	-	-	2		-		60	40	100
109	Practical Geometry	-	-	3				60	40	100
110	Workshop Practice	-	-	2				60	40	100
111	Discipline & Extra curricular Activities	-	-	-				50	-	50
	Grand Total	**15**	**04**	**11**	**-**	**400**	**100**	**320**	**180**	**1000**

(Total 30 periods per week)

Scheme of Teaching & Examination for I year B.Tech
II Semester Effective from the Session: 2016 – 2017
(Common to all branches of Engineering)

Sub Code	Subject	Number of Teaching Hours Per Week			Duration of theory Paper (Hours)	Marks Allocation				
		L	T	P		Theory	Term Test	Sessional	Prac. Exam	Total
201	Communication Techniques	2	-	-	3	80	20			100
202	Engineering Mathematics-II	3	1	-	3	80	20			100
203	Engineering Physics-II	2	1	-	3	80	20			100
204	Chemistry & Environmental Engineering	3	1	-	3	80	20			100
205	Engineering Mechanics	3	1	-	3	80	20			100
206	Fundamentals of Computer Programming	3	-	-	3	80	20			100
	Total	**16**	**04**	**-**	**-**	**480**	**120**			**600**
207	Engineering Physics Lab-II	-	-	2		-		30	20	50
208	Chemistry & Environmental Engineering Lab	-	-	2		-		30	20	50
209	Computer programming lab	-	-	2				45	30	75
210	Machine Drawing	-	-	3		-		60	40	100
211	Communication Technique Lab	-	-	2		-		45	30	75
212	Discipline & Extra Curricular Activities	-	-	-	-	-		50	-	50
	Grand Total	**16**	**04**	**11**	**-**	**480**	**120**	**260**	**140**	**1000**

(Total 31 periods per week)
L = Lecture, **T** = Tutorial, **P** = Practical

Subject Code/Name:- 101/201/Communication Skill

	List of Course Outcomes
CO-1	Graduates gain ability to understand classes needed for the communication major and emphasis. They should become acquainted with practicums, internships and job opportunities.
CO-2	Graduate will be able to communicate effectively in both verbal and written form. They will develop a better, presentation skill on academic and personal grounds that will enhance their personality in all aspects.
CO-3	Graduate will be able to enhance reading and writing skills by analyzing various comprehensions.
CO-4	Graduate will be able to enhance reading and writing skills by analyzing various literary texts.They should be able to mould the fictious world to the real world.
CO-5	Graduate will be able to learn the use of poetic devices and they should enhance their style of writing.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 102/Engineering Mathematics I

List of Course Outcomes	
CO-1	Interpret the area enclosed between curves as a definite integral and compute its value.
CO-2	Use comparison with a corresponding integral with other series to decide whether infinite series (including p-series) converge or diverge.
CO-3	Represent continuous-time periodic signals using Fourier series.
CO-4	Manipulate vectors to perform geometrical calculations in three dimensions.
CO-5	Use Green's theorem and the Divergence theorem to compute integrals.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- 103/203/Engineering Physics

	List of Course Outcomes
CO-1	Graduates gain ability to knowledge of fundamental physics and basic electrical and/or mechanical engineering principles to include advanced knowledge in one or more engineering disciplines.
CO-2	Graduate will be able to identify, formulate, and solve engineering physics problems.
CO-3	Graduate will be able to apply the design process to engineering problems.
CO-4	Graduate will be able to formulate, conduct, analyze and interpret experiments in engineering physics.
CO-5	Graduate will be able to use modern engineering physics techniques and tools, including software and laboratory instrumentation.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- 104/Engineering Chemistry

	After the completion of the course the students will be able :
CO-1	To define, determine, remove hardness & purify the water by applying suitable techniques.
CO-2	To determine, numerically calculate & analyze calorific value of different fuels. Also synthesize synthetic petrol through various methods. Identify instrumental techniques for analysis & analyze the quality parameters of chemical fuels
CO-3	To define & analyze engineering problems related to corrosion & solve the corrosion problems by different techniques & methods.
CO-4	To manufacture Cement & Glass by suitable technology. Identify & compare the materials like cement , glass best suited for construction
CO-5	To understand the reaction mechanism involved in the synthesis of various chemicals & drugs.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	2	1		2		1		1	1	1	2	2
II	1	2	1	2	1		1	2		1		1	2	1
III	2	1	3	2	1			2	1			1	2	1
IV	2			1		1		1			2	2	1	
V	2	1		1	2			1		1	1	2	2	1

Subject Code/Name:- 105/Basic Electrical & ElectronicsEngineering

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of Electrical DC circuits solving, and understand various DC circuit solving technique by learning theorems and Mathematical approach.
CO-2	Graduates analyze and understand the AC representation in single and tree phase, and its working and characteristics, and can analyze the behavior of Ac through Mathematical approach.
CO-3	Graduates gain ability to visualize and identify Electrical Machine. Learn the basic concept of Electrical machine such as Transformer, motor and generator and can learn to draw construction parts.
CO-4	Graduates can understand the Design of semiconductors. Understanding and analyzing of converter, inverter, rectifier and their practical application. Applications of these in projects and industries
CO-5	Graduates gain ability to understand the LT switchgears and their layout, configurations; they can also learn the different kind of switchgear and Earthing techniques.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	3						1	1	1	2	
II	3	2	1									1	2	1
III	2	2	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1	3	2		1				1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 202/ Engineering Mathematics II

	List of Course Outcomes
CO-1	Use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, orthogonality and diagonalization. (Computational and Algebraic Skills).
CO-2	Analyze real world scenarios to recognize when ordinary differential equations (ODEs) or systems of ODEs are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches, judge if the results are reasonable, and then interpret and clearly communicate the results.
CO-3	Use computational tools to solve problems and applications of Ordinary Differential Equations and Partial Differential Equations.
CO-4	Apply partial derivative equation techniques to predict the behaviour of certain phenomena.
CO-5	Use appropriate numerical methods to study phenomena modelled with partial derivative equations.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 204/Chemistry & Environmental Engineering

	After the completion of the course the students will be able :
CO-1	To define, determine, remove hardness & purify the water by applying suitable techniques.
CO-2	To determine, numerically calculate & analyze calorific value of different fuels. Also synthesize synthetic petrol through various methods. Identify instrumental techniques for analysis & analyze the quality parameters of chemical fuels
CO-3	To define & analyze engineering problems related to corrosion & solve the corrosion problems by different techniques & methods.
CO-4	To manufacture Cement & Glass by suitable technology. Identify & compare the materials like cement , glass best suited for construction
CO-5	Graduates gain ability to understand the concept of environment engineering which include the concept of ecology and biodiversity, treatment of water, its usage and saving and be able to define and learn about the various environmental pollutions and factors such as global warming, greenhouse effect and climate change.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	2	1		2		1		1	1	1	2	2
II	1	2	1	2	1		1	2		1		1	2	1
III	2	1	3	2	1			2	1			1	2	1
IV	2			1		1		1			2	2	1	
V	2	1		1	2			1		1	1	2	2	1

Subject Code/Name:- 205/Engineering Mechanics

	After the completion of the course the students will be able :
CO-1	Graduates understand Fundamental laws of mechanics and different type of system of forces, Resultant force, Resolution of force, Moment and Couples, Resolution of a force into a force and a couple.
CO-2	Graduates gain ability to understand the working of centrifugal and reciprocating pumps. They learn various aspects of four stroke and two stroke IC engines along with PV, TS and valve timing diagrams.
CO-3	Graduates differentiate and formulate various arrangements such as Open and cross belt drives. Study of rope drive , gear and design of belt for deriving the values of maximum power, tension ratio, velocity ratio, slip and length of belt generate ability to have problem solving approach in graduates.
CO-4	Graduates understand kinamatics of particles & rigid body. They can understand types of motion and effects of velocity & acceleration on the body. It also covers kinetics of particles and rigid body.
CO-5	Graduates gain ability to understand various manufacturing processes such as Casting, forming and joining. Study of various engineering materials help them to know about various metallurgical properties and their proper implementation in engineering aspects. Graduates come to know that how the proper selection of heat treatments such as annealing, normalizing, tempering, hardening and quenching, reduce the dependency on expensive materials.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1					1						3	1
II	3	1					2						3	2
III	3	1	3	2									3	3
IV	3	1		2			1						3	2
V											2	3	3	2

Subject Code/Name:- 206/Fundamental of Computer Programming

	List of Course Outcomes
CO-1	Graduates gain ability to understand the fundamental of computer architecture and stored programs. It provides the basic understanding of software used in the compilation process.
CO-2	Graduates will able to analyze and understand programming language in the context of basic structure of C programming, data types, operators, variable declaration and input/output function.
CO-3	Graduates gain ability to develop programs using the basic elements like control statements with conditional and iterative statements, arrays, strings and pointers.
CO-4	Graduates can understand the concept of effective usage of structures and functions to understand the memory management concepts. It elaborates the issues in file organization and the usage of file systems.
CO-5	Graduates gain ability to obtain the knowledge about the number systems which will be very useful for bitwise operations.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	1	1						1	1		2	
II	2	3	1								1		2	1
III		2	3	3	1						1		2	1
IV	2				1						2	2	1	
V	1	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Scheme of Teaching & Examination for I year B.Tech.
I Semester Effective from the Session: 2015 – 2016
(Common to all branches of Engineering)

Sub Code	Subject	Number of Teaching Hours			Duration of Theory Paper (Hours)	Marks Allocation				
		L	T	P		Theory	Term Test	Sessional	Prac. Exam	Total
101	Communicative English	3	1	-	3	80	20			100
102	Engineering Mathematics-I	3	1	-	3	80	20			100
103	Engineering Physics-I	3	1	-	3	80	20			100
104	Engineering Chemistry	3	1	-	3	80	20			100
105	Basic Electrical & Electronics Engineering	3	-	-	3	80	20			100
	Total	**15**	**04**	**-**	**-**	**400**	**100**			**500**
106	Engineering Physics Lab-I	-	-	2		-		45	30	75
107	Engineering Chemistry Lab			2				45	30	75
108	Electrical & Electronics Lab	-	-	2		-		60	40	100
109	Practical Geometry	-	-	3				60	40	100
110	Workshop Practice	-	-	2				60	40	100
111	Discipline & Extra curricular Activities	-	-	-				50	-	50
	Grand Total	**15**	**04**	**11**	**-**	**400**	**100**	**320**	**180**	**1000**

(Total 30 periods per week)

Scheme of Teaching & Examination for I year B.Tech
II Semester Effective from the Session: 2015 – 2016
(Common to all branches of Engineering)

Sub Code	Subject	Number of Teaching Hours Per Week			Duration of theory Paper (Hours)	Marks Allocation				
		L	T	P		Theory	Term Test	Sessional	Prac. Exam	Total
201	Communication Techniques	2	-	-	3	80	20			100
202	Engineering Mathematics-II	3	1	-	3	80	20			100
203	Engineering Physics-II	2	1	-	3	80	20			100
204	Chemistry & Environmental Engineering	3	1	-	3	80	20			100
205	Engineering Mechanics	3	1	-	3	80	20			100
206	Fundamentals of Computer Programming	3	-	-	3	80	20			100
Total		**16**	**04**	**-**	**-**	**480**	**120**			**600**
207	Engineering Physics Lab-II	-	-	2		-		30	20	50
208	Chemistry & Environmental Engineering Lab	-	-	2		-		30	20	50
209	Computer programming lab	-	-	2				45	30	75
210	Machine Drawing	-	-	3		-		60	40	100
211	Communication Technique Lab	-	-	2		-		45	30	75
212	Discipline & Extra Curricular Activities	-	-	-	-	-		50	-	50
Grand Total		**16**	**04**	**11**	**-**	**480**	**120**	**260**	**140**	**1000**

(Total 31 periods per week)

L = Lecture, **T** = Tutorial, **P** = Practical

Subject Code/Name:- 101/201/Communication Skill

	List of Course Outcomes
CO-1	Graduates gain ability to understand classes needed for the communication major and emphasis. They should become acquainted with practicums, internships and job opportunities.
CO-2	Graduate will be able to communicate effectively in both verbal and written form. They will develop a better, presentation skill on academic and personal grounds that will enhance their personality in all aspects.
CO-3	Graduate will be able to enhance reading and writing skills by analyzing various comprehensions.
CO-4	Graduate will be able to enhance reading and writing skills by analyzing various literary texts.They should be able to mould the fictious world to the real world.
CO-5	Graduate will be able to learn the use of poetic devices and they should enhance their style of writing.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 102/Engineering Mathematics I

	List of Course Outcomes	
CO-1	Interpret the area enclosed between curves as a definite integral and compute its value.	
CO-2	Use comparison with a corresponding integral with other series to decide whether infinite series (including p-series) converge or diverge.	
CO-3	Represent continuous-time periodic signals using Fourier series.	
CO-4	Manipulate vectors to perform geometrical calculations in three dimensions.	
CO-5	Use Green's theorem and the Divergence theorem to compute integrals.	

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- 103/203/Engineering Physics

	List of Course Outcomes
CO-1	Graduates gain ability to knowledge of fundamental physics and basic electrical and/or mechanical engineering principles to include advanced knowledge in one or more engineering disciplines.
CO-2	Graduate will be able to identify, formulate, and solve engineering physics problems.
CO-3	Graduate will be able to apply the design process to engineering problems.
CO-4	Graduate will be able to formulate, conduct, analyze and interpret experiments in engineering physics.
CO-5	Graduate will be able to use modern engineering physics techniques and tools, including software and laboratory instrumentation.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- 104/Engineering Chemistry

	After the completion of the course the students will be able :
CO-1	To define, determine, remove hardness & purify the water by applying suitable techniques.
CO-2	To determine, numerically calculate & analyze calorific value of different fuels. Also synthesize synthetic petrol through various methods. Identify instrumental techniques for analysis & analyze the quality parameters of chemical fuels
CO-3	To define & analyze engineering problems related to corrosion & solve the corrosion problems by different techniques & methods.
CO-4	To manufacture Cement & Glass by suitable technology. Identify & compare the materials like cement , glass best suited for construction
CO-5	To understand the reaction mechanism involved in the synthesis of various chemicals & drugs.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	2	1		2		1		1	1	1	2	2
II	1	2	1	2	1		1	2		1		1	2	1
III	2	1	3	2	1			2	1			1	2	1
IV	2			1		1		1			2	2	1	
V	2	1		1	2			1		1	1	2	2	1

Subject Code/Name:- 105/Basic Electrical & ElectronicsEngineering

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of Electrical DC circuits solving, and understand various DC circuit solving technique by learning theorems and Mathematical approach.
CO-2	Graduates analyze and understand the AC representation in single and tree phase, and its working and characteristics, and can analyze the behavior of Ac through Mathematical approach.
CO-3	Graduates gain ability to visualize and identify Electrical Machine. Learn the basic concept of Electrical machine such as Transformer, motor and generator and can learn to draw construction parts.
CO-4	Graduates can understand the Design of semiconductors. Understanding and analyzing of converter, inverter, rectifier and their practical application. Applications of these in projects and industries
CO-5	Graduates gain ability to understand the LT switchgears and their layout, configurations; they can also learn the different kind of switchgear and Earthing techniques.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	3						1	1	1	2	
II	3	2	1									1	2	1
III	2	2	3	3	1							1	2	1
IV	2				1						2	2	1	
V	2	1	3	2	1					1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 202/ Engineering Mathematics II

	List of Course Outcomes
CO-1	Use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, orthogonality and diagonalization. (Computational and Algebraic Skills).
CO-2	Analyze real world scenarios to recognize when ordinary differential equations (ODEs) or systems of ODEs are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches, judge if the results are reasonable, and then interpret and clearly communicate the results.
CO-3	Use computational tools to solve problems and applications of Ordinary Differential Equations and Partial Differential Equations.
CO-4	Apply partial derivative equation techniques to predict the behaviour of certain phenomena.
CO-5	Use appropriate numerical methods to study phenomena modelled with partial derivative equations.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 204/Chemistry & Environmental Engineering

	After the completion of the course the students will be able :
CO-1	To define, determine, remove hardness & purify the water by applying suitable techniques.
CO-2	To determine, numerically calculate & analyze calorific value of different fuels. Also synthesize synthetic petrol through various methods. Identify instrumental techniques for analysis & analyze the quality parameters of chemical fuels
CO-3	To define & analyze engineering problems related to corrosion & solve the corrosion problems by different techniques & methods.
CO-4	To manufacture Cement & Glass by suitable technology. Identify & compare the materials like cement , glass best suited for construction
CO-5	Graduates gain ability to understand the concept of environment engineering which include the concept of ecology and biodiversity, treatment of water, its usage and saving and be able to define and learn about the various environmental pollutions and factors such as global warming, greenhouse effect and climate change.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	2	1		2		1		1	1	1	2	2
II	1	2	1	2	1		1	2		1		1	2	1
III	2	1	3	2	1			2	1			1	2	1
IV	2			1		1		1			2	2	1	
V	2	1		1	2			1		1	1	2	2	1

Subject Code/Name:- 205/Engineering Mechanics

	After the completion of the course the students will be able :
CO-1	Graduates understand Fundamental laws of mechanics and different type of system of forces, Resultant force, Resolution of force, Moment and Couples, Resolution of a force into a force and a couple.
CO-2	Graduates gain ability to understand the working of centrifugal and reciprocating pumps. They learn various aspects of four stroke and two stroke IC engines along with PV, TS and valve timing diagrams.
CO-3	Graduates differentiate and formulate various arrangements such as Open and cross belt drives. Study of rope drive , gear and design of belt for deriving the values of maximum power, tension ratio, velocity ratio, slip and length of belt generate ability to have problem solving approach in graduates.
CO-4	Graduates understand kinamatics of particles & rigid body. They can understand types of motion and effects of velocity & acceleration on the body. It also covers kinetics of particles and rigid body.
CO-5	Graduates gain ability to understand various manufacturing processes such as Casting, forming and joining. Study of various engineering materials help them to know about various metallurgical properties and their proper implementation in engineering aspects. Graduates come to know that how the proper selection of heat treatments such as annealing, normalizing, tempering, hardening and quenching, reduce the dependency on expensive materials.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1					1						3	1
II	3	1					2						3	2
III	3	1	3	2									3	3
IV	3	1		2			1						3	2
V										2	3		3	2

Subject Code/Name:- 206/Fundamental of Computer Programming

	List of Course Outcomes
CO-1	Graduates gain ability to understand the fundamental of computer architecture and stored programs. It provides the basic understanding of software used in the compilation process.
CO-2	Graduates will able to analyze and understand programming language in the context of basic structure of C programming, data types, operators, variable declaration and input/output function.
CO-3	Graduates gain ability to develop programs using the basic elements like control statements with conditional and iterative statements, arrays, strings and pointers.
CO-4	Graduates can understand the concept of effective usage of structures and functions to understand the memory management concepts. It elaborates the issues in file organization and the usage of file systems.
CO-5	Graduates gain ability to obtain the knowledge about the number systems which will be very useful for bitwise operations.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	1	1						1	1		2	
II	2	3	1								1		2	1
III		2	3	3	1						1		2	1
IV	2					1					2	2	1	
V	1	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Scheme of Teaching & Examination for I year B.Tech.
I Semester Effective from the Session: 2014 – 2015
(Common to all branches of Engineering)

Sub Code	Subject	Number of Teaching Hours			Duration of Theory Paper (Hours)	Marks Allocation				
		L	T	P		Theory	Term Test	Sessional	Prac. Exam	Total
101	Communicative English	3	1	-	3	80	20			100
102	Engineering Mathematics-I	3	1	-	3	80	20			100
103	Engineering Physics-I	3	1	-	3	80	20			100
104	Engineering Chemistry	3	1	-	3	80	20			100
105	Basic Electrical & Electronics Engineering	3	-	-	3	80	20			100
	Total	**15**	**04**	**-**	**-**	**400**	**100**			**500**
106	Engineering Physics Lab-I	-	-	2		-		45	30	75
107	Engineering Chemistry Lab			2				45	30	75
108	Electrical & Electronics Lab	-	-	2		-		60	40	100
109	Practical Geometry	-	-	3				60	40	100
110	Workshop Practice	-	-	2				60	40	100
111	Discipline & Extra curricular Activities	-	-	-				50	-	50
	Grand Total	**15**	**04**	**11**	**-**	**400**	**100**	**320**	**180**	**1000**

(Total 30 periods per week)

Scheme of Teaching & Examination for I year B.Tech
II Semester Effective from the Session: 2014 – 2015
(Common to all branches of Engineering)

Sub Code	Subject	Number of Teaching Hours Per Week			Duration of theory Paper (Hours)	Marks Allocation				
		L	T	P		Theory	Term Test	Sessional	Prac. Exam	Total
201	Communication Techniques	2	-	-	3	80	20			100
202	Engineering Mathematics-II	3	1	-	3	80	20			100
203	Engineering Physics-II	2	1	-	3	80	20			100
204	Chemistry & Environmental Engineering	3	1	-	3	80	20			100
205	Engineering Mechanics	3	1	-	3	80	20			100
206	Fundamentals of Computer Programming	3	-	-	3	80	20			100
	Total	**16**	**04**	**-**	**-**	**480**	**120**			**600**
207	Engineering Physics Lab-II	-	-	2		-		30	20	50
208	Chemistry & Environmental Engineering Lab	-	-	2		-		30	20	50
209	Computer programming lab	-	-	2				45	30	75
210	Machine Drawing	-	-	3		-		60	40	100
211	Communication Technique Lab	-	-	2		-		45	30	75
212	Discipline & Extra Curricular Activities	-	-	-	-	-		50	-	50
	Grand Total	**16**	**04**	**11**	**-**	**480**	**120**	**260**	**140**	**1000**

(Total 31 periods per week)
L = Lecture, **T** = Tutorial, **P** = Practical

Subject Code/Name:- 101/201/Communication Skill

	List of Course Outcomes
CO-1	Graduates gain ability to understand classes needed for the communication major and emphasis. They should become acquainted with practicums, internships and job opportunities.
CO-2	Graduate will be able to communicate effectively in both verbal and written form. They will develop a better, presentation skill on academic and personal grounds that will enhance their personality in all aspects.
CO-3	Graduate will be able to enhance reading and writing skills by analyzing various comprehensions.
CO-4	Graduate will be able to enhance reading and writing skills by analyzing various literary texts.They should be able to mould the fictious world to the real world.
CO-5	Graduate will be able to learn the use of poetic devices and they should enhance their style of writing.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 102/Engineering Mathematics I

List of Course Outcomes	
CO-1	Interpret the area enclosed between curves as a definite integral and compute its value.
CO-2	Use comparison with a corresponding integral with other series to decide whether infinite series (including p-series) converge or diverge.
CO-3	Represent continuous-time periodic signals using Fourier series.
CO-4	Manipulate vectors to perform geometrical calculations in three dimensions.
CO-5	Use Green's theorem and the Divergence theorem to compute integrals.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- 103/203/Engineering Physics

	List of Course Outcomes
CO-1	Graduates gain ability to knowledge of fundamental physics and basic electrical and/or mechanical engineering principles to include advanced knowledge in one or more engineering disciplines.
CO-2	Graduate will be able to identify, formulate, and solve engineering physics problems.
CO-3	Graduate will be able to apply the design process to engineering problems.
CO-4	Graduate will be able to formulate, conduct, analyze and interpret experiments in engineering physics.
CO-5	Graduate will be able to use modern engineering physics techniques and tools, including software and laboratory instrumentation.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

| COURSE OBJECTIVE | PROGRAM OUTCOME | | | | | | | | | | | | PSO | |
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Subject Code/Name:- 104/Engineering Chemistry

	After the completion of the course the students will be able :
CO-1	To define, determine, remove hardness & purify the water by applying suitable techniques.
CO-2	To determine, numerically calculate & analyze calorific value of different fuels. Also synthesize synthetic petrol through various methods. Identify instrumental techniques for analysis & analyze the quality parameters of chemical fuels
CO-3	To define & analyze engineering problems related to corrosion & solve the corrosion problems by different techniques & methods.
CO-4	To manufacture Cement & Glass by suitable technology. Identify & compare the materials like cement , glass best suited for construction
CO-5	To understand the reaction mechanism involved in the synthesis of various chemicals & drugs.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	2	1		2		1		1	1	1	2	2
II	1	2	1	2	1		1	2		1		1	2	1
III	2	1	3	2	1			2	1			1	2	1
IV	2			1		1		1			2	2	1	
V	2	1		1	2			1		1	1	2	2	1

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of Electrical DC circuits solving, and understand various DC circuit solving technique by learning theorems and Mathematical approach.
CO-2	Graduates analyze and understand the AC representation in single and tree phase, and its working and characteristics, and can analyze the behavior of Ac through Mathematical approach.
CO-3	Graduates gain ability to visualize and identify Electrical Machine. Learn the basic concept of Electrical machine such as Transformer, motor and generator and can learn to draw construction parts.
CO-4	Graduates can understand the Design of semiconductors. Understanding and analyzing of converter, inverter, rectifier and their practical application. Applications of these in projects and industries
CO-5	Graduates gain ability to understand the LT switchgears and their layout, configurations; they can also learn the different kind of switchgear and Earthing techniques.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	3						1	1	1	2	
II	3	2	1									1	2	1
III	2	2	3	3	1							1	2	1
IV	2				1						2	2	1	
V	2	1	3	2		1				1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 202/ Engineering Mathematics II

List of Course Outcomes	
CO-1	Use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, orthogonality and diagonalization. (Computational and Algebraic Skills).
CO-2	Analyze real world scenarios to recognize when ordinary differential equations (ODEs) or systems of ODEs are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches, judge if the results are reasonable, and then interpret and clearly communicate the results.
CO-3	Use computational tools to solve problems and applications of Ordinary Differential Equations and Partial Differential Equations.
CO-4	Apply partial derivative equation techniques to predict the behaviour of certain phenomena.
CO-5	Use appropriate numerical methods to study phenomena modelled with partial derivative equations.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:- 204/Chemistry & Environmental Engineering

	After the completion of the course the students will be able :
CO-1	To define, determine, remove hardness & purify the water by applying suitable techniques.
CO-2	To determine, numerically calculate & analyze calorific value of different fuels. Also synthesize synthetic petrol through various methods. Identify instrumental techniques for analysis & analyze the quality parameters of chemical fuels
CO-3	To define & analyze engineering problems related to corrosion & solve the corrosion problems by different techniques & methods.
CO-4	To manufacture Cement & Glass by suitable technology. Identify & compare the materials like cement , glass best suited for construction
CO-5	Graduates gain ability to understand the concept of environment engineering which include the concept of ecology and biodiversity, treatment of water, its usage and saving and be able to define and learn about the various environmental pollutions and factors such as global warming, greenhouse effect and climate change.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME		PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	2	1		2		1		1	1	1	2	2
II	1	2	1	2	1		1	2		1		1	2	1
III	2	1	3	2	1			2	1			1	2	1
IV	2			1		1		1			2	2	1	
V	2	1		1	2			1		1	1	2	2	1

Subject Code/Name:- 205/Engineering Mechanics

	After the completion of the course the students will be able :
CO-1	Graduates understand Fundamental laws of mechanics and different type of system of forces, Resultant force, Resolution of force, Moment and Couples, Resolution of a force into a force and a couple.
CO-2	Graduates gain ability to understand the working of centrifugal and reciprocating pumps. They learn various aspects of four stroke and two stroke IC engines along with PV, TS and valve timing diagrams.
CO-3	Graduates differentiate and formulate various arrangements such as Open and cross belt drives. Study of rope drive , gear and design of belt for deriving the values of maximum power, tension ratio, velocity ratio, slip and length of belt generate ability to have problem solving approach in graduates.
CO-4	Graduates understand kinamatics of particles & rigid body. They can understand types of motion and effects of velocity & acceleration on the body. It also covers kinetics of particles and rigid body.
CO-5	Graduates gain ability to understand various manufacturing processes such as Casting, forming and joining. Study of various engineering materials help them to know about various metallurgical properties and their proper implementation in engineering aspects. Graduates come to know that how the proper selection of heat treatments such as annealing, normalizing, tempering, hardening and quenching, reduce the dependency on expensive materials.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1					1						3	1
II	3	1					2						3	2
III	3	1	3	2									3	3
IV	3	1		2			1						3	2
V										2	3		3	2

Subject Code/Name:- 206/Fundamental of Computer Programming

	List of Course Outcomes
CO-1	Graduates gain ability to understand the fundamental of computer architecture and stored programs. It provides the basic understanding of software used in the compilation process.
CO-2	Graduates will able to analyze and understand programming language in the context of basic structure of C programming, data types, operators, variable declaration and input/output function.
CO-3	Graduates gain ability to develop programs using the basic elements like control statements with conditional and iterative statements, arrays, strings and pointers.
CO-4	Graduates can understand the concept of effective usage of structures and functions to understand the memory management concepts. It elaborates the issues in file organization and the usage of file systems.
CO-5	Graduates gain ability to obtain the knowledge about the number systems which will be very useful for bitwise operations.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	1	1						1	1		2	
II	2	3	1								1		2	1
III		2	3	3	1						1		2	1
IV	2				1						2	2	1	
V	1	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Department of Electronics & Communication Engineering

All Courses Outcomes (CO's) and Mapping

With PO & PSO

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(Rajasthan Technical University, KOTA)

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Department of Electronics & Communication Engineering

All Courses Outcomes (CO's) and Mapping

With PO & PSO

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Department of Electronics &Communication Engineering

Program Outcomes

	List of Program Outcomes
PO-1	**Engineering Knowledge**: Apply knowledge of mathematics and science, with fundamentals of Engineering to be able to solve complex engineering problems.
PO-2	**Problem Analysis**: Identify, Formulate, review research literature and analyze complex engineering problems and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO-3	**Design/Development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.
PO-4	**Conduct Investigations of Complex problems**: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO-5	**Modern Tool Usage**: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to computer science related complex engineering activities with an understanding of the limitations.
PO-6	**The Engineer and Society**: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO-7	**Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
PO-8	**Ethics**: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO-9	**Individual and Team Work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.
PO-10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO-11	**Project Management and Finance**: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.
PO-12	**Life-Long Learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

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Department of Electronics &Communication Engineering

List of Programme Specific Outcome(PSO)	
PSO1	**Knowledge Enhancement in Electronics and Communication:-**Acquire hardware and software skills pertinent to research and industry practices in the field of Electronics & communication while acquiring soft skills like persistence/stick ability, proper judgment through projects and industrial interaction.
PSO2	**Hardware design and its Development:-**All Graduate students will be able to analyze hardware designing, trouble shooting of appropriate system to provide solution that are technically sound, economically feasible and globally acceptable.

