Name of the Department: Mechanical Engineering

BTPHXX-18 - Physics & Physics Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea
CO1: To be able to understand the basic principles of Quantum mechanics and to apply these to the complex phenomenon of matter radiation interaction	✓	/	√		√		V	V	V	√.	V	V	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO 2: To be able to understand the concept of wave packets using Heisenberg's uncertainty principle.			√		\		✓	V	V	✓	V	v	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO 3: To be able to apply Schrodinger's wave equations to study the complex physical phenomenon.	ś.		√		√		V	V	✓	√	V	V	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO 4: To be able to understand the structure of crystalline solids by applying knowledge of crystallography.			V		V		V	✓		V		V	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO 5: To be able to understand semiconducting materials by using the concepts of band theory of solids.	V	√	\ \	√	V	V	V	√	· V	V	V	V	Applying	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa

BTAMXX-18 - Maths-1

Department of Mechanical Engineering

K. Garris Published Sustainable

Mechanical Engineering

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PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Meas Attainment of CO
✓		V		✓		√	✓	√	✓	· V	V	Understanding	Yes	Minor Exams, Buisness Qui Assignments,End Term Exa
:		✓		V		√	√	√	√	√	~	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
√	√	√	√	V	V	√	V	√	*	√	√	Applying	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
inee	ring			A SECTION AND A	THE REAL PROPERTY.	Made	inal Eng Camp	preding us			-3· -0: ;	THE STATE OF THE S	2 1	
PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	10/17	POS	PO9	201			A CONTRACTOR OF THE PROPERTY O	Employabilit y / Entrepreneu	Assessment Tools to Mea Attainment of CO
V	V	V		~		V	√	✓	V	V	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
Warning of the Control of the Contro	√	✓		\		√	*	√	√	*	\	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
	- √	· V		 √		 	√	√	\ \ \		→	Understanding	Yes	Minor Exams, Buisness Qu Assignments, End Term Exa
	1 √ ineer PO 1	1 2	1 2 3	1 2 3 4 V V V Inneering PO PO PO A A A A A A A A A A A A A A A	1 2 3 4 5 V V V V V PO PO PO PO 1 2 3 4 5 V V V V V V V V V V V V V V V V V V	1 2 3 4 5 6 V V V V V V V V PO 1 1 2 3 4 5 6	1 2 3 4 5 6 PO/ V V V V V V V V Inneering Restrict d ledge Registration Restrict d ledge Registration Registration	1 2 3 4 5 6 PO POS V V V V V V V V V V V V V V V V V V V	1 2 3 4 5 6 PO7 PO8 PO9 V V V V V V V V V V ineering PO PO PO PO PO PO FO PO PO PO9 V V V V V V V V V V V V V V V V V V V	1 2 3 4 5 6 PO7 PO8 PO9 0 V V V V V V V V V V V V V V V V V V	1 2 3 4 5 6 PO7 PO8 PO9 0 1 V V V V V V V V V V V V V V V V V V	1 2 3 4 5 6 PO7 PO8 PO9 0 1 2 V V V V V V V V V V V V V V V V V V	1 2 3 4 5 6 PO POS POS O 1 2 Skill V V V V V V V V Understanding V V V V V V V V V Applying Department Skill PO PO PO PO PO PO PO PO POS POS POS POS	PO 1 2 3 4 5 6 PO

CO 4: Be introduced to types of wiring, batteries, and LT switchgear.		√ .	√		✓		V	 		√		√	Understanding	Yes	Minor Exams, Buisness Q Assignments,End Term Ex
BTEE101-18 Basic Electrical Engi	ineer	ring L	.ab			-									
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1	PO1	Skill	Focus on Employabilit y / Entrepreneu	Assessment Tools to Mea
CO1: The ability to use common electrical measuring instruments and understand the fundamentals of electrical engineering.	V	V	V		√		V	V	√	V	✓	~	Understanding	Yes	Minor Exams, Buisness Q Assignments,End Term Ex
CO 2: The ability to make electrical connections, and measure power, power factor using appropriate equipments.		✓	V		✓		*	~	V	V	V	✓	Understanding	Yes	Minor Exams, Buisness Q Assignments,End Term Ex
CO 3: Have the knowledge of electrical machines, components and their ratings		V	✓		~		V	▼	√	√	√	✓	Understanding	Yes	Minor Exams, Buisness Q Assignments,End Term Ex
CO 4: Understand the operation of transformers and electrical machines		✓	\		V		√	✓		√		V	Understanding	Yes	Minor Exams, Buisness Q Assignments,End Term Ex
Paper BTME101-18 Engineering	Grap	hics	& Des	sign							Soep MC Kapur	Dant .	Redundat Engineering	* 4 Aug ***********************************	n en
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	7 PO8	PO9	204	PO1 1			Focus on Employabilit y / Entrepreneu	Assessment Tools to Me Attainment of CO

within realistic constraints such as economic, environmental, social, nolitical ethical health and safety. CO 2: to prepare to communicate effectively. CO 3: to prepare to use the														. الله ا		
CO 2: to prepare to communicate effectively. CO 3: to prepare to use the techniques, skills, and modern engineering tools necessary for CO 3: to prepare to use the techniques, skills, and modern engineering tools necessary for	or process to meet desired needs within realistic constraints such as economic, environmental, social,	√	√	√	√	√	✓	V	√	√	√	√	√	Design	Yes	Minor Exams, Quiz, Assignment Term Exams
techniques, skills, and modern engineering tools necessary for $\sqrt{}$ Apply Yes Minor Exams, Quiz, Assignment Term Exams	1 ' '	√	*	√	√	✓	✓	✓	√	√	√	√	٧	Communicate	Yes	Minor Exams, Quiz, Assignment Term Exams
	techniques, skills, and modern engineering tools necessary for	√	√	√	√	V	√	√	✓	√	√	√	√	Apply	Yes	Minor Exams, Quiz, Assignment Term Exams

BMPD101-18 Mentoring and professional Development

Section of Mechanical Engineering LKG. P.T.U. Mich Compus

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea Attainment of CO
CO1: The student will be able to effectively communicate and present technical material.		V	√		\		V	√	V	V	√	V	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO2: Ability to think critically and creatively to generate innovative and optimum solutions.		√	√		√		V	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO3:The student will be able to identify, evaluate and synthesise information from a range of sources to optimise process engineering design and		√	√		√		√	V	V	V	V	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO4: Engage in continuous education, training and research, and take control of their own learning and overall development.		' √	V		√		V	V		De L/K	partn Gujr (M.	ent,c al Pur ain Ca	Understanding Understanding January Unpus) (Sounds	Neoring es	Minor Exams, Buisness Q Assignments,End Term Ex

BTCH101-18 - Chemistry -1

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PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea Attainment of CO
√		√		✓		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
		√		✓	-	✓	√	√	√	✓	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
		√		√		√	√	√	√	V	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
		√		√		√	√		√		√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
√	√	√	V	√	√	√	√	√	√	√	√	Applying	Yes	Minor Exams, Buisness Qu Assignments,End Term Ex
	1 ✓	1 2	1 2 3 VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV	1 2 3 4	1 2 3 4 5 V V V V V V V V V V V V V V V V V V	1 2 3 4 5 6 VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV	1 2 3 4 5 6 PO/ V V V V V V V V V V	1 2 3 4 5 6 PO7 PO8 V V V V V V V V V V V	1 2 3 4 5 6 PO7 PO8 PO9 V V V V V V V V V V V V	1 2 3 4 5 6 PO POS POS O V V V V V V V V V V V V V V V V V	1 2 3 4 5 6 PO POS POS O 1 V V V V V V V V V V V V V V V V V V	1 2 3 4 5 6 PO POS POS O 1 2 V V V V V V V V V V V V V V V V V V	1 2 3 4 5 6 PO7 PO8 PO9 0 1 2 Skill √ √ √ √ √ √ √ √ √ √ √ ✓ Understanding ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ Understanding	PO 1 2 3 4 5 6 5 6 PO 2 PO 2 Skill PO 6 PO 6 PO 6 PO 6 PO 6 PO 7 PO8 PO9 PO1 1 2 Skill PO1 1 2 Skill Employability / Entrepreneurshin V <

BTCH102-18 - Chemistry Lab

Constitution of Mechanical Engineering

Department of Archinical Engineering

4K. Gujral Punjob Technical University

"(Main Campus) Kapurthala

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rshin	Assessment Tools to Mea Attainment of CO
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		parameter	·		***************************************	,									
Estimate rate constants of reactions from concentration of reactants/products as a function of time	√		√	The state of the s	√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water. etc			V		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
Synthesize a small drug molecule and analyse a salt sample			 √		✓		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa

BTAMXX-18 Mathematics II

Dependent of Mechanical Engineering LKG, P.T.U. Michel Compus Kapaninals

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea Attainment of CO
CO1: The mathematical tools needed in evaluating multiple integrals and their usages.	√	A CONTRACTOR OF THE CONTRACTOR	√	V	√		√	√	*************************************	√	V	*	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO 2: The effective mathematical tools for the solutions of differential equations that model physical processes.			√	√	*		V	√	√	1	√	V	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Ex
CO 3: The tools of differentiation and integration of functions that are used in various techniques dealing engineering problems.			√	√	√		√	√	√ 0	√ epa rt	√	Å	Understanding	Yes	Minor Exams, Buisness Q Assignments,End Term Ex
BTPS101-18 Programming for P	roble	em So	lving			· 			L	C Gu	rai Pu	ings ampt	Lista Engineer Petroser Univer Petroserialiseta	519 sity	**************************************

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO8	P09	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rshin	Assessment Tools to Mea
To formulate simple algorithms for arithmetic and logical problems.	√	√	✓	1	√	V	1	√	√	√	~	V	Understanding	Yes	Minor Exams, Buisness Q Assignments,End Term Ex
To translate the algorithms to programs (in C language).		√	✓	-	\	\	√	√	√	√	V	V	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To test and execute the programs and correct syntax and logical errors.		V	V	√	V	V	V	√	V	√	√	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To implement conditional branching, iteration and recursion.		~	√		*	√		√		V		✓	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To decompose a problem into functions and synthesize a complete program using divide and conquer approach.		√	√		✓	√		√		√		✓ ,	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To use arrays, pointers and structures to formulate algorithms and programs.		√	√		1.1	33. T. I	11/.	√ mial ⊕ 238	ingines pus			√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.		✓	√		√	ærtha ✓	*	√	*	V		√ ,	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.		√	✓	- 110	√ ,	√		√ .		Depa K _v G	tmen Ijrai F Vain	Lof M Unjab Camp	Understandings Understandings Ve	ring Yes	Minor Exams, Buisness Qu Assignments,End Term Exa

BTPS102-18 Programming for Problem Solving Lab

				-	1	T	T	T	T	T	T	T-		Focus on	
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Employabilit y / Entrepreneu rshin	Assessment Tools to Mea Attainment of CO
To formulate the algorithms for simple problems	√	V	✓	V	✓		√	✓	✓	*****************	√	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To translate given algorithms to a working and correct program	√	V	√	V	√	V	-	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To be able to correct syntax errors as reported by the compilers	√	√	✓	✓	√	√	~	\	✓	 	V	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To be able to identify and correct logical errors encountered at run time	√	√	√	6	\ \ \	√		√	***	V	and the second s	✓	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To be able to write iterative as well as recursive programs	V	V	V	R. Ka	a funewick G. P.Z.: Vertical:	Media	Congny	apineeria pus _v		√		 	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To be able to represent data in arrays, strings and structures and manipulate them through a program	V	√	✓		√	✓		~		✓		V	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
To be able to declare pointers of different types and use them in defining self referential structures.	✓	✓	√		✓	✓		 		, D	partr C Gui	est di Halveu Main (Carried English	Neering Niversity Stall Yes	Minor Exams, Buisness Qui Assignments,End Term Exa

		r	 	<u> </u>						-		,	<u> </u>		
To be able to create, read and write to and from simple text files.	√	√	>		√ 1	√		✓		√		√	Understanding	Yes	Minor Exams, Buisness Assignments,End Term I
Paper BTMP 101-18 Workshop/i	Manu	factu	ring I	Practi	ces	**************************************	Barrier Portoneum							·	en e
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Me Attainment of CO
CO1: gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different	√ .	V	V	V	V	V	V			V	√	V	Understanding	Yes	Minor Exams, Project based Assignments, End Term I
CO 2: able to fabricate components with their own hands.	√	\	√	\	√	√	\			√	√	√ :	Apply	Yes	Minor Exams, Project based Assignments, End Term I
CO 3: Get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes	*	V	√	√	V	V	V			V	√	✓	Understanding	Yes	Minor Exams, Project based Assignments,End Term I
CO 4: By assembling different components, they will be able to produce small devices of their interest.	V	V	√ √	√	√	√	\			√		√	Apply	Yes	Minor Exams, Project based Assignments,End Term I
Paper BTHU101-18 English				:								ial En Marifine Guissa	inering H. A.	Engineering	
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8		PO1 0		(Ma PO1 2	n Campuc) Kapa Skill	Focus on Employabilit y / Entrepreneu	Assessment Tools to M Attainment of CO

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The objective of the course is to help the students become the independent users of English language.	√	√	√	√	√	√	√	217		√	√	V	() Understanding	Yes	Minor Exams, Project based le Assignments,End Term Ex
Students will acquire basic proficiency in reading & listening, comprehension, writing and speaking skills.	√	✓	√	√	√	√	√			√	√	√	Apply	Yes	Minor Exams, Project based le Assignments,End Term Ex
Students will be able to understand spoken and written English language, particularly the language of their chosen technical field.	✓	√	√	√	√	√	√			√	√	√	Understanding	Yes	Minor Exams, Project based le Assignments,End Term Ex
They will be able to converse fluently.	√	V	√	V	√	٧	V		-	√		 √	Apply	Yes	Minor Exams, Project based le Assignments,End Term Ex

Paper BTHU102-18 English Lab

Department of Mechanical Engineering LK.G. P.T.U. Mean Compus Kapunthalo

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea Attainment of CO
The objective of the course is to help the students become the independent users of English language.	√	✓	√	√	√	√	√			✓	√	V	Understanding	Yes	Minor Exams, Project based le Assignments,End Term Ex
Students will acquire basic proficiency in listening and speaking skills.	√	√	V	*	V	V	√			V	√	√	Apply	Yes	Minor Exams, Project based le Assignments,End Term Ex
Students will be able to understand spoken English language, particularly the language of their chosen technical field.	✓	V	✓.	√	√	V	√			√	n	4 Guj	ai Punjae (sam	Lai University	Minor Exams, Project based le Assignments,End Term Ex

fluently					Himmunana										Assignments,End Te
BMPD101-18 Mentoring and pro	ofessi	onal I	Devel	opme	ent										
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	P09	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rshin	Assessment Tools to Attainment o
CO1: The student will be able to effectively communicate and present technical material.	V	*	✓		V		\	√	√	√	V	\	Understanding	Yes	Minor Exams, Buisn Assignments,End Te
CO2: Ability to think critically and creatively to generate innovative and optimum solutions.		√	√		√		√	√	V	√	√	√	Understanding	Yes	Minor Exams, Buisn Assignments,End Te
CO3:The student will be able to identify, evaluate and synthesise information from a range of sources to optimise process engineering design and		V	V		V		√	V	V	V	V	V	Understanding	Yes	Minor Exams, Buisn Assignments,End Te
CO4: Engage in continuous education, training and research, and take control of their own learning and overall development.		V	√		V		√	V		√		V	Understanding	Yes	Minor Exams, Buisr Assignments,End Te
Paper BTME301-18 Fluid Mecha	anics									r !!		Enginee npus	1		
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07		PO9	4-979	P01	PO1	A inginearing Inice! University Inputiskin	Focus on Employabilit y /	Assessment Tools Attainment

