BACHELOR OF TECHNOLOGY
(B. TECH) – MECHANICAL ENGINEERING

COURSE OUTCOMES & CO-PO MAPPING
(SESSION 2020-21)

Estd. 2000

DEPARTMENT OF
MECHANICAL ENGINEERING

LIST OF COURSES
B-TECH. MECHANICAL ENGINEERING
(SECOND YEAR)

S.No.	Course Code	Course Title	(L)	(T)	(P)	Credits
SEMESTER III						
1.	KOE 038	Engg. Science Course (Electronics Engineering)	3	1	0	4
2.	KAS301	Technical Communication	3	0	0	3
3.	KME301	Thermodynamics	3	1	0	4
4.	KME302	Fluid Mechanics & Fluid Machines	3	1	0	4
5.	KME303	Materials Engineering	3	0	0	3
6.	KME351	Fluid Mechanics Lab	0	0	2	1
7.	KME352	Material Testing Lab	0	0	2	1
8.	KME353	Computer Aided Machine Drawing-I Lab	0	0	2	1
9.	KME354	Mini Project or Internship Assessment*	0	0	2	1
10	KNC302	Python Programming	2	0	0	0
11		MOOCs (Essential for Hons. Degree)	-	-	-	-
TOTAL SEMESTER CREDITS						22
***The Mini Project or internship (3-4 weeks) conducted during summer break after II semester and will be assessed during III semester.**						
S.No.	**Course Code**	**Course Title**	**(L)**	**(T)**	**(P)**	**Credits**
SEMESTER IV						
1.	KAS402	MATHS IV	3	1	0	4
2.	KVE401	Universal Human Values	3	0	0	3
3.	KME401	Applied Thermodynamics	3	0	0	3
4.	KME402	Engineering Mechanics	3	1	0	4
5.	KME403	Manufacturing Processes	3	1	0	4
6.	KME451	Applied Thermodynamics Lab	0	0	2	1
7.	KME452	Manufacturing Processes Lab	0	0	2	1
8.	KME453	Computer Aided Machine Drawing-II Lab	0	0	2	1
9.	KNC401	Computer System Security	2	0	0	0
10		MOOCs (Essential for Hons. Degree)				
TOTAL SEMESTER CREDITS						21
LIST OF ENGINEERING SCIENCE COURSES						
1.	KOE031/041	Engineering Mechanics	3	1	0	4
2.	KOE032/042	Material Science	3	1	0	4
3.	KOE035/045	Basics Data Structure & Algorithms	3	1	0	4
4.	KOE036/046	Introduction to Soft Computing	3	1	0	4
5.	KOE037/047	Analog Electronics Circuits	3	1	0	4
6.	KOE038/048	Electronics Engineering	3	1	0	4

LIST OF COURSES
B-TECH. MECHANICAL ENGINEERING
(THIRD YEAR)

S.No.	Course Code	Course Title	(L)	(T)	(P)	Credits
		SEMESTER V				
1	KME 501	Heat and Mass Transfer	3	1	0	4
2	KME 502	Strength of Materials	3	1	0	4
3	KME 503	Industrial Engineering	3	1	0	4
4	KME 551	Heat and Mass Transfer Lab	0	0	2	1
5	KME 552	Python Lab	0	0	2	1
6	KME 553	Internet of Things Lab	0	0	2	1
7	KME 051	Computer Integrated Manufacturing	3	0	0	3
8	KME 052	Mechatronics Systems				
9	KME 054	IC Engine Fuel and Lubrication				
10	KAU 051	Automobile Engines & Combustion				
11	KME 055	Advanced Welding	3	0	0	3
12	KME 056	Programming, DS & Algorithm				
13	KME 057	Mechanical Vibrations				
14	KAU 052	Automotive Chassis and Suspension				
15	KME 554	Mini Project or Internship Assessment*	0	0	2	1
		TOTAL SEMESTER CREDITS				22

S.No	Course Code	Course Title	(L)	(T)	(P)	Credits
		SEMESTER VI				
1	KME 601	Refrigeration and Air Conditioning	3	1	0	4
2	KME 602	Machine Design	3	1	0	4
3	KME 603	Theory of Machines	3	1	0	4
4	KME 651	R& AC Lab	0	0	2	1
5	KME 652	Machine Lab	0	0	2	1
6	KME 653	Theory of Machines Lab	0	0	2	1
7	KME 061	Non-Destructive Testing	3	0	0	3
8	KME 062	Artificial Intelligence				
9	KME 063	Tribology				
10	KME 064	Gas Dynamics and Jet Propulsion				
11	KAU 061	Automotive Electrical & Electronics				
12	KOE 067	Basics of Database Management	3	0	0	3
	KOE 068	Software Project Management				
		TOTAL SEMESTER CREDITS				21

LIST OF COURSES
B-TECH. MECHANICAL ENGINEERING
(FINAL YEAR)