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Department of Electronics &Communication Engineering

MAPPING OF PEO WITH PO & PSO

Program Education Objectives (PEO)	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
PEO-1	3	2	2	1	1	2	2	2	-	-	1	3	2	3
PEO-2	2	2	3	2	2	-	2	3	2	-	3	3	3	2
PEO-3	3	2	3	1	1	3	3	-	2	-	2	3	2	3
PEO-4	2	1	-	3	-	2	2	3	2	3	1	3	3	3
PEO-5	1	2	1	3	-	2	2	3	3	2	-	3	3	3

Note: - Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low)
2: Moderate (Medium)
3: Substantial (High)

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Electronics & Communication Engineering
Subject of All Courses Outcomes (CO's) and Mapping

With PO & PSO

2nd Year - III Semester

S No	Code	Subject
1	3EC2-01	Advanced Engineering Mathematics-I
2	3EC1-02/ 3EC1-03	Technical Communication/Managerial Economics and Financial Accounting
3	3EC4-04	Digital System Design
4	3EC4-05	Signal & Systems
5	3EC4-06	Network Theory
6	3EC4-07	Electronics Devices

Subject Code/Name:-3EC2-01/AEM-I

	List of Course Outcomes
CO-1	The use of Numerical Methods in solving practical technical problems using scientific and Mathematical tools when available, and using experience and intuition otherwise, Mathematical models provide a priori estimates of performance very desirable when prototypes or experiments are costly. Engineering problems frequently arise in which exact analytical solutions are not available. Approximate solutions are normally sufficient for engineering applications, allowing the use of approximate numerical methods.
CO-2	To use Fourier and Laplace transform, to evaluate the transfer function of linear time-invariant systems. Also use to Characterize and analyze the properties of DT signals and compute Z-transform and Fourier transform for DT signals.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	2	2						2		1	1	2	1
II	2			2					1			1	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject code/Name: 3EC3-04/DSD

	List of Course Outcomes
CO-1	Develop the understanding of number system and its application in digital electronics.
CO-2	Development and analysis of K-map to solve the Boolean function to the simplest form for the implementation of compact digital circuits.
CO-3	Design various combinational and sequential circuits using various metrics: switching speed, throughput/latency, gate count and area, energy dissipation and power.
CO-4	Understanding Interfacing between digital circuits and analog component using Analog to Digital Converter (ADC), Digital to Analog Converter (DAC) etc.
CO-5	Design and implement semiconductor memories, programmable logic devices (PLDs) and field programmable gate arrays (FPGA) in digital electronics.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	2	2	1		1							3	1
II	3	2	3	2									2	2
III	2	2	3	1	1								1	2
IV	3	2	1	1	1									
V	2	1	3	1	1									

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject code/Name: 3EC3-05/Signal & system

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of signal and system and and can learn to draw the waveforms of signal understand their classification and properties of signal and system which will help them to differentiate between different types of signal and system.
CO-2	Graduates analyze and understand the Linear Time invariant system and its properties, and can behavior of LTI system and about its response and applications.
CO-3	Graduates gain ability to visualize the concept of Fourier series and Fourier transform of continuous and discrete time domain signal and can learn the time domain and frequency domain signal, and convert from time domain to frequency domain and vice versa.
CO-4	Graduates can understand the concept of Laplace transform and Z-transform with different kind of properties and can learn the concept of power factor improvements
CO-5	Graduates gain ability to understand the dc to dc converters and their configurations; they can also learn the different kind of commutations techniques.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

PEO	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	3	2	3	2						1	2	1	1
II	3	3	3	3	3	1	1					2	2	2
III	3	3	3	3	3		1			1		1	3	3
IV						2	1	3	3	3	3	3		
V	1		1	1		3	3	2	3	2	2	3		

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Estd. 2005

II Year-III Semester

Name of subject with Code:- Network Theory (3EC4-06)

	List of Course Outcome
CO 1	Apply the basic electrical laws and simplify the network using nodal, mesh and network theorems
CO 2	Apply frequency domain and laplace techniques in different circuit applications
CO 3	Evaluate transient response of the circuit and two port network parameters
CO 4	Analyze the series and parallel resonance in the circuit and design filters

MAPPING OF COURSE OUTCOME WITH PO & PSO

Name of subject with Code:- Network Theory (3EC4-06)

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	3	3	2	2	1	-	1	-	-	1	2	2	1
CO-2	3	3	3	3	3	2	1	-	2	-	1	2	3	3
CO-3	3	3	3	3	3	2	1	-		1	-	2	3	3
CO-4	-	3	3	3	3	1	3	2	3	3	3	3	3	-
CO-5		2	2	1	-	2	3	2	3	2	2	3	-	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low)   2: Moderate (Medium)   3: Substantial (High)

Subject Code/ Name:- 3EC4-07 Electronics Devices

	List of Course Outcomes
CO-1	Understanding the semiconductor physics of the intrinsic, P and N materials.
CO-2	Understanding the characteristics of current flow in a bipolar junction transistor and MOSFET.
CO-3	Understand and utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems.
CO-4	Analyze the characteristics of different electronic devices such as Amplifiers, LEDs, Solar cells, etc.
CO-5	Theoretical as well as experimental understanding of Integrated circuit fabrication.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	-	2	1	1	-	-	-	-	-	-	2	2
II	3	2	1	-	-	2	-	-	-	-	-	-	1	-
III	2	1	-	2	-	1	2	-	-	-	-	-	2	2
IV	3	1	1	-	-	-	2	-	-	-	-	-	-	-
V	3	1	1	1	1	-	-	-	-	-	-	2	-	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Electronics & Communication Engineering
Subject of All Courses Outcomes (CO's) and Mapping

With PO & PSO

II ed Year - IV Semester

S No	Code	Subject
1	4EC2-01	Advanced Engineering Mathematics-II
2	4EC1-03/ 4EC1-02	Managerial Economics and Financial Accounting/ Technical Communication
3	4EC4-04	Analog Circuits
4	4EC4-05	Microcontrollers
5	4EC3-06	Electronics Measurement & Instrumentation
6	4EC4-07	Analog and Digital Communication

Subject Code/Name:-4EC2-01/AEM-II

List of Course Outcomes	
CO-1	To use Harmonic conjugates (Complex Theorem) in analog and Digital communication for modulation of signals
CO-2	To use special function in solving the problems of probabilities related with random variables.
CO-3	Vector space are use to solve space-time related problems in multiple access techniques.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	3	1										1	
II	2	2											1	2
III	2	3	1		2								2	

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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II Year- IV Semester

Analog Circuit(4EC4)

List of Course Outcomes	
CO-1	Understand the characteristics of diodes and transistors
CO-2	Design and analyze various rectifier and amplifier circuits
CO-3	Design sinusoidal and non-sinusoidal oscillators.
CO-4	Understand the functioning of OP-AMP and design OPAMP based circuits
CO-5	Understanding the designing of ADCs and DACs

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	-	1	1	2	-	-	-	-	-	-	-	2	2
CO-2	1	1	2	-	1	-	-	-	-	-	-	-	1	-
CO-3	3	1	-	1	-	-	-	-	-	-	-	-	2	2
CO-4	2	-	-	-	2	-	-	-	-	-	-	-	-	-
CO-5	2	3	-	2	-	-	-	-	-	-	-	-	-	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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II Year-IV Semester, Name of subject with Code:- Electronics Measurement &
Instrumentation (4EC3-06)

List of Course Outcome	
CO 1	Description the use of various electrical/electronic instruments, their block diagram, applications, and principles of operation, standards errors and units of measurements.
CO 2	Development the basic equipments skills in the design of electronic
CO 3	Analysis the different electrical/electronic parameters using state of equipments of measuring instruments which is require to all types of industries.
CO 4	Solution the identify electronics/ electrical instruments, understanding associated with the instruments
CO 5	Explanation of transducers in different types of field applications

MAPPING OF COURSE OUTCOME WITH PO & PSO

II Year-IV Semester, Name of subject with Code:- Electronics Measurement &
Instrumentation (4EC3-06)

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	1	1	1	-	-	-	-	-	1	1	1	2	-
CO-2	2	2	1	-	-	-	-	3	-	-	-	1	2	1
CO-3	2	1	3	3	1	-	-	-	-	-	-	1	2	1
CO-4	2		-	-	-	1	-	-	-	-	2	2	1	-
CO-5	3	1		1	-	-	-	-	-	1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low)   2: Moderate
(Medium)   3: Substantial (High)

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II Year-IV Semester
Name of subject with Code:- Microcontrollers (4EC4-05)

List of Course Outcome	
CO 1	Develop assembly language programming skills.
CO 2	Able to build interfacing of peripherals like, I/O, A/D, D/A, timer etc
CO 3	Understand the basics and programming of 8051 microcontroller.
CO 4	Explain the concept of memory organization. Understand RISC processors and design ARM microcontroller based systems.
CO 5	Understand RISC processors and design ARM microcontroller based systems.

MAPPING OF COURSE OUTCOME WITH PO & PSO

Name of subject with Code:- Microcontrollers (4EC4-05)

COURSE OUTCOME	List of Course Outcome												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	-	1	-	-	-	-	-	-	-	-	1	1	3
CO-2	1	3	1	3	-	1	3	1	3	1	3	1	2	1
CO-3	3	1	-	-	-	-	1	3	1	3	-	2	1	2
CO-4	2	-	-	1	3	1	3	-	-	-	-	1	1	3
CO-5	2	-	1	-	-	-	1	3	1	3	-	1	1	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low)   2: Moderate (Medium)   3: Substantial (High)

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Estd. 2005

Subject Code/Name:- 4EC4-07/ADC

List of Course Outcome	
CO 1	Analyze and compare different analog modulation schemes for their efficiency and bandwidth
CO 2	Analyze the behaviour of a communication system in presence of noise
CO 3	Investigate pulsed modulation system and analyze their system performance
CO 4	Analyze different digital modulation schemes and can compute the bit error performance
CO 5	Design a communication system comprised of both analog and digital modulation techniques

MAPPING OF COURSE OUTCOME WITH PO & PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	3		3		1				1			1	
CO-2	3	2		3		1							2	
CO-3	3	2		3		2							1	2
CO-4	3	3		3		2				1			1	
CO-5	3	2	3	3		3			2	2				

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low)   2: Moderate (Medium)   3: Substantial (High)
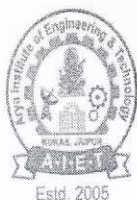
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Estd. 2005

Electronics & Communication Engineering
Subject of All Courses Outcomes (CO's) and Mapping

With PO & PSO

III ed Year - V Semester

S No	Code	Subject
1	5EC1A	Signals & Systems
2	5EC2A	Linear Integrated Circuits
3	5EC3A	Telecommunication Engg.
4	5EC4A	Analog Communication
5	5EC5A	Microwave Engg. -I
6	5EC6A	Elective (any one of the following)
6.1	5EC6.1A	Biomedical Instrumentation
6.2	5EC6.2A	Advanced Data Structures
6.3	5EC6.3A	Computer Oriented Numerical & Statistical Methods

Subject code/Name: 5EC1A/Signal & system

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of signal and system and and can learn to draw the waveforms of signal understand their classification and properties of signal and system which will help them to differentiate between different types of signal and system.
CO-2	Graduates analyze and understand the Linear Time invariant system and its properties, and can behavior of LTI system and about its response and applications.
CO-3	Graduates gain ability to visualize the concept of Fourier series and Fourier transform of continuous and discrete time domain signal and can learn the time domain and frequency domain signal, and convert from time domain to frequency domain and vice versa.
CO-4	Graduates can understand the concept of Laplace transform and Z-transform with different kind of properties and can learn the concept of power factor improvements
CO-5	Graduates gain ability to understand the dc to dc converters and their configurations; they can also learn the different kind of commutations techniques.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

PEO	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	3	2	3	2						1	2	1	1
II	3	3	3	3	3	1	1					2	2	2
III	3	3	3	3	3		1			1		1	3	3
IV						2	1	3	3	3	3	3		
V	1		1	1		3	3	2	3	2	2	3		

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:-5EC2A/LIC

List of Course Outcomes	
CO-1	Learn about the basic concepts for the circuit configuration for the design of linear integrated circuits and develops skill to solve engineering problems
CO-2	Develop skills to design simple circuits using OP-AMP.
CO-3	Gain knowledge about various multiplier circuits, modulators and demodulators.
CO-4	Develop skills to develop simple filter circuits and various amplifiers and can solve problems related to it.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	1	3									1	2	
II		1	1									2	1	
III			1									1	1	
IV			2									2	2	

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject code/Name: 5EC3A/TE

	List of Course Outcomes
CO-1	Graduate will be able to understand the basic concepts of transmission.
CO-2	Study of basic communications concepts including Networks, Telephone Equipment, Multiplexing, Switching, and Transmissions Media.
CO-3	Study and designing of various filters, equalizers, basic telephony system and telephone traffic measurement.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

Course outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
I	2	1										2	1	
II	1	3										3	1	
III	1		2	3								2		2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject code/Name: 5EC4A/AC

List of Course Outcomes	
CO-1	Understand different blocks in communication system and how noise affects communication using different parameters.
CO-2	Distinguish between different amplitude modulation schemes with their advantages, disadvantages and applications.
CO-3	Analyze generation and detection of FM signal and comparison between amplitude and angle modulation schemes.
CO-4	To understand the concept of sampling it types and its applications those are useful to obtain the discrete type of sampling.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	1		2								2	2	
II	3			1								1	2	
III			2	2	1							2		1
IV	2	2		1	3							3		1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Estd. 2005

III Year-V Semester SUB: Microwave Engg.-I (5EC5A)

List of Course Outcomes	
CO-1	To understand modes in rectangular waveguide, cut off frequency, group & phase velocity & field pattern of various modes.
CO-2	Ability to understand the scattering matrix, reciprocal network, Tee junction, directional coupler & power divider.
CO-3	Ability to understand microwave measurement like power, VSWR, frequency, impedance & network analyser
CO-4	To understand Microwave monolithic integrated circuit(MMIC), MIC & HIC
CO-5	To understand application of rectangular waveguide, cut off frequency, group & phase velocity & field pattern of various modes.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

SUB: Microwave Engg.-I (5EC5A)

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	2	1	1	2	2	2	-	-	-	2	3	-
CO-2	2	2	3	2	2	2	1	1	2	2	1	2	2	-
CO-3	2	2	3	1	1	3	3		2	-	-	2	-	-
CO-4	2	1	2	1	1	2	2	3	2	3	1	2	-	2
CO-5	2	2	1	3	-	2	2	3	3	2		3	-	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low)2: Moderate (Medium)3: Substantial (High

Subject code/Name: 5EC6.1A/BMI

	List of Course Outcomes	
CO 1	Students will have the knowledge of important systems of human physiology.	
CO 2	Describe methods and implementation of electrical and nonelectrical medical parameters diagnostic.	
CO 3	Demonstrate measuring of basic medical parameters.	
CO 4	Apply safety standards and select disposal method and procedures for electrical diagnostic equipment.	

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

CO	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3											1		
II	1	3		3	2							1	2	
III	3	1										2		
IV	2											1		
V	3											1		

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Estd. 2005

Electronics & Communication Engineering
Subject of All Courses Outcomes (CO's) and Mapping

With PO & PSO

3ed Year - VI Semester

S No	Code	Subject
1	6EC1A	Microwave Engg.-II
2	6EC2A	Microprocessors
3	6EC3A	Industrial Electronics
4	6EC4A	Digital Communication
5	6EC5A	Control Systems
6	6EC6A	Elective (any one of the following)
6.1	6EC6.1A	Neural Networks
6.2	6EC6.2A	Parallel Computation & Architecture
6.3	6EC6.3A	Optical Fiber Communication

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Estd. 2005

III Year-VI Semester SUB: Microwave Engg.-II (6EC1A)

List of Course Outcomes	
CO -1	To understand impedance matching using L-Section and transmission line stub. Students will also learn quarter wave transformer
CO -2	Ability to understand the microwave diode like GUNN diode, IMPATT diode, PIN diode etc.
CO -3	Ability to understand Microwave BJT, FET, MESFET and transducer
CO -4	To understand Reflex klystron, two cavity klystron, magneton & travelling wave tube.
CO- 5	To understand application of L-Section and transmission line stub. Students will also learn quarter wave transformer

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

SUB: Microwave Engg.-II (6EC1A)

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	2	1	1	2	2	2	-	-	-	2	3	3
CO-2	2	2	3	2	2	3	2	2	3	2	1	2	2	3
CO-3	3	2	3	1	1	3	3		2	-	-	2	3	3
CO-4	3	1	3	2	2	2	2	3	2	3	1	2	3	2
CO-5	3	2	1	3	-	2	2	3	3	2	-	3	-	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/ Name: 6EC2A Microprocessor

List of Course Outcomes

CO-1	Ability to understand the architecture & general organization of the 8085 microprocessor
CO-2	Ability to design, code and debug Assembly Language programs to implement simple programs and interfacing circuits
CO-3	Ability to understand the architecture, general organization & instructions of the peripheral interface
CO-4	Ability to obtain fundamental knowledge on computer architecture.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3											1		
II	1	3		3	2							1	2	
III	3	1										2		
IV	2											1		

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Estd. 2005

III Year-VI Semester

Name of subject with Code:- Industrial Electronics (6EC3A)

	List of Course Outcome
CO 1	To introduce with basic theory of power semiconductor devices and passive components, their practical application in power electronics..
CO 2	To familiarize the operation principle of AC-DC, DC-DC, DC-AC conversion in single and three phase.
CO 3	To introduce speed control of DC motors using phase controlled converters and choppers and basic idea of three phase induction motors
CO 4	To understand stepper Motors and its types and induction and dielectric heating control
CO 5	Explanation of transducers in different types of field applications

MAPPING OF COURSE OUTCOME WITH PO & PSO

Name of subject with Code:- Industrial Electronics (6EC3A)

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	-	-	-	2	3	3	2	3	-	-	3	2	3
CO-2	1	3	-	3	-	-	2	3	3	-	-	2	3	3
CO-3	3	2	-	2	3	3	-	-	2	3	3	2	2	3
CO-4	2	2	-	2	3	2	3	3	2	3	-	1	1	2
CO-5	3	-	-	-	2	3	3	2	3	-	-	3	2	3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low)   2: Moderate (Medium)   3: Substantial (High)

Subject code/Name: 6EC4A/Digital Communication

Course Outcomes

	List of Course Outcomes
CO-1	To understand concept of quantization, pulse code modulation and demodulation. Calculation of signal to noise ratio for PCM and delta modulation. Further implementation on quantization by DPCM and ADM
CO-2	Study of line coding, interference, Nyquist criterion for signals and Matched filter
CO-3	To understand the concept of shift keying like ASK, BPSK, BFSK, QPSK and M-ary PSK etc. Coherent detection of these techniques and calculations of error.
CO-4	Calculation of information, average information, information rate and calculation of capacity of Gaussian channel.
CO-5	Evaluate the coding and decoding of information and different types of code those are used for encoding the signals.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

CO	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/Name:-6EC5A/Control System

	List of Course Outcomes
CO-1	Graduates gain ability to describe basic components of feedback control system, formulate mathematical models of physical systems and represent them in block diagram and signal flow graph.
CO-2	Graduates analyze the time domain specifications, Analyze first order and second order system in time domain.
CO-3	Graduates gain ability to understand the concept of stability, Analyze stability of the system from transfer functions approach and graphical methods.
CO-4	Graduates gain ability to visualize the concept of bode plot, Nyquist Plot .These graphical plots provides significant insight into the analysis and design of control systems.
CO-5	Graduates gain ability to design controller, compensators.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	2	3	
II	2	2	1									1	2	
III	2	1	3	3	1							1	2	1
IV	3			3		1					2	2	2	2
V	2	1		2						1	2	2	2	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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III Year-VI Semester
Name of subject with Code:- Optical Fiber Communication (6EC6.3A)

List of Course Outcomes	
CO 1	Evaluate the Optical Fiber Overview like Introduction, Ray theory, Optical fibers: multimode, single mode, step index, graded index.
CO 2	Evaluate the OPTICAL FIBER SOURCES like laser and LED.
CO 3	Describe the Optical Detectors like PIN photo diode, Avalanche photo diodes, Noise in Detectors, Photo Diode Materials.
CO 4	Evaluate the Optical Fiber Measurements of Attenuation, Dispersion, Refractive Index Profile, Cut off Wave Length.
CO 5	Evaluate the Optical Fiber Systems of passive components, active components, optical sensors, optical amplifiers public network applications.

MAPPING OF COURSE OUTCOME WITH PO & PSO

Name of subject with Code:- Optical Fiber Communication (6EC6.3A)

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	1	1	1	3	2	-	-	2	1	1	1	2	3
CO-2	2	2	1	-	2	3	-	3	-	3	3	1	2	1
CO-3	2	1	3	3	1	-	3	3	3	3	-	1	2	1
CO-4	2	-	-	3	-	1	3	-	3	-	2	2	1	-
CO-5	3	1	3	1	-	-	3	-	-	1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low)   2: Moderate (Medium)   3: Substantial (High)

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Estd. 2005

Electronics & Communication Engineering
Subject of All Courses Outcomes (CO's) and Mapping

With PO & PSO

4th Year - VII Semester

S No	Code	Subject
1	7EC1A	Antenna & Wave Propagation
2	7EC2A	Digital Signal Processing
3	7EC3A	Digital Image Processing
4	7EC4A	Wireless Communication
5	7EC5A	VLSI Design
6	7EC6A	Elective (any one of the following)
7.1	7EC6.1A	Advanced Microprocessors
7.2	7EC6.2A	Artificial Intelligence and Expert Systems
7.3	7EC6.3A	VHDL

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Estd. 2005

IV Year-VII Semester SUB: Antenna & Wave Propagation (7EC1A)

List of Course Outcomes	
CO -1	Understand important and fundamental antenna engineering parameters and terminology.
CO -2	Develop the basic skills necessary for designing a wide variety of practical antennas and antenna arrays.
CO -3	Ability to understand different type of wideband antenna like yagi-uda, horn, parabolic reflector etc
CO -4	To understand the propagation of electromagnetic wave like sky wave, ground wave.
CO- 5	To understand the Space wave.propogation

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

SUB: Antenna & Wave Propagation (7EC1A)

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	2	1	1	2	2	2	-	-	-	2	3	-
CO-2	2	2	3	2	2	-	-	-	-	-	1	2	2	-
CO-3	-	2	3	1	1	3	3	-	2	-	-	2	-	-
CO-4	-	1	-	-	-	2	2	3	2	3	1	2	-	2
CO-5	-	2	1	3	-	2	2	3	3	2		3	-	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low)2: Moderate (Medium)3: Substantial (High)

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IV Year-VII Semester Name of subject with Code:- Digital Signal Processing (7EC2A)

List of Course Outcomes

CO-1	Develop the understanding of number system and its application in digital electronics.
CO-2	Development and analysis of K-map to solve the Boolean function to the simplest form for the implementation of compact digital circuits.
CO-3	Design various combinational and sequential circuits using various metrics: switching speed, throughput/latency, gate count and area.
CO-4	Understanding Interfacing between digital circuits and analog component using Analog to Digital Converter (ADC), Digital to Analog Converter etc.
CO-5	Design and implement semiconductor memories, programmable logic devices (PLDs) and field programmable gate arrays (FPGA) in digital electronics.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

Name of subject with Code:- Digital Signal Processing (7EC2A)

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	2	1	-	1	-	-	-	-	3	2	3	1
CO-2	3	2	3	2	-	-	-	-	-	-	2	3	2	2
CO-3	2	2	3	1	1	-	-	-	-	-	3	3	1	2
CO-4	3	2	1	1	1	-	-	-	-	-	2	2	3	2
CO-5	2	1	3	1	1	-	-	-	-	-	-	3	2	3

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject code/Name: 7EC3A/DIP

	List of Course Outcomes
CO-1	Review the fundamental concepts of a digital image processing system and analyze images in the frequency domain using various transforms
CO-2	Evaluate techniques for image enhancement and image restoration.
CO-3	Apply the morphological operations for identification of image.
CO-4	Interpret image segmentation and compression technique.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	1										2	2	
II	3											1	2	
III			2	2	1							2		1
IV	2	2		1	3							3		1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Code/ Name:- 7EC4 A Wireless Communication

List of Course Outcomes	
CO 1	Ability to understand spread spectrum modulation techniques and its type and significance.
CO 2	Ability to understand different type of fading and different types of free space losses.
CO 3	Ability to understand different type of multiple access technique like CDAM,FDMA and TDMA.
CO 4	Ability to understand the architecture of GSM system and satellite communication system. Also understand different type of wireless protocols like WLL and IEEE standards.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	-	2	1	-	-	-	-	-	-	-	2	3
II	3	2	1	-	-	-	-	-	-	-	-	-	1	-
III	2	1	-	2	-	1	-	-	-	-	-	-	3	2
IV	3	1	1	-	-	1	-	-	-	-	-	-	-	-

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Estd. 2005

IV Year-VII Semester

Name of subject with Code:- VLSI Design (7EC5A)

List of Course Outcomes	
CO-1	Ability to understand the basic structure of MOSFET, Models.
CO-2	Ability to design and understand the CMOS circuit designing & layout of different circuit.
CO-3	Ability to understand various dynamic circuit and different type of memory.
CO-4	Ability to obtain fundamental knowledge of basic designing tools like VHDL,FPGA.
CO-5	Ability to design the CMOS IC technology

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

Name of subject with Code:- VLSI Design (7EC5A)

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	-	1	-	-	-	-	-	-	-	-	2	-	-
CO-2	2	3	3	2	3	-	-	-	2	-	-	1	2	3
CO-3	2	-	-	-	-	2	-	2	-	-	-	2	-	2
CO-4	2	-	3	-	3	-	2	-	-	-	-	2	1	-
CO-5	2	3	3	2	3	-	-	-	2	-	-	1	2	3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject code/Name: 7EC6.3A/VHDL

	List of Course Outcomes
CO-1	Students must demonstrate the use and application of Boolean Algebra in the areas of digital circuit reduction, expansion, and factoring.
CO-2	Students must be able to simulate and debug digital systems described in VHDL
CO-3	Students must be able to synthesize complex digital circuits at several level of abstractions
CO-4	Students must be able to implement logic on an FPGA and a CPLD