		·····	·	<u>)</u>				***************************************							
CO1: Understand the concept of fluids and their properties.	√ .	√	√			\ √	✓		√	V		 ✓	Understanding	Yes	Minor Exams, Quiz, Assignment Term Exams
CO 2:Apply the concept to solve the problems related to statics, dynamics and kinematics	V	√	√			✓	✓		V	✓		1	Understanding	Yes	Minor Exams, Quiz, Assignment Term Exams
CO3: Use and apply dimensional analysis and similitude techniques to various physical	→	V	✓			V	~		✓	✓		V	Understanding	Yes	Minor Exams, Quiz, Assignmen Term Exams
CO4: Distinguish various types of flows and learn flow measurement methods.	✓	√	√			*	√		V	√		✓	Analyse	Yes	Minor Exams, Quiz, Assignmen Term Exams
BTME302-18 Theory of Machine	:s -1	Managan and managan ang ang ang ang ang ang ang ang a	#HHATTING SAME	4	Separation of the control of the con		edució Reja C	el Estén Empus	eding		-	<u></u>		Emergence of the Control of the Cont	A comment of the last of the l

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Course Outcome	PO 1	PO 2	PO 3	PO 4		PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment roots to mea
CO1: Understand constructional and working features of important machine elements.	V	√	√	√ ,	√	√			√	2	√	√	Understanding	Yes	Minor Exams, Assignments, En Exams
CO2: Design belt, rope and chain drives for transmission of motion from one shaft to	√	V	√	√	V	✓			V		V	√	. Understanding	Yes	Minor Exams, Assignments, En Exams
CO3: Identify different Cam and follower pairs for different applications and construct cam	 	\	✓	~	*	V			'n	epart C Guj	al Fi	1000	Jaiosi Engineer Conderat uriwe n S) Kapurthala	ng sity Yes	Minor Exams, Assignments, En Exams

	1	T			T	T***********	*	T		·····	γ	·			
CO4: Understand the function of brakes, dynamometers, flywheel and governors.	\	V	√	✓	*	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			V	:	√	*	Understanding, Applying	Yes	Minor Exams, Assignments, En Exams
4															

BTME303-18: Machine Drawing

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea Attainment of CO
CO1: Read, draw and interpret the machine drawings and related parameters.	V	V	V							√	√	√	Understanding	Yes	Minor Exams, Class and Ho Assignments, End Term Ex
CO2: Use standards used in machine drawings of machine components and assemblies.	√	✓	√							√	√		Applying	Yes	Minor Exams, Class and Ho Assignments, End Term Ex
CO3: Learn the concept of limits, fits and tolerances in various mating parts.	√	*	√							√	√		Understanding	Yes	Minor Exams, Class and Ho Assignments, End Term Ex
CO4: Visualize and generate different views of a component in the assembly.	V	√	V		V			:	:	√	√	√	Applying	Yes	Minor Exams, Class and Ho Assignments, End Term Ex
CO5: Use CAD tools for making drawings of machine components and assemblies.	\	✓	V		\ 					√	√	√	Applying	Yes	Minor Exams, Class and Ho Assignments, End Term Ex

BTME304-18 STRENGTH OF MATERIALS-I

Department of Mechanical Engineering I.K.G. P.T.U. States and I.K.G. P.T.U. States and I.K.G. Gujral Punios Technical University (Main Campus) Kepurthala

		-		J	**************************************										
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	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea Attainment of CO
CO1: Understand the concepts of stress and strain at a point, in the members subjected to axial, bending, torsional loads and temperature changes.	√	√	√			, √			√	√	√	\	Understanding	Yes	Minor Exams, Assignments, En Exams
CO 2: Determine principal stresses, maximum shearing stress and their angles, and the stresses acting on any arbitrary plane within a structural element.	√	~	√			V			V	*	V	V	Understanding and Analysing	Yes	Minor Exams, Assignments, En Exams
CO 3: Find bending moment and shear force over the span of various beams subjected to different kinds of loads.	√ *	√ .	√		√	V		7777	√	V	√	√	Analysing	Yes	Minor Exams, Assignments, En Exams
CO 4: Calculate load carrying capacity of columns and struts and their buckling strength.	√	V	V		√	√			V	✓	✓	\	Analysing	Yes	Minor Exams, Assignments, En Exams
CO 5: Evaluate the slope and deflection of beams subjected to loads.	V	*	√		√	V			V	V	√	√	Analysing	Yes	Minor Exams, Assignments, En Exams
BTME305-18 Basic Electronics E	Engine	eering)				mand of	Media Nicola	imal Ent Conty	jnedin Bartı	nont (sad Shaical Engineeri	ina	
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	(M PO 10	TALL 27 32		Permed Univers	y Focus on Employabilit y / Entrepreneu rship	Assessment 1001s to Med
Understand construction of diodes and their rectifier applications.	✓	√	√			V			√	√	√	\	Understanding	Yes	Minor Exams, Assignments, Er Exams

Exams

Appreciate the construction and working bipolar junction transistors and MOSFETs.	√	√	√		√		√	√	√	√	Understanding and Analysing	Yes	Minor Exams, Assignments, En Exams
Design Op-Amp IC based fundamental applications.	*	√	V	√	√		√	√	V	√	Analysing	Yes	Minor Exams, Assignments, En Exams

Paper Basic Thermodynamics BTME 305-18

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO7	PO8	PO9	PO1 0	PO1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Attainment of CO
CO1: Apply energy balance to Systems and Control Volumes in situations involving heat and work interactions.	V	V	V		*		✓	~	✓	V	✓		Applying	Yes	Minor Exams, Quiz, demonstr through videos/ lab, End Term
CO2: Evaluate changes in thermodynamic properties of substances		V	√	V	V				\			\	Applying	Yes	Minor Exams, Quiz, demonst through videos/ lab, End Term
CO3:Evaluate performance of energy conversion devices		✓	*	√	\				V		\	√	Applying	Yes	Minor Exams, Quiz, demonst through videos/ lab, End Term
CO4:Explain and apply various gas power and vapor power cycles		✓	✓	V	V	1			√	√	f		Understanding	Yes	Minor Exams, Quiz, demonst through videos/ lab, End Tern
BTME306-18 Strength of Materi	ial La	b	derentario in manerale de la constanta de la c		E m		planica lieis Gr	Engine Engine Empus	Guire Guire	al Pun: ain Ca	ist is	tologi Ichnik I) Kep	Engineering cal University outhala		

Course Outcome	PO 1	PO 2	PO 3	PO 4	PG 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment roots to mea
CO1: Measure the various mechanical properties such as tensile and compressive strength, impact strength, torsion strength and fatioue strenoth and hardness	√	√	✓	√		✓			V	√	√	√	Understanding	Yes	Quiz, Viva
CO 2: Calculate load carrying capacity of long columns and their buckling strength.	√	√	√	√		√			√	V	√	V	Understanding and Analysing	Yes	Quiz, Viva

BTME307-18 Theory of Machines Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu rship	Attainment of CO
CO1: Understand constructional and working features of important machine elements.	 √	√	\	*	V	√			√		√	√	Understanding	Yes	Minor Exams, Assignments, Er Exams
CO2: Design belt, rope and chain drives for transmission of motion from one shaft to															
another	✓	√	√	√	√	√			V		√	√	Designing	Yes	Minor Exams, Assignments, Er Exams
CO3: Identify different Cam and follower pairs for different applications and construct cam									De LK.	partm Gujra	eni fi Pun	Maci Maci at Ta	d cical Engineerin chnical Universi	g January	and di Machanical Engineering

profile for required follower motion.	√	V	V	√	√	√		V	v .	√	√	Designing	Yes	Minor Exams, Assignments, En Exams
CO4: Understand the function of brakes, dynamometers, flywheel and governors.	√	V	V	V	V	√		√		√	√	Understanding, Applying	Yes	Minor Exams, Assignments, En Exams

Paper BTME308-18 Fluid Mechanics Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea Attainment of CO
CO1: Distinguish various type of flows and flow measurement methods and concept of	:							de la companya de la							
statics and dynamics of liquids.	✓				√		V		√	V		√	Understanding	Yes	Minor Exams, Buisness Qu Assignments, End Term Ex
CO 2: Determine discharge and head loss, hydraulic and friction coefficient, for different															
types of flow in pipe and open channels.							V		V	v		V	Analyse	Yes	Minor Exams, Buisness Q Assignments,End Term Ex

BMPD301-18 Mentoring and professional Development

Denature (Main Campas) Reputhala

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea Attainment of CO
CO1: The student will be able to effectively communicate and present technical material.	√	✓	√ .		✓		V	V	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO2: Ability to think critically and creatively to generate innovative and optimum solutions.		V	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO3:The student will be able to identify, evaluate and synthesise information from a range of sources to optimise process engineering design and		✓	√		√		√	√	√	√	√	V	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa
CO4: Engage in continuous education, training and research, and take control of their own learning and overall development.		√	√		V		√	V		V		√	Understanding	Yes	Minor Exams, Buisness Qu Assignments,End Term Exa

BTME401-18 APPLIED THERMODYNAMICS

Department of Mechanical Engineering

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Course Outcome	gine	2 (Pro	3	4 (Co ndu	5 (Mo der	6 (Th	7 (En	PO8 (Eth ics)	(Ind	10 (Co mm	11 (Pro	: e	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment roots to Mea
CO1: Explain the functioning and performance evaluation of reciprocating air compressors.	\		✓	√	✓	✓	✓		√	\		V	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, Er Exams
CO 2: Analyze the combustion phenomenon in boilers and I.C. engines.	V	\ \ \		1	V	V	V	V	√	√C U	Span K. Gu	mehit Hal Pi	Up lication ding, of Madphing Enguise Technical U	dineering	Minor Exams, Assignments, Er Exams
												CHII C	anpus) Kapurth	ala	

		· · · · · · · · · · · · · · · · · · ·	·	4											
CO 3: Use of Steam Tables and MollierChart to solve vapour power cycle problems.	√	\	V	√	V	✓	√	√	√	√	V	V	Understanding, Applying	Yes	Minor Exams, Assignments, Er Exams
CO 4: Demostrate the constructional features and working of steam power plants and to evaluate their performance.	√	V	*	✓	√	✓ -	V		٧	V	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, Er Exams

Paper BTME 402-18 Fluid Machines

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea Attainment of CO
CO1: Determine discharge and head loss, hydraulic and friction coefficient, for different types of flow in pipe and open channels.	√	√	√			√	V		V	V	-	V	Knowledge	Yes	Lectures, Tutorials, Assignm Powerpoint Presentations, Nur etc.
CO 2:Know about constructional details, working and design aspects of runner/wheel and evaluate the performance of various turbines like Pelton. Kanlan and Francis.	√	V	√		any .	✓	V		V	V		√	Knowledge	Yes	Lectures, Tutorials, Assignm Powerpoint Presentations, Nun etc.
CO 3: Know about constructional details, working and evaluate the performance of centrifugal pump under different vane shape conditions.	√	√	√	and the second s		√	√ ,		√	√		√	Knowledge	Yes	Lectures, Tutorials, Assignm Powerpoint Presentations, Nun etc.
CO 4: Know about constructional details, working and evaluate the performance of reciprocating pump and evaluate the effect of various deviations from the ideal							le chan	al Engl	ecio)	De	pertm	e nt of	flead Jeannical Engli		
CO5: Know about constructional details and working of hydraulic devices like fluid coupling, accumulator and intensifier.				,	KG. Kapi					· K	4.00	1 2 2 2 3 3 3	Technical Engli Technical Un Tip (s) (Sanuthal Knowledgehal	h	Lectures, Tutorials, Assignm Powerpoint Presentations, Nun etc.

BTME403-18 STRENGTH OF MATERIALS-II

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	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Mea Attainment of CO
CO1: Understand the concepts of stress and strain at a point, in the members subjected to axial, bending, torsional loads and temperature changes.	V	√	√			√			√	V	√	V	Understanding	Yes	Minor Exams, Assignments, En Exams
CO 2: Determine principal stresses, maximum shearing stress and their angles, and the stresses acting on any arbitrary plane within a structural element.	√	٧	√			V			V	V	V	V	Understanding and Analysing	Yes	Minor Exams, Assignments, En Exams
CO 3: Find bending moment and shear force over the span of various beams subjected to different kinds of loads.	V	√	√		V	√			V	 √	V	V	Analysing	Yes	Minor Exams, Assignments, En Exams
CO 4: Calculate load carrying capacity of columns and struts and their buckling strength.	V	√	√		V	√			√	√	√	√	Analysing	Yes	Minor Exams, Assignments, Er Exams
CO 5: Evaluate the slope and deflection of beams subjected to loads.	V	√	V		√	√			V	V	V	\ \ \	Analysing	Yes	Minor Exams, Assignments, Er Exams

BTME404-18 MATERIALS ENGINEERING

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	PO	PO	PO	PO	PO	PO	PO		PO	PO	PO	PO		Focus on	N. Carriera
	1	2	3	4	5	6	7	PO8	9	10	11	12		Employabilit	Assessment Tools to Mea
Course Outcome	(En	(Pro	(De	(Co	(Mo	(Th	(En	(Eth	(Ind	(Co	(Pro	(Lif	Skill	у/	Attainment of CO
	gine	ble	sign	ndu	der	е	viro	ics)	ivid	mm	ject	е		Entrepreneu	
	erin	m	/De	ct)	n	Engi	nme		ual	unic	Man	long		rship	

	···y-														
CO1: Illustrate the significance of structure-property-correlation for engineering materials including ferrous and nonferrous.	✓	 ✓		✓	✓		V		 	 	√	V	Underst. ling, Applying and Designing	Yes	Minor Exams, Assignments, En Exams
CO 2: Explain the use and importance of various heat treatment processes used for engineering materials and their practical applications.	√		√	√	V	√	√	√	√	V	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, En Exams
CO 3: Identify the various structural changes occurred in metals with respect to time temperature transformations.	✓	√	√	√	√	√	√		√	V	V	√	Understanding, Applying	Yes	Minor Exams, Assignments, En Exams
CO 4: Interpret the significance of Fe-C and TTT diagram for controlling the desired structure and properties of the materials.	√	√		√	<u>۷</u>	٧ >	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, En Exams
BTME405-18 : Theory of Machin	nes -I	I			Station K.G. P	ni di Me T.U. Si pale	desiral Print Con	Eagle mpus	eneg	L	L				

gear trains.