S.No.	Course Code		(L)	(T)	(P)	Credits
		SEMESTER VII				
1.	ROE071 - 074	Open Elective -I	3	0	0	3
2.	RME070 - 073	DEPTT ELECTIVE COURSE-3	3	0	0	3
3.	RME074 - 078	DEPTT ELECTIVE COURSE-4	3	1	0	4
4.	RME701	CAD/CAM	3	0	0	3
5.	RME702	Automobile Engineering	3	1	0	4
6.	RME751	CAD/CAM Lab	0	0	2	1
7.	RME752	Automobile Lab	0	0	2	1
8.	RME753	INDUSTRIAL TRAINING	0	0	3	2
9.	RME754	PROJECT-1	0	0	6	3
		TOTAL SEMESTER CREDITS				24

DEPARTMENTAL ELECTIVE-3	DEPARTMENTAL ELECTIVE-4
RME070 Composite Materials	RME075 Operation Research
RME071 Power Plant Engineering	RME076 Modelling &Simulation
RME072 Supply Chain Management	RME077 Computational Fluid Dynamics
RME073 Additive Manufacturing	RME078 Automation & Robotics

S.No	Course Code		(L)	(T)	(P)	Credits
		SEMESTER VIII				
1.	ROE081-088	Open Elective - 2	3	0	0	3
2.	RME080-083	DEPTT ELECTIVE COURSE-5	3	1	0	4
3.	RME085-88	DEPTT ELECTIVE COURSE-6	3	0	0	3
4.	RME851	Seminar	0	0	3	2
5.	RME852	Project-2	0	0	12	12
		TOTAL SEMESTER CREDITS				24

Department. Elective Course-5	Department Elective Course-6
RME080 Non-Destructive Testing Management	RME085 Total Quality Management
RME081 Advance Welding	RME086 Gas Dynamics & Jet Propulsion
RME082 Thermal Turbo Machine	RME087 Design & Transmission System
RME083 Energy Conservation &Management	RME088 Theory of Elasticity.

LIST OF OPEN ELECTIVE COURSES

OPEN ELECTIVE-I

ROE 071	Modelling and Simulation of Dynamic Systems
ROE 072	Introduction to Smart Grid
ROE073	Cloud Computing
ROE074	Understanding the human being Comprehensively Human Aspiration audits fulfilment

OPEN ELECTIVE-II

ROE 081	Digital and Social Media Marketing
ROE 082	Entrepreneurship Development
ROE 083	Machine Learning
ROE 084	Micro and Smart Systems
ROE 085	Operations Research
ROE 086	Renewable Energy Resources
ROE 087	Human Values in Madhyasth Darshan
ROE 088	Values, Relationship & Ethical Human Conduct-For a Happy & Harmonious Society

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: III
Subject Code: KOE 038
Subject Name: Electronics Engineering
Pre-requisites of course:

1. **Basics of Semiconductor Physics**
2. **Kirchoff's Voltage & Current Laws**

Course Outcomes:
Upon the completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Understand the concept of PN junction and special purpose diodes.	K2
CO2	Study the application of conventional diode and semiconductor diode.	K3
CO3	Analyze the IV characteristics of BJT & FET.	K3
CO4	Analyze the Op-amp, amplifiers, integrator & differentiator.	K4
CO5	Understand the concept of DSO and compare DSO with oscilloscope.	K2

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)

K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO2
CO1	3	3	2	1	1	2	2	1	3	1	2
CO2	3	3	2	1	1	1	1	1	2	1	2
CO3	2	3	2	1	1	2	1	1	2	1	2
CO4	2	3	2	1	1	1	2	1	2	1	2
CO5	2	2	2	1	1	1	1	1	2	1	2
Course	2.40	2.80	2.00	1.00	1.00	1.40	1.40	1.00	2.20	1.00	2.00

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Year / Semester: III
Subject Code: KAS-301
Subject Name: TECHNICAL COMMUNICATION
Pre-requisites of Course: Basic knowledge of Professional English
Course Outcomes:

Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Students will be enabled to understand the nature and objective of technical communication relevant for the work place as engineers.	K2
CO2	Students will utilize the technical writing for the purposes of technical communication and its exposure in various dimensions.	K6
CO3	Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.	K3
CO4	Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence.	K6
CO5	It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.	K5

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	1	1	1	3	2	2	2	3	1	2
CO2	2	2	1	1	1	2	2	2	1	3	1	2
CO3	2	1	2	1	1	3	1	2	2	3	1	2
CO4	2	1	2	1	2	1	1	2	1	3	1	2
CO5	1	1	1	1	1	2	1	2	1	3	2	2
COURSE	1.60	1.40	1.40	1.00	1.20	2.20	1.40	2.00	1.40	3.00	1.20	2.00

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: III
Subject Code: KME 301
Subject Name: Thermodynamics
Pre-requisites of Course: KAS101 Physics, KAS103 Mathematics

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Analyze about Steam, its properties and steam table	K4
CO2	Understand and apply concepts of enthalpy, entropy, availability and irreversibility etc.	K2
CO3	Evaluate the working and applications of different thermodynamic cycles	K5
CO4	Evaluate the working and application of refrigeration cycle and psychometric	K5
CO5	Understand various thermodynamic properties, thermodynamics laws and its limitations	K2