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	2	1	1								1	1	
II	1		2	3								2	2	
III	1	1		1	1							2	1	
IV	1	1	2	3								3	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Estd. 2005

Electronics & Communication Engineering
Subject of All Courses Outcomes (CO's) and Mapping
With PO & PSO

4th Year - VIII Semester

S No	Code	Subject
1	8EC1A	IC Technology
2	8EC2A	Radar & TV Engineering
3	8EC3A	MEMS and Nanotechnology
4 .1	8EC4.1A	Computer Networks
4.2	8EC4.2A	Operating Systems
4.3	8EC4.3A	Microcontroller and Embedded Systems

COURSE OUTCOMES:-

Course Code	Course Name	Course Outcome	Details
8EC1a	Integrated Circuit Technology	CO 1	Study of crystals and crystal defect gives an idea to the students of the complicated crystals.
		CO 2	Demonstrate skills to use modern IC fabrication techniques and equipments.
		CO 3	demonstrate knowledge of eventual yield in microelectronic fabrication industry
		CO 4	Understanding of impact of IC fabrication solutions on daily life.
		CO 5	demonstrate an ability to identify, formulate and solve IC processing problems

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO-1	PSO-1
CO 1	3		3	2	1	2	3		3		3		2	3
CO 2	3				3						2		2	2
CO 3		2		1	2			2	2				2	2
CO 4	3					3	3				2		1	2
CO 5	3	3	3	3	3	3	3	2			2		2	1

3: Strongly   2: Moderate   1: Weak

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IV Year-VIII Semester Name of subject with Code:- Radar and TV (8EC2A)

List of Course Outcome	
CO-1	Ability to understand the basic of radar system, Blind speed, DME.
CO-2	To introduce the basics of picture transmission and reception, analysis and synthesis of composite video signal, receiver and picture tubes and television camera tubes.
CO-3	To study various colour television systems with greater emphasis .
CO-4	To introduce most latest and revolutionary ideas in the field of digital TV, HDTV, WDTV.
CO-5	To study various modern systems DTH, Cable T.V ,LCD, Plasma TV

MAPPING OF COURSE OUTCOME WITH PO & PSO

Name of subject with Code:- Name of subject with Code:- Radar and TV (8EC2A)

COURSE OUTCOME	List of Course Outcome												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	2	2	1	-	1	-	-	-	-	-	-	2	2
CO-2	3	2	3	2	-	-	-	-	-	-	-	-	2	-
CO-3	2	2	3	1	1	-	-	-	-	-	-	-	-	1
CO-4	2	2	1	1	1	-	-	-	-	-	-	-	2	-
CO-5	2	1	3	1	1	-	-	-	-	-	-	-	-	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low)   2: Moderate (Medium)   3: Substantial (High)

Subject code/Name: 8EC3A/MEMS

Course Outcomes:

	List of Course Outcomes
CO-1	Graduates gain ability to understand the nonmaterial, Nanotechnology potential, STM, AFM, Idea of band structure-Metal, insulator and semiconductor, Superconductivity, Graphene, Carbon nano tube
CO-2	Graduates analyze and understand the Silicon processing method, Cleaning /etching, Alkaline, Oxidation, CVD MOCVD, PVD Method, Photolithography, Nano imprinting, X-ray Lithography.
CO-3	Graduates analyze and understand the Infrared spectroscopy, Raman spectroscopy, Raman Scattering, Rayleigh Scattering, X-ray Photon Spectroscopy, Photo electron spectroscopy, SEM ,TEM ,STM, Atomic force microscopy.
CO-4	Graduates gain ability to visualize the concept of Classification of Nanomaterial, Metallic nanowires, Quantum dots, Nano-sensor Nano mediciene.
CO-5	Graduates gain ability to understand the Evolution of micro fabrication, MEMS and its application in various fields, Description of MEMS, Manufacturing of MEMS, Advantage of MEMS, Potential application of MEMS device.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1		2		2		1			1	1	2	2
II	2	1	1				2				3	1	2	1
III	1	1			2			3		1		3	1	
IV			2		1			2		3		1		2
V	1		2			1		3	1		1		1	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

SUBJECT CODE/NAME : 8EC4.1A/COMPUTER NETWORKS

List of Course Outcomes

Course Code	Course Name	Course Outcome	Details
8EC4.1A	COMPUTER NETWORKS	CO 1	To evaluate the mathematical expressions by using several algorithms for real time applications.
		CO 2	To make the students to understand the different layers of ISO/OSI model and TCP/IP Network.
		CO 3	Analyze different routing algorithms and methods to improve QOS.
		CO 4	Summarize the application and transport layer protocols, congestion control methods.

MAPPING OF COURSE OUTCOME WITH PO AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3				3								3	3
II	3		2		3								3	2
III			3		3								3	2
IV	3	2	3	3				3			3	3		3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Department of Electrical Engineering

CO'S PO'S & THEIR MAPPING
CRITERIA – 2.6.1

ARYA Institute of Engineering Technology

Department of Electrical Engineering

(Rajasthan Technical University, KOTA)

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Program Educational Objective (PEO)

I. **Preparation**: To prepare undergraduate students with appropriate blend of theoretical foundations, experimentation & technical implementation to comprehend and pinpoint problems in the field of Electrical Engineering to excel in postgraduate programs or to succeed in industry / technical profession.

II. **Core competence**: To provide students with a solid foundation in mathematical, scientific and engineering fundamentals required to solve Electrical Engineering problems and also to pursue higher studies. Student will be able to employ his knowledge along with necessary techniques & tools for modern engineering applications.

III. **Breadth**: To train students with good scientific and engineering breadth so as to comprehend, analyze, design, and create novel products and solutions for the real life problems in the present electrical system.

IV. **Professionalism:** To inculcate in student's professional and ethical attitude, Communication Skills, teamwork Skills, programming skill and an ability to relate Electrical Engineering issues to broader social context.

V. **Learning Environment**: To provide student with an academic environment aware of excellence, leadership, and the life-long learning needed for a successful professional career through independent studies, thesis, internships etc.

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Program Outcomes

List of Program Outcomes

PO-1 Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Engineering to be able to solve complex engineering problems.

PO-2 Problem Analysis: Identify, Formulate, review research literature and analyze complex electrical engineering problems and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO-3 Design/Development of solutions: Design solutions for complex electrical engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO-4 Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO-5 Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and electrical tools including prediction and modeling to electrical engineering related complex engineering activities with an understanding of the limitations.

PO-6 The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO-7 Environment and Sustainability: Understand the impact of the professional electrical engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO-8 Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the electrical engineering practice.

PO-9 Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

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PO-10 Communication: Communicate effectively on complex engineering activities with the electrical engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO-11 Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.

PO-12 Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Syllabus of

UNDERGRADUATE DEGREE COURSE

Electrical Engineering

Rajasthan Technical University, Kota

Effective from session: 2018 – 2019

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Estd. 2005

Program Specific Outcome (PSO)

Department has specifically defined few objectives of this program which make students realize the fact that the knowledge and techniques learnt in this course has direct implication for the betterment of society and its sustainability.

PSO.1 Graduates will understand the design building blocks of real time applications and automations by using modern engineering tools and multidisciplinary concepts.

PSO.2 Graduates will adopt the new methodologies as smart grid to resolve power system complexities, which can improve the efficiency of the power system

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B.Tech. : Electrical Engineering
2nd Year - III Semester   {2018-19} {current}

SN	Category	Course Code	Course Title	Contact hrs/week L	T	P	Exm Hrs	IA	ETE	Total	Cr
THEORY											
1	BSC	3EE2-01	Advance Mathematics ✓	3	0	0	3	30	120	**150**	**3**
2	HSMC	3EE1-02/ 3EE1-03	Technical Communication / Managerial Economics and Financial Accounting ✓	2	0	0	2	20	80	**100**	**2**
3	ESC	3EE3-04	Power generation Process ✓	2	0	0	2	20	80	**100**	**2**
4	PCC	3EE4-05	Electrical Circuit Analysis ✓	3	0	0	3	30	120	**150**	**3**
5		3EE4-06	Analog Electronics	3	0	0	3	30	120	**150**	**3**
6		3EE4-07	Electrical Machine - I ✓	3	0	0	3	30	120	**150**	**3**
7		3EE4-08	Electromagnetic Field ✓	2	0	0	2	20	80	**100**	**2**
			Sub Total	18	0	0		180	720	**900**	**18**
PRACTICAL & SESSIONAL											
8	PCC	3EE4-21	Analog Electronics Lab	0	0	2		30	20	**50**	**1**
9		3EE4-22	Electrical Machine-I Lab	0	0	4		60	40	**100**	**2**
10		3EE4-23	Electrical circuit design Lab	0	0	4		60	40	**100**	**2**
13	PSIT	3EE7-30	Industrial Training	0	0	2				**50**	**1**
14	SODE CA	3EE8-00	Social Outreach, Discipline & Extra Curricular Activities							**25**	**0.5**
			Sub- Total	0	0	12		150	100	**325**	**6.5**
			TOTAL OF III SEMESTER	18	0	12		330	820	**1225**	**24.5**

L: Lecture, T: Tutorial, P: Practical, Cr: Credits

ETE: End Term Exam, IA: Internal Assessment

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B.Tech. : Electrical Engineering
2nd Year - IV Semester

SN	Category	Course Code	Course Title	L	T	P	Exm Hrs	IA	ETE	Total	Cr
THEORY												
1	BSC	4EE2-01	Biology	2	0	0	2	20	80	100	2
2	HSMC	4EE1-02/ 4EE1-03	Technical Communication / Managerial Economics and Financial Accounting	2	0	0	2	20	80	100	2
3	ESC	4EE3-04	Electronic Measurement & Instrumentation	2	0	0	2	20	80	100	2
4	PCC	4EE4-05	Electrical Machine - II	3	0	0	3	30	120	150	3
5		4EE4-06	Power Electronics	3	0	0	3	30	120	150	3
6		4EE4-07	Signals & Systems	3	0	0	3	30	120	150	3
7		4EE4-08	Digital Electronics	2	0	0	2	20	80	100	2
			Sub Total	17	0	0		170	680	850	17

SN	Category	Course Code	Course Title	L	T	P		IA	ETE	Total	Cr
PRACTICAL & SESSIONAL												
8	PCC	4EE4-21	Electrical Machine - II Lab	0	0	4		60	40	100	2
9		4EE4-22	Power Electronics Lab	0	0	4		60	40	100	2
10		4EE4-23	Digital Electronics Lab	0	0	2		30	20	50	1
11		4EE3-24	Measurement Lab	0	0	2		30	20	50	1
13	SODE CA	4EE8-00	Social Outreach, Discipline & Extra Curricular Activities							25	0.5
			Sub- Total	0	0	12		180	120	325	6.5
			TOTAL OF IV SEMEESTER	17	0	12		350	800	1175	23.5

L: *Lecture,* **T:** *Tutorial,* **P:** *Practical,* **Cr:** *Credits*

ETE: *End Term Exam,* **IA:** *Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

old scheme – 12-18

Course		Electrical Engineering				Code	EE

SEMESTER III

Subject Code	Title	Hrs. / Week			IA	Exam	Total
		L	T	P			
3EE1A	Electronic Devices & Circuits	3	1	Theory Subjects	20	80	100
3EE2A	Circuit Analysis-I	3	1		20	80	100
3EE3A	Digital Electronics	3	1		20	80	100
3EE4A	Object Oriented Programming	3			20	80	100
3EE5A	Electrical Machines-I	3	1		20	80	100
3EE6A	Advanced Engg. Mathematics-1	3			20	80	100
3EE7A	Electronic Devices Lab			2	45	30	75
3EE8A	Electrical Circuit Lab	Practical laboratory courses		2	30	20	50
3EE9A	Digital Electronics Lab			2	45	30	75
3EE10A	C++ Programming Lab			2	45	30	75
3EE11A	Humanities & Social Sciences			2	45	30	75
3EEDC	Discipline & Extra Curricular Activity						50
	Total	18	4	10			1000

SEMESTER IV

Subject Code	Title	Hrs. / Week			IA	Exam	Total
		L	T	P			
4EE1A	Analog Electronics	3	1	Theory Subjects	20	80	100
4EE2A	Circuit Analysis-II	3	1		20	80	100
4EE3A	Electrical Measurements	3	1		20	80	100
4EE4A	Generation of Electrical Power	3			20	80	100
4EE5A	Electrical Machines-II	3	1		20	80	100
4EE6A	Advanced Engineering Mathematics-II	3			20	80	100
4EE7A	Analog Electronics Lab			2	60	40	100
4EE8A	Electrical Measurement Lab	Practical laboratory courses		2	45	30	75
4EE9A	Power System Design Lab			2	30	20	50
4EE10A	Electrical Machines Lab			2	45	30	75
4EE11A	Electrical Machine Design			2	30	20	50
4EEDC	Discipline & Extra Curricular Activity						50
	Total	18	4	10			1000

Course		Electrical Engineering		Code	EE

SEMESTER V Subject Code	Title	Hrs. / Week			IA	Exam	Total
		L	T	P			
5EE1A	Power Electronics	3	1		20	80	100
5EE2A	Microprocessors & Computer Architecture	3			20	80	100
5EE3A	Control Systems	3	1		20	80	100
5EE4A	Data Base Management System	3			20	80	100
5EE5A	Transmission & Distribution of Electrical Power	3	1		20	80	100
5EE6.1A	Optimisation Techniques	3	1		20	80	100
5EE6.2A	Principle of Communication Systems						
5EE6.3A	Introduction to VLSI						
5EE7A	Power Electronics Lab			2	45	30	75
5EE8A	Microprocessor Lab			2	45	30	75
5EE9A	System Programming Lab			2	45	30	75
5EE10A	DBMS Lab			2	45	30	75
5EE11A	Professional Ethics and Disaster Manage			2	30	20	50
5EEDC	Discipline & Extra Curricular Activity						50
	Total	18	3	10			1000

SEMESTER VI Subject Code	Title	Hrs. / Week			IA	Exam	Total
		L	T	P			
6EE1A	Modern Control Theory	3	1		20	80	100
6EE2A	High Voltage Engineering	3			20	80	100
6EE3A	Switchgear & Protection	3	1		20	80	100
6EE4A	Advanced Power Electronics	3	1		20	80	100
6EE5A	Smart Grid Technology	3			20	80	100
6EE6.1A	Advanced Microprocessors	3	1		20	80	100
6EE6.2A	Power System Instrumentation						
6EE6.3A	Digital Communication and Information Theory						
6EE7A	Control System Lab			2	45	30	75
6EE8A	Power System Lab			2	45	30	75
6EE9A	Advanced Power Electronics Lab			2	45	30	75
6EE10A	Smart Grid Lab			2	45	30	75
6EE11A	Entrepreneurship Development			2	30	20	50
6EEDC	Discipline & Extra Curricular Activity						50
	Total	18	3	10			1000

Course	Electrical Engineering		Code	EE

SEMESTER VII

Subject Code	Title	Hrs. / Week			IA	Exam	Total
		L	T	P			
7EE1A	Power System Planning	3			20	80	100
7EE2A	Power System Analysis	3	1		20	80	100
7EE3A	Artificial Intelligence Techniques	3			20	80	100
7EE4A	Non Conventional Energy Sources	3			20	80	100
7EE5A	Power System Engineering	3	1		20	80	100
7EE6.1A	Electromagnetic Field Theory				20	80	100
7EE6.2A	Computer Aided Design of Electrical Machines	3	1		20	80	100
7EE6.3A	Economic Operation of Power Systems						
7EE7A	Power System Planning Lab			2	45	30	75
7EE8A	Power System Modelling & Simulation Lab			2	45	30	75
7EE9A	Industrial Economics & Management			2	30	20	50
7EETR	Practical Training & Industrial visit			2		100	100
7EEPR	Project-1			2	50		50
7EEDC	Discipline & Extra Curricular Activity						50
	Total	18	2	10			1000

SEMESTER VIII

Subject Code	Title	Hrs. / Week			IA	Exam	Total
		L	T	P			
8EE1A	EHV AC/DC Transmission	3	1		20	80	100
8EE2A	Electric Drives and Their Control	3	1		20	80	100
8EE3A	Protection of Power System	3			20	80	100
8EE4.1A	Utilization of Electrical Power						
8EE4.2A	FACTS Devices & Their Applications	3			20	80	100
8EE4.3A	Power System Transients						
8EE5A	Computer Based Power System Lab			3	60	40	100
8EE6A	Electrical Drives and Control Lab			3	60	40	100
8EE7A	High Voltage Engineering Lab			2			50
8EEPR	Project-2			2	120	80	200
8EESM	Seminar			2	60	40	100
8EEDC	Discipline & Extra Curricular Activity						50
	Total	12	2	12			1000

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Department of Electrical Engineering

2.6.2 Attainment of program outcomes, program specific outcomes and course outcomes are evaluated by the institution

The process of attainment of COs, POs, and PSOs starts from writing appropriate COs for each course of the program from the first year to the fourth year in a four-year engineering degree program. The course outcomes are written and their mapping with POs are reviewed frequently by a committee of senior faculty members before they are finalized. Course Outcomes are statements that describe what students are expected to know,
and be able to do at the end of each course.

For the attainment of Course Outcomes, assessment process can be divided into two categories:

Direct Assessment and Indirect Assessment

A direct method which is based on a sample of actual student work, including reports, exams, demonstrations, performances, and completed works, requires students to produce work so that reviewers can assess how well students meet expectations.

An indirect method is based upon a report of perceived student learning. Indirect measures of assessment provide opportunities for students to reflect on their learning. The tools such as homework assignments, Exams, quizzes, Observations of field work, internship performance. Rubric scores for writing, oral presentations, performances, Grades based on explicit criteria related to clear learning goals tests, assignments, examinations etc. are taken for direct assessment method and Percent of class time spent in active learning, Number of student hours spent on service learning, Number of student hours spent at intellectual or cultural activities related to the course comes under indirect assessment method.

Program Outcomes (POs) are one step broader statements than COs that describe what students are expected to know and be able to do upon the graduation. These relate to the skills, knowledge, and behavior that students acquire in their matriculation through the program. Program outcomes and 'program specific outcomes' are attained through the attainment of COs. This is called direct attainment of POs and PSOs. Attainment of CO and PO is measured considering the Topic learning outcomes also. So attainment that is being spoken here is the guaranteed minimum attainment. An excel sheet with all the necessary formulae for measuring attainment is prepared. The faculty after completion of the evaluation of IA booklets in his course has to enter the marks in the excel sheet. Also, he has to enter the CO to which the question meets, the maximum marks for that bit of question, and CO-PO mapping done in the lesson plan. All other calculation for one IA is done with the formulae proposed.

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Department of Electrical Engineering

Attainment of program outcomes, program specific outcomes and course outcomes

Batch 2014 - 2018

Course: 3EE1A Electronic Devices and Circuits:

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 85.57%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 60.33%: **ATTAINMENT LEVEL 2**

Total attainment level = 0.20*3 + 0.80*2 = 2.2

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Course: 3EE2A   Circuit Analysis-I

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 90.33%: **ATTAINMENT LEVEL** 3

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 77.58%: **ATTAINMENT LEVEL 2**

Total attainment level = 0.20*3 + 0.80*2 = 2.2

Course 3EE3A Digital Electronics

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

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Percentage achieved in Mid Term Exam = 90%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 78.5%: **ATTAINMENT LEVEL 2**

Total attainment level = 0.20*3 + 0.80*2 = 2.2

Course: 3EE4A Object Oriented Programming

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 92.66%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 77.66%: **ATTAINMENT LEVEL 2**

Total attainment level = 0.20*3 + 0.80*2 = 2.2

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Course: 3EE5A   Electrical Machines-I

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 95.44%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 81.74%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = 3

Course: 3EE6A   Advanced Engg. Mathematics-1

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

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Estd. 2005

Percentage achieved in Mid Term Exam = 88.00%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 72.33%: **ATTAINMENT LEVEL 2**

Total attainment level = 0.20*3 + 0.80*2 = 2.2

Course: 4EE1A   Analog Electronics

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 90.63%: **ATTAINMENT LEVEL** 3

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 74.80%: **ATTAINMENT LEVEL 2**

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Total attainment level = 0.20*3 + 0.80*2 = **2.2**

Course: 4EE2A Circuit Analysis-II

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 88.57%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 86.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 4EE3A Electrical Measurements

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

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Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 91.57%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 63.50%: **ATTAINMENT LEVEL 2**

Total attainment level = 0.20*3 + 0.80*2 = **2.2**

Course: 4EE4A Generation of Electrical Power

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 95.57%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

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Percentage achieved in University Examination = 85.33%: **ATTAINMENT LEVEL 3**

Total attainment level 0.20*3 + 0.80*3 = **3**

Course: 4EE5A Electrical Machines-II

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 92.00%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 78.33%: **ATTAINMENT LEVEL 2**

Total attainment level = 0.20*3 + 0.80*2 = **2.2**

Course: 4EE6A Advanced Engineering Mathematics-II

Internal Assessment (Midterm Examination)

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Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 88.51%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 82.07%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 5EE1A Power Electronics

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 93.44%: **ATTAINMENT LEVEL 3**

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External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 74.63%: **ATTAINMENT LEVEL 2**

Total attainment level = 0.20*3 + 0.80*2 = **2.2**

Course: 5EE2A Microprocessors & Computer Architecture

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 88.14%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 72.54%: **ATTAINMENT LEVEL 2**

Total attainment level = 0.20*3 + 0.80*2 = **2.2**

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Course: 5EE3A Control Systems

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 90.57%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 80.33%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 5EE4A Data Base Management System

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

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Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 84.67%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 77.66%: **ATTAINMENT LEVEL 2**

Total attainment level = 0.20*3 + 0.80*2 = **2.2**

Course: 5EE5A Transmission & Distribution of Electrical Power

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 94.17%: **ATTAINMENT LEVEL** 3

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

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Percentage achieved in University Examination = 74.51%: **ATTAINMENT LEVEL 2**

Total attainment level = $0.20*3 + 0.80*2 = $ **2.2**

Course: 5EE6.2A Principle of Communication Systems

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 88.57%: **ATTAINMENT LEVEL** 3

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 68.04%: **ATTAINMENT LEVEL 2**

Total attainment level = $0.20*3 + 0.80*2 = $ **2.2**

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Course: 6EE1A Modern Control Theory

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 92.33%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 94.72%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 6EE2A High Voltage Engineering

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

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Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 88.00%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 85.91%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 6EE3A Switchgear & Protection

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 94.33%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

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Percentage achieved in University Examination = 81.10%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 6EE4A   Advanced Power Electronics

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 86.27%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 87.42%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

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6EE5A Smart Grid Technology

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 88.57%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 97.26%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

6EE6.2A Power System Instrumentation

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

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Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 94.41%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 92.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 7EE1A Power System Planning

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 93.57%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

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Percentage achieved in University Examination = 92.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 7EE2A Power System Analysis

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 90.55%: **ATTAINMENT LEVEL** 3

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 96.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 7EE3A Artificial Intelligence Techniques

Internal Assessment (Midterm Examination)

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Percentage achieved in University Examination = 92.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 7EE2A Power System Analysis

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 90.55%: **ATTAINMENT LEVEL** 3

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 96.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 7EE3A Artificial Intelligence Techniques

Internal Assessment (Midterm Examination)

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Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 88.33%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 94.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 7EE4A Non Conventional Energy Sources

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 88.63%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

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Estd. 2005

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 92.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 7EE5A Power System Engineering

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 95.61%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 88.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

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Course: 7EE6.3A Economic Operation of Power Systems

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 94.54%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 92.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 8EE1A EHV AC/DC Transmission

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 94.33%: **ATTAINMENT LEVEL 3**

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External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 96.00%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 8EE2A Electric Drives and Their Control

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 96.51%: **ATTAINMENT LEVEL** 3

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 94.10%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

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Estd. 2005

Course: 8EE3A Protection of Power System

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

Percentage achieved in Mid Term Exam = 94.57%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 94.60%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

Course: 8EE4.1A Utilization of Electrical Power

Internal Assessment (Midterm Examination)

Attainment level 1: 50% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 2: 60% students scoring more than 40% of marks out of relevant maximum marks.

Attainment level 3: 80% students scoring more than 40% of marks out of relevant maximum marks.

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Percentage achieved in Mid Term Exam = 88.33%: **ATTAINMENT LEVEL 3**

External Assessment (University Examination)

Attainment level 1: 50% students scoring more than 40% marks in University examination.

Attainment level 2: 60% students scoring more than 40% marks in University examination.

Attainment level 3: 80% students scoring more than 40% marks in University examination.