Focus on PO PO PO PO **Employabilit** PO PO PO PO PO PO PO **Course Outcome** P07 **Assessment Tools to Mea** Skill 1 2 3 **y** / 10 11 12 **Attainment of CO Entrepreneu** rshin CO1: Understand the basic concepts of inertia forces & couples Understanding & √ \checkmark Minor Exams, Assignments, En √ applied to reciprocating parts of a Yes **Applying** Exams machine. CO2: Understand balancing of Department of Modern rotating and reciprocating parts of Understanding & √ Minor Exams, Assignments, En Yes machines. d Shankering Exams ical University CO3: Select suitable type of gears (Main Const 45 7 southala. for different application and analyse **Understanding &** Minor Exams, Assignments, En √ √ the motion of different elements of Yes Applying Exams

		·				p	 ,	·			***************************************	X		
CO4: Understand the concept and application of gyroscopic effect.	√	V	✓	√	√ .	Y					√	Understatiuing & Applying	Yes	Minor Exams, Assignments, Er Exams
CO5: Gain knowledge of kinematic synthesis.	√	√	√	√	√	:				√	√	Understanding & Applying	Yes	Minor Exams, Buisness Quiz, E Exams

EVS101-18 ENVIRONMENTAL SCIENCE

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu rship	Attainment of CO
Students will enable to understand environmental problems at local and national level through literature and general awareness.	√	√	√	√							√	√	Understanding & Applying	Yes	Minor Exams, Assignments, Er Exams
The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various	√	V	√	√	√	:					√	√	Understanding & Applying	Yes	Minor Exams, Assignments, Er Exams
The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate	√	√	√	V	V						√	√	Understanding & Applying	Yes	Minor Exams, Assignments, Er Exams
Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world	√	√	√	√	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	不完全	nami o	Wecha	ial E	gine din		√	Understanding & Applying	Yes	Minor Exams, Assignments, Er

BTME406-18 APPLIED THERMODYNAMICS Lab

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1 -	ble	sign	ndu	der	е	viro	(Eth	(Ind	mm	ject	е	Skill	Focus on Employabilit y / Entrepreneu rshin	Assessment Tools to Measu Attainment of CO
✓		✓	V	V	V	*		√	√		√	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End T Exams
√	√		√	√	✓	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End T Exams
✓	√	✓	~	*	√	✓	√	√	√	√	V	Understanding, Applying	Yes	Minor Exams, Assignments, End T Exams
√	√	√	√	√	./	V	A-00-11 to	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End T Exams
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Paper BTME407-18 Fluid Machines Lab

Topartinant of Medianical Engineering
I.K.G. P.T.U. Made Compus
Kaparibala

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu	Attainment of CO
CO1: Conduct experiments on scaled down models or on actual size hydraulic machines and evaluate results in terms of unit or specific quantities for comparison	٧	√	√		✓	√ :	√		√	*	V	√		La Karatatan Badalah	ा Case Study, Group Discussions e
CO 2: Understand the working of various hydraulic machines (turbines and pumps) and can suggest remedial solutions for various faults.	√	√	√		√	V	√		√	√	✓	√	Understanding	Yes	Case Study, Group Discussions e

Paper BTME408-18 Material Engineering Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
Analyse the microstructure of different ferrous and non-ferrous samples.	√	√	√		√	√	√		~	√	√	√	Applying	Yes	Case Study, Group Discussions
Explore the effect of heat treatment on various engineering materials by analysing its microstructure and hardness	√	√	√		√	V	√		√	√	√	,√	Understanding	Yes	Case Study, Group Discussions (

BMPD401-18 Mentoring and professional Development

Denaturant of Mechanical Engineering LKG, P.T.U. Marin Compus Kapunthrala

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Attainment of CO
CO1: The student will be able to effectively communicate and present technical material.	V	V	V		V		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO2: Ability to think critically and reatively to generate innovative and optimum solutions.		√	√	-	√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO3:The student will be able to dentify, evaluate and synthesise nformation from a range of ources to optimise process engineering design and	***************************************	V	√		✓		√	√	V	√	√	√	Department Understärlding (Mass)	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

	·											
CO4: Engage in continuous education, training and research, and take control of their own learning and overall development.		√	√	√	√	√		√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exam
				 	 	·	·		 			

BTME501-18 Heat Transfer

Course Outcome	PO 1 (En gine erin	1	PO 3 (De sign /De		der	e	PO 7 (En viro nme	ics)	PO 9 (Ind ivid ual	PO 10 (Co mm unic	ject	e	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
To teach students the basic principles of conduction, radiation, and convection heat transfer. Students will demonstrate an understanding of the basic	√		✓	√	√	√	√		√	√		V	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End [*] Exams
To extend the basic principle of conservation of energy to systems that involve conduction, radiation, and heat transfer. Students will demonstrate an understanding of	√	√		~	√	¥	V	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Exams
To train students to identify, formulate, and solve engineering problems involving conduction heat transfer. Students will demonstrate the ability to formulate practical	√	٧	√	✓	>	√	√	V	√	✓.	√	✓	Understanding, Applying	Yes	Minor Exams, Assignments, End Exams
To train students to identify, formulate, and solve engineering problems involving forced convection heat transfer, and heat	√	√	√	√	√	√	√		√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Exams
To train students to identify, formulate, and solve engineering problems involving radiation heat transfer among black surfaces and among diffuse gray surfaces.	V	√	> (> /	√	√	√		V	√	V	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Exams

BTME502-18: Design of Machine Elements (C. P.T.). Librar Campus Naturithals

		ľ							1		I	T		Focus on	
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	10 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Employabilit y / Entrepreneu rshin	Assessment Tools to Measu Attainment of CO
CO1: Demonstrate recalling and applying knowledge of Basic Sciences, Graphics & Drawing, Basic Manufacturing Processes and Material Science, for design CO2: Comprehend the effect of	V	V	٧	√	√	. V				✓	✓	V	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End Exams
ifferent stresses and strains under arious loading conditions on the nechanical components and dentify the mechanism/mode of	V		V	√ 	√	V				✓	. √ 33.3	y	Understanding and Applying	Yes	Minor Exams, Assignments, End Exams
O3: Examine and solve design roblems involving machine lements on the basis of various neories of failure.	V		٧	V	V	V				✓	✓	√	Applying and Designing	Yes	Minor Exams, Assignments, End Exams
O4: Synergize forces, moments and strength information to levelop ability to analyze, design and/or select machine elements iming for safety, reliability, and	V	\	✓	V	V	V	V			V	√	V	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End Exams
Paper BTME 503-18 Manufactur	ing P	roces	ses			mid Mi	derica Post G	d English Empus						J. Floor	The state of the s
Course Outcome	PO 1	PO 2	P0 3	PO 4	PO 5	PO 6	P07	PO8	PO9	PO1 0	PO1 1	PO1 2	SKING (N	Focus on A Employabilit Y / Entrepreneu	Assessment Tools to Measi Attainment of CO
	L							21 September 18			22. T.				
O1: Understand the different conventional manufacturing nethods employed for making lifferent products.	V	√	V		✓	✓	✓			✓	√	✓	Understanding	Yes	Minor Exams, Quiz, Assignments Term Exams

Paper BTME 503-18 Management & Engineering Economics

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO8	PO9	PO1 0	PO1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
CO1: Explain the development of management and the role it plays at different levels in an organization.	√		::				√	√	√	~	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exam:
CO 2: Comprehend the process and role of effective planning, prganizing and staffing for the development of an organization.			:				√	√	V	√	V	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exam:
CO 3: Understand the necessity of good leadership, communication and coordination for establishing effective control in an organization.							√	V	✓ .	√	✓	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exam:
CO 4: Understand engineering economics demand supply and its mportance in economics decision naking and problem solving.							√	√		✓		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exam:
CO 5: Calculate present worth, annual worth and IRR for different alternatives in economic decision making.	√	√	√	√	√	V	√	√	√	√	√ :	√	Applying	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exam
CO 6: Understand the procedure nvolved in estimation of cost for a simple component, product costing and depreciation, its methods.	√	√	V	✓	V	> /	√	√	✓	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exam

Paper BTME 503-18 Heat Transfer Lab

Devertment of Mechanical Engineering

K.G. P.T.U. Sizes Company

Kaparthalia

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	r O 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
Design and fabricate the experimental setups related to heat transfer phenomena.	✓	V	-		√	√	V			√	√ .	√	Understanding	Yes	Minor Exams, Quiz, Assignments, Term Exams
Measure and analyse different heat gransfer parameters.	√	√	√		√	√	✓			√	√	√	Understanding	Yes	Minor Exams, Quiz, Assignments, Term Exams

Paper BTME 506-18 Manufacturing Processes Laboratory

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu	Attainment of CO
CO1: Determine/calculate the clay content, moisture content, lardness, permeability and grain ineness number of moulding sand ample.	√ '	√	V	√	√	√	√			\ \	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
O 2: Use oxy-acetylene gas velding, manual arc welding, MIG, IG and spot-welding processes to nake various joints.	√	√	√	√ :	V	>/	√	-		V	✓	√	Applying	Technology Col	Migor Exams, Buisness Quiz, End Exams
O 3: Use machine tools such as athe, shaper and milling machine or machining/cutting various rofiles on work pieces.	√	√	√	√	I VK		\mathbb{U}	anid	inine Supplemental Supplemental	V	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
O 4: Learn about the onstructional features and working f grinding machines, hydraulic ress, draw bench, rolling mills, rawing and extrusion equipment	√	V	√	√	v	√	√			V	✓	V	Applying	Yes	Minor Exams, Buisness Quiz, End Exams

Paper BTME 507-18 Numerical Methods Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
Inderstand different mplementation modes of numerical nethods.	√	✓	√	✓	✓	√	√			√	✓	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
Ise the numerical methods with he understanding of limitations of hese methods for solving roblems.	٧	√	V	V	V	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
evelop and implement their own omputer programs.	√	✓	✓	~	>	√ -	V			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
olve problems more accurately nd efficiently in low computational rne.	√	✓	√	√	√	. ✓	✓			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End
andle the problems conveniently hich are difficult to deal with anually	√	√	√	√	√	√	√			√	✓	√	Applying	Ostoliken On	Exams Minor Exams, Buisness Quiz, End Exams

aper BTMC102-18 ESSENCE OF INDIAN KNOWLEDGE TRADITION

Department of Mechanical Engineering
LKG. PTV: Mode Compus
Kapurthaic

ourse Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO8	PO9	PO1 0	PO1	PO1 2	Skill	Focus on Employabilit	Assessment 100is to Measu
										<u> </u>		<u> </u>	Tark T. M.	Entrepreneu rshin	

which are difficult to deal with nanually Paper BTME 409-18 4 weeks inc	√ ustri	al tra	ining		> W.S.	>	a Med	a Gan		√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
promise to act weeks in					\$ \$48 he				Ą					
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6		PO8	204	PO1 1	PO1 2	Skill	Focus on Employability Y / Entrepreneu	Assessment Tools to Measu Attainment of CO
	•	ł			PO	PO			PO1			Skill Applying	Employabilit	Assessment Tools to Measu

and the second s	~			<u>C</u>									C		
ecome updated with all the latest hanges in technological world.	V	√	V	√	√	√	V			✓	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
bility to communicate efficiently.	√	√	V	V	V	√	√			V	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
nack to be a multi-skilled engineer ith good technical knowledge, nanagement, leadership and ntrepreneurship skills.	√	V	V	√	V	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
bility to identify, formulate and lodel problems and find ngineering solution based on a stems approach.	√	√	\ \	V	V	√	V			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
apability and enthusiasm for self- nprovement through continuous rofessional development and life- ng learning	√	V	V	√	√	√.	V			√	√	V	Applying	Yes	Minor Exams, Buisness Quiz, End ⁻ Exams
wareness of the social, cultural, oual and environmental esponsibility as an engineer.	√	√	√	V	√	V	V			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
TME601-18 REFREGERATION	AND /	AIR C	ONDI	TION	ING	NEW XX	finanto 3. P.T.: urthala	i Veda	mical En	ginediq US		1	Depart LIC Gu	ment of Mecha gral Purgab Tec	ical Enginearing Antical University
ourse Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Employabilit y / Entrepreneu rship	Naparatas:
O1: Understand the fundamental inciples and applications of frigeration and air conditioning stem	√	√	V	√	√		\	√	\	V	V	V	Understanding	Yes	Minor Exams, Assignments, End T Exams
	~			·	1	<u> </u>	<u> </u>	<u> </u>	1	<u> </u>	1		1	L	

	~ ~~		···												
CO2: The students will be able to obtain cooling capacity and coefficient of performance by conducting test on refrigeration octains	✓	✓	√	V	√	**************************************	V		√		V	V	Applying and Designing	Yes	Minor Exams, Assignments, End Exams
CO3: The students will develop ability to calculate the energy equirements of cooling and heat equipment for air conditioning and lications.	√		√	√	√	V	V		√	\	V	√	Applying and Designing	Yes	Minor Exams, Assignments, End Exams
CO4: The students will be able to Explain the properties, applications and enironmental issues of different refrigerants.	√	V		V	V	√		√	V	V		√	Applying and Designing	Yes	Minor Exams, Assignments, End Exams
CO5: The students can demonstrate an ability to analysis asychrometric processes and cycles of air conditioning systems.	√	√	V	√	V		√		V	V	√	√	Applying and Designing	Yes	Minor Exams, Assignments, End T Exams
								C	7						_
Paper BTME602-18 Mechanical	Meas	urem	ents	& Met	rolog	y	1	Times:	mark of l P.T.!).	(circle) (cal Engi Tempu	nesčaji S	Depart LK G	imeni c! Mechi gral Purist: Ta Mein Campus	Head Engineering Harical University Kapunthala
Paper BTME602-18 Mechanical Course Outcome	Meas PO 1	PO 2	PO 3	& Met	PO 5	PO 6	T	I.K.G. Kapu	mari di P.T.!).		:@m p u	PO1	Depart LK G	Focus on Employabilit y / Entrepreneu	Kapurthala
	РО	PO	PO	PO	РО	PO	T	I.K.G. Kapu	need of l P.T.!. Strele	PO1	PO1	PO1	j uk G	Mein Campus Focus on Employabilit y /	Kapurthala Assessment Tools to Measu
Course Outcome O1: To provide a knowledge bout measurement systems and	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	T	I.K.G. Kapu	PT.II.	PO1 0	PO1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rshin	Assessment Tools to Measu Attainment of CO Lectures, Tutorials, Assignmen Powerpoint Presentations, Nume

				C _	-	r	.	,			T	Y	C	1	
O 4: To learn metrology of screw, ear and surface texture.	√	√	√ :	√	√	✓			√	√	√	✓	Understanding	Yes	Lectures, Tutorials, Assignment Powerpoint Presentations, Numer etc.
TME603-18 AUTOMOBILE ENG	INEE	RING										**************************************	•		
ourse Outcome	PO 1 (Fn	PO 2 (Pro	PO 3 (De	4	5	6	7	PO8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit	Assessment Tools to Measu

-	ble	sign	ndu	der	e	viro	ics)	ivid	mm	ject	е	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
√	:	√	√	√	√	√		√ '	√	√	√	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End 1 Exams
√		√	√	√	√	√	√	√	V	√	✓	Understanding, Applying	Yes	Minor Exams, Assignments, End 1 Exams
√	√	√	√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End 1 Exams Exam
•	1 (En gine erin	1 (En (Pro ble erin w	1 2 3 (De gine ble sign / De	1 2 3 4 (Co pine perin m /De ct)	1 2 3 4 5 (En (Pro ble sign of multiple sign) V V V V V V V	1 (En (Pro ble sign ndu der n Engi	1 2 3 4 5 6 7 (En (Pro ble sign ndu der e viro nme) V V V V V V V V V V V V V V V	1 2 3 4 5 6 7 PO8 (En (Pro ble sign ndu der n Fnai nme) 1 (Pro ble sign ndu der n Fnai nme) 1 (En (Pro the sign ndu der n Fnai nme) 1 (En (Eth tics) nme) 1 (En (En (Eth tics) nme) 2 (En (Eth tics) nme) 3 (En (En (Eth tics) nme) 4 (ITh tics) nme) 4 (ITh tics) nme)	1 2 3 4 5 6 7 PO8 9 (Eth circle) ivid properties of the circle of the ci	1 2 3 4 5 6 7 PO8 9 10 (Co (Mo of the prine) m /De ct) n Final name with the prine m /De ct) n /V	1 2 3 4 5 6 7 PO8 9 10 11 (En (Pro gine erin m /De ct) n Final nme ct) 11 (En (ind ivid mm ject unic Man	1 2 3 4 5 6 7 (Pro (De to proper the proper to	1 2 3 4 5 (Mo Gine ble sign ndu perin m /De ct) n Final nme ct	1 2 3 4 5 6 7 PO8 9 10 11 12 (Lif gine ble sign ndu der e n Engi nme erin

aper BTME 604-18 Introduction to Industrial Management

Department of Mechanical Engineering

I.K.G. P.T.

Kapurchal

(Main Campus) Kagunthal

ourse Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
O1: 1.Understand the omplexities associated with lanagement in the organizations nd integrate the learning in andling these complexities.	v	√	√		√	√	√	√	√	√	√	√	Understanding		Minor Exams, Buisness Quiz, Assignments,End Term Exams

	900111111111111111111111111111111111111				×.								C		
CO 2: 2.Demonstrate the roles, kills and functions of nanagement.	√	V	V		√	\ \ \	√	V	· ✓	√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exam
CO 3: 3.Understand the concepts elated to industrial management.	√		√	\		V	\	V	√	√	V	√	Applying	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exam
STME605-18 REFREGERATION	AND /	AIR C	ONDI	TION	ING	LAB		~		1	N SEE	Sintent (n Mechanical Engineeri J. Livin Osmbus	Mr Cuiral Phil.	Head Machaical Equineering into Technical University mpus) Kapurthala
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
CO1: Understand the fundamental rinciples and applications of efrigeration and air conditioning system	√	V	√	√	V		V	√	√	√	√ '	√	Understanding	Yes	Minor Exams, Assignments, End T Exams
O2: The students will be able to btain cooling capacity and oefficient of performance by onducting test on refrigeration ystems.	√	V	V	V	V		V		√		√	√	Applying and Designing	Yes	Minor Exams, Assignments, End ⁻ Exams
O3: The students will develop bility to calculate the energy equirements of cooling and heat quipment for air conditioning polications.	√		√	V	√	·V	√		V	V	√	V	Applying and Designing	Yes	Minor Exams, Assignments, End Exams
O4: The students will be able to xplain the properties, applications nd enironmental issues of ifferent refrigerants.	✓	√		√	√	· •		V	√	V		√	Applying and Designing	Yes	Minor Exams, Assignments, End Exams
O5: The students can emonstrate an ability to analysis sychrometric processes and cycles f air conditioning systems.	√	√	V	V	√		√		√	V	√	V	Applying and Designing	Yes	Minor Exams, Assignments, End Exams

Paper BTME606-18 Mechanical Measurements & Metrology Lab

PO	DO.			T	<u> </u>	T	T	Γ	l	T	T			
1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu	Assessment 100is to Measu
√	√	✓	√	√	√			√	√	V	√	Understanding	Yes	Case Study, Group Discussions,
√	√	√	√	~	√			√	√	√	√	Knowledge	Yes	Case Study, Group Discussions,
√	✓	√	√	> 4	う			~	√	√	√	Applying	Yes	Case Study, Group Discussions,
	✓	✓ ✓	√ √ √	√ √ √ √ √ √ √	V V V V V	V V V V V V	V V V V V V V	V V V V V V V V V V V V V V V V V V V					✓ ✓	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

BTME603-18 AUTOMOBILE ENGINEERING LAB

Superiment of Mechanical Engineering L.K.G. P.T.U. Meth Compus Kapurthalo

Department of Machinical Engineering LK. Gulral Punjab Technical University (Mein Campus) Kapurthale

Course Outcome	PO 1 (En gine erin	ble	PO 3 (De sign /De	4 (Co ndu	5 (Mo der	e	•	ics)	ivid	mm	ject	PO 12 (Lif e long		Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
IO1: Identify the different parts of he automobile.	√		√	√	✓	✓	√		√	√	√	~	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End T Exams
O 2: Demostrate the working of arious parts like engine, ransmission, clutch, brakes, teering and the suspension vstems.	√	ć	√	√	√	√	√	√	✓	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End T Exams

CO 2: Evelpin the mond of webble							
CO 3: Explain the need of vehicle safety systems and future developments in the automobile ndustry.	√ √	/ \	✓	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Exams

BTME-608-18 : Minor Project

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
CO1:Identify an open ended problem in area of mechanical engineering which requires further nvestigation.	√		√		√	√	√	: √	V	√	√ .	V	Understanding	Yes	Reports, Project Presentations and Viva
CO2: Identify the methods and materials required for the project work.	√	√	√	V	√	√	√	√	√	√	V	√	Applying and Designing	Yes	Reports, Project Presentations and Viva
CG3: Manage the work with team nembers.	√		√	√	√	√	√	√	V	√	√	√ .	Applying and Designing	Yes	Reports, Project Presentations and Viva
CO4: . Formulate and implement nnovative ideas for social and environmental benefits.	√	√	√	√	√	٧	V	√	✓ ,	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Viva
CO5: Write technical report of the project apart from developing a presentation.	√	√	√	√	· √	√	√		V	√ :	V	√	Applying and Designing	Yes	Reports, Project Presentations and Viva

Paper: Internal Combustion Engines 609-18

Department of Mechanical Engineering
L.K.C. P.T. H. Campus
Kapurtha

Department

LK. Gujra

(Main Campus) Kapurmala on the same

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PG 5) PO6	P07	PO8	PO9	PO1 0	P01	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Attainment of CO
CO1:Knowledge about the basics of IC engines	V	V	V	V			√		√	√		V	Understanding	Yes	Minor Exams, Quiz, demonstrat through videos/ lab, End Term E
CO2:Ability to evaluate operational characteristics of IC Engines	√	√	1	√		✓	√		√	√ 1	V	√	Understanding	Yes	Minor Exams, Quiz, demonstrat through videos/ lab, End Term E
CO3:Ability to ascertain the effects of fuel/supply systems on emission rom an engine.		√	*	√	✓		√	:	:	:	V	√	Understanding	Yes	Minor Exams, Quiz, demonstrati through videos/ lab, End Term E
CO4:Ability to test engine performance	:	√ '	√	√	√		√	√		✓		✓	Applying		
BTME-610-18 Mechatronics Syst	tems		1	Aleman K.C. I	он () И ! Т . Ј	da i	al Engi n	aing						K. Gujisi Punj	Application Engineering ab Technical University (1975) Keburinale
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
CO1: Design mux, demux, flip- lops, and shift registers.		√	√	√	√		√	√	√	√	√		Applying and Designing	Yes	Minor Exams, Assignments, End 1 Exams
CO2:Describe the block diagram, egisters, ALU, bus systems, timing k control signals, instruction cycles, and interrupts of 8085 picroprocessors.	√	√		3	√		· ✓	√	√	√	√ .	V	Applying and Designing	Yes	Minor Exams, Assignments, End T Exams

					•								~ :		
CO3: Apply the concept of 8085 microprocessor instruction sets and addressing modes in writing assembly language program for a niven problem. CO4: Describe the interfacing of memory, 8255 PPI, ADC, DAC, 7-	√	\	✓		V	√	√	√	V	√	V		Applying and Designing	Yes	Minor Exams, Assignments, End Exams
segment LED system, stepper notor, 8251 and 8253 ICs with 8085 microprocessor	√		√	√	√		V			√		√	Applying and Designing	Yes	Minor Exams, Assignments, End Exams
BTME-611-18 Microprocessor in	auto	omatio	on			No. of the last of	Marina G. P.	Norwe I.V. : I. Ve	dianical	Enginer Tipus				the feet of the	Lieuwholoei Engaleach g dao Taomhad Univarsity ann an Kaomhada
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu	Assessment Tools to Measu Attainment of CO
itudent is able to describe the architecture and different modes of operations of a typical nicroprocessor.		*	√	√	√		√	~	√	√	✓		Applying and Designing	Yes	Minor Exams, Assignments, End 1 Exams
Student is able to understand lifferent addressing modes and nstructions of 8086 design and levelop assembly language mograms using software interrunts.	√	√			√ :		√	√	· √	√	✓	√	Applying and Designing	Yes	Minor Exams, Assignments, End 1 Exams
itudent is able to interface nemory, I/O devises and interrupt ontroller with 8086 nicroprocessors.	√	√	√		√	√	√	√	✓	√	v		Applying and Designing	Yes	Minor Exams, Assignments, End T Exams
tudent is able to describe the nternal architecture and different nodes of operations of a typical nicrocontroller	√		√	√.	V		√			~		✓	Applying and Designing	Yes	Minor Exams, Assignments, End T Exams
tudent is able to design and evelop assembly language rograms using 8051 nicrocontroller	√		√	√	√		√			√		✓	Applying and Designing	Yes	Minor Exams, Assignments, End T Exams

S 305.6 Student is able to analyze nd compare the features of nicroprocessors and	√	√	C		√		✓	Applying and	Yes	Minor Exams, Assignments, End
nicrocontrollers.							·	Designing	(05	Exams

Course Outcome	PO 1 (En gine erin	ble	PO 3 (De sign /De	ndu	der	6 (Th	viro	ics)	ivid	10 (Co mm	PO 11 (Pro ject Man	12 (Lif e		Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
IO1: Explain the concept, need and pplications of composite materials.	√	✓	✓	√	√	√	√		√	√		V	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End 1 Exams
10 2: Suggest/select optimum ombination of fatrix/Reinforcement for various ngineering applications.	√	✓	√	√	× ×	√	~	~	√	✓	V	√	Understanding, Applying	Yes	Minor Exams, Assignments, End 1 Exams
IO 3: Analyze the effects of nfluencing factors on the strength f composite materials.	√	√	√	√	✓	V	~		√		√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End T Exams

TME-613-18 Computer Aided Design

Department of Mechanical Engineering

I.K.C. P.T.U. I.L. Sampus

Kayurthala

Department of Muchaical Engineering
LK Gujral Punjeb Tachnical University
(Main Campus) Kapurthala

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu	Assessment 100is to Measu
O1: Create the different ireframe primitives using arametric representations	✓	✓	√		√ .		V	√		~	√		Applying and Designing	Yes	Minor Exams, Assignments, End T Exams

	·	·	·	_(/	· y ···································	· · · · · · · · · · · · · · · · · · ·	·		~~~		<u> </u>	La constante	
CO2: Create surface primitives using parametric modeling.		√		√	√	,	√	■	✓		**************************************	✓	Applying and Designing	Yes	Minor Exams, Assignments, End ⁻ Exams
CO3: Create the different solid rimitives using the different epresentation schemes	√		√	√	✓		√	√	√	V	√		Applying and Designing	Yes	Minor Exams, Assignments, End Exams
CO4: Apply geometric ransformations on the created vireframe, surface and solid nodels.	√	V	√		√	√	√		√	√		√	Applying and Designing	Yes	Minor Exams, Assignments, End ⁻ Exams
Paper BTME 614-18 Product Des	nent				LKG.	P.T.U.	Vechan Spiziel	cal Engl	neering S	De	L Guiral Progra	Engineering Construction University (aux) Xupurthala			
Course Outcome	PO PO PO PO PO PO PO FO								PO9	PO1 0	PO1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
101: Understand desirable design spects considering various roduction processes and also neerstand the economic factors of lesion.	٧	V	√	√	√	√	√	V	V	√	V	V	Understanding	Yes	Minor Exams, Quiz, Assignments, Term Exams
O 2: Employ engineering, cientific, and mathematical rinciples to execute a design from oncept to finished product.	√	√	√	√	√	√	√	V	√	√	√	√	Applying	Yes	Minor Exams, Quiz, Assignments, Term Exams
O 3: Apply the modern pproaches to product design onsidering concurrent design, uality function deployment and arious rapid prototyping methods	√	√	√	√	√	V	√	√	√	√	V	√	Applying	Yes	Minor Exams, Quiz, Assignments, Term Exams
O 4: Apply innovative process echniques in synthesizing nformation, problem-solving and ritical thinking.	√	√	√	√	√	√	V	√	√	√	√	√	Applying	Yes	Minor Exams, Quiz, Assignments, Term Exams

BTME 615-18: Non Conventional Energy Resources

	,		·			•									
Course Outcome	PO 1	PO 2	PO3	PO 4	PO 5	PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
O1: To Explain renewable energy ources & systems.	√	✓				V						\	Understanding	Yes	Minor Exams, Buisness Quiz, End Exams
O2: To Apply engineering echniques to build solar, wind, dal, geothermal, biofuel, fuel cell, bydrogen and sterling engine	√	√	√	√	√	√	V	√	V		√		Designing	Yes	Minor Exams, Buisness Quiz, End Exams
O3: To Analyze and evaluate the nplication of renewable energy. oncepts in solving numerical roblems pertaining to solar adiation geometry and wind	√	√	√	√	V	√	√				V		Applying	Yes	Minor Exams, Buisness Quiz, End Exams
O4: To Demonstrate self -learning apability to design & establish enewable energy systems.	√	*************************************	√	✓	√	√	√	√	✓		√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
O5: To Conduct experiments to ssess the performance of solar PV, plar thermal and biodiesel systems	V	√	√	√	√	√	√	√ -	√		√	V	Applying	Yes	Minor Exams, Buisness Quiz, End Exams
TME616-18 : OPERATION RESE	EARC	H			,	IKC	timent of P.T.:	Necha		ineri(and the second s	Ogusen LE GAR (in	Control Acquisition
ourse Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y /	Assessment 100is to measure

y / Entrepreneu

rshin

	Ţ					-							7		
CO1: Explain various mathematical deterministic operation research models.	√	√	√	✓	V			√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Class and Hom- Assignments, End Term Exam
CO2: Describe the problems of probabilistic and simulation models.	√	V	√	V	 			√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Class and Home Assignments, End Term Exam
CO3: Demonstrate the queuing, nventory and replacement models etc.	√	V	√	V	√			v	√	V	√	√	Applying and Designing	Yes	Minor Exams, Class and Home Assignments, End Term Exam
CO4: Formulate and analyze the network models.	√	✓	\	✓	√			√	√	√	√	√	Applying and Designing	Yes	Minor Exams, Class and Home Assignments, End Term Exam
	L			<u> </u>		7	7	L	4	L	L	L	1		
BTME617-18: MAINTENANCE &	RELI	ABILI	ITY		(J. W.)	permou G.P.	i of Mex	lanied ht Car	Enginee npus		L			1	Jenson of Green Punishing Secondary University
STME617-18: MAINTENANCE &	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	of Mex	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu	The offence Process Engineering
	PO	PO	РО	1	PO	PO	is.	PO	PO	PO			Skill Understanding	Focus on Employabilit y /	Assessment Tools to Measu
Course Outcome CO1: Understand the concepts of	PO 1	PO 2	PO 3	4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	11	12	verificação e a companya de la comp	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO Minor Exams, Assignments, End 1