Percentage achieved in University Examination = 96.55%: **ATTAINMENT LEVEL 3**

Total attainment level = 0.20*3 + 0.80*3 = **3**

ARYA Institute of Engg. & Technology

Attainment Level of Electrical Engineering 2014-2018

Course	PO 1	PO 2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSC
3EE1A	2.2	2.2		2.2	2.2							2.2	2.2	
3EE2A	2.2	2.2	2.2	2.2	2.2	2.2				2.2	2.2	2.2	2.2	2.2
3EE3A	2.2	2.2	2.2	2.2	2.2							2.2	2.2	
3EE4A	2.2	2.2	2.2	2.2						2.2		2.2	2.2	2.2
3EE5A	3			3	3									3
3EE6A	2.2	2.2	2.2	2.2							2.2	2.2	2.2	
4EE1A	2.2	2.2		2.2	2.2							2.2		
4EE2A	3	3											3	
4EE3A	2.2	2.2	2.2		3						2.2	2.2	2.2	2.2
4EE4A	3	3	3	3	3				3	3	3	3	3	3
4EE5A	2.2	2.2		2.2	2.2								2.2	
4EE6A	3	3	3	3					3	3				3
5EE1A	2.2	2.2	2.2		2.2				2.2					2.2
5EE2A	2.2	2.2		2.2	2.2								2.2	2.2
5EE3A	3				3					3			3	
5EE4A	2.2	2.2	2.2	2.2	2.2	2.2				2.2	2.2	2.2	2.2	2.2
5EE5A	2.2	2.2	2.2	2.2							2.2	2.2	2.2	2.2
5EE6.2A	2.2	2.2	2.2	2.2	2.2					2.2	2.2	2.2	2.2	2.2
6EE1A	3	3	3		3		3		3			3	3	3
6EE2A	3	3	3		3	3						3	3	3
6EE3A	3	3	3		3								3	
6EE4A	3	3	3	3							3		3	3
6EE5A	3	3				3				3				3
6EE6.2A	3	3	3										3	
7EE1A	3	3	3	3	3					3	3	3	3	3
7EE2A	3		3					3			3	3	3	3
7EE3A	3	3	3	3	3	3	3				3	3	3	3
7EE4A	3	3	3	3	3				3			3	3	
7EE5A	3	3	3	3	3	3			3	3	3	3	3	3
7EE6.3A	3	3			3	3			3				3	3
8EE1A	3	3	3		3	3			3				3	3
8EE2A	3	3												3
8EE3A	3	3	3	3	3	3				3	3	3	3	
8EE4.1A	3	3	3									3	3	3
	2.69412	2.66452	2.7	2.56	2.68696	2.82222	3	3	2.86667	2.70909	2.63077	2.6	2.68571	2.717

ADVANCE MATHEMATICS 3EE2-01

	List of Course Outcomes
CO-1	The use of Numerical Methods in solving practical technical problems using scientific and Mathematical tools when available, and using experience and intuition otherwise, Mathematical models provide a priori estimates of performance very desirable when prototypes or experiments are costly. Engineering problems frequently arise in which exact analytical solutions are not available. Approximate solutions are normally sufficient for engineering applications, allowing the use of approximate numerical methods.
CO-2	To use Fourier and Laplace transform, to evaluate the transfer function of linear time-invariant systems. Also use to Characterize and analyze the properties of DT signals and compute Z-transform and Fourier transform for DT signals.
CO-3	To explain and understanding of the basic concepts underlying complex analysis.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	2	2						2		1	1	2	1
II	2			2					1			1	2	1
III	2	1		1								1	2	1
IV	2											2	1	
V	2	1	2	2								2	2	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Technical Communication3EE1-02

List of Course Outcomes	
CO-1	Understand professional writing by studying management communication contexts and genres, researching contemporary business topics, analyzing quantifiable data discovered by researching, and constructing finished professional workplace documents.
CO-2	Recognize, explain, and use the formal elements of specific genres of organizational communication: white papers, recommendation and analytical reports, proposals, memorandums, web pages, wikis, blogs, business letters, and promotional documents.
CO-3	Understand the ethical, international, social, and professional constraints of audience, style, and content for writing situations a.) Among managers or co-workers and colleagues of an organization, and b.) Between organizations, or between an organization and the public.
CO-4	Understand the current resources (such as search engines and databases) for locating secondary information, and also understand the strategies of effective primary data gathering.
CO-5	Practice the unique qualities of professional rhetoric and writing style, such as sentence conciseness, clarity, accuracy, honesty, avoiding wordiness or ambiguity, using direct order organization, readability, coherence and transitional devices.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	1				2		2	2	1	1	2	
II	1	1	1							2		1	2	1
III	1	1								1		1	3	1
IV	1				1		2	2		2	2	3		

EMI 4EE3A
Prepared by:- Pushpendra Foujdar

List of Course Outcomes

CO-1	Graduates gain ability to understand the basics of Electronic Measurement & Instrumentation and understand the Different Instruements and their characteristics which will help them to visualize the errors.
CO-2	Graduates analyze and understand the Instruments analysis and its applications which are used in Measurement system i.e. PMMC, MI, EMMC etc.
CO-3	Graduates gain ability to visualize the concept of Electronic Measurement & Instrumentation and can learn to calculate different energy measurements so that they can understand the behavior of Electronic Measurement & Instruments.
CO-4	Graduates can understand the concept of different electrical quantity measurements like voltage, current, power & energy with different kind of characteristics and Magnetic field intensity and can learn the concept of calculation techniques..
CO-5	Graduates gain ability to understand the different types of error accuracy, precision.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

List of Course Outcomes	
CO-1	Graduates gain ability to understand the basics idea about the working of power plant.
CO-2	Graduates analyze and understand the different types of Energy Sources
CO-3	Graduates gain ability to understand about Load,demand.load curves and the different factors of energy sources.
CO-4	Graduates can understand that how to improve Power Factor.
CO-5	Graduates gain ability to understand objective of tarrifs and energy Calculation

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2			2		1	2							1
II	3	2	2	3		1							1	
III	2	3	2	2									2	
IV	2	2	2										2	
V	3	2	2	2									2	

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

EMFT 3EE4-08
Prepared by:- Pushpendra Foujdar

List of Course Outcomes

CO-1	Graduates gain ability to understand the basics of Electromagnetic fileds, and understand the Different coordinate systems and their characteristics which will help them to visualize the 3D system.
CO-2	Graduates analyze and understand the vector analysis and its applications which are used in 3 dimensional coordinate system i.e. Cartesian coordinate system, Spherical coordinate system, cylindrical coordinate system.
CO-3	Graduates gain ability to visualize the concept of electromagnetic waves and can learn to calculate different energy measurements so that they can understand the behavior of Electromagnetic waves.
CO-4	Graduates can understand the concept of different electrical quantity measurements like voltage, current, power & energy with different kind of characteristics and Magnetic field intensity and can learn the concept of calculation techniques.
CO-5	Graduates gain ability to understand the Biosavarts law, Gauss Law, Amperes Law and Maxwells Equation.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	3						1	1	1	2	
II	2	2	3									1	2	1
III	3	1	3	3	1							1	1	1
IV	2				1						2	2	1	3
V	3	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

	List of Course Outcomes
CO-1	Graduates gain ability to understand Magnetic circuits, MMF, magnetic field strength, permeability, reluctance, analogy between electric and magnetic circuits, B-H curve, hysteresis, series and parallel magnetic circuits, Electromechanical energy conversion & their applications.
CO-2	Graduates can analyze and understand to DC Generators, construction, types, emf equation, lap and wave windings, methods of improving commutation, Demagnetizing and cross magnetizing ampere turns, series and compound generators, losses and efficiency, condition for maximum efficiency.
CO-3	Graduates gain ability to DC Motor principals, back-emf, torque of motor, types, characteristics of shunt, series and compound motors, speed control Starting of DC motors, losses and efficiency, testing electric braking of DC motors, Applications.
CO-4	Graduates can understand Transformer Principal, Types, emf equation, no load and short circuit test, equivalent circuits, back-to-back , phasor diagram, Efficiency, parallel operation , auto-transformer etc.
CO-5	Graduates gain ability to understand Polyphase Transformer: choice of connections, open delta connection, Scott connection, three phase to two phase conversion and vice-versa, Applications, Parallel operation and its conditions techniques.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1								1	1	1	1
II	2	2	1		3							1	1	2
III	2	1	2	1	2								1	1
IV	2				1						1	1	1	1
V	2	1		1						1		1	1	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

List of Course Outcomes	
CO-1	Graduates gain ability to understand the basics concept of electrical network's and understand by using the various theorems and their concepts which will help them to determine voltage & current in complex electrical circuit.
CO-2	Graduates analyze and understand the solution of first and second differential equation for series and parallel RL,RC and RLC circuit.
CO-3	Graduates gain ability to visualize the concept of steady state analysis and can learn to draw the phasor diagram so that they can understand the voltage and current behavior.
CO-4	Graduates can understand the concept of Laplace transform with their uses in electrical circuit analysis and can learn the concept of transfer function representation.
CO-5	Graduates gain ability to understand the two port network and their terminal pairs they can also learn the different relationships of two port variables.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1								1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1		2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

4EE4-06 PE

List of Course Outcomes	
CO-1	Acquire knowledge about fundamental concept and techniques used in power electronics.
CO-2	Ability to analyze various single phase and three phase power converter circuits and understand their applications.
CO-3	Foster ability to identify basic requirements for power electronics based design application.
CO-4	To develop skills to build, and troubleshoot power electronics circuits.
CO-5	Foster ability to understand the use of power converters in commercial and industrial applications.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I			3	2			1		2				2	
II	3				2			2					1	2
III			2			3				2				3
IV		2		2				2	3					2
V	2	3			1		1							

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

5EEIA POWER ELECTRONICS

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of power electronics, and understand the semiconductor devices and their characteristics which will help them to differentiate between devices and components.
CO-2	Graduates analyze and understand the SCR and its working and characteristics, and can understand the switching behavior of SCR and about its protection and applications.
CO-3	Graduates gain ability to visualize the concept of converters and can learn to draw the waveforms so that they can understand the voltage and current behavior of converters with different kind of loads.
CO-4	Graduates can understand the concept of half controlled converters with different kind of loads and can learn the concept of power factor improvements techniques.
CO-5	Graduates gain ability to understand the dc to dc converters and their configurations; they can also learn the different kind of commutations techniques.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1								1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1		2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

5EE3A CONTROL SYSTEM

	List of Course Outcomes
CO-1	Graduates gain ability to describe basic components of feedback control system, formulate mathematical models of physical systems and represent them in block diagram and signal flow graph.
CO-2	Graduates analyze the time domain specifications, Analyze first order and second order system in time domain.
CO-3	Graduates gain ability to understand the concept of stability, Analyze stability of the system from transfer functions approach and graphical methods.
CO-4	Graduates gain ability to visualize the concept of bode plot,Nyquist Plot .These graphical plots provides significant insight into the analysis and design of control systems.
CO-5	Graduates gain ability to design controller, compensators.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	2	3	
II	2	2	1								1	2		
III	2	1	3	3	1						1	2	1	
IV	3			3	1						2	2	2	2
V	2	1		2						1	2	2	2	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Prepared by:- Pushpendra Foujdar

List of Course Outcomes

CO-1 Graduates gain ability to understand the basics of power electronics, and understand the semiconductor devices and their characteristics which will help them to differentiate between devices and components.

CO-2 Graduates analyze and understand the SCR and its working and characteristics, and can understand the switching behavior of SCR and about its protection and applications.

CO-3 Graduates gain ability to visualize the concept of converters and can learn to draw the waveforms so that they can understand the voltage and current behavior of converters with different kind of loads.

CO-4 Graduates can understand the concept of half controlled converters with different kind of loads and can learn the concept of power factor improvements techniques.

CO-5 Graduates gain ability to understand the dc to dc converters and their configurations; they can also learn the different kind of commutations techniques.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	1	1						1	1	1	2	
II	1	2	1									1	2	1
III	2	1	1	3	1							1	2	1
IV	1				1						2	2	1	
V	1	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Prepared by:- Pushpendra Foujdar

List of Course Outcomes

CO-1 Graduates gain ability to understand the basics of power System Instrumentation, and understand the Different devices and their characteristics which will help them to differentiate between Accuracy & Precision.

CO-2 Graduates analyze and understand the Analogue instruments and its working and characteristics, and can understand the behavior of instruments and about its applications.

CO-3 Graduates gain ability to visualize the concept of wattmeter's and can learn to calculate different power measurements so that they can understand the voltage and current behavior of instruments

CO-4 Graduates can understand the concept of different electrical quantity measurements like voltage, current, power & energy with different kind of loads and can learn the concept of power factor improvements techniques.

CO-5 Graduates gain ability to understand the Energy meters and Watt meters and Calculation of power & Energy.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE Outcome	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	1	1	3	2	1							1	1	1
IV	2					1					2	2	1	
V	2	1		1						1	1	3	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High

6EE1A MODERN CONTROL THEORY

	List of Course Outcomes
CO-1	Students will learn the basic techniques and principle of modern control theory.
CO-2	Students will be able to analyze systems represented by state-space models in time domain.
CO-3	Principles and techniques of modern control theory help in real time automation of system like SCADA and PLC used in power utilities and other industries.
CO-4	This course will help the student to prepare for various competitive examinations like GATE, and other PSU's
CO-5	Graduates gain ability to design digital controllers and stability analysis of discrete systems.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	1	2	1						1	1	2	3	
II	2	2	1								1	2	1
III	2	1	3	3	1							3	2	1
IV	2			3		1					2	3	2	2
V	3	1		2						1	2	2	2	3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

7PSP

	List of Course Outcomes
CO-1	Graduates analyze the study and importance of power planning, Criteria of National and Regional Planning, structure of P.S., need of planning tools and their significance, Electricity Regulation, Electrical Forecasting, forecasting techniques and their outputs in better forecasting modelling.
CO-2	Graduates analyze the study of generation planning, transmission planning distribution planning and bulk power supply systems, production costing analysis and load forecasting. Dispersed generation.execute production costing analysis like power sector economics and finance and private participation and rural electrification expansion plans in a deregulated environment
CO-3	Graduates gain ability to analyze electric power system reliability and stability, load forecasting, power quality and reliability issues in power system. It aims to arm the students with the concepts of evaluation of generation, transmission and distribution system reliability and their impacts on system planning. Concept of Online power flow studies, state estimation, and computerized management
CO-4	Graduates visualize the concept of Computer aided planning for power system memory management through the use of the hardware and memory and a virtual memory system.. Effect on environment of generation of electrical energy, the greenhouse effect. Requirement of Insulation coordination and Reactive power compensation.
CO-5	Graduates gain ability to understand optimal power system expansion planning : Formulation of least cost optimization problem incorporating the capital, Operating and maintenance cost of candidate plants of different types .

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MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1					3	2	2	3			2	2		2
CO-2			2			1	2		1	1				2
CO-3			1						2				1	
CO-4					1		2	2		2		3		2
CO-5					1	2	1	2		1		3		1

SGP

List of Course Outcomes	
CO-1	Graduates analyze the study of basics of static relays. Graduates will be able to know different types of static over current relays i.e. instantaneous, inverse time and directional over current relays. Provides the knowledge of Static Relays, merits and demerits, amplitude and phase comparators, duality between amplitude and phase comparators.
CO-2	It gives knowledge about different types of Static differential relays and Static distance relays. Provides knowledge of instantaneous, definite time, inverse time and directional over current relays, static differential protection of generator and transformer.
CO-3	Provides practical knowledge of static impedance, reactance and mho relays, effect of power swings on the performance of distance protection, Out of step tripping and blocking relays, mho relay with blinders.
CO-4	Provides knowledge of Electric arc and its characteristics, arc interruption-high resistance interruption and current zero interruption, Arc interruption theories–recovery rate theory and energy balance theory.
CO-5	Provides techniques for Air blast, SF6 and vacuum circuit breakers, Selection of circuit breakers, rating of circuit breakers, transformer differential and transmission line distance protection.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1			2	2	1	2						2	2	
CO-2		2							2			2	1	
CO-3	1	2		2										1
CO-4				1	2	1				1			2	
CO-5			1	1	2	1				1			1	

7EE5A PSE

	List of Course Outcomes
CO-1	Graduates will learn the basics of power system, stability condition of power system.
CO-2	Economic operation of power system makes the whole generating system to operate in
CO-3	This Subject gives the stable operation of operation power system, study of rotor dynamic equation and swing equation, stable operation of power system in transient period.
CO-4	This course gives the brief idea of optimization technique which can be used to implement in various course of electrical engineering.
CO-5	This course finds its application in generation companies along with various power handling companies.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1								1	2		1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PSA

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of Evolution of 3-phase system Admittance Model: Branch and node admittances Equivalent admittance network and calculation of Y bus. Modification of an existing Y bus.
CO-2	Graduates analyze and understand the Technology Drivers, Thevenin's theorem and Z bus. Direct determination of Z bus. Modification of an existing bus. Symmetrical fault Analysis: Transient on a Transmission line, short circuit of a synchronous machine on no load, short circuit of a loaded synchronous machine. Equivalent circuits of synchronous machine under sub transient, transient and steady state conditions
CO-3	Graduates analyze and understand the Fault Analysis: Analysis of single line to ground faults using symmetrical components, connection of sequence networks under the fault condition.
CO-4	Graduates can understand the concept Analysis of line-to-line and double line to ground faults using symmetrical components, connection of sequence networks under fault conditions. Analysis of unsymmetrical shunt faults using bus impedance matrix method
CO-5	Graduates gain ability to Load flow problem, development of load flow equations, bus classificationGauss Seidel, Newton Raphosn, decoupled and fast decoupled methods for load flow analysis. Comparison of load flow methods

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	3				1	1					2		2
II	2	3	2			2					2	3	2	3
III	1	3	3	2		2					2	3	2	3
IV	3	2	3	2	1	1	1					2		
V	2	3	3	3	2	2	3	2			3	3	3	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

	List of Course Outcomes
CO-1	Graduates gain ability to understand the Smart Grid provides significant benefits in terms of its support for bidirectional flow of information both to the appliances and devices inside the customer premise and back to the utility provider using Internet Protocol based communications. "Smart grid" technologies are made possible by two-way communication technologies
CO-2	Graduates analyze and understand the Technology Drivers, Smart energy resources, Smart substations, Substation Automation, Feeder Automation Protection and Control, Distribution Systems
CO-3	Graduates analyze and understand the e advanced technologies include advanced sensors known as Phasor Measurement Units (PMUs) that allow operators to assess grid stability, advanced digital meters that give consumers better information and automatically report outages, relays that sense and recover from faults in the substation automatically, automated feeder switches that re-route power around problems, and batteries that store excess energy and make it available later to the grid to meet customer demand.
CO-4	Graduates can understand the concept Power Quality Management in Smart Grid: Power Quality & EMC in Smart Grid, Power Quality Conditioners for Smart Grid, Web based Power Quality monitoring,
CO-5	Graduates gain ability to understand High Performance Computing for Smart Grid Applications: Local Area Network (LAN), House Area Network (HAN), Wide Area Network (WAN), Broadband over Power line (BPL),

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	2	1	1			1			1	1	1	2	1
II	2	2	1			1	2			1		1	2	2
III	1	1	3	3	1		2					1	2	1
IV	1	1	1			1	1				2	2	1	
V	1	1	2	1			1			1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

8EE1 EHV AC/DC Transmission

List of Course Outcomes	
CO-1	Graduates will learn the basics about the EHV AC and HVDC Transmission
CO-2	In this course students will develop an ability and skill to comprehend the basic principle of extra high voltage of transmission lines, basic idea of turbine speed governing system and the basic idea of HVDC transmission system with different FACTs controller in the power system.
CO-3	This course will help the student to pursue for various postgraduates courses and Research fields associated with electrical engineering.
CO-4	This subject will impart the knowledge for implementation of various issues of EHV AC and HVDC Transmission in power sector and production industries.
CO-5	This course will help the student to prepare for various competitive examinations.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	2	1	3						1	1	2	3	
II	3	2	1									1	2	
III	3	1	3	3	1							1	2	1
IV	2			3		1					2	3	2	3
V	2	1		2						2	2	3	2	2

8EE2A EDTC

	List of Course Outcomes
CO-1	Graduates will learn the basics of ac and dcelectric drives and their control.
CO-2	This subject gives the comparative study of electric and non electric drives with their advantages and disadvantages.
CO-3	This Subject gives the speed control dc motors and different types of braking for dc drives.
CO-4	This Subject gives the speed control ac motors and different types of braking for dc drives.
CO-5	This course finds its application in electric drives companies along with various speed control deice companies.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2				1						2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

	List of Course Outcomes
CO-1	Graduates analyze the study of basics of Power system protection, detecting faults or abnormalities in the electrical energy systems and (2) taking remedial action like tripping of faulty apparatus to minimize damage as well as provide safety to the human life. This function is implemented by a `decision making element' called a relay. A relay can be thought of as a micrprocessor which primarily processes analog current and voltage signals for decision making. The voltage and current signals are derived from transducers called voltage and current transformers. A clear understanding of CTs and VTs and its interaction with relays is a must.
CO-2	It gives knowledge of two important transducers known as Voltage and Current transformers (VT and CT) which scale down the corresponding KV and KA signals to lower voltages and current. The relay element reads these scaled down signals. Faithful replication of the primary side signal is key requirement for successful design of protection system. This calls for a clear understanding of CTs and VTs. This aspect is treated adequately in this course.From a application engineers perspective relays have to set and co-ordinated properly. For this purpose, in this course, we will study sequence components and fault analysis. Relay setting and co-ordination for distance and overcurrent relays will be discussed in sufficient detail.
CO-3	We will introduce the fundamentals of apparatus and system protection. There are three fundamental principles of apparatus protection viz. overcurrent, distance and differential protection. Overcurrent and distance protection is primarily used for feeder and transmission line protection while differential protection is mainly used in bus bar, transformer and generator stator winding protection.
CO-4	Provides knowledge of Importance of redundancy in bus protection. Different bus arrangements and their application like: Single bus single breaker arrangement. Single breaker double bus with bus tie. Double bus double breaker arrangement. Ring bus arrangement. One and a half circuit breaker arrangement. Implementation of differential bus protection using high impedance bus differential relay. Non-linear percentage differential characteristics
CO-5	Provides techniques for feeder and transmission line protection while differential protection. These principles will be introduced by considering first the transmission line/feeder protection problem. On the other hand, system protection is primarily achieved by under frequency, over frequency and rate of change of frequency relays. System protection will be briefly covered in the course.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME		PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1			2	2	2	2						2	2	
CO-2		2							2			2	1	1
CO-3	2	2		2									2	1
CO-4				2	2	1				1			2	
CO-5			1	1	2	1				1			1	

UEP

List of Course Outcomes	
CO-1	Graduates gain ability to understand the basics of electricity uses.
CO-2	Graduates analyze and understand the different types of Lamps and their working principle,Light Calculations.
CO-3	Graduates gain ability to understand about Electrolytic process and their industrial purposes.
CO-4	Graduates can understand the Electric Traction, working of AC and DC locomotive and their comparison.
CO-5	Graduates gain ability to understand the different types of Electric traction srunning and braking of electric Locomotive.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PG-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2			2		1	2							1
II	3	2	2	3		1							1	
III	2	3	2	2									2	
IV	2	2	2										2	
V	3	2	2	2									2	

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

V	1	1				2		1			2	3	1

E4-05 Electrical Machine-II

List of Course Outcomes	
CO-1	Graduates will analyze the general equation of inducted emf of ac machine.
CO-2	Graduates will understand the different types of AC winding used in ac machine.
CO-3	Graduates will learn about Basic principal of Induction Motor and Construction
CO-4	Graduates will learn about the Various methods of starting & speed control of squirrel cage & slip ring motor.
CO-5	Graduates will analyze the OC & SC tests, zero power factor characteristics, potier triangle and ASA method of finding voltage regulation.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1								1	2	
II	2	2	1		1							2	2	2
III	2	1	3	1	1							2	2	1
IV	2					1					1	1	1	
V	2	1	1									2	2	1

6 EE 2 High Voltage Engineering

	List of Course Outcomes
CO-1	Graduate will analyze the Breaking in Solids, liquid and Gas gives basically insulation failure of insulator materials.
CO-2	Graduate will understand the basic concept of Voltage Multiplier which is used to generate High Voltage DC power in power system according to over need.
CO-3	Graduate will compare the Basic wide-band and narrow band Partial Discharge detection circuits provides Nondestructive Insulation Test
CO-4	Graduate will learn about Lighting strokes which increases over voltage on line and it can be studied by lighting phenomena.
CO-5	Graduate will analyze the Lighting Arrester in GSS and Power Plant provided safety to System from Lighting Strokes.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1		1								1	1	
II	2	1	1		1							3	1	1
III	2	1	1	1	1							1	1	
IV	2					1					1	1		
V	2	1	1									2	2	1

8EE4.1 Non-Conventional Energy Sources

List of Course Outcomes	
CO-1	Graduates will be able to becomes aware of power available in nature in forms of solar, Wind, Geothermal.
CO-2	Graduates will be able to become aware of technology to use solar energy which is available free of cost and everywhere, gifted by God.
CO-3	Graduates will be able touse of earth heat energy in steam power plants and reduction in operating cost.
CO-4	Graduates will learn aboutapplication of solar energy in various ways like air or water heating & cooling, space heating
CO-5	Graduates will understand aboutbiomass energy generating plant where we use bio fuels, a best way of utilization of waste materials.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1		1								1	1	
II	2		1		1						1	3	1	1
III	2		1	1	1						2	2	1	
IV	1				1						1	1		
V	2	1	1								1	2	2	1

3EE2-01 CO and Mapping

	List of Course Outcomes
CO-1	The use of Numerical Methods in solving practical technical problems using scientific and Mathematical tools when available, and using experience and intuition otherwise, Mathematical models provide a priori estimates of performance very desirable when prototypes or experiments are costly. Engineering problems frequently arise in which exact analytical solutions are not available. Approximate solutions are normally sufficient for engineering applications, allowing the use of approximate numerical methods.
CO-2	To use Fourier and Laplace transform, to evaluate the transfer function of linear time-invariant systems. Also use to Characterize and analyze the properties of DT signals and compute Z-transform and Fourier transform for DT signals.
CO-3	To explain and understanding of the basic concepts underlying complex analysis.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	2	2						2		1	1	2	1
II	2			2					1			1	2	1
III	2	1		1								1	2	1
IV	2											2	1	
V	2	1	2	2								2	2	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Technical Communication 3EE1-02

	List of Course Outcomes
CO-1	Understand professional writing by studying management communication contexts and genres, researching contemporary business topics, analyzing quantifiable data discovered by researching, and constructing finished professional workplace documents.
CO-2	Recognize, explain, and use the formal elements of specific genres of organizational communication: white papers, recommendation and analytical reports, proposals, memorandums, web pages, wikis, blogs, business letters, and promotional documents.
CO-3	Understand the ethical, international, social, and professional constraints of audience, style, and content for writing situations a.) among managers or co-workers and colleagues of an organization, and b.) between organizations, or between an organization and the public.
CO-4	Understand the current resources (such as search engines and databases) for locating secondary information, and also understand the strategies of effective primary data gathering.
CO-5	Practice the unique qualities of professional rhetoric and writing style, such as sentence conciseness, clarity, accuracy, honesty, avoiding wordiness or ambiguity, using direct order organization, readability, coherence and transitional devices.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	1	1				2		2	2	1	1	2	
II	1	1	1							2		1	2	1
III	1	1								1		1	3	1
IV	1					1		2	2		2	2	3	
V	1	1					2		1			2	3	1

ANIL BHARGAVA 3EE3-04 PGP

COURSE OUTCOMES

List of Course Outcomes			
Course Code	Course Name	Course Outcome	Details
3EE3-04	Power Generation Process	CO-1	Graduates will be analysis to learn the basics about the working of electrical power generation through different power plant and learn about different type of tariff calculation of power consumption.
		CO-2	Graduates will understand about the different method of power factor improvement and its advantages like reduce penalty factor and able to understand the different load curves.
		CO-3	Graduates will understand about the future of non renewable sources, its scope and advantages.
		CO-4	Graduates can the different method of site selection for power plant and he will learn about the installation of different kind of power plants.
		CO-5	Graduates will able to learn the economics of a power plant and can understand how the tariff and annual cost of a power plant can be estimated.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	1								1	1	2		
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Electrical Circuit Analysis 3EE4-05

List of Course Outcomes	
CO-1	Graduates gain ability to understand the basics concept of electrical network's and understand by using the various theorems and their concepts which will help them to determine voltage & current in complex electrical circuit.
CO-2	Graduates analyze and understand the solution of first and second differential equation for series and parallel RL,RC and RLC circuit.
CO-3	Graduates gain ability to visualize the concept of steady state analysis and can learn to draw the phasor diagram so that they can understand the voltage and current behavior.
CO-4	Graduates can understand the concept of Laplace transform with their uses in electrical circuit analysis and can learn the concept of transfer function representation.
CO-5	Graduates gain ability to understand the two port network and their terminal pairs they can also learn the different relationships of two port variables.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1								1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2				1						2	2	1	
V	2	1		1						1		2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

3EE4-07 Electrical Machine-I

	List of Course Outcomes
CO-1	Graduates will understand about the Electromechanical energy principal that helps us to make how energy is converted from electrical to mechanical and vice versa
CO-2	Graduates will able to analyze the design of DC Generator model in case of different types of Generator.
CO-3	Graduates will learn about Electromechanical energy principal which helps to make study about physical aspects and phenomenon of energy conversion and energy balance equation.
CO-4	Graduates can apply to identify, formulates, and Select Which Types Machine is to be used for Different application.
CO-5	Graduates will be able to learn the Construction, type, emf Equation of a Transformer at Load and No – load Condition

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	2	1								1	2	
II	2	2										2	2	2
III	2	1	2	1	1							2	2	1
IV	2					1					1	1	1	
V	2	1	1	1								2	2	1

Program Specific Outcome

Department has specifically defined few objectives of this program which make students realize the fact that the knowledge and techniques learnt in this course has direct implication for the betterment of society and its sustainability.

PSO.1 Graduates will understand the design building blocks of real time applications and automations by using modern engineering tools and multidisciplinary concepts.