Paper BTME701-18 Mechanical Vibrations

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO8	PO9	PO1 0	PO1 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu rship	Assessment Tools to Measu Attainment of CO
CO1: Formulate mathematical nodels of problems in vibrations using Newton's second law or energy	√	√	✓	√	√	√	V		V	√	√	√	Understanding	Yes	Lectures, Tutorials, Assignmen Powerpoint Presentations, Numer etc.
20 2: Understand the need and neasurement of vibration in nechanical systems.	√	√	V	√	√	V	√		√	√	V	√	Understanding	Yes	Lectures, Tutorials, Assignment Powerpoint Presentations, Numer etc.
O 3: Calculate principal modes of ibration.	√	√	√	√	√	√	V		√	√	√	√	Applying	Yes	Lectures, Tutorials, Assignmen Powerpoint Presentations, Numer etc.
O4: Explore the suitable methods f vibration reduction and bsorption.	√	V	√	√	✓	√	√		√	√	√	√	Applying	Yes	Lectures, Tutorials, Assignmen Powerpoint Presentations, Numer etc.
O5: Ability to determine vibratory esponses of SDOF and MDOF ystems.	>	√	✓	√	√	✓	V		√	√		√	Analyse	Yes	Lectures, Tutorials, Assignmen Powerpoint Presentations, Numer etc.
O6: Ability to determine vibratory esponses of SDOF and MDOF ystems.	√	√	√	√	√	V	√		V	√	√	V	Analyse	Yes	Lectures, Tutorials, Assignmen Powerpoint Presentations, Nume etc.

aper BTME702-18 Automation in manufacturing

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	6	PO7	PO8	PO9	PO1 0	P01 1	PO1 2	Skill	Focus on Employabilit y / Entrepreneu	Attainment of CO
Illustrate the basic concepts of automation in machine tools.															
Analyze various automated flow ines, Explain assembly systems and line balancing methods.	√	V	V	V	√	V	√		√	√	✓	√	Applying	Yes	Lectures, Tutorials, Assignment Powerpoint Presentations, Numer etc.
Describe the importance of automated material handling and attorage systems.	√	V	√	V	√	√	√		√	√	V	√	Understanding	Yes	Lectures, Tutorials, Assignment Powerpoint Presentations, Numer etc.
Interpret the importance of daptive control systems, automated inspection systems.	√	√	√	√	√	√	√		√	√	√	√	Applying	Yes	Lectures, Tutorials, Assignment Powerpoint Presentations, Numer etc.
BTME703-18 Fundamentals of M	lanag	jemer	nt for	Engir	neers	S S S	inneral co	(Necha	nical En Camp	gine đia US				Department of LK Gujral Pun (Main Ca	Head Machinical Engineering jab Technical University Impust Kondulusia
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu	Assessment Tools to Measur Attainment of CO
O1: The students understand the ignificance of Management in their rofession	√					√		√	✓	√	√	√	Understanding	Yes	Minor Exams, Assignments, End T Exams
O2: The various Management unctions like Planning, Organizing, taffing, Leading, aspects are earnt in this course	√		-	√	√	√		√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End T Exams

CO3: Understand the complexities associated with management in the organizations and integrate the earning in handling these complexities.	√	V	V	V	✓	V		V	√	√	V	✓	Understanding, Applying	Yes	Minor Exams, Assignments, End Exams
CO4: Demonstrate the roles, skills and functions of management.	√			√	✓	✓		 	√	√	 	√	Applying	Yes	Minor Exams, Assignments, End Exams
BTME-704-18 : Project-II						I.K.G.	mank of P.T.!	Mechar , species	nical Eng Campi	yne sity US			1	epartment of i	Tiead Mechnical Engineering ab Technical University
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu	Assessment Tools to Measu
O1: To create an Industrial nvironment and culture within the astitution.	√		V		√	√	√	>	~	√	√	√	Understanding	Yes	Reports, Project Presentations and Viva
O2: To set up production lab tilizing the infrastructure of the stitution.	√	V	√		V	√ -	✓	√	√	~	✓	√	Applying and Designing	Yes	Reports, Project Presentations and Viva
O3: To standardize laboratories to dustrial standard, thereby giving sposure to industrial busekeeping standards.	√	√	√		√	√	√	√	√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Viva
O4: Demonstrate an ability to research ork to a panel of experts.	√		✓	√	√	√	√	√	✓	√	· ✓	✓	Applying and Designing	Yes	Reports, Project Presentations and Viva
D5: Demonstrate knowledge of ontemporary issues in their losen field of research.	√	√	√	√	V	✓	√		V	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Viva

STME-801 Software/Industrial Training

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employabilit y / Entrepreneu rshin	Assessment Tools to Measu Attainment of CO
apability to acquire and apply undamental principles of ngineering.	√		√		V	√	√	√	√	V	√	√	Understanding	Yes	Reports, Project Presentations and Viva
ecome master in one's specialized echnology	√	√	√		√	√	√	√	√	√	V	√	Applying and Designing	Yes	Reports, Project Presentations and Viva
ecome updated with all the latest hanges in technological world.	√	√	√		√	√	√	√	√	√	V	*	Applying and Designing	Yes	Reports, Project Presentations and Viva
bility to communicate efficiently.	√		√	√	>	√	√	V	√	√	> ✓	>	Applying and Designing	Yes	Reports, Project Presentations and Viva
nack to be a multi-skilled engineer ith good technical knowledge, anagement, leadership and ntrepreneurship skills.	√	√	~	√	√	√	✓		√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Viva
pility to identify, formulate and odel problems and find ngineering solution based on a stems approach.	✓	√	√	1. Jan. 1.		y Wed	ي ا الخام ة مورة أن	ប់ ះម ន ៤ទំ	¥	✓	√	√	Applying and Designing	Yes Transment	Reports, Project Presentations and Mechnical Englishing
apability and enthusiasm for self- aprovement through continuous ofessional development and life- ng learning	√	√	√	√	<i>*</i> // (1.	√	√		√	√	✓	√	Applying and Designing	Yes	Reports, Project Presentations and Viva

	T	i	T(C	I		1	,	I				<u>C</u>	***************************************	
Awareness of the social, cultural, global and environmental responsibility as an engineer	✓	V	V	√	V	√	√		√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Viva



Department of Mechanical Engineering
UK. Gufrat Purpolation and Anthonorality
(Main Company) Analytical

NTME-201 RESEARCH METHODOLG	TTV	1E-201	RESEARCH	METHODOLG
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OURSE OUTCOME	1	1	PO 3	P()	PO 5	POS		Ì	PO 9	Į.	PO 11	PO 12	SKILL	Focus on empolyability/entrepenship	Assessment tools to measure attainmentt of CO
O1: Formulate the	v	V	v	v	v	v	v	V	V		v	V	understanding ,applying and	yes	Minor exam, Business Quiz, assignments, End
esearch problem		ľ	Ľ		_			•					designing	yes	term Exams
O2: Carry out the different xperimental designs and heir analysis.	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O3: Apply different tatistical tools for the esearch analysis	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	V	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O4: Follow research ethics.	٧		٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
1TME -202 ADVANCED WELD	ING T	TECH	NOL	OGY											
O1: Describe metal ransfer mechanism and lassify different type of relding process on the asis of heat sources	٧	V	٧	٧	V	٧	٧	٧	√		V	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O2: Analyze the nechanism of modern relding process and their arameters and control	٧	٧	٧	٧	٧	٧	٧	٧	٧		٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

Department of Mechnical Emiros

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(Main Cambus)

TANK A PROMISE WHILE (WAS OUT INCOMES WITH A MATERIAL OF A MATERIAL PROMISE WHILE A PROMISE WHICH A PARTY OF A MATERIAL PROMISE WHICH A PARTY OF A PARTY OF A MATERIAL PROMISE WHICH A PARTY OF	_		·			merona de la como	*******		-	 _	-		Laffill variation and accordance with the matter to a state of the transfer of the state of the	
O3: Explain the influence f heat input and emperature distribution cross a welded structure ased on weld geometry.	٧	٧	V	٧	٧	٧	٧	٧	٧	V	V	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
O4: Illustrate the onsumables and welding ower sources used for relding.	٧	٧	٧	٧	٧	٧	٧	٧	٧	V	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
ITME –203 CORROSION SCIEN	ICE									 				
O1. Theoretical knowledge f electrochemistry and its sociation with corrosion	٧	٧	٧	٧	v	٧	٧	V	٧	٧	√ .	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
O2. The student is trained distinguishing between ne different corrosion orms and in proposing roper measures of revention, right design and eatment	√	. ✔	٧	√	. √.	٧	>	٧	√	٧	√.	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams

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Artes Builde Torridas

Man Company

O3. The student acquires nowledge about the main prosion forms of major lloy families, the respective putes of corrosion revention, protection and lanagement.	٧	V	٧	٧	٧	٧	٧	٧	٧		٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O4. The student acquires nowledge of the effect of arious environments on prrosion	٧	V	٧	V	٧	٧	٧	٧	٧	V	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
ITME – 204 ADVANCED MA	TER	IAL (CHAI	RACT	reriz	ZATIC	N T	ECH	NIQ	JES	<u> </u>	L			
O1: Understand various laterials characterization echniques.	٧	٧	٧	٧		٧	٧		V	٧	٧		understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O2: Comprehend the rinciple and operation of haracterization equipment	√	٧	٧	٧		٧	٧	٧	٧		٧		understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O3: Decide the naracterization tool for pecific application	٧	٧	٧	٧		٧	٧	٧	٧	·	٧		understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

Department of Mechadoal Engineering
L.K. Gujral Punjeb Technical University
(Main Campus) Kapuithala

PRAINT: TOPPU	T	T		T	Γ	r	T	r		T		politica para construction and construction and construction and construction of the c		
٧	V	V	V		٧	V	٧	٧		٧		understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End
		-									٠.,			term Exams
٧	٧	٧	٧		>	٧	٧	٧		٧		understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
														,
٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	V	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
٧	٧	٧	V	\	V	٧	٧	٧	٧	>	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes Head ent of Mechnical	Minor exam, Business Quiz, assignments, End term Exams Engineents
D RO	ROT	ICS												
	V V	v v v v	V V V V V	V V V V V V V V V V V V V V V	V V V V V V V V V V V V V V V V V V V V	V V V V V V V V V V V V V V V V V V V V	V V	V V	V V	V V	V V	V V	V V	V V

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01 Demonstrate													understanding		
owledge of the													applying and		
lationship between			-										designing		Minor exam, Business
echanical structures of		\ ا	∨	٧	٧	٧	٧	٧	√	٧	٧	٧		yes	Quiz, assignments, End
dustrial robots and their															term Exams
perational workspace															
naracteristics															
O2. Apply spatial													understanding		
ansformation to obtain			l		İ								applying and		Minor exam, Business
rward kinematics	√	√	√	٧	√	٧	٧	٧	V	٧	√	٧	designing	yes	Quiz, assignments, End
quation of robot															term Exams
anipulators.															
03. Solve inverse													understanding		Minor exam, Business
nematics of simple robot		٧	V	V	V	I۷	٧	V	٧	√	V	٧	applying and	yes	Quiz, assignments, End
anipulators.													designing		term Exams
04. Obtain the Jacobian													understanding		Minor exam, Business
atrix and use it to identify	٧	√	٧	√	٧	٧	√	٧	٧	√	√	٧	applying and	yes	Quiz, assignments, End
ngularities.													designing		term Exams
05. Generate joint													understanding	_	Minor exam, Business
ajectory for motion	٧	٧		I۷	٧	٧		٧	٧	٧	٧	٧	applying and	yes	Quiz, assignments, End
anning													designing		term Exams
D6. Demonstrate													understanding		Minor exam, Business
owledge of robot		٧	٧	V	٧	٧		V		√	✓	٧	applying and	yes	Quiz, assignments, End
ontrollers													designing		term Exams
TME-207 PLASTIC ENGINEERI	NG														
													understanding		
Knowledge of variety of													applying and		Minor exam, Business
ethods used to process		٧	٧	٧	٧	٧	√	٧	٧	√	٧	٧	designing	yes	Quiz, assignments, End
mmercial plastic resins,															term Exams
cluding limitations				l									ا الاسما		

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LK Gujral Programment | Control | Contr

. Knowledge of the basic		NACAMETER STATE	T	T	Т	Printed december of	Y	T	T	·	· ************************************	T	e spekin - krokeros i tamaniminano majan se in kropinto dalominin memili mendinto distribuna distribungan per	and the second s	DI JANGSENDA KOMBUNIKAN BERGICI, URANGSI KANGSI
													understanding		Minor exam, Business
ooling requirements for		V	V	V	V	V	V	V	V	V	V	V	applying and	yes	Quiz, assignments, End
arious plastic processing								ľ	"	Ť	*		designing	y C.3	term Exams
ethods.	<u> </u>		<u> </u>	ļ	<u> </u>										LETTI LAGITIS
Ability to write					1								understanding		Minor exam, Business
ofessionally formatted		l v	V	v	V	V	l v	l v	V	V	v	v	applying and		
ımmaries of plastic		"	*	"	"	*	\ \	\ \ \	ľ	'	"	ľ	designing	yes	Quiz, assignments, End
rocessing experiments.					<u> </u>					ļ					term Exams
Articulate the roll of													understanding		
ditives in changing the		١.,	١.,	١.,		٠.,	١.	١.	١.	١.		١.	,applying and		Minor exam, Business
erformance of commercial		٧	√	▼	۷	٧	۷	٧	۷	۷	٧	√	designing	yes	Quiz, assignments, End
esin systems				ļ						İ					term Exams
TME – 208 RAPID PROTOTYP	ING		•					L	•	<u> </u>	L				
													understanding		
D1: Describe product													applying and		
evelopment, conceptual													designing		Minor exam, Business
esign and classify rapid	l۷	١v	V	V	_V	٧	٧	V	_V	V	l v l	٧	a congrue	yes	Quiz, assignments, End
ototyping systems;			Ì								-	·		, 00	term Exams
plain stereo lithography															term Exams
ocess and applications															
D2: Explain direct metal													understanding		
ser sintering, LOM and													applying and		Minor exam, Business
sion deposition modeling		√	٧	√	۷	٧	٧	٧	٧	٧	٧	٧	designing	yes	Quiz, assignments, End
ocesses													uesigiiiig		term Exams
03: Demonstrate solid			 	ļ									understanding		Minor exam, Business
ound curing principle and	V	_	٧	V	_V	٧	٧	V	V	V	v	٧	applying and	Voc	<u>'</u>
ocess	•	ľ	•	•		•	•	•	•	•	"	٧	l I	yes	Quiz,assignments,End
TME – 209 ADVANCED META	T CO.	TIN	G	<u> </u>									designing	******	term Exams
													understanding		Minor exam, Business
01.Overview of the	V	v	v.			v	v		V	٧	V	V	applying and	VOC	i i
inciples of metal cutting		Ī	•			•	•		•	•	•	٧	1	yes ∧	Quiz, assignments, End
				L	LI							***********	designing	Dansedman -	Mochnical Engineering