PSO.2 Graduates will adopt the new methodologies as smart grid to resolve power system complexities, which can improve the efficiency of the power system

MAPPING OF PROGRAM EDUCATIONAL OBJECTIVE WITH PROGRAM OUTCOMES ANS PSO

PEO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1	3	1				2						2	1
II	1	2	2		1									3
III		2	2	2	3		3				2		1	1
IV	1				2		1	1		2	3	1		
V	1	1			2			1	2	1		3	1	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Name - Bhawana Sharma

Sub. - Biology (EE)

List of Course Outcomes

CO-1	Graduates gain ability to understand the significance of Biology as all other scientific disciplines. Distinguish and classify the living forms on the basis of their characters.
CO-2	Students will be able to link the biological aspects into engineering applications.
CO-3	By this course they may able to utilize the knowledge for minimizing and solving several environmental problems like land and water pollution.
CO-4	It will benefit engineers to design advanced instruments or devices and software to be used in health care.
CO-5	Certain computer simulation and electrical circuits can be designed to test the effect of new drug therapies without experimenting them on living organisms.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I		2	2	2		2	3				2			
II		1			2	2	2				2	1		
III							3							
IV		2					2				3			
V		2				2	3				2			

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Electronic Measurement & Instrumentation 4EE3-04

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of Electronic Measurement & Instrumentation and understand the Different Instruements and their characteristics which will help them to visualize the errors.
CO-2	Graduates analyze and understand the Instruments analysis and its applications which are used in Measurement system i.e. PMMC, MI, EMMC etc.
CO-3	Graduates gain ability to visualize the concept of Electronic Measurement & Instrumentation and can learn to calculate different energy measurements so that they can understand the behavior of Electronic Measurement & Instruments.
CO-4	Graduates can understand the concept of different electrical quantity measurements like voltage, current, power & energy with different kind of characteristics and Magnetic field intensity and can learn the concept of calculation techniques..
CO-5	Graduates gain ability to understand the different types of error accuracy, precision.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

4EE4-05 Electrical Machine-II

List of Course Outcomes	
CO-1	Graduates will analyze the general equation of inducted emf of ac machine.
CO-2	Graduates will understand the different types of AC winding used in ac machine.
CO-3	Graduates will learn about Basic principal of Induction Motor and Construction
CO-4	Graduates will learn about the Various methods of starting & speed control of squirrel cage & slip ring motor.
CO-5	Graduates will analyze the OC & SC tests, zero power factor characteristics, potier triangle and ASA method of finding voltage regulation.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1								1	2	
II	2	2	1		1							2	2	2
III	2	1	3	1	1							2	2	1
IV	2					1					1	1	1	1
V	2	1	1									2	2	1

4EE4-06: POWER ELECTRONICS   ANIL BHARGAVA

List of Course Outcomes	
CO-1	Graduates gain ability to understand the basics of power electronics, and understand the semiconductor devices and their characteristics which will help them to differentiate between devices and components.
CO-2	Graduates gain ability to visualize the concept of converters and can learn to draw the waveforms so that they can understand the voltage and current behavior of converters with different kind of loads.
CO-3	Graduates can understand the concept of buck converter with different kind of loads and can learn the concept of power factor improvements techniques.
CO-4	Graduates can understand the concept of boost converter with different kind of loads and can learn the concept of power factor improvements techniques.
CO-5	Graduates gain ability to understand the voltage source inverter and their configurations; they can also learn the different kind of commutations techniques.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1									1	2	
II	2	2										1	2	1
III	2	1	3	2	1							1	1	1
IV	2					1					2	1	1	
V	2	1		1					1		2	2		1

PE 5EE1A ANIL BHARGAVA

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of power electronics, and understand the semiconductor devices and their characteristics which will help them to differentiate between devices and components.
CO-2	Graduates analyze and understand the SCR and its working and characteristics, and can understand the switching behavior of SCR and about its protection and applications.
CO-3	Graduates gain ability to visualize the concept of converters and can learn to draw the waveforms so that they can understand the voltage and current behavior of converters with different kind of loads.
CO-4	Graduates can understand the concept of half controlled converters with different kind of loads and can learn the concept of power factor improvements techniques.
CO-5	Graduates gain ability to understand the dc to dc converters and their configurations; they can also learn the different kind of commutations techniques.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1								1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1		2	2	1

5EE3A CONTROL SYSTEM

	List of Course Outcomes
CO-1	Graduates gain ability to describe basic components of feedback control system, formulate mathematical models of physical systems and represent them in block diagram and signal flow graph.
CO-2	Graduates analyze the time domain specifications, Analyze first order and second order system in time domain.
CO-3	Graduates gain ability to understand the concept of stability, Analyze stability of the system from transfer functions approach and graphical methods.
CO-4	Graduates gain ability to visualize the concept of bode plot,Nyquist Plot .These graphical plots provides significant insight into the analysis and design of control systems.
CO-5	Graduates gain ability to design controller, compensators.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	2	3	
II	2	2	1									1	2	
III	2	1	3	3	1							1	2	1
IV	3			3		1					2	2	2	2
V	2	1		2						1	2	2	2	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of power electronics, and understand the semiconductor devices and their characteristics which will help them to differentiate between devices and components.
CO-2	Graduates analyze and understand the SCR and its working and characteristics, and can understand the switching behavior of SCR and about its protection and applications.
CO-3	Graduates gain ability to visualize the concept of converters and can learn to draw the waveforms so that they can understand the voltage and current behavior of converters with different kind of loads.
CO-4	Graduates can understand the concept of half controlled converters with different kind of loads and can learn the concept of power factor improvements techniques.
CO-5	Graduates gain ability to understand the dc to dc converters and their configurations; they can also learn the different kind of commutations techniques.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	2	1	1						1	1		2	
II	2	1	1										2	1
III	2	1	2	3	1							2	2	3
IV	3				1						2	3	1	
V	2	2		3						2	2	1	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

6EE1A MODERN CONTROL THEORY

	List of Course Outcomes
CO-1	Students will learn the basic techniques and principle of modern control theory.
CO-2	Students will be able to analyze systems represented by state-space models in time domain.
CO-3	Principles and techniques of modern control theory help in real time automation of system like SCADA and PLC used in power utilities and other industries.
CO-4	This course will help the student to prepare for various competitive examinations like GATE, and other PSU's
CO-5	Graduates gain ability to design digital controllers and stability analysis of discrete systems.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	1	2	1						1	1	2	3	
II	2	2	1									1	2	1
III	2	1	3	3	1							3	2	1
IV	2			3		1					2	3	2	2
V	3	1		2						1	2	2	2	3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

6 EE 2 High Voltage Engineering

	List of Course Outcomes
CO-1	Graduate will analyze the Breaking in Solids, liquid and Gas gives basically insulation failure of insulator materials.
CO-2	Graduate will understand the basic concept of Voltage Multiplier which is used to generate High Voltage DC power in power system according to over need.
CO-3	Graduate will compare the Basic wide-band and narrow band Partial Discharge detection circuits provides Nondestructive Insulation Test
CO-4	Graduate will learn about Lighting strokes which increases over voltage on line and it can be studied by lighting phenomena.
CO-5	Graduate will analyze the Lighting Arrester in GSS and Power Plant provided safety to System from Lighting Strokes.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1		1								1	1	
II	2	1	1		1							3	1	1
III	2	1	1	1	1							1	1	
IV	2					1					1	1		
V	2	1	1									2	2	1

Subject Name : SMART GRID TECHNOLOGY

Subject Code : 6EE5A

	List of Course Outcomes
CO-1	Graduates gain ability to understand the Smart Grid provides significant benefits in terms of its support for bidirectional flow of information both to the appliances and devices inside the customer premise and back to the utility provider using Internet Protocol based communications. "Smart grid" technologies are made possible by two-way communication technologies,
CO-2	Graduates analyze and understand the Technology Drivers, Smart energy resources, Smart substations, Substation Automation, Feeder Automation Protection and Control, Distribution Systems
CO-3	Graduates analyze and understand the e advanced technologies include advanced sensors known as Phasor Measurement Units (PMUs) that allow operators to assess grid stability, advanced digital meters that give consumers better information and automatically report outages, relays that sense and recover from faults in the substation automatically, automated feeder switches that re-route power around problems, and batteries that store excess energy and make it available later to the grid to meet customer demand
CO-4	Graduates can understand the concept Power Quality Management in Smart Grid: Power Quality & EMC in Smart Grid, Power Quality Conditioners for Smart Grid, Web based Power Quality monitoring,
CO-5	Graduates gain ability to understand High Performance Computing for Smart Grid Applications: Local Area Network (LAN), House Area Network (HAN), Wide Area Network (WAN), Broadband over Power line (BPL),

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I			1				2			1	1	1	2	
II			3	1	2	3	3					1	2	2
III	1		2	1	2	3	2					1	2	2
IV			2	3		2					2	2		
V		1			3	1				1	1	2	2	3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Subject Name : Power system analysis
Subject Code : 7EE2

	List of Course Outcomes
CO-1	Graduates gain ability to understand the basics of Evolution of 3-phase system Admittance Model: Branch and node admittances Equivalent admittance network and calculation of Y bus. Modification of an existing Y bus.
CO-2	Graduates analyze and understand the Technology Drivers, Thevenin's theorem and Z bus. Direct determination of Z bus. Modification of an existing bus. Symmetrical fault Analysis: Transient on a Transmission line, short circuit of a synchronous machine on no load, short circuit of a loaded synchronous machine. Equivalent circuits of synchronous machine under sub transient, transient and steady state conditions
CO-3	Graduates analyze and understand the Fault Analysis: Analysis of single line to ground faults using symmetrical components, connection of sequence networks under the fault condition.
CO-4	Graduates can understand the concept Analysis of line-to-line and double line to ground faults using symmetrical components, connection of sequence networks under fault conditions. Analysis of unsymmetrical shunt faults using bus impedance matrix method
CO-5	Graduates gain ability to Load flow problem, development of load flow equations, bus classification Gauss Seidel, Newton Raphosn, decoupled and fast decoupled methods for load flow analysis. Comparison of load flow methods

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	3				1	1					2		2
II	2	3	2			2			2		2	3	2	3
III	1	3	3	2		2			2	2	2	3	2	3
IV	3	2	3	2	2	1	1			1		2		
V	2	3	3	3	3	2	3	2	3	2	3	3	3	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

8EE4.1 Non-Conventional Energy Sources

	List of Course Outcomes
CO-1	Graduates will be able to becomes aware of power available in nature in forms of solar, Wind, Geothermal.
CO-2	Graduates will be able to become aware of technology to use solar energy which is available free of cost and everywhere, gifted by God.
CO-3	Graduates will be able to use of earth heat energy in steam power plants and reduction in operating cost.
CO-4	Graduates will learn about application of solar energy in various ways like air or water heating & cooling, space heating
CO-5	Graduates will understand about biomass energy generating plant where we use bio fuels, a best way of utilization of waste materials.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1		1								1	1	
II	2		1		1						1	3	1	1
III	2		1	1	1						2	2	1	
IV	1					1					1	1		
V	2	1	1								1	2	2	1

List of Course Outcomes	
CO-1	Graduates will learn the basics of power system, stability condition of power system.
CO-2	Economic operation of power system makes the whole generating system to operate in
CO-3	This Subject gives the stable operation of operation power system, study of rotor dynamic equation and swing equation, stable operation of power system in transient period.
CO-4	This course gives the brief idea of optimization technique which can be used to implement in various course of electrical engineering.
CO-5	This course finds its application in generation companies along with various power handling companies.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1					2	2	1	
V	2	1		1						1	1	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

8EE1 EHV AC/DC Transmission

	List of Course Outcomes
CO-1	Graduates will be able to learn the basics about the extra high voltage transmission system,and power handling capacity of transmission lines.
CO-2	Graduates will be able to calculate corona loss and effect of corona in ehv and will learn about advantages of bundle conductors
CO-3	Graduates will understand about flexible ac transmission system and will learn about statcom unified power flow controller.
CO-4	Graduates will be able to understand about the load sharing between parallel operating generators
CO-5	Graduates can apply different methods for control of power system.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	1		1								1	1	
II	2		1		1						1	3		1
III	2	2	1	1							1	2	1	
IV	1					1					1	1		
V	1	1	1								1	2	1	1

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Estd. 2005

Department of Mechanical Engineering

PROGRAM EDUCATION OBJECTIVES AND OUTCOMES

(1) Program Description: To offer high quality education in the field of Engineering and to prepare students abreast of latest global industrial and research requirements and fulfill responsibility towards community.

(2) Program Education Objective:

I. **Preparation**: To prepare undergraduate students with appropriate blend of theoretical foundations, experimentation & technical implementation to comprehend and pinpoint problems in the field of Engineering to excel in under-graduate programs or to succeed in industry / technical profession.

II. **Core competence**: To provide students with a solid foundation in mathematical, scientific and engineering fundamentals required to solve engineering problems and also to pursue higher studies. Student will be able to employ his knowledge along with necessary techniques & tools for modern engineering applications.

III. **Breadth**: To train students with good scientific and engineering breadth so as to comprehend, analyze, design, and create novel products and solutions for the real life problems in the present system.

IV. **Professionalism:** To inculcate in students professional and ethical attitude, Communication Skills, teamwork Skills, computer programming skill and an ability to relate engineering issues to broader social context.

V. **Learning Environment**: To provide student with an academic environment aware of excellence, leadership, and the life-long learning needed for a successful professional career through independent studies, thesis, internships etc.

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Estd. 2005

Program Outcomes

PO-1 Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Engineering to be able to solve complex engineering problems.

PO-2 Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO-3 Design/Development of solutions: Design solutions for Pcomplex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO-4 Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO-5 Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to computer science related complex engineering activities with an understanding of the limitations.

PO-6 The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO-7 Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO-8 Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9 Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

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Estd. 2005

PO-10 Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO-11 Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.

PO-12 Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

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Estd. 2005

Program Specific Outcome

Department has specifically defined few objectives of this program which make students realize the fact that the knowledge and techniques learnt in this course has direct implication for the betterment of society and its sustainability.

PSO-1 The graduate will be able to work in power plant ,automobile industries , and manufacturing industries in sphere of Operation, Maintenance and Design with the help of CAD/CAM tool while ensuring best manufacturing practices .

PSO-2 The graduate will be able to inculcate their skill and knowledge in the domain of thermal and fluid sciences to reduce the complexity of mechanical engineering by utilizing advanced technology.

DEPARTMENT OF MECHANICAL ENGINEERING

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MAPPING OF PROGRAM EDUCATION OBJECTIVE WITH PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

PEO	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	3	2	3	2							2	2	2
II	3	3	3	3	3	1	1					2	3	
III	3	3	3	3	3	1						3	1	1
IV						2	2	3	3	3	3	1		
V	1		1	1		3	3	2	3	2	2	3		

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

(AEM-I) 3ME2-01

	List of Course Outcomes
CO-1	The use of Numerical Methods in solving practical technical problems using scientific and Mathematical tools when available, and using experience and intuition otherwise, Mathematical models provide a priori estimates of performance very desirable when prototypes or experiments are costly.
CO-2	Engineering problems frequently arise in which exact analytical solutions are not available. Approximate solutions are normally sufficient for engineering applications, allowing the use of approximate numerical methods.
CO-3	To use Fourier series and Fourier transform, to evaluate the transfer function of linear time-invariant systems. Also use to Characterize and analyze the properties of CT and DT signals.
CO-4	To use Laplace transform, to evaluate the transfer function and convergence of time domain to frequency domain of signal and systems. Also use to Characterize and analyze the properties of CT signals.
CO-5	To use the Z-transform and its properties for DT signals and relation between CT and DT signal/ system for various transformation method.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	2	2						2		1		2	1
II	3			2					1			1		1
III	2	1		1								1	2	1
IV	2											2	1	
V	2	1		2								2		2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Estd. 2005

Subject Name: Engg. Mechanics (3ME3-04)

	List of Course Outcomes
CO-1	The student will be able to model physical structures and processes with calculus based techniques and produce a solution (either analytical or numerical).
CO-2	The student will be able to synthesize Newtonian Physics with static analysis to determine the complete load impact (net forces, shears, torques, and bending moments) on all components (members and joints) of a given structure with a load.
CO-3	The student will be able to Apply fundamental concepts of kinematics and kinetics of particles and rigid bodies to the analysis of simple, practical problems
CO-4	Student will learn to apply laws of mechanics to determine efficiency of simple machines with consideration of friction. Analyse statically determinate planar frames. Analyse the motion and calculate trajectory characteristics.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOMES	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	3	2	1								2	3
CO-2	2	3	2	3	2								2	3
CO-3		3		3									2	3
CO-4	2	2	2	2	2							3	2	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Estd. 2005

SUB- ENGINEERING THERMODYNAMICS (3ME4-05)

List of Course Outcomes	
CO1	Understand the concepts of continuum, system, control volume, thermodynamic properties, thermodynamic equilibrium, work and heat.
CO2	Apply the laws of thermodynamics to analyze boilers, heat pumps, refrigerators, heat engines, compressors and nozzles.
CO3	Evaluate the performance of steam power cycles.
CO4	Evaluate the available energy and irreversibility.
CO5	Evaluate properties of pure substances and gas mixtures.
CO6	Analyze air standard cycles applied in prime movers.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	3	3	3	2	1	2	1	2			2	2	
CO-2	3	3	2	3	3	1	2		2			2		
CO-3	3	2	1	2	1	1	1		2			2		3
CO-4	3	3	3		1	1	1		2			2	2	3
CO-5	3	3	1	3	1	1	2		2			2	2	3
CO-6	3	3	1	3	2	1	2		1			2	2	

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Estd. 2005

SUB- MATERIAL SCIENCE AND ENGINEERING (3ME4-06)

	List of Course Outcomes
CO1	Understand the crystal structure and classification of materials.
CO2	Understand methods of determining mechanical properties and their suitability for applications.
CO3	Classify cast irons and study their applications.
CO4	Interpret the phase diagrams of materials.
CO5	Select suitable heat-treatment process to achieve desired properties of metals and alloys.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	3	2	1	2		1					1		2
CO-2	2	3	2	1	2		1					1	1	2
CO-3	2	3	1	1	1		3					1	1	2
CO-4	2	3	1	1	2		1					1		2
CO-5	2	3	2	1	2		3					1		2

Note: Correlation levels 1, 2 or 3 as defined below:
1. Slight (Low) 2. Moderate (Medium) 3: Substantial (High)

SUB- Mechanics of Solids (3ME4-07)

List of Course Outcomes	
CO1	Understand statically determinate and indeterminate problems.
CO2	Determine the resistance and deformation in members subjected to axial, flexural and torsional loads.
CO3	Evaluate principal stresses, strains and apply the concept of failure theories for design.
CO4	Analyze and design thin, thick cylinders and springs.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	3	2	1			2					1	2	3
CO-2	3	3	2	2			2					1	2	
CO-3	3	3	2	1			2					1	2	3
CO-4	3	3	3	1			2					1	2	2

Subject Name : Managerial Economics and Financial Accounting

Subject Code : 3CS1-03 / 4ME1-03

	List of Course Outcomes
CO-1	Graduates gain ability to apply the knowledge of managerial and economic concepts and ability to apply the tools and techniques.
CO-2	Ability to understand the demand and supply analysis and to Know the implementation of demand forecasting methods for production decisions and cost analysis.
CO-3	Ability to understand the types of markets and pricing methods and to understand the techniques regarding the long term investment decisions.
CO-4	Ability to understand the application of various ratios in order to know the firm's financial position in depth and to understand different techniques of capital budgeting.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOME	PROGRAM OUTCOME											
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO-1	1	2	2	3	1	1	3	1	2	2	3	3
CO-2	2	2	1	3	3	3	2	3	3	2	3	3
CO-3	1	1	2	2	1	3	3	2	2	2	3	3
CO-4	2	2	3	2	2	1	1	1	2	2	3	3

Note: Correlation levels 1, 2 or 3 as defined below:
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Estd. 2005

4ME3-04 – Digital Electronics Engineering

List of Course Outcomes	
CO-1	Student will be able to acquire basic knowledge on the working of various semi-conductor devices
CO-2	Student will be able to develop competence in linear and nonlinear Op-amp circuit analysis
CO-3	Student will be able to understand the basic concepts of AM and FM signals
CO-4	Student will study various type of oscillators and timing circuits.
CO-5	Student will be able to analyze, build, and troubleshoot combinatorial circuits using digital integrated circuits

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OBJECTIVE	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3											3	2	
CO-2		3	3										2	
CO-3						3							2	
CO-4											3	3	2	

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

DEPARTMENT OF MECHANICAL ENGINEERING

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Estd. 2005

SUB:- FLUID MECHANICS AND FLUID MACHINES(4ME4-05)

COURSE OUTCOME

Course Outcomes: At the end of the course, the student will be able to:

CO1	Apply conservation laws to fluid flow problems in engineering applications.
CO2	Design experimental procedure for physical model studies
CO3	Design the working proportions of hydraulic machines.
CO4	Compute drag and lift coefficients using the theory of boundary layer flows.
CO5	Analyze and design free surface and pipe flows
CO6	Formulate and solve one dimensional compressible fluid flow problems

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	2		3					1			1	2	
CO-2	2	2	2	3					1			1		2
CO-3			1	3										2
CO-4	2	2	2	3	1				1			1	1	
CO-5	2	2	2	3	2				1			1	1	3

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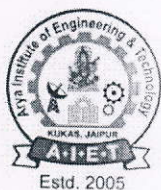
Estd. 2005

SUB- MANUFACTRING PROCESS(4ME4-06)

	List of Course Outcomes
CO1	Select materials, types and allowances of patterns used in casting and analyze the components of moulds.
CO2	Design core, core print and gating system in metal casting processes
CO3	Understand arc, gas, solid state and resistance welding processes.
CO4	Develop process-maps for metal forming processes using plasticity principles
CO5	Identify the effect of process variables to manufacture defect free products.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	1	1	1	1	1	1					1	1	2	
CO-2	3	3	1	1	1	1					1	1	2	
CO-3	2	2	2	2			1				1	1	2	2
CO-4	3	3	3	2	2	2					1	1	2	
CO-5	3	3	2	2	1		1				1	1		3

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SUBJECT: THEORY OF MACHINES

CODE:4ME4-07

	List of Course Outcomes
CO-1	Students will be Understand the principles of kinematic pairs, chains and their classification, DOF, inversions, equivalent chains and planar mechanisms.
CO-2	Students will be able to determine the appropriate parameters for stability of a vehicle using the concept of gyroscopic action.
CO-3	Student will be able to understand fundamentals of gear theory which will be the prerequisite for gear box design.
CO-4	Student will be able to Demonstrate basic concepts of balancing of forces and couples and analyzing the cam and follower for specified motion profile

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUT COME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	1	2	1		1	1						2	
CO-2		2	3			1						1	2	
CO-3		3		3		2	1						2	
CO-4	2						1						2	3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

DEPARTMENT OF MECHANICAL ENGINEERING

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Estd. 2005

SUB- HEAT TRANSFER (5ME1A)

List of Course Outcomes	
CO1	Understand the basic modes of heat transfer.
CO2	Compute temperature distribution in steady-state and unsteady-state heat conduction.
CO3	Understand and analyse heat transfer through extended surfaces.
CO4	Interpret and analyze forced and free convection heat transfer.
CO5	Understand the principles of radiation heat transfer .
CO6	Design heat exchangers using LMTD and NTU methods

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	2	2	2	1						1	1	
CO-2	3	2	2	2	1	1						1	2	2
CO-3	2	3	2	2	1	1	1					1	2	2
CO-4	2	3	2	2	1	1	1					1	2	2
CO-5	3	2	2	1	1	1	1					1		
CO-6	3	2	2	2	1	1						1		3

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Estd. 2005

SUBJECT: DYNAMICS OF MACHINES

CODE: 5ME2A

List of Course Outcomes	
CO-1	Students will be able to apply engineering principle of mechanics to design motion transmission devices and flywheels.
CO-2	Students will be able to determine the appropriate parameters for stability of a vehicle using the concept of gyroscopic action.
CO-3	Student will be able to understand fundamentals of gear theory which will be the prerequisite for gear box design.
CO-4	Student will be able to Demonstrate basic concepts of balancing of forces and couples and solutions to balancing problems of machines

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUT COME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	1	2	1		1	1						2	
CO-2		2	3			1						1	2	
CO-3		3		3		2	1						2	
CO-4	2						1						2	3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

DEPARTMENT OF MECHANICALENGINEERING

SUB- Measurements and Metrology (5ME3A)

	List of Course Outcomes
CO1	Estimate errors and uncertainty in measurements using statistical analysis.
CO2	Understand working principles in the measurement of field quantities.
CO3	Identify sensors for measurement of vibration, thermo-physical properties and radiation properties of surfaces.
CO4	Understand the conceptual development of zero, first and second order systems.
CO5	Interpret International Standards of measurements (ITS-90) and identify Internationally accepted measuring standards for measurands.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	3		1	3				2			2	2	
CO-2	1	3	1	1	2				2			2	2	
CO-3	2	3	1	2	3				3			2	2	1
CO-4	3	3		1	2				2			2	2	1
CO-5		3	1	1	2	1		1	1			1		

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Estd. 2005

Subject : Quality Assurance & Reliability

Code : 5ME4A

	List of Course Outcomes
CO-1	Graduates gain ability to improve quality and can estimate parameters of any process.
CO-2	Graduates can analyze the quality by using control charts.
CO-3	Graduates gain ability to accept or reject the lot of production by sampling plans.
CO-4	Graduates gain ability estimate the useful life of the product by using life testing methods and can able to analyze & increase the reliability of product.

Mapping with POs

COURSE OUTCOME	PROGRAM OUTCOME												PSO-01	PSO-02
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12		
CO-1	2	3	3	2	2	2					1	1	3	
CO-2	1	2	2			3	1			2			2	
CO-3		2		2	2		3	2	2		1	3		2
CO-4		1												2

Department of Mechanical Engineering

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Subject: SEE [SMESA]

COURSE OUTCOMES

1. To teach students the concepts, theories, and methods of the behavioral and social services.

2. To introduce students to the basic social processes of society, social institutions and patterns of social behavior.

3. To train students to understand and to interpret objectively the role of social processes, social institutions and social interactions in their lives.

4. To enable students to cope effectively with the socio-cultural and interpersonal processes of a constantly changing complex society.