Department of Mechnical Engineering
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											The state of the s	ALL DAY THE MANAGEMENT	understanding	COMPANY OF A GO OF A THE WARRY PROPERTY OF THE WARRY A COMPANY OF THE WARRY OF THE COMPANY OF TH	Minor exam, Business
O2. Describe the methods	٧	٧	٧			٧	٧		٧	٧	V	٧	applying and	yes	Quiz, assignments, End
f metal cutting	-												designing		term Exams
O3. Describe the cutting				Ì									understanding	STREET, COLOR OF STREET, COLOR OF STREET, COLOR OF STREET, COLOR OF STREET, COLOR OF STREET, COLOR OF STREET,	Minor exam, Business
orces involved and their	٧	√	√	√		•	٧		٧	√	V	٧	applying and	yes	Quiz, assignments, End
easurements													designing		term Exams
O4. Describe the													understanding		Minor exam, Business
arameters effecting tool	√	٧	V		٧	٧	٧	V		l۷		V	applying and	yes	Quiz, assignments, End
orces													designing	·	term Exams
O5. Describe the													understanding		Minor exam, Business
neory/methods to find tool	٧	V	V		V	٧	١v	V		V			applying and	yes	Quiz, assignments, End
fe.			ł										designing		term Exams
TTME-210 COMPUTER AIDED	DESIG	SN 8	k MA	NUF	ACTU	JRING	<u> </u>	•						سنسوسي المساوسي	
O1 Understand the basic													understanding		
indamentals of computer		١,	١,	١.		١.	١.	١.	١.	١.			,applying and		Minor exam, Business
ded design and	٧	٧	٧	√	٧	٧	√	√	٧	٧	√	٧	designing	yes	Quiz, assignments, End
anufacturing															term Exams
O2 To learn 2D & 3D													understanding		
ansformations of the basic		١.	١.	١.		_		١.					applying and		Minor exam, Business
ntities like line, circle,	٧	٧	٧	√	۷	٧	٧	√	۷	٧	۷	٧	designing	yes	Quiz, assignments, End
lipse etc.															term Exams
O3 To understand the											<u> </u>		understanding		
fferent geometric													,applying and		
odelling techniques like													designing		
olid modelling, surface										l			designing		
odelling, feature based										İ					Minor exam, Business
odelling etc. and to	٧	٧	√	√	۷	٧	٧	٧	✓	√	√	٧		yes	Quiz, assignments, End
sualize how the															term Exams
omponents look like															
efore its manufacturing or															
brication														1 H	Hean
		L	<u></u>	L	L		L	L		L	L			I marin mile	echnical Economic

Water State Control of the Control o															
O4 To learn the part rogramming, importance f group technology, omputer aided process anning, computer aided uality control	V	V	٧	٧	٧	٧	٧	٧	V	٧	V	V	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O5 To learn the overall onfiguration and elements f computer integrated nanufacturing systems.	٧	٧		٧		٧	٧	٧	V	٧	٧		understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
TME – 211 MAINTENANCE A	ND R	ELIA	BILIT	YEN	GINE	ERIN	G								****
O1. Understand the procepts of Maintenance, eliability and Availability	٧	٧	V	V	٧	٧	٧	V	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O2. Establish maintenance rategies according to stem characteristics and esign transition programs implement these rategies	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
D3. Develop fault trees for system and apply various liability models on fault nalysis	٧	٧	٧	٧	٧	٧	>	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
D4. Develop hazard rate odels to know the haviour of components.		٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

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O5. Manage the nanufacturing organisation with highest possible vailability.	٧	٧	V	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
1TME – 212 SUPPLY CHAIN MA	ANAC	t IVI	ENI	Γ				····			ı	1	ı		
O1 Explain the undamentals of elements nd functions of supply hain, role of drivers and emand forecasting. To nderstand how supply hain drivers play an aportant role in redefining alue chain excellence of irms.	V		٧		V	٧	٧	٧	٧		٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
O2 Apply various echniques of inventory nanagement and their ractical situations.	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
O3 Analyze how supply hain decisions related to scility location can be pplied to various industries nd designing the supply hain	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

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LK. Gujral Primiab Tachnical University
(Main Compac) Adjantmala

O4 How various varehousing management ystem and transportation an be practiced in various industries?	V	٧	V	٧	V	٧	٧	٧	٧	V	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O5 How supply chain erformance can be neasured using various nodels?	٧	V	٧	٧	٧ 0:	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
ITME-213 PRODUCTION PLAN	ININC	S AN	ID CC	NTR	OL						_		T		
O1: Forecast the ppropriate requirement of esources for various roduction processes and ther shop floor activities.	v	٧	V	V	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O2: Design an appropriate rategy for resource lanning through ppropriate MRP tool	٧	٧	٧	٧	٧	٧	٧	v	V	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O3: Improve the roductivity of shop floor brough design of ppropriate production vstems such as mass roduction, batch roduction etc. within kisting conditions.	٧	٧	٧	٧	٧	٧	٧	v	√	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams

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O4: Apply scientific tools uch as MRP, JIT optimizing roduction systems. ITME – 214 PRODUCT DESIGN	V	V	VELC	√ V	√ N.T.	٧	V	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O1. Learn the importance	ANL) DE	VELC	PIVIE	INI	<u> </u>	Γ	ı —	T	1		Γ			
f product design in idustry and principal equirements of good roduct design.	٧	٧	V	٧	٧	٧	v	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O2. Learn the knowledge bout the ergonomic factor product design and roduct design ethodology and echniques.	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
O3. Learn the knowledge bout the basic elements nd concepts of visual esign	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O4. Learn the importance f product graphics, roduct development and ackaging of materials	٧	٧	v	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O5. Learn how the product esign helps in to reduce he time to launch product marke	٧	V	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
ITME-215 ENTREPRENEURSHI	P				namen and a name of the same	*****		F Abrillo (1871-1466) 1-1							

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	٧	٧	٧	٧	٧	٧	٧	٧	V	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
٧	٧	٧	٧	٧	٧	V	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
٧	٧	٧	٧	٧	٧	٧	v	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
	v v	v v v v	VVVVVV	V V V V V V V V V V V V	V V V V V V V V V V V V V V V								V V	V V

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To provide basic nderstanding to the cudents about the concept nd significance of work cudy and ergonomics.	٧	٧	٧	٧	V	v	٧	٧	٧	V	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
To impart thorough nowledge to the students pout various techniques of ork-study for improving ne productivity of an rganization	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
To inculcate the skill mong the students for nalyzing and improving sisting methods of working the shop floor of an aganization	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
To impart through cowledge and skills to udents with respect to owances, rating, lculation of basic and andard time for manual perations in an ganization	٧	٧	٧	٧	٧	٧	v	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

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Study the characteristics d specification of struments		٧	V	٧	✓	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
Understand the sensors d transducers used in anufacturing industries e displacement, velocity, celeration, force, torque d load		٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
Grasp the world class dustrial safety aspect miliar with various tomation technologies in unufacturing and process dustries.		٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
Understand various comation tools and thous in manufacturing lustry	٧	٧	٧		٧	٧	٧	٧		٧			understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
Implement various ntrol and automation ethod in process lustries.	٧	V	٧		٧	٧	٧	٧		٧		٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
ME-218 FINITE ELEMENT AN	IALY	SIS													
01: To explain the ncepts behind mulation methods in M.	٧	٧	٧		٧	٧	٧	٧		٧			understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

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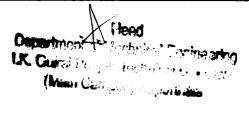
O2: To identify the	per-	T	Τ	J	Τ	<u> </u>	Ţ	Γ		1	Γ	Γ		Andrew Planes Ramine Williams	
oplication and													understanding ,applying and		Minor exam, Business
	٧	٧	V		V	V	V	V		V	V	V	designing	yes	Quiz, assignments, End
ements such as bars,			ĺ							Į				7-2-	term Exams
eams, plane and iso-			l												COM EXAMS
arametric elements.		<u> </u>			ļ	ļ					<u> </u>				
O3: To develop element													understanding		Minor exam, Business
naracteristic equation and	V	l۷		l۷	V	V	V		v	l v	,		applying and	yes	Quiz, assignments, End
eneration of global									-	•			designing	y C S	term Exams
quation.				<u></u>						ļ					CETTI EXATITS
04. To apply suitable													understanding		
O4: To apply suitable													applying and		
oundary conditions to a													designing		
obal equation for bars,															Minor exam, Business
usses, beams, circular	٧	V		l v		V		_v	٧	V	v	V		yes	Quiz, assignments, End
afts, heat transfer, fluid	•	`		•					•	•	•	•		yes	term Exams
ow, axi-symmetric and															term exams
namic problems and solve															
em for displacements,															
ress and strains induced.															
TME-219 LOW COST AUTOMA	OITA	N_						, ——.							
O1 Understand the types													understanding		Minor exam, Business
automation and its	٧	٧	V	٧	۷	٧	٧	√	٧	√	∀	٧	applying and	yes	Quiz, assignments, End
rious elements.													designing		term Exams
D2 Select various													understanding		Minor exam, Business
omponents for low-cost	٧	٧	٧	٧	٧	٧	٧	V	٧	٧	۷	٧	,applying and	yes	Quiz, assignments, End
utomation systems.							<u> </u>						designing		term Exams
													understanding		Minor exam, Business
3 Do some assembly	√	۷	٧	٧	٧	٧	٧	٧	٧	V	٧	٧	applying and	yes	Quiz, assignments, End
utomation													designing	•	term Exams

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TME-201 RESEARCH METHOL	DOLG	i	granica rese	granements.	r oracements or			openione		nativa Mada Tancasa	and the second		s, o service en meno vien i mesopologica en culturalisación i en qui qui protectivo a segui propio.	materinasia ari materiaasi 37 tiiskajat nääkäjänyä jähkä teini, jolaata sakeaari 17. arius ajimaks 14. mähin sakea tilijä jähkä sakea tilijä sakea tilijä sakea tilijä sakea tilijä sakea tilij	
OURSE OUTCOME	PO 1	PO 2	PO 3	PO 4	PO 5	PO6		PO 8	PO 9	PO 10	PO 11	PO 12	SKILL	Focus on empolyability/entrepenship	Assessment tools to measure attainmentt of CO
O1: Formulate the esearch problem	٧	٧	٧	٧	٧	٧	٧	٧	٧		٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
O2: Carry out the different xperimental designs and neir analysis.	V	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O3: Apply different atistical tools for the esearch analysis	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O4: Follow research ethics.	٧		V V	٧	٧	٧	٧	٧	V	V	V	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
ITME –202 ADVANCED WELD	ING 1	ECH	NOL	OGY						· · · · ·	T		1		
O1: Describe metal ransfer mechanism and lassify different type of relding process on the asis of heat sources	V	V	V	٧	V	٧	٧	٧	V		V	V	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O2: Analyze the nechanism of modern relding process and their arameters and control	٧	٧	٧	٧	V	٧	٧	٧	V		٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams



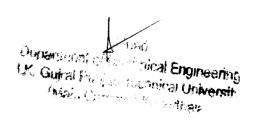
D3: Explain the influence heat input and mperature distribution ross a welded structure ased on weld geometry.	٧	√	٧	٧	V	٧	√	V	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
D4: Illustrate the onsumables and welding ower sources used for elding.	٧	٧	٧	٧	٧	٧	٧	٧	>	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
TME -203 CORROSION SCIEN	CE									 				
O1. Theoretical knowledge felectrochemistry and its	٧	V	٧	٧	٧	V	V	V	V	٧	V	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
O2. The student is trained distinguishing between he different corrosion orms and in proposing roper measures of revention, right design and reatment	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

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103. The student acquires nowledge about the main orrosion forms of major lloy families, the respective outes of corrosion revention, protection and nanagement.	٧	V	٧	٧	V	٧	٧	٧	٧		٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
IO4. The student acquires nowledge of the effect of arious environments on orrosion	٧	٧	٧	V	٧	٧	V	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
ITME – 204 ADVANCED MA	TERI	AL (CHAF	RACT	ERIZ	ZATIC)N T	ECH	NIQI	JES					1
O1: Understand various naterials characterization echniques.	٧	V	٧	٧		٧	٧		٧	٧	٧		understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O2: Comprehend the rinciple and operation of haracterization equipment	>	٧	٧	٧		٧	٧	٧	٧		V		understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
O3: Decide the haracterization tool for pecific application	٧	٧	٧	٧		٧	٧	٧	>		٧		understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams



٧		V	V		٧	V	٧	V		٧		understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
٧	٧	٧	٧		٧	٧	٧	٧		٧		understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
\	٧	✓	٧	>	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
٧	٧	٧	v	٧	٧	>	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams Department of Moderated En (Main Campus) Kosarth
	√	√ √ √ √	V V V V	V V V V V V V V V	V V V V V V V V V V V V	V V V V V V V V V V V V V V V	V V V V V V V V V V V V V V	V V V V V V V V V V V V V V V V V	V V	V V	V V		V V	V V

O1 Demonstrate													understanding		
nowledge of the													applying and		
lationship between													designing		Minor exam, Business
echanical structures of		V	V	٧	٧	٧	٧	٧	٧	V	٧	V		yes	Quiz, assignments, End
dustrial robots and their			:							ĺ				•	term Exams
perational workspace															
naracteristics			1	İ											
O2. Apply spatial													understanding		
ansformation to obtain			1										,applying and		Minor exam, Business
rward kinematics	٧	١v	V	V	٧	√	١v	l۷	٧	l۷	٧	٧	designing	yes	Quiz, assignments, End
quation of robot														-	term Exams
anipulators.			İ]		
03. Solve inverse													understanding		Minor exam, Business
nematics of simple robot		V	V	l۷	٧	V	V	V	٧	V	٧	V	applying and	yes	Quiz, assignments, End
anipulators.													designing		term Exams
O4. Obtain the Jacobian													understanding		Minor exam, Business
atrix and use it to identify	٧	٧	√	V	٧	٧	V	V	√	٧	٧	٧	applying and	yes	Quiz, assignments, End
ngularities.		<u> </u>											designing		term Exams
O5. Generate joint													understanding		Minor exam, Business
ajectory for motion	٧	٧		√	٧	V		V	√	√	٧	٧	applying and	yes	Quiz, assignments, End
anning			<u> </u>										designing		term Exams
D6. Demonstrate													understanding		Minor exam, Business
nowledge of robot		٧	√	٧	√	V		٧		٧	٧	٧	applying and	yes	Quiz, assignments, End
ontrollers			<u> </u>		<u> </u>	<u></u>		<u> </u>					designing		term Exams
TME-207 PLASTIC ENGINEER	NG			_											
													understanding		
Knowledge of variety of													,applying and		Minor exam, Business
ethods used to process		٧	√	٧	٧	V	۷	٧	٧	√	٧	٧	designing	yes	Quiz, assignments, End
ommercial plastic resins,															term Exams
cluding limitations										<u></u>					