5. To train students for positions in criminal justice, gerontology, social science and social welfare.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2					3		3				2	1	1
CO-2						3		3				2		
CO-3						3		3				1		
CO-4						3		3				2		
CO-5						3	3	3						

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

DEPARTMENT OF MECHANICAL ENGINEERING

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SUB- AUTOMOBILE ENGINEERING (5ME6.2A)

	List of Course Outcomes
CO-1	Understand the basic lay-out of an automobile.
CO-2	Understand the operation of engine cooling, lubrication, ignition, electrical and air conditioning systems.
CO-3	Understand the principles of transmission, suspension, steering and braking systems.
CO-4	Understand automotive electronics.
CO-5	Study latest developments in automobiles.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	1		2	3	3	3	1		1	2	2	1	1	
CO-2	2	3	2	3	3	3	3	1				1		2
CO-3	3	2	3	2	3	1	3	1	1			2	1	1
CO-4	4	3	3	3	3	1	3		1	1	1		1	
CO-5	5	3	3	3	3	3	3			1	1	1		2

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Estd. 2005

SUB- DESIGN OF MACHINE ELEMENT -2 (6ME1A)

	List of Course Outcomes
CO-1	Understand the concepts of principal stresses, theories of failure, stress concentration and fatigue loading.
CO-2	Design shafts, couplings and gears.
CO-3	Analyze the pressure distribution and design journal bearings.
CO-4	Design belts, springs, brakes, clutches and engine parts.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	3	2	2	1			2				2	2	
CO-2	3	3	2	2	2			2				2		1
CO-3	3	3	2	3	2							2	2	2
CO-4	3	3	3	2	2							2	2	

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Estd. 2005

SUB- NEWER MACHINING METHODS (6ME2A)

	List of Course Outcomes
CO1	Understand abrasive and electrical discharge machining processes.
CO2	Understand principles and applications of electron beam, ion beam and laser hybrid welding processes.
CO3	Understand the relation between the process parameters and mechanical properties.
CO4	Understand forming process for thin sections
CO5	Understand the principles and applications of friction stir welding processes

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	2	2	1							1	2	
CO-2	3	2	2	2	1							1	2	
CO-3	2	3	2	1	1	1						1	2	
CO-4	2	3	2	1	1	1	1					1	2	
CO-5	3	3	2	1	1	1	1					1		

Subject Name: Mechatronics
Code: 6ME3A

List of Course Outcomes

CO-1	Graduates gain ability to understand basic knowledge about Mechatronics and its application.
CO-2	Graduates learn about different types of Sensors and its application in intelligent manufacturing processing.
CO-3	Thorough understanding of frequency domain analysis of discrete time signals and its uses in Mechatronics.
CO-4	Graduates learn about different component such as transducer, sensor, A/D converter, D/A converter etc and its uses in Data acquisition.
CO-5	Graduates gain knowledge about Home appliances, design of aeroplane and helicopter, ABS (anti lock braking system) and other areas in automotive engineering.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

COURSE OUTCOMES	PROGRAM OUTCOMES											
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO-1	3	1	1	1							1	3
CO-2	3	2	2	1	2						1	3
CO-3	3	3	3	3	2						1	3
CO-4	3	2	2	2	3						1	3
CO-5	3	1	3	3	3						3	3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

SUB- VIBRATION ENGINEERING (6ME4A)

List of Course Outcomes	
CO1	Understand the causes and effects of vibration in mechanical systems.
CO2	Develop schematic models for physical systems and formulate governing equations of motion.
CO3	Understand the role of damping, stiffness and inertia in mechanical systems
CO4	Analyze rotating and reciprocating systems and compute critical speeds.
CO5	Analyze and design machine supporting structures, vibration isolators and absorbers.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	3	1	1	2		1					2	2	
CO-2	3	3	3	1	1							2	2	2
CO-3	3	2	2	1	1							2	2	2
CO-4	3	3	2	2	2							2	2	
CO-5	3	3	2	3	3		3					3		3
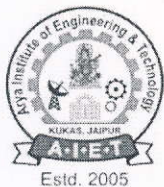
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SUBJECT: STEAM ENGINEERING

CODE: 6ME5A

	List of Course Outcomes
CO-1	Students will be able to understand the types of boiler, mountings and accessories
CO-2	Students will able to analyze different types of steam cycles and estimate efficiencies in a steam power plant.
CO-3	Students will able to List types, principles of operations, components and applications of steam turbines, steam generators, condensers, feed water and circulating water systems.
CO-4	Student will be able to relate the problems in designing of steam power plant and turbines.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUT COME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	1	2	1									2	
CO-2		2	3			1						1	2	
CO-3		3		1		2	1						2	
CO-4	2		3				1		1				2	3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

DEPARTMENT OF MECHANICALENGINEERING

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Estd. 2005
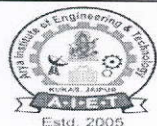
6ME3A – Maintenance Management

List of Course Outcomes

CO-1	Student will be able to analyze how maintenance best practices contribute to the attainment of business goals and objectives and he can describe the operating context of maintenance and outline the history of maintenance and the evolution of maintenance strategies.
CO-2	Student will be able to define the application of a preventive maintenance strategy. Includes : Maintenance & Operation coordination, Work Management process, Shutdown Management, Computerized Maintenance Management Systems, Routine Scheduled Maintenance, Functional Integration, Essential Care.
CO-3	Student will be able to understand the application of a predictive maintenance strategy. Includes ; OEE, Trade flexibility and Skills development, autonomous Maintenance, RCM in overview, Condition Monitoring and failure prevention in overview.
CO-4	Student will be able to explain outline the principles of Reliability Centered Maintenance (RCM). Apply a structured decision Logic to FMECA results to appropriate maintenance tactics.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE Outcomes	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	1		2	1			3	2				2	2	
CO-2		1		2		2			3	2				2
CO-3	1	2		2	3								2	
CO-4						3		2				2		3

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Estd. 2005

SUB:- FINITE ELEMENT METHODS (7ME1A)

COURSE OUTCOME

Students who successfully complete this course will have demonstrated an ability to:

CO1	Apply finite element method to solve problems in solid mechanics, fluid mechanics and heat transfer.
CO2	Formulate and solve problems in one dimensional structures including trusses, beams and frames.
CO3	Formulate FE characteristic equations for two dimensional elements and analyze plain stress, plain strain, axi-symmetric and plate bending problems.
CO4	Implement and solve the finite element formulations using MATLAB.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	2			3				1	1		1	2	
CO-2	3	3	1	1	3								2	
CO-3	3	3	1	1	3								3	1
CO-4	1	2			3		2					2	3	1
CO-5	2	2			3				1	1		1	2	

SUB- REFRIGERATION AND AIR CONDITIONING (7ME2A)

List of Course Outcomes	
CO-1	Understand the principles and applications of refrigeration systems.
CO-2	Understand vapour compression refrigeration system and identify methods for performance improvement.
CO-3	Study the working principles of air, vapour absorption, thermoelectric and steam-jet refrigeration systems.
CO-4	Analyze air-conditioning processes using the principles of psychrometry.
CO-5	Evaluate cooling and heating loads in an air-conditioning system.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	1	3	3	1		1	2	1	1			2	2	
CO-2	2	3	1	1	2				2			2	1	1
CO-3	1	3	1	2	2				3			2	2	2
CO-4	2	3		1	2				2			2	1	
CO-5		3	1	1	2	1		1	1			1		2

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Estd. 2005

SUB:- OPERATION RESEARCH(7ME3A)

List of Course Outcomes	
CO-1	Student will be able to define & formulate the Linear Programming problem, utilization of Simplex method, Graphical method, Identify the Transportation problem to compile the least transportation cost, Solve & design the Assignment problem to assign the jobs to the workers on individual basis to complete the job in required time.
CO-2	Student will be able to Reproduce the items that deteriorate with time using replacement policy, predict the age of the items which requires replacement either with value of money counted or not. Justify and resolve the items that fail suddenly using individual or group replacement techniques.
CO-3	Student will be able to design different optimal strategies to win the game, justify the games using minimax or maximini principles to complete the value of the game using saddle point or dominance method of optimal strategies.
CO-4	Student will be able to define inventory model and different stocks and their computations. Distinguish between deterministic inventory controls models with real world of inventory models termed as probabilistic inventory models.
CO-5	Student will be able to differentiate between analytical and simulation modesls, using Monte Carlo simulation technique for solving various types of problem & Design best solution using computer languages for simulatation.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	3	2	2	1		2		2	2	1	1	2	
CO-2	2	2	3	2		2	2		2	2	1	1	2	
CO-3	2	3		2	1			3	2	1	2	1	2	
CO-4	3	3			1	1			2	2	2	1	2	
CO-5	2	2	3	3	3	2	3	2	3	2	3	2		2

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Estd. 2005

Subject Name : Turbo Machine

Code : 7ME4A

List of Course Outcomes	
CO-1	Explain the working principles of turbo machines and apply it to various types of machines and able to apply dimensional analysis in hydraulic machines.
CO-2	Determine the off-design behavior of turbines and compressors and relate it to changes in the velocity triangles and also able to make operating characteristic curve regarding compressors.
CO-3	Match a pump to a system and discuss various solutions of pump matching from a sustainability point-of-view.
CO-4	Student will be able to explain features and characteristics of practical turbine cycle and also explain different types of aerodynamic engines and will able to explain how they were improve the efficiency of turbo machines.
CO-5	Recognize and discuss today's and tomorrow's use of turbomachines for enabling a sustainable society and able to calculate the efficiency of turbines.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	1	1	1		1	1			1		2	2	
CO-2	3	1	3			1				1		2	2	
CO-3		1					3			1		2	2	
CO-4	2		1		2		1			1		2	2	
CO-5	2		3			1				1		2		2

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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7ME5A Operation Management

	List of Course Outcomes
CO-1	Student will be able to describe the concept of operations management and productivity& also able to understand the demand forecasting concepts.
CO-2	Student will be able to apply the decision models to various real time problems in product & service designing. And also understand the capacity planning concept.
CO-3	Student will be able to understand andevaluate the rank of the facility locations plan and production schedule by solving the problems.
CO-4	Student will be able to understand the production control, just in time philosophy, & also lean manufacturing system in production field.
CO-5	Understand theof the concepts of purchasing and supply chain management (SCM)& also able to understand the concept of project management& its techniques.

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Estd. 2005

Subject : CNC

Code : 7ME6.3A

	List of Course Outcomes
CO-1	The student can able to operate a CNC machine and produce completed product as per the work order or approved drawings, meeting all required quality standards and scrap standards – consistent and repetitive output is the goal.
CO-2	The student's knowledge of CNC specific technical work practices, such as blueprint reading, applied math concept, tools and measurement concepts.
CO-3	The student's knowledge of general manufacturing technical practices, that are applicable to all sectors of manufacturing.

Mapping with POs

COURSE OUTCOME	PROGRAM OUTCOME													
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-01	PSO-02
CO-1	2		1		3								1	
CO-2			3	1	2									3
CO-3	3	2			1									2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Department of Mechanical Engineering

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Estd. 2005

SUB- COMPUTER INTEGRATED MANUFACTING SYSTEM(8ME1A)

List of Course Outcomes	
CO1	Apply the manufacturing activities inter relation with computers for plant operations
CO2	Apply the concept of Group Technology in computer aided manufacturing.
CO3	Apply the knowledge of process planning through computers
CO4	Apply the concept of shop floor control and FMS.
CO5	Apply the system modeling tools in CIM and the fundamental concepts of data communications
CO6	Apply the principles of open System and data base for computer integrated manufacturing

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2						2					3	2	
CO-2	2	3	1		1		2		2	2		3	2	2
CO-3	3	3	2		1		2		2	2		3	3	2
CO-4	3		1		1				2	2			2	
CO-5	2			2			2		2	2			3	
CO-6	2			2			2		2	2				2

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Estd. 2005

Subject Name : LAWS FOR ENGINEERS

Code : 8ME2A

List of Course Outcomes	
CO-1	Student will be able to understand the Constitutional law and about the government contracts.
CO-2	Student will be able to understand about the human rights and labour laws.
CO-3	Student will be able to Apply information acts in general way.
CO-4	Student will be able to understand about copyright, trademark and patent.
CO-5	Student will be able to Understand about the corporate laws and about the election commission in India.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I					2	3	2	3				2	2	
II					2	3	1	3	2			3	2	1
III				2	3	2		3	2	2			2	1
IV	3				3			1		2		2	1	
V					3	3		2		2	2		2	1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Subject :Power Generation
Code-8ME3A

List of Course Outcomes	
CO-1	The student will be able to understand various energy resources and energy conversion methods available for the production of electric power in India.
CO-2	The student will be able to determine the efficiency and output of a modern Rankine cycle steam power plant from given data, including superheat, reheat, regeneration, and irreversibilities
CO-3	The student will be able to understand the performance of gas turbines with reheat and regeneration, and discuss the performance of combined cycle power plants.
CO-4	Student will be able to know major types of hydro-power and wind-power turbines and estimate power generation potential.
CO-5	Student will be able to know about the selection & suitability of site for a power plant.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	2	2		2		3				2		2	
II	3	3	2	2	2						2		2	1
III	3	3	2	2	2						2		2	1
IV	2	2		2	2	2	2		3	2			1	
V			3				3				3	2	2	1

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Estd. 2005

SUB- Product Development and Launching (8ME4.1A)

List of Course Outcomes	
CO1	Understand production systems and their characteristics.
CO2	Understand basics of variability and its role in the performance of a production system.
CO3	Analyze aggregate planning strategies.
CO4	Apply forecasting and scheduling techniques to production systems.
CO5	Understand theory of constraints for effective management of production systems.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1		1	2			1	2	3			2	1	1	
CO-2		3			1	1	1		3	1	2	3	1	2
CO-3		3	2		1				2	2	1	1		2
CO-4		2	2		1	3	1		1		1		1	
CO-5	2	1	1						1	1	3	1	2	

Subject Name: Object Oriented Programming in C++

Subject Code : 3ME5A

List of Course Outcomes	
CO-1	Graduates gain ability to understand the concept of object oriented language. C++ uses the basic of object oriented programming language. Graduates will know about class, object, data members ,inheritance etc.
CO-2	Graduates analyze the working of pointers, String and dynamic memory allocation
CO-3	Graduates will understand the concept of member function ,friend function ,Constructor ,Virtual function ,destructor, overload the function ,and types of inheritance etc
CO-4	Graduates gain ability to understand the iterators ,template and libraries, files and classification of files.
CO-5	Graduates gain ability to understand the linked list and it's type.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOME	PROGRAM OUTCOME											
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO-1	2	-	-	-	-	-	-	-	-	-	-	-
CO-2	-	-	-	-	2	-	-	-	-	-	-	-
CO-3	-	-	-	-	-	-	-	-	-	-	-	3
CO-4	-	-	-	1	-	-	-	-	-	-	-	-
CO-5	-	-	-	-	3	-	-	-	-	-	-	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

(AEM-I) 3ME6A

	List of Course Outcomes
CO-1	The use of Numerical Methods in solving practical technical problems using scientific and Mathematical tools when available, and using experience and intuition otherwise, Mathematical models provide a priori estimates of performance very desirable when prototypes or experiments are costly.
CO-2	Engineering problems frequently arise in which exact analytical solutions are not available. Approximate solutions are normally sufficient for engineering applications, allowing the use of approximate numerical methods.
CO-3	To use Fourier series and Fourier transform, to evaluate the transfer function of linear time-invariant systems. Also use to Characterize and analyze the properties of CT and DT signals.
CO-4	To use Laplace transform, to evaluate the transfer function and convergence of time domain to frequency domain of signal and systems. Also use to Characterize and analyze the properties of CT signals.
CO-5	The ability to use the appropriate and relevant, fundamental and applied mathematical and statistical knowledge, methodologies and modern computational tools.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	2	2						2		1		2	1
II	3			2					1			1		1
III	2	1		1								1	2	1
IV	2											2	1	
V	2						3				1	2		1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Estd. 2005

SUB- Kinematics of Machines (4ME1A)

	List of Course Outcomes
CO1	Understand the principles of kinematic pairs, chains and their classification, DOF, inversions, equivalent chains and planar mechanisms.
CO2	Analyze the planar mechanisms for position, velocity and acceleration.
CO3	Synthesize planar four bar and slider crank mechanisms for specified kinematic conditions.
CO4	Evaluate gear tooth geometry and select appropriate gears for the required applications.
CO5	Design cams and followers for specified motion profiles.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	1	1		1							1	2	
CO-2	2	3	2	3						1		1	2	2
CO-3	2	1	3	3	2					1		2		3
CO-4	2	1	3	1								2	2	3
CO-5	1	2	1		2							1	2	

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Estd. 2005

SUB- MACHINING AND MACHINE TOOLS(4ME3A)

List of Course Outcomes	
CO1	Understand working of lathe, shaper, planer, drilling, milling and grinding machines.
CO2	Comprehend speed and feed mechanisms of machine tools.
CO3	Estimate machining times for machining operations on machine tools
CO4	Identify techniques to minimize the errors in measurement.
CO5	Identify methods and devices for measurement of length, angle, gear & thread parameters, surface roughness and geometric features of parts.
CO6	Design the limit gauges.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	1	1	3	1	1				1		1	1	
CO-2	2	2	1	1	1					1		1	3	
CO-3	2	2	1	2	1					1		1	2	
CO-4	1	3	1	2	1					1		1	2	1
CO-5	3	3	2	3	3	2				1		1		1
CO-6	2	3	1	1	1									1

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Estd. 2005

SUB- DESIGN OF MACHINE ELEMENT -1 (4ME4A)

	List of Course Outcomes
CO-1	Understand the customers' need, formulate the problem and draw the design specifications.
CO-2	Understand component behavior subjected to loads and identify the failure criteria.
CO-3	Analyze the stresses and strains induced in a machine element.
CO-4	Design a machine component using theories of failure.
CO-5	Design keys, cotters, couplings and joints including riveted, bolted and welded joints.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	1	1						1		1		1	2	1
CO-2	2	2		1		1		1		1		1	2	
CO-3	3	1				1		1		1		1	1	2
CO-4	3	3	2			2		1		1		1		1
CO-5	3	2	2			1		1		1		1	1	

Course outcome – Industrial Engineering (4ME5A)

CO1- Apply industrial engineering concept in industrial environment.

CO2-Understand different concepts regarding Organization and Productivity in industries.

CO3-Undertake small case study based project works regarding work measurement and time study.

CO4-Planning and controlling of production system and use of modern forecasting and management techniques for different types of industries.

CO5-Understand various cost accounting and financial management practices widely applied in industries.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	1					3	2					1		2
II											2			3
III						1	1				3	2		2
IV					3									2
V						2	2					1		2

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Estd. 2005

SUB- I C ENGINE(4ME6A)

	List of Course Outcomes
CO1	Understand working and performance of IC Engines through thermodynamic cycles.
CO2	Understand combustion phenomena in SI and CI engines and factors influencing combustion chamber design.
CO3	Outline emission formation mechanism of IC engines, its effects and the legislation standards.
CO4	Understand working principles of instrumentation used for engine performance and emission parameters.
CO5	Evaluate methods for improving the IC engine performance.
CO6	Understand the latest developments in IC Engines and alternate fuels.

MAPPING OF CO'S ,PO'S,AND PSO'S

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	1	1	1							1	2	1	
CO-2	2	2	1		1		1				1	2	1	
CO-3	2	3	2	2	1	1	1					2	2	
CO-4	1	1	3		2	1		2	2			2		2
CO-5	1		2	3	2	1						1		3
CO-6	2	3	2	3	2	1	1	1				1		

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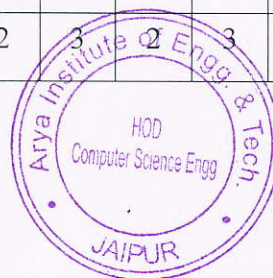|	List of Program Outcomes	
PO-1	**Engineering Knowledge**: Apply knowledge of mathematics and science, with fundamentals of Engineering to be able to solve complex engineering problems related.	
PO-2	**Problem Analysis**: Identify, Formulate, review research literature and analyze complex engineering problems and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.	
PO-3	**Design/Development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.	
PO-4	**Conduct Investigations of Complex problems**: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	
PO-5	**Modern Tool Usage**: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.	
PO-6	**The Engineer and Society**: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	
PO-7	**Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.	
PO-8	**Ethics**: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.	
PO-9	**Individual and Team Work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.	
PO-10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.	
PO-11	**Project Management and Finance**: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.	
PO-12	**Life-Long Learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.	

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List of Program Specific Outcomes (PSO)	
PSO-1	**Knowledge Enhancement in Computing:** The ability to interpret the foundation and strategy of hardware and software of computer systems. Graduates can solve the problems in the areas related to algorithms, multimedia, data analytics, cloud computing, human computer interface, robotics, artificial intelligence and networking for efficient design of computer systems.
PSO-2	**Software Design and Development**: The ability to understand the software development lifecycle and methodologies of software systems. Graduate will learn competent skills and knowledge of software design process. Graduate will be acquaintance to practical proficiency with a broad area of programming concepts.

MAPPING OF PEO WITHPO & PSO

Program Education Objectives (PEO)	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
PEO-1	3	3	2	3	-	-	-	1	-	-	1	2	3	2
PEO-2	3	3	3	3	3	-	1	-	-	-	-	2	2	3
PEO-3	3	3	3	2	3	-	-	-	-	-	-	3	3	2
PEO-4	-	-	-	-	-	2	2	3	3	3	3	3	1	2
PEO-5	-	1	2	1	-	3	2	2	3	2	3	3	2	3

Note: Correlation levels 1, 2 or 3 as defined below:
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Department of Computer Science & Engineering

Subject Code/Name:- 5CS3-01 Information Theory &Coding

List of Course Outcomes	
CO-1	Apply information theory and linear algebra in source coding.
CO-2	Design channel performance using information theory.
CO-3	Apply linear block codes for error detection and error correction.
CO-4	Apply Cyclic codes for error detection and error correction.
CO-5	Apply convolution codes for performance analysis

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	3	3										1	
CO-2	2	3	3										2	
CO-3	2	3	3										2	
CO-4	3	3												
CO-5	2	2	2											

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department of Computer Science & Engineering

Subject Code/Name:- 5CS4-02 Compiler Design

List of Course Outcomes	
CO-1	Graduates gain ability to learn concepts and types of various translators along with several representations, specification and construction formats using a variety of software tools and phases of a typical compiler, including the front and backend part
CO-2	Graduate will able to identify tokens from a high-level programming language code, define regular expressions for tokens and design or implement a lexical analyzer using scanner generator.
CO-3	Graduate will learn role of a parser in a compiler and relate the yield of a parse tree to a grammar derivation and will able to construct a parser for a small context-free grammar.
CO-4	Graduates gain ability to visualize the concept of runtime memory organization and implementation of intermediate code generator based on given code patterns.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1								1	2	1	
III	2	1	3	3	1					3		1	2	1
IV	2					1				2	2	2	1	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Department of Computer Science & Engineering

Subject Code/Name:- 5CS4-03 Operating System

List of Course Outcomes	
CO-1	Graduates gain ability to understand the operating system concepts, thread and process management.
CO-2	Graduates analyze the problem and solution of IPC and CPU scheduling.
CO-3	Graduates gain ability to visualize the concept of deadlock, memory management and virtual memory system.
CO-4	Graduates gain ability to understand file system and concept of disk scheduling.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3		2				2				1	1	2	
II	3	2	3	3							3	1	3	1
III	3	1	2									1	2	1
IV	3					1				3	2	2	2	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Department of Computer Science & Engineering

Subject Code/Name:- 5CS4-04 Computer Graphics & Multimedia

List of Course Outcomes	
CO-1	Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
CO-2	Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis
CO-3	Use of geometric transformations on graphics objects and their application in composite form
CO-4	Extract scene with different clipping methods and its transformation to graphics display device
CO-5	Explore projections and visible surface detection techniques for display of 3D scene on 2D screen

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3		2					2				3	2	3
CO-2	2	3		2		1			1		5	2		3
CO-3	3	3		2								2		3
CO-4	1	2					3					3	3	2
CO-5	2	3		2								2	1	1

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department of Computer Science & Engineering

Subject Code/Name:- 5CS4-05 Analysis of Algorithms

List of Course Outcomes	
CO-1	Define the basic concepts of algorithms and analyze the performance of algorithms.
CO-2	Discuss various algorithm design techniques for developing algorithms.
CO-3	Discuss various searching, sorting and graph traversal algorithms
CO-4	Understand NP completeness and identify different NP complete problems.
CO-5	Discuss various advanced topics on algorithms

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3												3	
CO-2	3	2	3		2								3	
CO-3	3		2		2								3	
CO-4		3	3	3	3							3	3	
CO-5		3	3	2	2							2	3	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Department of Computer Science & Engineering

Subject Code/Name:- 5CS5-11 Wireless Communication

List of Course Outcomes	
CO-1	Explain the basic concepts of wireless network and wireless generations
CO-2	Demonstrate the different wireless technologies such as CDMA, GSM, GPRS etc
CO-3	Appraise the importance of Adhoc networks such as MANET and VANET
CO-4	Explain the design considerations for deploying the wireless network infrastructure
CO-5	Differentiate and support the security measures, standards. Services and layer wise security considerations

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2								3				1	
CO-2	2					2	2		3		2		3	
CO-3	2			3	2	2	2		3				2	3
CO-4	2	3	3	3					3			3	2	2
CO-5	2	3	3	2	2			3	3			3	3	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Department of Computer Science & Engineering

Subject Code/Name:- 6CS3-01 Digital Image Processing

List of Course Outcomes	
CO-1	Remember the fundamental concepts of image processing.
CO-2	Explain different Image enhancement techniques
CO-3	Understand and review image transforms
CO-4	Analyze the basic algorithms used for image processing &image compression with morphological image processing.
CO-5	Contrast Image Segmentation and Representation

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1			2										2	
CO-2		3	3										2	
CO-3	3													
CO-4	3			3	3	3						3	3	3
CO-5	3	3		3				2					3	3

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Department of Computer Science & Engineering

Subject Code/Name:- 6CS4-02 Machine Learning

List of Course Outcomes	
CO-1	Recognize the characteristics of machine learning that make it useful to real-world problems and understand supervised learning algorithms.
CO-2	Characterize machine learning algorithms as supervised, semi-supervised, and unsupervised.
CO-3	Understand and apply unsupervised algorithms for clustering and model selection.
CO-4	Understand semi-supervise &reinforcement learning algorithms for hidden Markov model and deep learning concepts (Neural network).
CO-5	Understand the concepts of Statistical Learning Theory for feature extraction and feature selections.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	3	3		3	2						2	3	
CO-2	3	3	3		3	3	2					2	3	
CO-3	3	3	3	3		3	3					3	3	
CO-4	3	2	3	3	3	3	3					3	3	
CO-5	3	3	2			2						2	3	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department of Computer Science & Engineering

Subject Code/Name:- 6CS4-03 Information Security System

List of Course Outcomes	
CO-1	Illustrate the concept of network security attacks, various encryption techniques and modern block ciphers.
CO-2	Explain various symmetric key techniques and concept of S-Box theory.
CO-3	Illustrate the concept of Public Key Cryptosystems, key management and understand the concept of key exchange.
CO-4	Summarize the different authentication techniques and illustrate the concept of digital signature.
CO-5	Implement IP Security Architecture and understand the concept of strong password protocols.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1		2		2								2	3	
CO-2	3	2		3			2					2	3	
CO-3	3	3	3	2	2		2	2				2	3	3
CO-4	2			3			2					2	3	
CO-5	2		2	2	3	2	2	3				3	3	3

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department of Computer Science & Engineering

Subject Code/Name:- 6CS4-04 Computer Architecture and Organization

	List of Course Outcomes
CO-1	Graduates gain ability to understand the Architecture and organization of computer, Flynn classification and machine instructions and implement different microoperation hardware.
CO-2	Graduates analyze the internal working of CPU organization, recognize the skills to use the concept of pipelining and the way it can speed-up processing.
CO-3	Graduates gain ability to perform computer arithmetic operations on fixed and floating point numbers using different algorithms like Booth algo, restoring method etc.
CO-4	Graduates gain ability to visualize the concept of memory through the presentation of the hardware requirement for a cache memory and a virtual memory system.
CO-5	Graduates gain ability to understand Input / Output Organization and modes of data transfer using DMA & IOP.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2			2								2	3	
CO-2	3	3						2					3	2
CO-3	2		3	3								2	3	2
CO-4	3	2					2	2				3	3	
CO-5	2						3	2					3	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department of Computer Science & Engineering

Subject Code/Name:- 6CS4-05 Artificial Intelligence

List of Course Outcomes	
CO-1	Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.
CO-2	Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game based technique to solve them.
CO-3	Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing
CO-4	Characterize different learning algorithms as supervised, semi-supervised, and unsupervised and neural networks.
CO-5	Apply concept Natural Language processing to problems leading to understanding of cognitive computing

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	1	2				3						2	3	
CO-2	2	3	2			3						3	3	
CO-3	3	2	3			3		2				2	3	
CO-4		3	3	3	3	3	3	2				3	3	2
CO-5		2		2	3	3	3	2				3	3	2

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department of Computer Science & Engineering

Subject Code/Name:- 6CS4-06 Cloud Computing

	List of Course Outcomes
CO-1	Define Cloud Computing and memorize the different Cloud service and deployment models
CO-2	Describe importance of virtualization along with their technologies
CO-3	Use and Examine different cloud computing services
CO-4	Analyze the components of AWS, Azure, ANEKA & Google Cloud platform and understand Mobile Cloud Computing
CO-5	Design & develop backup strategies for cloud data based on features and understand the security of cloud resources.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	1											2	2	
CO-2	2				3	2					3	2	3	
CO-3					2		2					1	3	
CO-4	3				3	3	3				3	3	3	
CO-5	2	3	2		1	3	2					2	2	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department of Computer Science & Engineering

Subject Code/Name:- 6CS5-11 Distributed System

List of Course Outcomes	
CO-1	Students will identify the core concepts of distributed systems: the way in which several machines orchestrate to correctly solve problems in an efficient, reliable and scalable way.
CO-2	Students will examine how existing systems have applied the concepts of distributed systems in designing large systems and will additionally apply these concepts to develop sample systems.
CO-3	Understand scheduling in distributed operating systems, fault tolerance, realtime distributed systems, and designing of distributed file systems.
CO-4	Understand the concept of design and implementation in the context of distributed operating systems

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	3				2	3							
CO-2		2		3		3	2		2			2		
CO-3	1	3	2	2				2	3			2	2	3
CO-4			1					2	2			3	3	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Department of Computer Science & Engineering

Subject Code/Name:- 7CS4-01: Internet of Things

List of Course Outcomes	
CO-1	Understand the definition and significance of the Internet of Things
CO-2	Implement basic IoT applications on embedded platform
CO-3	Discuss the architecture, operation, and business benefits of an IoT solution
CO-4	Analyze basic protocols in wireless sensor network

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	3				2	3							
CO-2	2	1		2	2	1	2		2			2	1	2
CO-3	1	3	2	2				1	2		2		2	3
CO-4	3		1					3	2			3	2	2

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department of Computer Science & Engineering

Subject Code/Name:- 7ME6-60.2 Quality Management

List of Course Outcomes	
CO-1	To understand the concept of Quality
CO-2	To understand the Implication of Quality on Business
CO-3	To Implement Quality Implementation Program
CO-4	To have exposure to challenges in Quality Improvement Programs

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2								2					
CO-2	2	2					3					3		
CO-3			3		4		2							1
CO-4			2	2					2			2		

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Department of Computer Science & Engineering

Subject Code/Name:- 8CS4-01 Big Data Analytics

List of Course Outcomes	
CO-1	Understand the key issues in big data management and its associated applications in intelligent business and scientific computing
CO-2	Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics
CO-3	Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.
CO-4	Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2													3
CO-2	2				3			3		2	3		2	2
CO-3	3	1							2				2	
CO-4		2								3	2		3	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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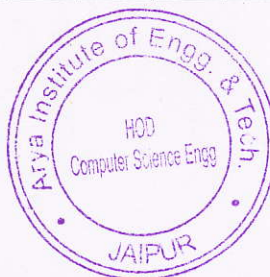● Ph.: 0141-2820700, 5148801 ● Toll Free No. : 1800-102-1044