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инстрактивання при при при при при при при при при при	description to the second	-		·	epine en en en en en en en en en en en en e	pentrumanan are	рттон нелого	garanten santan santan santan santan santan santan santan santan santan santan santan santan santan santan sa	gazanowan sawa	gzdau 24. martin Rancom	principal de management de	PROBLEM CONTRACTOR		additional colonidation in the transfer delication of the colonic delication of the colonic of t	
Knowledge of the basic pling requirements for rious plastic processing ethods.		V	V	V	٧	٧	V	٧	V	٧	V	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
Ability to write of single of the standard of the standard of plastic of plastic occessing experiments.		٧	٧	٧	٧	٧	٧	٧	٧	٧	V	V	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
Articulate the roll of ditives in changing the rformance of commercial sin systems		٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
ME – 208 RAPID PROTOTYP	ING	<u> </u>			<u></u>	•	·			•		<u> </u>			
01: Describe product velopment, conceptual sign and classify rapid ototyping systems; plain stereo lithography ocess and applications	٧	v	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
22: Explain direct metal er sintering, LOM and sion deposition modeling ocesses		٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
3: Demonstrate solid ound curing principle and ocess	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
TME – 209 ADVANCED META	r Cn	TTIN	G												
01.Overview of the inciples of metal cutting	٧	٧	٧			٧	٧		٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

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													understanding		Minor exam, Business
O2. Describe the methods	٧	٧	V			٧	٧		٧	٧	٧	٧	applying and	yes	Quiz, assignments, End
f metal cutting		s were									<u></u>		designing	and the second production in the delication of the second	term Exams
O3. Describe the cutting			1								ĺ	İ	understanding		Minor exam, Business
orces involved and their	٧	√	√	V		ĺ	٧		V	٧	V	√	,applying and	yes	Quiz, assignments, End
easurements				<u> </u>									designing		term Exams
O4. Describe the													understanding		Minor exam, Business
arameters effecting tool	٧	\ ا	√		٧	٧	√	٧		۷		V	applying and	yes	Quiz, assignments, End
orces													designing		term Exams
O5. Describe the													understanding		Minor exam, Business
neory/methods to find tool	٧	√	V		٧	√	√	V		√			applying and	yes	Quiz, assignments, End
e.												Ī	designing	•	term Exams
TME-210 COMPUTER AIDED	DESIG	SN 8	k MA	NUF	ACTL	JRING	;								
O1 Understand the basic													understanding		D. di
indamentals of computer	V	_v	ĺ .,	١.,		٠,		١.		١,	١.	١.	applying and		Minor exam, Business
ded design and	V	Į V	√	√	√	٧	٧	√	√	٧	٧	√	designing	yes	Quiz, assignments, End
anufacturing				l											term Exams
O2 To learn 2D & 3D													understanding		
ansformations of the basic	_,	١.,	ļ.,	١.,		,	,		١.	١.	۱.	١.	applying and		Minor exam, Business
ntities like line, circle,	٧	√	√	√	۷	٧	۷	۷	٧	٧	√	٧	designing	yes	Quiz, assignments, End
lipse etc.															term Exams
O3 To understand the													understanding		
fferent geometric		}		ĺ								-	applying and		
odelling techniques like													designing		
olid modelling, surface													ucsigining		
odelling, feature based							:								Minor exam, Business
odelling etc. and to	٧	٧	√	√	۷	√	٧	√	√ '	٧	٧	٧		yes	Quiz, assignments, End
sualize how the															term Exams
mponents look like															
efore its manufacturing or															1
brication														ost.	
			<u> </u>	1	L			<u> </u>			<u></u>			0	bertment of Manual

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CONTRACT CON	againment of	-	TOTAL ASSESSED	Approximately 18 and	TOTAL PROPERTY.										
	V	\ _V	V	V	V	V	V	V	V	V			understanding	and maked hereway and a second residence of the confidence of the	Minor exam, Business
	V	V	"	٧	V	V	V	V	V	V	٧	V	applying and	yes	Quiz, assignments, End
	_		 -		 	 					ļ		designing	e de la composito de la compo	term Exams
O5 To learn the overall onfiguration and elements f computer integrated nanufacturing systems.	V	V		V		√	V	V	V	V	٧		understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
ITME – 211 MAINTENANCE A	ND R	FI I A	L RILIT	V FN	GINI	FERIN	6	<u></u>	<u> </u>	<u> </u>		<u> </u>			
O1. Understand the procepts of Maintenance, eliability and Availability	٧	٧	٧	√	V	٧	V	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O2. Establish maintenance rategies according to stem characteristics and esign transition programs implement these rategies	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O3. Develop fault trees for system and apply various liability models on fault halysis	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
D4. Develop hazard rate odels to know the chaviour of components.		٧	٧	٧	٧	٧	٧	٧	>	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
D5. Manage the anufacturing organisation ith highest possible vailability.	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
TME – 212 SUPPLY CHAIN MA	ANAG	ιΕΜΙ	ENT					-				·			Deciminate of the

Change of the Second Engineering Second Seco

O1 Explain the indamentals of elements of functions of supply nain, role of drivers and emand forecasting. To nderstand how supply nain drivers play an aportant role in redefining alue chain excellence of rms.	٧		V		V	٧	V	٧	√		٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
O2 Apply various chniques of inventory anagement and their ractical situations.	٧	v	٧	V	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O3 Analyze how supply hain decisions related to cility location can be oplied to various industries and designing the supply hain	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O4 How various arehousing management ystem and transportation an be practiced in various dustries?	٧	v	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O5 How supply chain erformance can be easured using various odels?	٧	٧	٧	V	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

		West managery				-	900 Lanenar		CF1,0000Ept	V-2/2002	T-Marie -				
TME-213 PRODUCTION PLAN	MIN	G AN	ID C	ONTR	ROL	·	and the second s		grantenews.		TOPICS (NEW YORK)	CARRACTURE AND AND AND AND AND AND AND AND AND AND		7 (Allender 1996) (1996) 1996 (1996) (1996) (1996) 1996 (1996) (1996) (1996) (1996) (1996) (1996) (1996) (1996) THE CASE OF THE STREET OF THE	
O1: Forecast the ppropriate requirement of esources for various roduction processes and ther shop floor activities.	V	٧	\ \ \	V	√	V	V	▼ V		V	V	V	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
O2: Design an appropriate rategy for resource lanning through ppropriate MRP tool	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
O3: Improve the roductivity of shop floor arough design of oppropriate production estems such as mass roduction, batch roduction etc. within kisting conditions.	٧	V	V	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
D4: Apply scientific tools ich as MRP, JIT optimizing oduction systems.	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
TME – 214 PRODUCT DESIGN	AND	DE\	VELO	PME	NT										
O1. Learn the importance product design in dustry and principal quirements of good oduct design.	٧	٧	٧	V	٧	٧	٧	>	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

Department of Mechnical Engineering LK. Gujral Punjab Technical Universit (Main Campus) Kapurthala

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D2. Learn the knowledge out the ergonomic factor product design and oduct design ethodology and chniques.	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
03. Learn the knowledge out the basic elements d concepts of visual sign	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
04. Learn the importance product graphics, oduct development and ckaging of materials	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
D5. Learn how the product sign helps in to reduce e time to launch product marke	>	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
TME-215 ENTREPRENEURSHI	P														
D1 Gain knowledge of scovering opportunities of basic entrepreneurial sues	٧	V	V	V	V	٧	V	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
D2 Develop critical inking skills on developing career as entrepreneurs id define the concept of itrepreneurship.	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

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To inculcate the skill nong the students for lalyzing and improving isting methods of working the shop floor of an iganization	٧	V	V	٧	٧	V	√	>	V	V	V	√	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
To impart through nowledge and skills to udents with respect to lowances, rating, Ilculation of basic and andard time for manual perations in an	٧	V	٧	٧	V	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
ITME-217 METROLOGY AN	D IN	DUS	TRIA	L AL	JTOI	MATI	ON								
Study the characteristics nd specification of struments		٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams
Understand the sensors nd transducers used in anufacturing industries ke displacement, velocity, cceleration, force, torque nd load		٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam, Business Quiz, assignments, End term Exams

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O3 Understand strategic cisions that trepreneurs need to ake and the ability to gage in strategic anning.	٧	٧	∨	>	>	~	>	V	٧	V	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
D4 Develop the ability to live real life atrepreneurship issue and mall/ Medium Business belongs	٧	V	v	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
D4 Develop the ability to live real life atrepreneurship issue and nall/ Medium Business oblems	٧	٧	٧	V	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
TME-216 WORK SYSTEM DES	IGN A	AND	ERG	ONO	MIC	S									
To provide basic nderstanding to the udents about the concept nd significance of work udy and ergonomics.	٧	٧	V	V	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
To impart thorough nowledge to the students pout various techniques of ork-study for improving he productivity of an rganization	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams

Broad mark of Podersical Engineering of Ship at the 380 Technical University (Australias of Kacumba).

D4: To apply suitable bundary conditions to a obal equation for bars, usses, beams, circular lafts, heat transfer, fluid bw, axi-symmetric and ynamic problems and solve lem for displacements, ress and strains induced.		٧		٧		٧		٧	٧	٧	٧	٧	understanding ,applying and designing	yes	Minor exam,Business Quiz,assignments,End term Exams
TME-219 LOW COST AUTOMA	ATION	V	ı	Γ	[r								I
O1 Understand the types										١,			understanding		Minor exam, Business
automation and its	٧	√	۷	٧	 V	٧	۷	٧	٧	٧	٧	٧	,applying and	yes	Quiz, assignments, End
rious elements.													designing		term Exams
O2 Select various													understanding		Minor exam, Business
pmponents for low-cost	٧	√	٧	√	∨	٧	√	٧	∀	٧	√	٧	applying and,	yes	Quiz, assignments, End
utomation systems.													designing		term Exams
													understanding		Minor exam, Business
3 Do some assembly	٧	٧	۷ ا	√	√	٧	V	٧	V	٧	۷	٧	applying and,	yes	Quiz, assignments, End
utomation													designing		term Exams

Head
Department of Machinical Engineering
LK. Gujral Punjab Technical University
(Main Commes) Koourthale

Grasp the world class	T					**************************************							understanding	antir (an) na mai na magana (na dana) na magana an magana an magana an magana an magana an magana an magana an	
dustrial safety aspect													applying and		Minor exam, Business
miliar with various		V	V	V	V	v	V	V	V	v	v	V	designing	yes	Quiz, assignments, End
itomation technologies in		'	•			•		•	`	•	•	•		y C3	term Exams
anufacturing and process	1														term Exams
dustries.								<u> </u>							
Understand various													understanding		Minor exam, Business
itomation tools and	V	V	V		v	v	V	l v		٧			applying and	yes	Quiz, assignments, End
ethods in manufacturing	'	•	'			•	'	*		•			designing	yes	term Exams
dustry															teriii Laaiiis
Implement various	1												understanding		Minor exam, Business
ontrol and automation	V	_v	V		_v	V	V	l v		V		_v	applying and	yes	Quiz, assignments, End
ethod in process	"	"	"		•	"	"	"		\ \		*	designing	yes	term Exams
dustries.			<u>l</u>												term Exams
TME-218 FINITE ELEMENT A	NALY:	SIS													
O1: To explain the	Γ	Ι	<u> </u>		Γ		Ι	Ι				T .	understanding		
oncepts behind													,applying and		Minor exam, Business
rmulation methods in	∨	√	√			٧	√	٧		٧			designing	yes	Quiz, assignments, End
EM.													designing		term Exams
O2: To identify the			<u> </u>				ļ						understanding		
plication and				l									applying and		
naracteristics of FEA													designing		Minor exam, Business
ements such as bars,	٧	√	√		√	٧	V	۷		٧	٧	√	uesigiiii g	yes	Quiz, assignments, End
eams, plane and iso-															term Exams
arametric elements.									1						
O3: To develop element	†			<u> </u>			!	 		<u> </u>			understanding		
naracteristic equation and													,applying and		Minor exam, Business
eneration of global	√	٧		٧	۷	∨	√		√	٧	٧		designing	yes	Quiz, assignments, End
quation.													Mesigning		term Exams /
Manual Alice of the State of th	<u></u>	J			-	L		<u> </u>		L	CONTRACTOR AND ADDRESS OF THE PARTY OF THE P	I			

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P0 7	PO 8	PO 9	PO 10		PO 12	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measu Attainment of CO
CO1: Formulate a research problem	√	√_	√	√	√	✓	√	√	√		√	√	Understand	Yes	Minor Exams, Assignments, Er Term Exams
CO 2: Explain the different experimental designs and their analysis.	√	√	√	√	√	√	√	√	√	√	√	√	Understand	Yes	Minor Exams, Assignments, Er Term Exams
CO 3: Apply different statistical tools for the research analysis	V	√	√	√	√	√	√	√	√	√	√	V	Applying and Designing	Yes	Minor Exams, Assignments, Er Term Exams
CO 4: Apply the research ethics	√		√	√	√	√	✓	✓	√	√	✓	√	Applying and Designing	Yes	Assignments, Presentations ar
Non Conventional Machining (PhD Cour	se V	Vork)	,			4		4	L			<u> </u>		Final Viva
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	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measu Attainment of CO
CO1: Understand the need of Non Conventional Machining Processes and able to Classify various processes.	√	√	√		√		√	√	√	√		√	Understand	Yes	Minor Exams, Assignments, Er Term Exams
CO2: Recognize the role of mechanical energy in non-Conventional machining processes.		>		√			√	√	√		√	√	Understand	Yes	Minor Exams, Assignments, Er Term Exams
CO3: Apply the knowledge on machining electrically conductive material through electrical energy in non-Conventional machining processes.	√		√	~		✓	V	✓		√	√		Applying and Designing	Yes	Minor Exams, Assignments, Er Term Exams
CO4: Understand the concept of machining the hard material using chemical energy andelectrochemical energy.		√	√				√	√	~	√		√	Applying and Designing	Yes	Assignments, Presentations ar Final Viva
CO5: Apply the knowledge on machining electrically conductive material through electrical energy in non-Conventional machining processes.		Z Z Z R		* 1 * C	(e X ta		ω γ .		✓	√		V	Applying and	Head nt of electrical Engi Punjeb Technical U	Minor Exams, Assignments, Er

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CO6: Familiarity and application of various thermal energy based non-conventional machining processes.	 		→	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\ \ 	\ \ 	√	√	V	V		V	Applying and Designing	Yes	Minor Exams, Assignments, En
PhD Paper Presentation/Seminar	J		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>		<u></u>	<u> </u>		
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	P0 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: Deal with nerves and think more positively about public speaking.	√	√	√		√	V	√	V	√	V	V	V	Thinking	Yes	Field based assignments, Repormaking, presentations etc.
CO 2: Consider ways of grabbing the listener's attention, holding their interest, and concluding strongly.	V		√			V	√	√	√	√	 √	V	Thinking	Yes	Field based assignments, Repormaking, presentations etc.
CO3: Use body language and tone of voice to enhance their presentations.			V		√	>	√	√	√	√	√	√	Applying	Yes	Field based assignments, Repor making, presentations etc.
CO4: Use slides and visual aids effectively.	√	√	√		√	√	√	√	√	√	√	√	Applying	Yes	Field based assignments, Repor making, presentations etc.
CO5: Deliver an enthusiastic and well- practised presentation.	√	√	√		√	√	√	√	√	√	✓	✓	Applying	Yes	Field based assignments, Repor making, presentations etc.
Advanced Heat Transfer							<u> </u>		L	l		L			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Course Outcome mand a Medianical Engineering K.G. P.T.U. Addition Compus Kepunikal	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: Understand the principles of heat transfer through conduction, convection and radiation modes.	√	√	√		✓	√	√		√	√	V	√	Thinking	Yes	Field based assignments, Repormaking, presentations etc.
CO2: Understand the heat transfer during phase-change processes, such as boiling and condensation.	√	√	√,			√		. ✓	√	√	√	√	Thinking	Yes	Field based assignments, Report making, presentations etc.
CO3: Understand the practical aspects of the theories of heat transfer, such as design of heat exchangers.	√		√		√	√	√	√	√		√	√	Applying	Yes	Field based assignments, Report making, presentations etc.
CO4: Understand the concept related to mass transfer and its connection with heat transfer.		√	√		√	√	√	√		V	✓	√	Daparene Abbyilityjra) (Mai	Hopf Weethnical Engli Punjab Technical Un n Campus Kapurtha	reid based assignments, Report making, presentations etc.