Department of Computer Science & Engineering

Subject Code/Name:- 8EE6-60.2 Soft Computing

List of Course Outcomes	
CO-1	Ability to analyze and appreciate the applications which can use fuzzy logic
CO-2	Ability to design inference systems
CO-3	.Ability to understand the difference between learning and programming and explore practical applications of Neural Networks (NN).
CO-4	Ability to appreciate the importance of optimizations and its use in computer engineering fields and other domains
CO-5	Students would understand the efficiency of a hybrid system and how Neural Network and fuzzy logic can be hybridized to form a Neuro-fuzzy network and its various applications.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3		2						1			2	1	
CO-2	3	2			2							2		2
CO-3	3	3		3					2			2	2	
CO-4	3	2	2		1							2		2
CO-5	3		3		2				2			2	2	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department Of Computer Science & Engineering
Subject Code/Name:- 8CS1/Mobile Computing

List of Course Outcomes	
CO-1	Evaluate the architecture and principles of operation of mobile systems and networks. Synthesize principles and theories of computer science and software engineering for application to different computing paradigms.
CO-2	Synthesize new knowledge in the area of mobile computing by using appropriate research methodologies and techniques
CO-3	Evaluate the role of mobile applications in software intensive systems.
CO-4	Evaluate the usability of representative mobile devices such as smart phones and tablets. Appraise the quality and performance of mobile applications. Assess and implement security principles in mobile applications.
CO-5	Evaluate wireless network topologies, wireless connectivity and characteristics, and the impact of wireless networks on security and Internet communications

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	1	3	2										3	1
CO-2	3	3										1	3	1
CO-3	3				2								3	1
CO-4					3		3						3	
CO-5	2				3								3	2

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
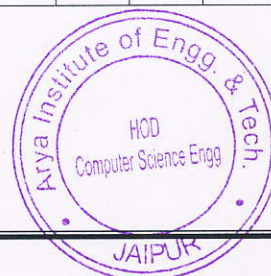
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Department Of Computer Science & Engineering

Subject Code/Name: - 8CS2A Digital Image Processing

	List of Course Outcomes
CO-1	Explain how digital images are represented and manipulated in a computer, including reading and writing from storage, and displaying.
CO-2	To learn and understand the fundamentals of digital image processing and various image Transforms, Image Enhancement Techniques, Image restoration Techniques and methods, image compression and Segmentation used in digital image processing.
CO-3	To learn a program which implements fundamental image processing algorithms. Be conversant with the mathematical description of image processing techniques.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	1											1	
II	3												1	
III			2	2	1									1

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
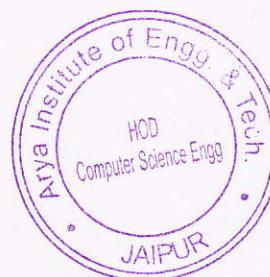
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Department Of Computer Science & Engineering
Subject Code/Name:- 8CS3/Distributed Systems

| List of Course Outcomes	
CO-1	Students will identify the core concepts of distributed systems: the way in which several machines orchestrate to correctly solve problems in an efficient, reliable and scalable way.
CO-2	Students will examine how existing systems have applied the concepts of distributed systems in designing large systems and will additionally apply these concepts to develop sample systems.
CO-3	Understand scheduling in distributed operating systems, fault tolerance, realtime distributed systems, and designing of distributed file systems.
CO-4	Understand the concept of design and implementation in the context of distributed operating systems

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1		3	3		2	3					3		3	2
CO-2		2	3	3	3		1						1	3
CO-3	1				3	2					1	2	2	1
CO-4	3					3				3				

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
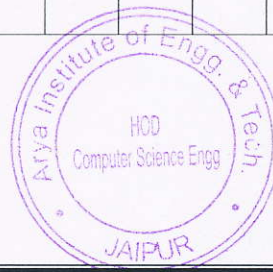
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Department Of Computer Science & Engineering
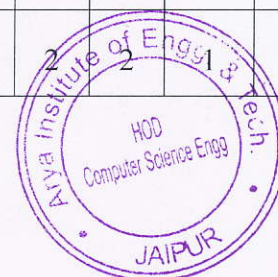
Subject Code/Name:- 8CS4.2A/Real Time System

	List of Course Outcomes
CO-1	Graduates gain ability to understand the real time system concepts and its applications.
CO-2	Graduates gain the ability to understand precedence constraints, data dependency and real time scheduling.
CO-3	Graduates analyze the problem and solution of periodic and aperiodic task scheduling.
CO-4	Graduates gain ability to understand resources access control.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	-	-	-	-	-	-	-	-	-	-	3	3	-
CO-2	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO-3	2	2	2	-	-	-	-	-	-	-	-	2	-	2
CO-4	3	-	-	-	-	-	-	-	-	-	-	-	1	-

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Department Of Computer Science & Engineering

Subject Code/Name:- 7CS1A/Cloud Computing

List of Course Outcomes	
CO-1	Graduates should be able to use graphic computing techniques to plan, develop, evaluate and manage a solution to a particular problem based on graphic systems.
CO-2	Graduates should understand and apply ethical responsibility, legislation and codes of practice to professional activity in computer engineering.
CO-3	Graduates should be able to explain, discuss and solve simple problems in the basic representation and handling of multimedia data (images, audio and animation), and the basic components of a 2D and 3D-environments.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
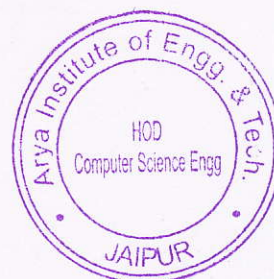
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Department Of Computer Science & Engineering

Subject Code/Name:- 7CS2A/Information System and Security

	List of Course Outcomes
CO-1	Illustrate the concept of network security attacks, various encryption techniques and modern block ciphers.
CO-2	Explain various symmetric key techniques and concept of S-Box theory.
CO-3	Illustrate the concept of Public Key Cryptosystems, key management and understand the concept of key exchange.
CO-4	Summarize the different authentication techniques and illustrate the concept of digital signature.
CO-5	Implement IP Security Architecture and understand the concept of strong password protocols.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	-	-	-	-	-	-	-	-	-	-	2	3	-
II	2	-	3	-	-	-	-	-	-	-	-	-	-	-
III	2	-	-	-	-	-	-	-	-	-	-	-	3	2
IV	-	-	-	-	-	-	-	3	-	-	-	-	-	-
V	-	-	-	-	-	-	-	-	-	-	2	3	-	-

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
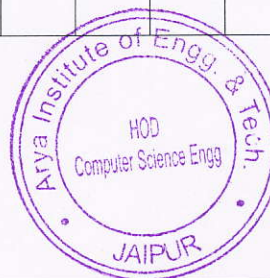
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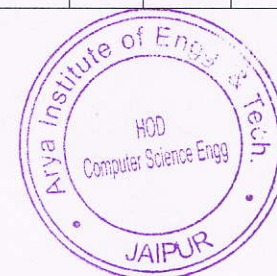## Department Of Computer Science & Engineering
Subject Code/Name:- 7CS3A/Data Mining And Warehousing

List of Course Outcomes	
CO-1	Graduates gain ability to design a data mart or data warehouse for any organization
CO-2	Graduates gain ability to asses raw input data and preprocess it to provide suitable input for range of data mining algorithms
CO-3	Graduates gain ability to extract association rules and classification model
CO-4	Graduates gain ability to identify the similar objects using clustering techniques

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	3			3								3	
CO-2		2	2		3		1						1	
CO-3	1	3			3									2
CO-4	3			2							2	2		3

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
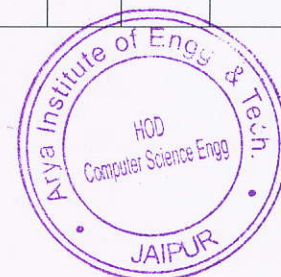
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Department Of Computer Science & Engineering

Subject Code/Name:- 7CS4A/CAD For VLSI

List of Course Outcomes	
CO-1	Graduates gain ability tounderstand and designing different types of Programmable logic devices.
CO-2	Graduates analyze the internaldesigning and working of Boolean function using different types of algorithm and graph.
CO-3	Graduates gain ability to perform reducing the algorithm and concept of the pipelined circuit.
CO-4	Graduates can optimize and minimize the logic function.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	-	3	-	-	-	-	-	-	-	-	2	3	-
CO-2	1	1	2	2	-	-	-	-	2	-	-	1	2	-
CO-3	2	1	-	2	-	-	-	-	1	-	-	2	-	-
CO-4	2	-	-	-	2	-	-	-	-	-	-	2	-	1

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
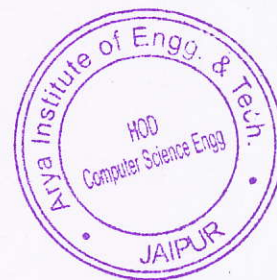
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Department Of Computer Science & Engineering
Subject Code/Name:- 7CS5A/Complier Construction

List of Course Outcomes	
CO-1	Graduates gain ability to learn concepts and types of various translators along with several representations, specification and construction formats using a variety of software tools and phases of a typical compiler, including the front and backend part
CO-2	Graduate will able to identify tokens from a high-level programming language code, define regular expressions for tokens and design or implement a lexical analyzer using scanner generator.
CO-3	Graduate will learn role of a parser in a compiler and relate the yield of a parse tree to a grammar derivation and will able to construct a parser for a small context-free grammar.
CO-4	Graduates gain ability to visualize the concept of runtime memory organization and implementation of intermediate code generator based on given code patterns.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2					1						2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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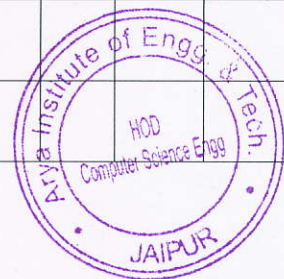• Ph.: 0141-2820700, 5148801 • Toll Free No. : 1800-102-1044

Department Of Computer Science & Engineering

Subject Code/Name:- 7CS6.1A/Advance Data Base Management System

	List of Course Outcomes
CO-1	Graduates should be able to understand the Query Processing and Optimization in Relational DBMS and also gain knowledge of alternate plans.
CO-2	Graduates should be able to analyze the Objects, OIDs and able to design the ORDBMS for an enterprise and gain ability to compare RDBMS, OODBMS and ORDBMS.
CO-3	Graduates should be able to define Parallel and Distributed databases and gain basic understanding of Distributed transaction, Distributed concurrency control and distributed recovery.
CO-4	Graduates should be able to play the role of DBA and with good ethics should be able to secure and authorize the database access.
CO-5	Graduates should be familiar with the POSTGRES user interface and XML

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	1	3											3	1
CO-2	3	3											3	1
CO-3	3				2								3	1
CO-4						3		3					3	
CO-5	2				3								3	2

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
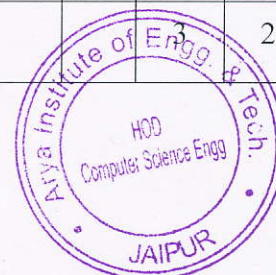
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Department Of Computer Science & Engineering

Subject Code/Name:- 6CS1A/Computer Networks

List of Course Outcomes	
CO-1	To master the terminology and concepts of the OSI reference model and the TCP/IP reference model, working of network layer, routing algorithms.
CO-2	To master the concepts of protocols, internetworking, network interfaces, and IP addressing.
CO-3	To be familiar with wireless networking concepts, transport protocols, multiplexing demultiplexing and reliable data transfer.
CO-4	To be familiar with contemporary issues in networking technologies, transmission policies, working of transport layer in internet.
CO-5	To be familiar with network tools and network programming, working of application layer.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	-	3	-	-	-	-	-	-	-	-	-	3	3	-
CO-2	1	-	-	-	-	-	-	-	2	-	-	-	1	1
CO-3	3	2	-	-	2	-	-	-	-	-	-	3	2	1
CO-4	2	-	3	-	-	-	-	-	-	-	-	3	3	-
CO-5	2	-	3	-	-	-	2	-	-	-	-	3	3	2

Note: Correlation levels 1, 2 or 3 as defined below:

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Department Of Computer Science & Engineering

Subject Code/Name:- 6CS2A/Design and Analysis of Algorithms

List of Course Outcomes	
CO-1	Graduates gain ability to Analyze the asymptotic performance of algorithms and ability to write rigorous correctness proofs for algorithm
CO-2	Graduates gain ability to apply important algorithmic design paradigms and methods of analysis like Divide and Conquer, Greedy Strategy, Dynamic Programming, Randomized algorithm and Approximation algorithm.
CO-3	Graduates gain ability to classify the algorithms into different categories like P-class, NP-class, NP-hard and NP-complete problems and their proofs.
CO-4	Graduates gain ability to apply the algorithms and design techniques to solve problems, and mathematically evaluate the quality of the solutions

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	3	3	-	-	-	-	-	-	-	-	3	3	3
II	2	3	3	-	2	2	-	-	-	-	-	3	3	3
III	2	3	3	-	2	2	-	-	-	-	-	3	3	3
IV	3	3	3	-	3	3	-	-	-	-	-	3	3	3

Note: Correlation levels 1, 2 or 3 as defined below:

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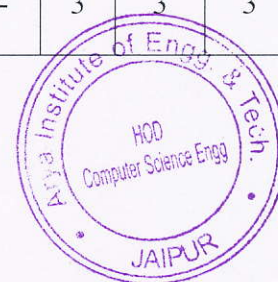
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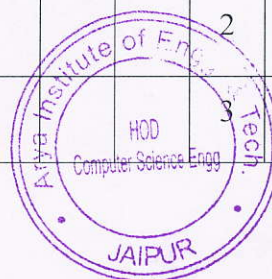## Department Of Computer Science & Engineering

Subject Code/Name:- 6CS3A/Theory of Computation

List of Course Outcomes	
CO-1	Students will learn several formal mathematical models of computation along with their relationships with formal languages. Also students will learn that not all problems are solvable by computers, and some problems do not admit efficient algorithms.
CO-2	Students will Be able to construct finite state machines and the equivalent regular expressions. And they willBe able to prove the equivalence of languages described by finite state machines and regular expressions.
CO-3	Students will Be able to construct pushdown automata and the equivalent context free grammars. And prove the equivalence of languages described by pushdown automata and context free grammars
CO-4	Students will Be able to construct Turing machines and Post machines. And prove the equivalence of languages described by Turing machines and Post machines

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	1		1									
CO-2	2	2	1											
CO-3	2	1			1									
CO-4	2													

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Department Of Computer Science & Engineering
Subject Code/Name:- 6CS4A/ Computer Graphics and Multimedia Techniques

List of Course Outcomes	
CO-1	Graduates should be able to use graphic computing techniques to plan, develop, evaluate and manage a solution to a particular problem based on graphic systems
CO-2	Graduates should understand and apply ethical responsibility, legislation and codes of practice to professional activity in computer engineering.
CO-3	Graduates should be able to explain, discuss and solve simple problems in the basic representation and handling of multimedia data (images, audio and animation), and the basic components of a 2D and 3D-environments.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	1		1						2	3	2	
CO-2	2	2	1									2		3
CO-3	2	1			1							3	3	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
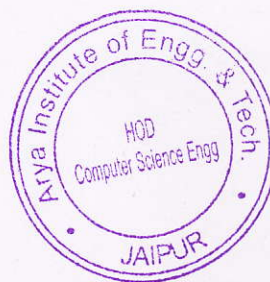
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Department Of Computer Science & Engineering

Subject Code/Name:- 6CS5A/Embedded System Design

List of Course Outcomes	
CO-1	Graduates acquire knowledge about microcontrollers embedded processors and their applications.
CO-2	Graduate will get ability to understand the internal architecture and interfacing of different peripheral devices with Microcontrollers
CO-3	Graduate will learn the design concept of embedded systems and role of embedded systems in industry.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1		1
III	2	1		3	1							1	2	1

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
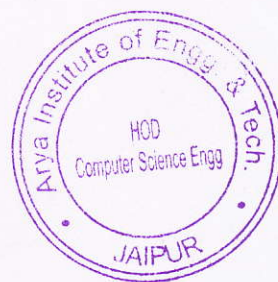
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Department Of Computer Science & Engineering

Subject Code/Name: - 6CS6.3A/Human Computer Interface

List of Course Outcomes	
CO-1	Define what is computer system and humans and how they can interact with each other.
CO-2	Understand the design process and design rules of a HCI system
CO-3	User can evaluate the HCI system with the help of evaluation techniques
CO-4	Understand the cognitive methods and various communication models with system and user.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1		1						1	1	1	2	
II	2	2										1		
III	2	1		3	1							1	2	
IV	3			2										2

Note: Correlation levels 1, 2 or 3 as defined below:

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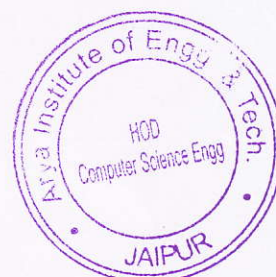
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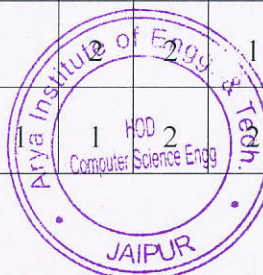● Ph.: 0141-2820700, 5148801   ● Toll Free No. : 1800-102-1044

Department Of Computer Science & Engineering

Subject Code/Name:- 5CS1A/Computer Architecture

List of Course Outcomes	
CO-1	Graduates gain ability to understand the Architecture and organization of computer, Flynn classification and machine instructions and implement different microoperation hardware.
CO-2	Graduates analyze the internal working of CPU organization, recognize the skills to use the concept of pipelining and the way it can speed-up processing.
CO-3	Graduates gain ability to perform computer arithmetic operations on fixed and floating point numbers using different algorithms like Booth algo, restoring method etc.
CO-4	Graduates gain ability to visualize the concept of memory through the presentation of the hardware requirement for a cache memory and a virtual memory system.
CO-5	Graduates gain ability to understand Input / Output Organization and modes of data transfer using DMA & IOP.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I		3										3	2	
II	1								2					2
III	3	2			2							3	3	
IV	2		3									2	3	
V	3											3		

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Department Of Computer Science & Engineering

Subject Code/Name:- 5CS2A/Digital Logic Design

List of Course Outcomes	
CO-1	To demonstrate Hardware Description Languages and their use in digital logic design.
CO-2	To design a digital system, components or process to meet desired needs within realistic constraints.
CO-3	To design different controllers using JK and D flip flop
CO-4	To Analyze and design of asynchronous circuits and understanding the concepts of different hazards.
CO-5	To understand the concept of FPGA, Technology mapping of FPGA

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	2	-	1	1	-	-	-	-	-	-	-	-	3
CO-2	2	2	-	3	1	-	-	-	-	-	-	-	1	1
CO-3	2	3	-	3	1	-	-	-	-	-	-	-	1	2
CO-4	3	2	-	2	1	-	-	-	-	-	-	-	-	-
CO-5	2	2	-	1	1	-	--	-	-	-	-	-	-	2

Note: Correlation levels 1, 2 or 3 as defined below:

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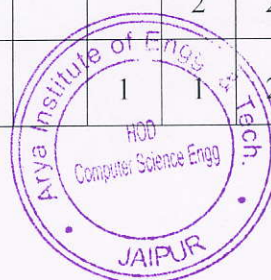● Ph.: 0141-2820700, 5148801   ● Toll Free No. : 1800-102-1044

Department Of Computer Science & Engineering

Subject Code/Name:- 5CS3A \Telecommunication Fundamentals

List of Course Outcomes	
CO-1	Articulate the fundamental concepts of Telecommunications such as bandwidth, capacity and data rates ,Network reference models.
CO-2	Describe and determine the performance of different error control coding schemes for the reliable transmission of digital representation of signals and information over the channel and data link control.
CO-3	Understand the basics of Wireless LAN witn their architecture and protocol stack model. Also discuss data link layer swictching.
CO-4	Examine the concept of multiplexing ,multiple access technique and switching.
CO-5	Analyze various spreading techniques and generation of spreading sequence ,generation of spreading codes.

COURSE OUTCOME	PROGRAM OUTCOME												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO-2	2	2	-	3	1	-	-	-	-	-	-	2	1	1
CO-3	2	3	-	3	1	-	-	-	-	-	-	-	1	2
CO-4	3	2	-	2	1	-	-	-	-	-	-	-	-	-
CO-5	2	2	-	1	1	-	--	-	-	-	-	3	-	2

Note: Correlation levels 1, 2 or 3 as defined below:

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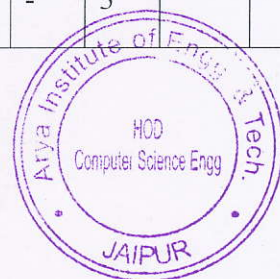
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Department Of Computer Science & Engineering

Subject Code/Name:- 5CS4A/Database Management System

List of Course Outcomes	
CO-1	Graduates gain ability to understand the concept of database and Database management system software on the conceptual model.
CO-2	Graduates will have high-level understanding of major DBMS components and their function
CO-3	Graduates will be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based
CO-4	Graduates will be able to write SQL commands to create tables and indexes , insert/update/delete data and query data in a relational DBMS.
CO-5	Graduates gain ability to understand normalization theory and apply such knowledge to the normalization of a database and to be able to program a data intensiveapplication using DBMS APIs.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I		1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2				1						2		1	
V	2	1		2						1	1	2		1

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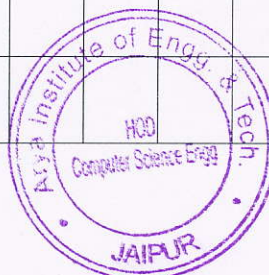● Ph.: 0141-2820700, 5148801 ● Toll Free No. : 1800-102-1044

Department Of Computer Science & Engineering

Subject Code/Name:- 5CS5A/Operating System

List of Course Outcomes	
CO-1	Graduates gain ability to understand the operating system concepts, thread and process management.
CO-2	Graduates analyze the problem and solution of IPC and CPU scheduling.
CO-3	Graduates gain ability to visualize the concept of deadlock, memory management and virtual memory system.
CO-4	Graduates gain ability to understand file system and concept of disk scheduling.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3											1	2	
II	3	2	3	3								1	3	1
III	3	1	2									1	2	1
IV	3				1						2	2	2	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
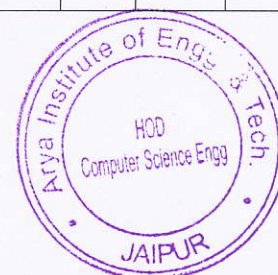
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Department Of Computer Science & Engineering

Subject Code/Name: - 5CS6.1A\Advanced Data Structure

	List of Course Outcomes
CO-1	Students develop knowledge of applications of advance trees including the ability to implement algorithms for the creation, insertion, deletion, searching in trees.
CO-2	Students develop knowledge of basic data structures for storage and retrieval of ordered or unordered data. Data structures include binomial trees, heaps.
CO-3	Graduate will able to understand the meaning of graphs and trees also including the ability to implement algorithms for connectedness.
CO-4	Graduates gain ability to visualize the concept of sorting networks also including the ability to implement its applications
CO-5	Graduates gain ability to understand number theoretic algorithm also develop the knowledge of modular arithmetic and discrete logarithms.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3		1	1						1	1	1	3	
II	2	2	1									1	2	1
III	3	1	3		1							3	3	2
IV	3				3						2	2	1	
V	2	1		2						1	1	2	2	1

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Department Of Computer Science & Engineering

Subject Code/Name:- 4CS1-02/ Technical Communication

List of Course Outcomes	
CO-1	Students learn the importance, nuances and aspects of communication.
CO-2	Graduates learn the art and science behind reading, how can one develop the skill and use it to one's benefit.
CO-3	Graduates learn the art and science of objective writing/business/scientific writing.
CO-4	Graduates learn the importance, characteristics, format of Technical document like, reports, proposals and article.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I										3		1		
II	1				2							1	2	
III										3		2		
IV	2									3		1		

Note: Correlation levels 1, 2 or 3 as defined below:

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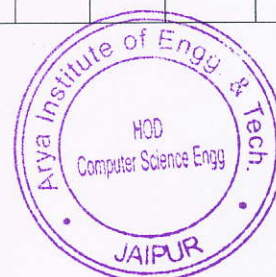
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Department Of Computer Science & Engineering

Subject Code/Name:- 4CS3-04/Microprocessor & Interfaces

List of Course Outcomes	
CO-1	Describe the architecture of 8085 microprocessor and understand the basic concept of static and dynamic RAM and types of ROM
CO-2	Understand instruction set and write programs using assembly language programming. Write programs using advance assembly language using interrupts and subroutine.
CO-3	Interface peripheral devices like 8255, 8259 and understand and describe Interfacing external devices like memory and other hardware devices.
CO-4	Understand microprocessor applications such as Interfacing scanned multiplexed display and liquid crystal display, USART 8251, RS232C and RS422A.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3											1		
II	1	3		3	2							1	2	
III	3	1										2		
IV	2											1		

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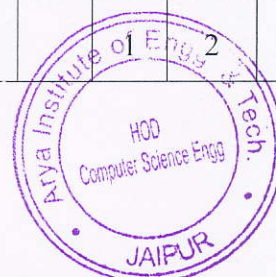## Department Of Computer Science & Engineering
Subject Code/Name:- 4CS4-05/Database Management System

List of Course Outcomes	
CO-1	Graduates gain ability to understand the concept of database and Database management system software on the conceptual model.
CO-2	Graduates will have high-level understanding of major DBMS components and their function
CO-3	Graduates will be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based
CO-4	Graduates will be able to write SQL commands to create tables and indexes , insert/update/delete data and query data in a relational DBMS.
CO-5	Graduates gain ability to understand normalization theory and apply such knowledge to the normalization of a database and to be able to program a data intensive application using DBMS APIs.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I		1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1							1	2	1
IV	2				1						2	2	1	
V	2	1		2						1	1	2	2	1

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Department Of Computer Science & Engineering
Subject Code/Name:- 4CS4-06/Theory of Computation

	List of Course Outcomes
CO-1	Students will learn several formal mathematical models of computation along with their relationships with formal languages. Also students will learn that not all problems are solvable by computers, and some problems do not admit efficient algorithms.
CO-2	Students will Be able to construct finite state machines and the equivalent regular expressions. And they willBe able to prove the equivalence of languages described by finite state machines and regular expressions.
CO-3	Students will Be able to construct pushdown automata and the equivalent context free grammars. And prove the equivalence of languages described by pushdown automata and context free grammars
CO-4	Students will Be able to construct Turing machines and Post machines. And prove the equivalence of languages described by Turing machines and Post machines

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOMES	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	1		1									
CO-2	2	2	1											
CO-3	2	1			1									
CO-4	2													

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
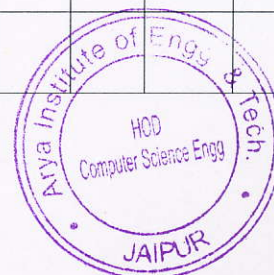
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Department Of Computer Science & Engineering

Subject Code/Name:- 4CS4-07/Data Communication and Computer Networks

List of Course Outcomes	
CO-1	Enumerate the layers of OSI & TCP/IP model and functionality of each layer.
CO-2	Detect the different types of error and their correction method in data link layer.
CO-3	Summarize and compare different routing algorithm in network layer.
CO-4	To be familiar with working of transport layer and its services and protocols.
CO-5	Explain the different protocols used in application layer.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	1	-	-	-	-	-	-	-	-	-	3	3	-
CO-2	1	-	-	-	-	-	-	-	2	-	-	-	1	1
CO-3	3	2	-	-	2	-	-	-	-	-	-	3	2	1
CO-4	2	-	3	-	-	-	-	-	-	-	-	3	3	-
CO-5	2	-	3	-	-	-	2	-	-	-	-	3	3	2

Note: Correlation levels 1, 2 or 3 as defined below:

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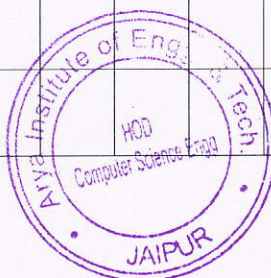
Department Of Computer Science & Engineering

Subject Code/Name:- 3CS2-01/Advanced Engineering Mathematics

List of Course Outcomes	
CO-1	Graduates gain ability to understand the decision making capability and how to translate real-world problems into probability models
CO-2	Graduates analyze the ability to formulate a wide range of management problems that can be solved to optimality by classical combinatorial optimization techniques and the knowledge of alternative solution approaches such as metaheuristics that can find nearly optimal solutions.
CO-3	Graduates understand the course aims to introduce students to Use operations research techniques for effective decisions–making, Model formulation and applications that are used in solving business decision problems.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	1	1	1						1	1	1	2	
II	2	2	1									1	2	1
III	2	1	3	3	1								2	1