CO5: Carry out laboratory tests verifying the various principles of heat transfer.		√	√		 √ 	✓	√	√	✓	√		√	Applyin_ \	Yes	Field based assignments, Report making, presentations etc.
Advanced Fluid Mechanics and CFD	***************************************	·	·A		·		4		<u> </u>	1	J			L	
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P0 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: Understand the concept of computational fluid dynamics, modeling and simulation.	√	√	V		√	√	√		√		√	√	Understanding	Yes	Field based assignments, Report making, presentations etc.
CO2: Learn about the different governing equations of fluid dynamics.	√		√					√	√	√	V	√	Thinking	Yes	Field based assignments, Repormaking, presentations etc.
CO3: Understand the concept of parabolic, elliptic and hyperbolic equations and various			✓		√	√	√	√	√		√	√	Applying	Yes	Field based assignments, Repor making, presentations etc.
methods of finite differencing and stability.		√	٧		√	√ .	√	√		V	√	V	Understanding	Yes	Field based assignments, Repormaking, presentations etc.
CO4: Understand the concept of turbulence, error and uncertainty & different turbulent	√	√	 √ ,		√	✓	√		√	√			Applying	Yes	Field based assignments, Repor making, presentations etc.
Finite Elements Methods	<u> </u>	L	<u> </u>	L		<u></u>		<u> </u>	<u></u>	<u> </u>		<u> </u>			
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10			Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: To obtain an understanding of the fundamental theory of the FEA method;	√		\	√	√ ,	√	√	:	√	√	√	√	Thinking	Yes	Field based assignments, Repor making, presentations etc.
CO2: To develop the knowledge of mathematics and engineering in solving the problems related to structural and heat transfer.	√		√			√		√	√	√	√ .	√	Designing	Yes	Field based assignments, Repor making, presentations etc.
CO3: To identify the application and			 											And the state of t	

1.K. Guiral Puniab Technical United Indication of Mechanical Enditaring (Main Carages) Resports I.K.C. P.T.

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CO4: To understand the application and use of the FE method for heat transfer problems		√	√	\(\frac{\cappa_{\chi}}{\chi}\)	\ 	√	√	√		√	 	√	Understanding	Yes	Field based assignments, Repor making, presentations etc.
CO5: Use the commercial FEA packages like ANSYS and modern CAD/CAE tools for solving real life structural problems.	V	√	√		√	√	√	√	√	√		√	Applying	Yes	Field based assignments, Repor making, presentations etc.
Composite Materials	<u> </u>	L	<u> </u>	1	1	<u> </u>	<u> </u>	<u> </u>	1	<u> </u>	L	<u> </u>	<u> </u>		
Course Outcome	PO 1	P0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10		1	CLill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: Describe the concept, need and applications of composite materials.			√	√	V	√	√		√	√	√	√	Thinking	Yes	Field based assignments, Repormaking, presentations etc.
CO 2: Solve the problem of effects of influencing factors on the strength of composite materials	√		\			√	٠	√	√	✓	√	√	Designing	Yes	Field based assignments, Report making, presentations etc.
CO3: Demonstrate the various manufacturing processes of the Metal/ceramic/polymer-based composites.	√	√	\ 	√	V	V	V	√	\		Ī√	√	Applying	Yes	Field based assignments, Report making, presentations etc.
CO 4: Test and characterize the composite and suggest secondary processing as per application.	√	√	√		V	√	√	√		√	 √	√	Understanding	Yes	Field based assignments, Report making, presentations etc.
Optimization Techniques	<u></u>	I	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>		1	<u></u>	L	<u> </u>	<u> </u>		
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	1	1	Chill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: Ability to apply the theory of optimization methods and algorithms to develop and for solving various types of optimization problems	\ \ \		V	V	√	V	V		 √	√	√	✓	Thinking	Yes	Field based assignments, Repo making, presentations etc.
CO2: Ability to go in research by applying optimization techniques in problems of		 √	√		***************************************	√		√	√	√	V	 √	Designing	Yes	Field based assignments, Repo making, presentations etc.

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CO3: Ability to solve the mathematical results and numerical techniques of optimization theory to concrete Engineering problems by using computer software.	√	V	\ \ \ \	√	\ \ \	 √	\	V	\ 		√	\	Applying	Yes	Field based assignments, Repo making, presentations etc.
Computer Aided Design and Manufactur	ring	(CA	D/C	AM)	1	J	<u> </u>	<u> </u>	<u> </u>	L	<u> </u>	<u> </u>		<u> </u>	
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10		PO 12	l CLIII	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: Apply/develop solutions or to do research in the areas of Design and simulation in Mechanical Engineering.	√	√	V	√	✓	√	√		√	V	1	\ \ \	Understand	Yes	Field based assignments, Report making, presentations etc.
CO2: Have abilities and capabilities in developing and applying computer software and hardware to mechanical design and manufacturing fields.	√	√	· V			√		*	V	V	V	√	Understand	Yes	Field based assignments, Repo making, presentations etc.
CO3: Review and document the knowledge developed by scholarly predecessors and critically assess the relevant technological issues.		-	√	√	V	V	√	✓	√		. ✓	√	Applying and Designing	Yes	Field based assignments, Report making, presentations etc.
CO4: Formulate relevant research problems; conduct experimental and/or analytical study and analyzing results with modern mathematical/scientific methods and use of software tools.		✓	✓	V	V	✓	√	√		✓	√	V	Applying ∂-∠ -	Yes	Field based assignments, Report making, presentations etc.
Advanced Theory of Vibrations		······································		· · · · · · · · · · · · · · · · · · ·	·	L.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		L	L	L	L	<u></u>	L		L
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9			PO 12	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: Recognize the need and measurement of vibration in mechanical systems	√		√	√		√	>		√	√	√	√	Understand	Yes	Field based assignments, Report making, presentations etc.
CO2: Suggest suitable methods of vibration	√	√	√			√				√	√	√	Understand		Field based assignments, Report

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	V	√	1		√	V	√	V		V	V	Applying and Designi.	Yes	Field based assignments, Repo making, presentations etc.
✓	√	√	✓		✓	√	√		V	√	√	Applying	Yes	Field based assignments, Repo making, presentations etc.
	<u> </u>	<u> </u>	<u> </u>		<u></u>	<u> </u>	<u></u>	<u> </u>	<u></u>	<u> </u>	<u></u>			making, presentations etc.
PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	P0 12	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
√	√	√	√	√	√			√	√	√	√	Understand	Yes	Field based assignments, Repor
√	√	√		√	√		V	 √	√	√	V	Understand	Yes	making, presentations etc. Field based assignments, Report making, presentations etc.
		√	 √	√	√		√	√		V	V	Applying and Designing	Yes	Field based assignments, Report making, presentations etc.
√	√	√	V		√	√	√		V	√	√	Applying	Yes	Field based assignments, Report making, presentations etc.
L	L	L	1	L		<u> </u>	***************************************		<u> </u>	L	<u> </u>	······································		
PO 1	PO 2	PO 3	PO 4	PO 5	P0 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
√		✓	✓	~	✓	~	√	√	V	V	✓	Thiņking	Yes	Field based assignments, Repormaking, presentations etc.
√	√	√		√	√		v	√	√	√	√	Thinking	Yes	Field based assignments, Repor
	PO 1 V	PO 1 PO 1 PO 2 PO 1 PO 2	PO 1 PO 3 V V V V V V V V V V V V PO 1 PO 3 PO 2 PO 3	PO 1 PO PO PO 1 V V V V V V V V V V V V V V V V V V	V	V	PO	PO	PO			V	PO 1 2 3 4 7 √ PO 2 3 4 5 6 7 8 9 PO 10 11 PO 3 4 5 6 7 8 9 PO 10 11 PO 12 PO 14 PO 14 PO 14 PO 14 PO 15 PO 16	PO

Department of Mechanical Engineering

LK. Gujral Purise Technical University

Department of Mechanical Engineering

(Main Campus)

LK.C. P.T.J. Main Campus

Kapurthol

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CO3: Apply the knowledge gained by analyzing the steam power plants, steam generators and gas turbine power plants, to improve the efficiency and reduce the thermal losses.	40 respective to the contract of the contract	*	\	✓		▼	Videological	\	*		V	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Applying	Yes	Field based assignments, Report making, presentations etc.
CO4: Apply the knowledge in calculating the Power Load Calculations and Distribution.	√	V	√	√		√	 √	 √		V	√	\ \ \	Applying	Yes	Field based assignments, Repormaking, presentations etc.
Advanced Thermodynamics	·	<u></u>	<u> </u>		1	<u> </u>	<u> </u>	<u> </u>	<u></u>	1	<u></u>	<u> </u>	<u> </u>	<u> </u>	
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	P0 6	PO 7	P0 8	PO 9		PO 11	1	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: Describe the various laws of thermodynamics and their applications	√	√		√	✓	✓	√		√	√	√	√ 1	Understand	Yes	Field based assignments, Repor making, presentations etc.
CO 2: Explain the concepts of availability and irreversibility with respect to reacting and nonreacting systems.					√	\			√	\	√	√	Understand	Yes	Field based assignments, Repor making, presentations etc.
CO 3: Describe methods in using equations of potentials, availability, and exergy for thermodynamic analysis.	√	✓		V	V	√			√		V	√	Applying and Designing	Yes	Field based assignments, Repor making, presentations etc.
CO 4: Explain the behaviour of gases and chemical equilibrium.	√	√		V		 	 √			√	√	√	Applying	Yes	Field based assignments, Repor making, presentations etc.
Presentation/Seminar	r	·	············	******	·	·	······	<u>. </u>	<u> </u>	L	<u> </u>	L			
Course Outcome	P0 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: Deal with nerves and think more positively about public speaking.		√	√	√	√	√	√		 	√	√	√	Thinking	Yes	Field based assignments, Repor making, presentations etc.
CO 2: Consider ways of grabbing the listener's attention, holding their interest, and concluding strongly.	√				√	√			√	√	√	√	Thinking	Yes	Field based assignments, Repormaking, presentations etc.
and concluding strongly.		1	1	[l .	! .		1	li l						

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Department of Mechanical Engineering
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CO4: Use slides and visual aids effectively.	√	✓	√	Y		√	√			√	√	✓	Applyin	Yes	Field based assignments, Repo making, presentations etc.
Production Engineering		1	1	T			·····	7			***************************************	·			maning, presentations e.e.
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11		Skili	Focus on Employability / Entrepreneurship	Assessment Tools to Measu Attainment of CO
CO1: Understand the various Conventional and Non-Conventional machining processes	√		√	V	√		√		√	√	. √	√	Understand	Yes	Field based assignments, Repo making, presentations etc.
CO2: Learn about measuring equipment, error types and their evaluation	√	√	√	V	V				√	√	√	√	Understand	Yes	Field based assignments, Repo making, presentations etc.
CO3: Learn about process capability and six sigma		√	√	√	√				√		√	√	Applying and Designing	Yes	Field based assignments, Repo making, presentations etc.
CO4: Learn about quality control and quality assurance systems	√	√	V	✓			√			√.	√	√	Applying	Yes	Field based assignments, Repo making, presentations etc.
Advanced Mechanics of Solids					L	L		L	L	L	L	L			
Course Outcome	PO 1	P0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11		Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measu Attainment of CO
CO1: Understand concepts of stress and strain in solids and associated theories of failure.	√		√	√	√		√		√	√	√	√	Understand	Yes	Field based assignments, Repo making, presentations etc.
CO2: Derive governing equations to solve engineering problem.	√	√			√				√	. √	√	√	Understand	Yes	Field based assignments, Repo making, presentations etc.
CO3: Apply analysis techniques to determine stress in components such as shafts, beams, shells and rotating discs under different loading conditions.		√	√	✓	√				√		>	✓	Applying and Designing	Yes	Field based assignments, Repo making, presentations etc.
CO4: Analyze deformations in beam and locate shear centre in thin-walled beams.	√	√ 1	√	√			√			√	√ ·	√	Applying	Yes	Field based assignments, Repo making, presentations etc.
Mechatronics		,	·	<u> </u>	L	1		I	L	L					
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO	PO	РО	PO	Skill	Focus on Crempleyability /	Assessment Tools to Measu Attainment of CO

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CO1: Each individual should develop competence in technologies of automation.	√	٧	V		\ 		✓	√	V	√	V	V	Thinkin	Yes	Field based assignments, Repo making, presentations etc.
CO2: Capable to develop simple control systems and study the system response.	√	√			√			√	√	√	√	√	Thinking	Yes	Field based assignments, Repo making, presentations etc.
CO3: Individual should be able to understand the communication system in automation		√	 √	√	√						V	V	Applying	Yes	Field based assignments, Reportations etc.
CO4: Analyze deformations in beam and locate shear centre in thin-walled beams.	√		V	√			V	√	√	√	√	√	Applying	Yes	Field based assignments, Report making, presentations etc.
Product Design and Development		<u> </u>	1	1	J	J		<u> </u>	<u> </u>	<u> </u>	<u></u>	<u></u>		<u>L</u>	making, presentations etc.
Course Outcome	PO 1	PO 2	PO 3	PO 4	P0 5	PO 6	PO 7	PO 8	PO 9	PO 10			Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measur Attainment of CO
CO1: To introduce the objects of product design and requirements of a good product design.		√	\	\	✓	V	V	√	√	V	V	√	Understand	Yes	Field based assignments, Report making, presentations etc.
CO2: Knowledge of different design principles like designing for function, production, installation and handling, maintenance, packing etc.	√ .	√			V	√.		√	√	√	. 🗸	✓	Understand	Yes	Field based assignments, Repormaking, presentations etc.
CO3: Knowledge and use of latest	**********	 	 		 		 		-	 	 	 			,

Comparament of Associated Engineering LKG. PTU, when Compus Kapunthala Compus C