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department Of Computer Science & Engineering

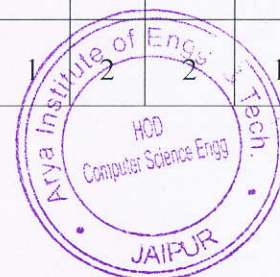Subject Code/Name:- 3CS1-03/Managerial Economics and Financial Accounting

List of Course Outcomes	
CO-1	Graduates gain ability to apply the knowledge of managerial and economic concepts and ability to apply the tools and techniques.
CO-2	Abilityto understand the demand and supply analysis and to Know the implementation of demand forecasting methods for production decisions and cost analysis.
CO-3	Abilityto understand the types of markets and pricing methods and to understand the techniques regarding the long term investment decisions.
CO-4	Abilityto understand the application of various ratios in order to know the firm's financial position in depth and to understand different techniques of capital budgeting.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2		2									1	2	
II	3	2	3	2								1	3	1
III	3	1	2									1	2	1
IV	3		1		1							2	2	2

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
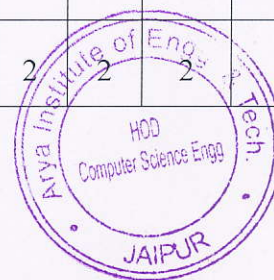
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Subject Code/Name:- 3CS3-04/Digital Electronics
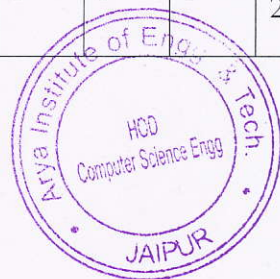
List of Course Outcomes	
CO-1	Apply the principles of number system, binary codes and Boolean algebra to minimize logic expressions and knowledge about the various logic gates
CO-2	Develop the K- maps and apply QuineMcCluskey's method to minimize and optimize the logic functions up to 4 variables.
CO-3	Acquire the knowledge about various logic families and analyze basic logic gate circuits of these families
CO-4	Design the various combinational circuits such as adders, encoders, decoders and multiplexers
CO-5	Design the various sequential circuits such as flip flops, counters and shift registers.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3	2	1									2	2	
II	3	2	2									2	2	
III	2	2		1								3	2	
IV	2	2		1	1							2	1	
V	2	2	1	2	2							2	2	

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Department Of Computer Science & Engineering

Subject Code/Name:- 3CS4-05/Data Structures and Algorithms

List of Course Outcomes	
CO-1	Graduate will be able to visualize of the programming languages paradigms.
CO-2	Student will be able to use space & time complexity for particular functions.
CO-3	Graduate will be able to develop effective algorithms through the attribute conceptual integrity.
CO-4	Student will be able to analyze the concept of array and structure and implementation of 2-d array & sparse matrix.
CO-5	Graduate will be able to improve the use existing programming language in a more efficiently way through the data such as array, strings, records, list.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	3		1	1						1	1	1	3	
II	2	2	1									1	2	1
III	3	1	3		1							3	3	2
IV	3				3						2	2	1	
V	2	1		2						1	2	2	2	1

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department Of Computer Science & Engineering

Subject Code/Name:- 3CS4-06/Object Oriented Programming

	List of Course Outcomes
CO-1	Graduates gain ability to understand the concept of object oriented language. C++ uses the basic of object oriented programming language. Graduates will know about class, object, data members etc.
CO-2	Graduates analyze the working dynamic memory allocation using new and delete operator and inline functions
CO-3	Graduates will understand the concept of different types of inheritance. Virtual base class, overloading concept etc
CO-4	Graduates gain ability to understand constant data members and member function, different types of polymorphism uses of polymorphism.
CO-5	Graduates gain ability to understand Input / Output permanently using the file handling. Templates give the overview of how to use single program for different data types.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOME	PROGRAM OUTCOME											
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO-1	2	-	-	-	-	-	-	-	-	-	-	-
CO-2	-	-	-	-	2	-	-	-	-	-	-	-
CO-3	-	-	-	-	-	-	-	-	-	-	-	3
CO-4	-	-	-	1	-	-	-	-	-	-	-	-
CO-5	-	-	-	-	3	-	-	-	-	-	-	2

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Department Of Computer Science & Engineering

Subject Code/Name:- 3CS4-07/Software Engineering

	List of Course Outcomes
CO-1	Gain knowledge of basic Software engineering methods and practices, and their appropriate application, understanding of software development process models such as the waterfall and evolutionary models etc and approaches of verification and validation including static analysis, and reviews.
CO-2	An understanding of the role of project management including planning, scheduling, risk management.
CO-3	An understanding of software requirements and the SRS document, different software architectural styles and implementation issues such as modularity.
CO-4	Analyze and translate a specification into a design, and then realize that design practically, using an appropriate Software engineering methodology.
CO-5	Provide basic knowledge of object orientation and OO analysis and design using the Unified Process and the Unified Modeling Language (UML) as tools.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOMES	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	-	2	-	-	-	-	-	-	-	-	2	-	1
CO-2	-	-	-	-	-	-	-	-	1	2	1	-	-	-
CO-3	-	2	-	3	3	-	-	-	-	3	-	-	3	-
CO-4	-	-	2	3	-	-	-	-	-	-	-	-	-	3
CO-5	-	-	2	2	3	-	-	-	-	-	-	-	-	3

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
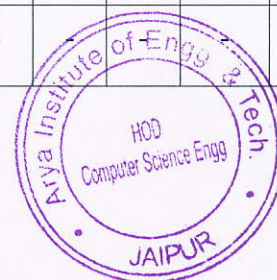
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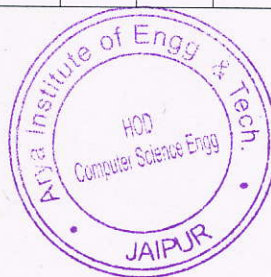• Ph.: 0141- 5148800-02, 0141-2622099 • FAX : 01426-6570040

Course Title: Technical Seminar

Prerequisites:

➤ Students should have basic programming experience

➤ Students should have been in a position to understand design and development of experimental procedures

➤ Students should be reasonably capable of understanding and analyzing technical documents.
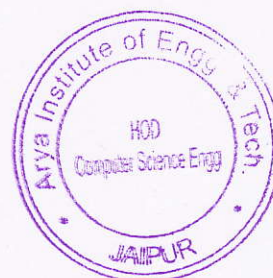
COURSE CONTENT

➤ Seminar topic shall be selected from the emerging technical areas only and presented before internal review committee.

➤ The topic will be selected in consultation with a Guide.

➤ Study and presentation should be done by individual student and not in a team.

Rubrics:

Performance Indicators	Low (1)	Medium (2)	High (3)
Literature Survey and Problem understanding	Literature Survey not relevant	Incomplete literature survey and improper understanding of problem	Extensive literature survey with clear state of the art problem understanding
Creativity	Is unable to predict or defend problem outcomes	Approximately predicts and defends problem outcomes	Can predict and defend problem outcomes very well
Presentation/ and communication	Disorganized and ineffective presentation	Organized, but ineffective presentation	Effective organized presentation
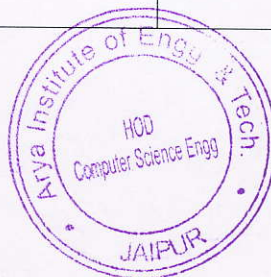
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Course Outcomes:

1. Student will be experts in technical paper presentation.

2. Students will be able to appreciate the significance of learning new topics in related engineering discipline.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2							3					3	3
CO-2	1							1					3	3

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Estd. 2005

Course Title: Project

Prerequisites:

- ➢ Students should have basic programming experience
- ➢ Students should have been in a position to understand design and development of experimental procedures
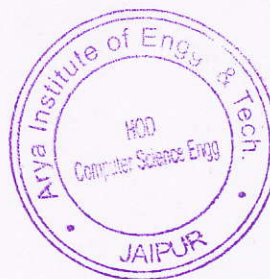- ➢ Students should be reasonably capable of understanding and analyzing technical documents.

Course Outcomes:

1. Ability to present technical papers.
2. Ability to learn and implement new concepts in multidisciplinary area.

Assessment: Review of the oral presentation, report document, demonstration of the working model, by the internal examiners.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1								3					3	3
CO-2	2	3	2	3	3	3		3		3	2	3	3	3

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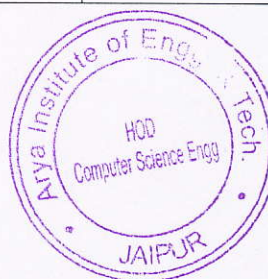S.P.-40, Kukas Industrial Area (RIICO) Jaipur-303 101 • Website : www.aryainstitutejpr.com
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Course content

The topic will be selected in consultation with a Guide. Study, implementation and presentation should be done by project team.

Rubrics:

Performance Indicators	Low (1)	Medium (2)	High (3)
Literature Survey and Problem Definition	Literature Survey not pertaining to the title of the project.	Incomplete literature survey and improper problem definition	Extensive literature survey with clear state of the art problem definition
Creativity	Is unable to predict or defend problem outcomes	Approximately predicts and defends problem outcomes	Can predict and defend problem outcomes
Effective Formulation of strategies	Has no coherent strategies for problem solving	Has some strategies for problem-solving, but does not apply them consistently	Formulates strategies for solving problems
Verification/Visualization of the results	No attempt at checking the obviously incorrect solution. Improper visualization of the results	The solution is correct, but not visualized inefficiently	The solution is correct and visualized in an efficient way
Presentation/ and communication	Disorganized and ineffective presentation	Organized, but ineffective presentation	Effective organized presentation

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Course Title: Industry Internship

Prerequisites:

➢ Students should have basic programming experience

➢ Students should have been in a position to understand design and development of experimental procedures

➢ Students should be reasonably capable of understanding and analyzing technical documents.

Course Outcomes:

1. Ability to present technical papers.

2. Ability to learn and implement new concepts in multidisciplinary area.

Assessment: Review of the oral presentation, report document, demonstration of the working model, by the internal examiners.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1								3					3	3
CO-2	2	3	2	3	3	3		3		3	2	3	3	3

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Estd. 2005

Course content

The topic will be selected in consultation with a Guide. Study, implementation and presentation should be done by project team.

Rubrics:

Performance Indicators	Low (1)	Medium (2)	High (3)
Literature Survey and Problem Definition	Literature Survey not pertaining to the title of the project.	Incomplete literature survey and improper problem definition	Extensive literature survey with clear state of the art problem definition
Creativity	Is unable to predict or defend problem outcomes	Approximately predicts and defends problem outcomes	Can predict and defend problem outcomes
Effective Formulation of strategies	Has no coherent strategies for problem solving	Has some strategies for problem-solving, but does not apply them consistently	Formulates strategies for solving problems
Verification/Visualization of the results	No attempt at checking the obviously incorrect solution. Improper visualization of the results	The solution is correct, but not visualized inefficiently	The solution is correct and visualized in an efficient way
Presentation/ and communication	Disorganized and ineffective presentation	Organized, but ineffective presentation	Effective organized presentation

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Lab Name : **Data Structures and Algorithms Lab**

Lab Code : **3CS4-21**

Branch : **Computer Engineering**

Year : **Second Year (III Sem.)**

Course Outcomes :

CO-1.This lab provide to use and understand Collection class in C, with major emphasis on array , linked Lists, Stacks and Queues in C++.

CO-2. This lab provide to understand the basic concepts of self balancing Binary Search Trees

CO-3. This lab helps to teach Program basic sorting algorithms (such as Insertion, Selection, Merge and Quick) in C.

Course Objective to Program Outcomes Mapping:

Course Objective	PROGRAM OUTCOME													
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
1	3	2	2			1							3	2
2	2	3	3		1								2	
3		2	3				2				1	2		3

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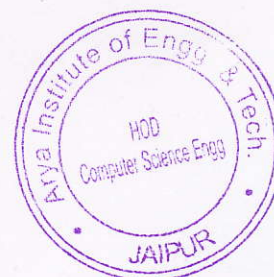• Ph.: 0141- 5148800-02, 0141-2622099 • FAX : 01426-6570040

Estd. 2005

Lab Name	: Digital Electronics Lab
Lab Code	: 3CS4-24
Branch	: Computer Engineering
Year	: Second Year (III Sem)

Course Outcomes :

1. Able to identify and differentiate digital electronics applications.
2. Able to describe and analyze the logic circuit.
3. Capable in recognizing and integrating electronic components in specific applications.
4. To understand the operation of different sequential circuits Flip-flop, Counters, Register, basic functions of transistors, comparators, and digital signals.

Course Objective to Program Outcomes Mapping:

COURSE OUTCOMES	PROGRAM OUTCOMES											
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO-1	2	-	-	-	-	-	-	-	-	-	-	-
CO-2	-	2	-	-	-	-	-	-	-	-	-	-
CO-3	-	-	2	1	-	-	-	-	-	-	-	-
CO-4	-	-	-	-	3	-	-	-	-	-	-	-
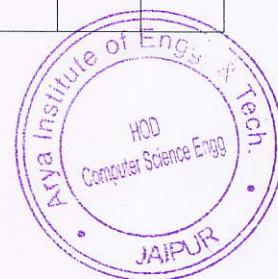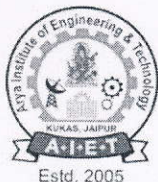
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Lab Name : **Object Oriented Programming Lab**

Lab Code : **3CS4-22**

Branch : **Computer Engineering**

Year : **Second Year (III Sem)**

	List of Course Outcomes
CO-1	Graduates gain ability to understand the difference between object oriented programming and procedural oriented language and data types in C++.
CO-2	Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.
CO-3	Graduates will be able to perform templates and exception handling which improve programmer productivity.
CO-4	To familiarize the students with language environment and to implement various concepts related to language.

MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	-	-	-	-	-	-	-	-	-	-	3	2	-
CO-2	2	3	2		-	-	-	-	-	-	-	-		2
CO-3	3		-	-	3	-	-	-	-	-	-	3		2
CO-4		-	-	-	3	-	-	2	-	-	-	3	2	2

Note: Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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Lab Name : Software Engineering Lab

Lab Code : 3CS4-23

Branch : Computer Engineering

Year : Second Year (IIISem)

Course Outcomes:

CO-1 Students will learn the ability to function on multi-disciplinary teams.

CO-2 It will generate ability to identify, formulate, and solve engineering problems.

CO-3 An ability to communicate effectively. For team work we need to understand the power of communication

CO-4 The ability to verify,design, analyze, validate, implement, apply, and maintain software systems

Course Outcome to Program Outcomes Mapping:

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO-2	2	-	-	3	-	-	-	-	-	-	-	-	3	2
CO-3	-	-	1	-	-	-	-	-	-	-	-	2	-	-
CO-4	1	2	-	-	-	-	-	-	-	-	-	3	2	3

Note: Correlation levels 1, 2 or 3 as defined below:

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Lab Name	: Java Programming Lab
Lab Code	: 4CS4-25
Branch	: Computer Engineering
Year	: Second Year (IV Sem)

Course Outcomes

List of Course Outcomes	
CO-1	Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
CO-2	Read and make elementary modifications to Java programs that solve real-world problems.
CO-3	Validate input in a Java program, Identify and fix defects and common security issues in code.
CO-4	Document a Java program using Javadoc.
CO-5	Use a version control system to track source code in a project.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES

COURSE OUTCOME	PROGRAM OUTCOME											
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO-1	3											
CO-2		2										
CO-3		2	2									
CO-4					2		1					
CO-5											3	

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
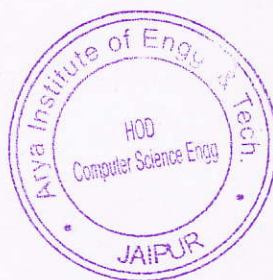
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Estd. 2005

Lab Name	: Network Programming Lab
Lab Code	: 4CS4-23
Branch	: Computer Engineering
Year	: Second Year (IV Sem)

Course Outcomes:

CO-1 Analyze the requirements of a networked programming environment and identify the issues to be solved;

CO-2 Create conceptual solutions to those issues and implement a programming solution;

CO-3 understand the key protocols that support the Internet;

CO-4 apply several common programming interfaces to network communication,understand the use of TCP/UDP Sockets

Course Outcome to Program Outcomes Mapping:

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO-2	2	-	-	3	-	-	-	-	-	-	-	-	3	2
CO-3	1	-	-	-	-	-	-	-	-	-	-	2	-	-
CO-4	1	2	-	-	-	-	-	-	-	-	-	3	2	3

Note: Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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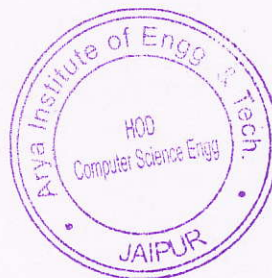• Ph.: 0141- 5148800-02, 0141-2622099 • FAX : 01426-6570040

Estd. 2005

Lab Name : **Microprocessor Lab**

Lab Code : **4CS4-21**

Branch : **Computer Engineering**

Year : **Second Year (IV Sem)**

Course Outcomes:

(1)To understand the study of system behavior, components and programming of 8085 microprocessor.

(2)Learn how to arithmetical, logical and data transfer operations are performed using 8085 microprocessor.

(3)The course provides an access to the interface with the peripherals and provides access to real time operating systems.

(4)This program provides students with the compatibility of surviving in the developing field of technology. The student can apply the gained knowledge of coding in the fields of Robotics, radar, military, automation, industries, and various fields of burgeoning technology.

(5)This lab finds its application in various industries related to telecom and in design/analysis of automation process of various devices/equipment's.

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Estd. 2005

Course Objective to Program Outcomes Mapping:

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	-	-	-	-	3	-	-	2	1	-	-	-	1	-
CO-2	-	-	-	2	3	-	-	-	-	-	-	-	-	-
CO-3	-	-	-	2	3	-	-	-	-	-	2	-	-	2
CO-4	-	-	2	3	3	-	-	1	1	-	-	3	3	2
CO-5	-	-	-	-	-	-	-	2	2	2	2	3	3	3

Note: Correlation levels 1, 2 or 3 as defined below:

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Estd. 2005

Lab Name	: **Digital Hardware Design Lab**
Lab Code	: **5CS10A**
Branch	: **Computer Engineering**
Year	: **Third Year (V Sem)**

Course Outcomes:

1. Graduate will be able to learn a view of the digital circuits used in developing modern VHDL languages.

2. Graduate will be able to understand the relationship between a source program and its execution behavior using various data types like vector, arrays, and structures.

3. Graduate can develop their logical and programming skills using various sequence and control statements like loops, switch cases.

4. Student will learn the conceptual building blocks from which languages are assembled and specifying the semantics, including various scope and environment of DHD programming languages.

   5. **COURSE OOUTCOMES TO PROGRAM OUTCOMES MAPPING:**

Course Objective	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
1	2	3	-	2	-	-	-	-	-	-	-	1
2	1	2	-	-	-	-	-	-	-	-	-	1
3	1	2	-	-	-	-	-	-	-	-	-	1
4	2	-	-	-	2	-	-	-	-	-	-	1

Note: Correlation levels 1, 2 or 3 as defined below:

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Estd. 2005
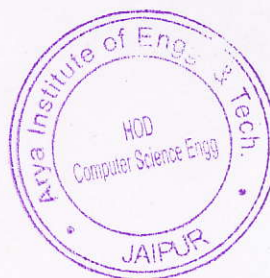
Lab Name : Operating Systems Simulation Lab

Lab Code : 5CS7A

Branch : Computer Science & Engineering

Year : Third Year (V Sem)

COURSE OUTCOMES :

1. This Lab helps the students toimplement proficiency in using advance operating system according to market demand.
2. This Lab helps the student to show interest towards the development of different modern and efficient tool (like moss simulator).
3. This lab helps the student Graduates will able to know about the deadlock among processors and resources, and about the scheduling.
4. This lab helps the students to able to implement various algorithms required for management, scheduling, allocation and communication used in operating system.
5. Lab Can give better emerging computer based techniques and ideas to analyze, design and implement industry based on operating system development.

COURSE OBJECTIVE TO PROGRAM OUTCOMES MAPPING:

Course Objective	Program Outcomes													
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-	PO-12	PSO-1	PSO-
1	3	2	3	1	3	-	-	-	-	-	-	2	2	3
2	3	2	3	1	3	-	-	-	-	-	-	2	2	3
3	3	3	3	1	3	-	-	-	-	-	-	2	2	3
4	3	3	3	1	3	-	-	-	-	-	-	2	2	3
5	3	3	3	-	-	-	-	-	-	-	-	3	2	3

Note: Correlation levels 1, 2 or 3 as defined below:

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Estd. 2005

Lab Name	: Java Programming Lab
Lab Code	: 6CS7
Branch	: Computer Engineering
Year	: Third Year (VI Sem)

Course Outcomes

List of Course Outcomes	
CO-1	Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
CO-2	Read and make elementary modifications to Java programs that solve real-world problems.
CO-3	Validate input in a Java program, Identify and fix defects and common security issues in code.
CO-4	Document a Java program using Javadoc.
CO-5	Use a version control system to track source code in a project.

MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES

COURSE OUTCOME	PROGRAM OUTCOME											
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO-1	3											
CO-2		2										
CO-3		2	2									
CO-4					2		1					
CO-5											3	

Note: Correlation levels 1, 2 or 3 as defined below:

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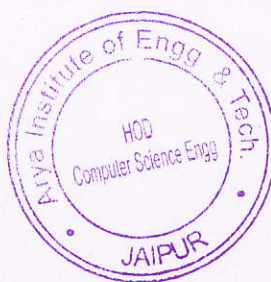S.P.-40, Kukas Industrial Area (RIICO) Jaipur-303 101 • Website : www.aryainstitutejpr.com
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Estd. 2005

Lab Name	**: Computer Graphics&Multimedia Techniques**
Lab Code	**: 6CS8A**
Branch	**: Computer Engineering**
Year	**:Third Year (VI Sem)**

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Estd. 2005

Lab Name	: **Design and Analysis of Algorithm**
Lab Code	: **6CS9**
Branch	: **Computer Engineering**
Year	: **Third Year (VI Sem)**

COURSE OUTCOMES :

1. This Lab helps the student to understand mathematical formulation, complexity analysis and methodologies to solve recurrence relations for algorithms.

2. This lab provide ability to design algorithms using standard paradigms like: Greedy, Divide and Conquer, Dynamic Programming and Backtracking.

3. This lab helps the student to design algorithms using advance data structures and implement traversals techniques.

4. This lab helps the students to apply algorithm design principles to derive solutions for real life problems and comment on complexity of solution.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

Course Objective	Program Outcomes													
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-	PO-11	PO-12	PSO-1	PSO-2
1	3	3	3	2	2	-	-	-	-	-	-	2	3	3
2	3	3	3	2	2	-	-	-	-	-	-	2	3	3
3	3	3	3	2	2	-	-	-	-	-	-	2	3	3
4	3	3	3	1	2	-	-	-	-	-	-	2	2	2

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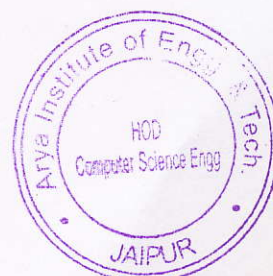
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Lab Name	**: Embedded System & Design Lab**
Lab Code	**: 6CS10**
Branch	**: Computer Engineering**
Year	**: Third Year (VI Sem)**

COURSE OUTCOMES :

1. Graduate will be able to implement designing requirements of Embedded Systems and analyze different aspects of design challenges used in designing an efficient/optimized Embedded System.

2. Graduate will be able to implement the detailed Embedded System by using MSP 430 Microcontroller.

3. Graduate will implement ARM Fundamentals and be able to distinguish ARM processor with other processors.

4. Graduate will be able to implement Embedded System by using 8051 Microcontroller and develop a programming model of Embedded System by using 8051 Microcontroller.

Course Objective to Program Outcomes Mapping:

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	3	-	-	-	-	-	-	-	3	3	3	-
CO-2	3	2	3	3	-	-	-	-	-	-	2	-	-	-
CO-3	3	3	2	-	-	-	-	-	-	-	2	2	2	-
CO-4	2	-	3	-	-	-	-	-	-	-	3	-	1	-

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Lab Name	: **Compiler Designing Lab**
Lab Code	: **7CS9A**
Branch	: **Computer Engineering**
Year	: **Fourth Year (VII Sem)**

COURSE OUTCOMES :

1. Develop an in depth understanding of system programming concept. Lexical analysis, syntaxanalysis, semantics analysis, code optimization, code generation. Language specification andprocessing.

2. Develop an Understanding of Scanning by using concept of Finite state automaton. Parse treeand syntax tree, Top down parsing (recursive decent parsing, LL (1) parser) Bottom up parsing(operator precedence parsing).

3. Develop an Understanding about Language processor development tools: LEX, YACC.

4. Language processing activities (Program generation and execution)

Course Objective to Program Outcomes Mapping:

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO-2	2	-	-	3	-	-	-	-	-	-	-	-	3	2
CO-3	1	-	-	-	-	-	-	-	-	-	-	2	-	-
CO-4	1	2	-	-	-	-	-	-	-	-	-	3	2	3

Note: Correlation levels 1, 2 or 3 as defined below:

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Lab Name	: **VLSI Physical Design Lab**
Lab Code	: **7CS8A**
Branch	: **Computer Engineering**
Year	: **Fourth Year (VII Sem)**

List of Course Outcomes

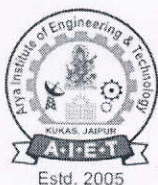|	
CO-1	Demonstrate knowledge and understanding the fundamentals of Xilinx tool ,testing and simulation
CO-2	Graduates gain ability to apply the concepts of basic combinational logic circuits, sequential circuit elements, and programmable logic in the laboratory setting
CO-3	To develop familiarity and confidence with designing, building and testing digital circuits, including the use of Xilinx tool.
CO-4	Student will be able to complete a significant VLSI design project having a set of objective criteria and design constraints.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	-	2	-	-	-	-	-	-	-	-	-	-	-	-
CO-2	1	-	-	2	2	-	-	-	-	-	-	-	1	-
CO-3	-	-	-	2	-	-	-	-	-	-	-	-	-	-
CO-4	-	-	-	3	2	-	-	-	-	-	-	-	-	-

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Estd. 2005

|	
Lab Name	**: Digital Image Processing Lab**
Lab Code	**: 8CS7**
Branch	**: Computer Engineering**
Year	**: Fourth Year (VIII Sem)**

1. This Lab helps the student to understand the Fundamentals of Digital image andits processing.

2. Perform the image enhancement technique for the improvement of pictorial information for human perception i.e. enhancing the quality of the image so that the image will have a better look

3. Apply the concepts of image segmentation and compression using which agraduate will be able to remove the redundancy pixels and transmit the image using less bandwidth.

4. Describe object detection and recognition technique learning which a graduate will be able to understand the fundamentals of digital signal processing with particular emphasis on problems in biomedical research and clinical medicine.

MAPPING OF COURSE OUTCOMES WITH PO & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	-	-	-	-	-	-	-	-	-	-	1	1	-
CO-2	1	-	-	2	-	-	-	-	-	-	-	-	-	-
CO-3	-	-	-	3	-	-	-	-	-	-	-	-	-	-
CO-4	-	-	-	-	-	1	-	-	-	-	-	-	-	-

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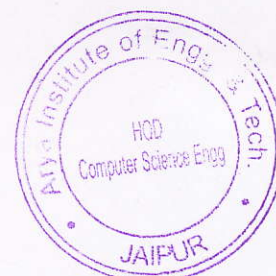
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Lab Name	: FPGA Lab
Lab Code	: 8CS6
Branch	: Computer Engineering
Year	: Fourth Year (VIII Sem)

List of Course Outcomes

CO-1	Implementation and understanding of DSP and FPGA circuits/modules and will be able to understand the difference among various DSP applications.
CO-2	Graduates will able to know about the programming as well as block diagram implementation of a DSP system using MATLAB and SIMULINK of a DSP system.
CO-3	By understanding it, graduate will be able to design and implement existing, as well as innovative system designs in DSP.
CO-4	They will introduce the concepts of using DSP processor kit and interfacing it with computer software.

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List of Supporting Files (2.6.1)

PEO
PO
PSO
All CO's