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO12
CO1	2	2	3	
CO2	3	3	1	
CO3	1	2	1	1
CO4	2	2	2	2
CO5	2	2	3	2
Course	**2.00**	**2.20**	**2.00**	**1.67**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Year / Semester: III
Subject Code: KME 302
Subject Name: Fluid Mechanics & Fluid Machines
Pre-requisites of course: Mathematics I (KAS-103), Mathematics II (KAS-203)

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Understand the properties of fluids and learn about the application of mass and momentum conservation laws for fluid flows.	**K_2**
CO2	Obtain the velocity and pressure variations in various types of simple flows and understand the importance of dimensional analysis.	**K_2**
CO3	Analyze fully developed laminar and turbulent pipe flows and also apply laminar and turbulent boundary layer fundamentals.	**K_4**
CO4	Analyze simple flow situations mathematically and evaluate the performance of turbines.	**K_5**
CO5	Analyze simple flow situations mathematically and evaluate the performance of pumps.	**K_5**

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)

K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PSO2
CO1	3	2	2	3
CO2	3	2	2	3
CO3	3	3	2	3
CO4	3	3	2	3
CO5	3	3	3	3
Course	**3.00**	**2.6**	**2.20**	**3.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: III
Subject Code: KME303
Subject Name: Materials Engineering
Pre-requisites of course: Basic Knowledge of Physics and Chemistry

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Analyze the structure of materials and basic concepts of materials like unit cell, FCC, BCC, HCP, etc.	L4
CO2	Describe and discriminate concept of mechanical behavior of materials.	L5
CO3	Construction and identification of phase diagrams and reactions to create desired microstructure.	L6
CO4	Suggest the heat treatment process for engineering application and its impact on microstructure and material properties.	L3
CO5	Explain basic principles and applications of advanced materials such as smart materials, composite materials, etc.	L2

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO & PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO7	PO12
CO1	**3**	**2**	**2**		
CO2	**3**	**2**	**2**		
CO3	**3**	**2**	**2**		
CO4	**3**	**2**		**1**	**1**
CO5	**3**				
Course	**3.00**	**2.00**	**2.00**	**1.00**	**1.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: IV
Subject Code: KAS 402
Subject Name: MATHEMATICS IV
Pre-requisites of Course: KAS 103/203 Mathematics - I, KAS 203 Mathematics
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Remember the concept of partial differential equation and to solve partial differential equations to solve partial differential equations differential equations	K5
CO2	Analyze the concept of partial differential equations to evaluate the problems concerned with partial differential equations.	K4
CO3	Understand the concept of correlation, moments, skewness and kurtosis and curve fitting.	K5
CO4	Remember the concept of probability to evaluate probability distributions	K6
CO5	Apply the concept of hypothesis testing and statistical quality control to create control charts.	K5

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO9	PO11	PO12	PSO2
CO1	2	2	1	1		2	2
CO2	3	2	2		1		2
CO3	2	1	3			1	2
CO4	1	2	2	1	1		2
CO5	2	1	1	1	1		2
Course	**2.00**	**1.60**	**1.80**	**1.00**	**1.00**	**1.50**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: IV
Subject Code: KVE 401
Subject Name: Universal Human Values and Professional Ethics
Pre-requisites of Course: NA
Course Outcomes:

Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Recognize the significance of value inputs in a classroom to distinguish values and skills to explore the meaning of happiness and	K3
CO2	Distinguish between the Self and the body to understand the meaning of harmony for co-existence of Self and body.	K4
CO3	Recognize the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human	K3
CO4	Recognize the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.	K5
CO5	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment	K4

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO2	PO3	PO6	PO7	PO8	PO9	PO12	PSO2
CO1	1	2	2	3	1			
CO2				2			2	2
CO3			2			3		
CO4	1	1	3	3			2	
CO5	1	3	2	1	3		1	2
Course	**1.00**	**1.20**	**2.20**	**1.80**	**2.00**	**3.00**	**1.67**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester:IV
Subject Code: KME 401
Subject Name: APPLIED THERMODYNAMICS
Pre-requisites of Course: KME 301 THERMODYNAMICS
Course Outcomes:

Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Differentiate various thermodynamic relations and the process of combustion of fuels	K4
CO2	Explain the working and practical importance of boilers and condensers.	K4
CO3	Demonstrate and apply steam engines and steam nozzles fundamentals.	K4
CO4	Analyze different vapour power cycles and steam turbines relationship.	K4
CO5	Analyze gas turbines and outline principle of jet propulsion.	K5

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO6	PO7	PO12	PSO1	PSO2
CO1	3	3	3	1	1	1	2	2
CO2	3	3	2	1	2	1	3	2
CO3	3	2	3	1	1	1	2	2
CO4	3	2	3	1	1	1	2	2
CO5	3	2	3	1	1	1	2	2
Course	**3.00**	**2.40**	**2.80**	**1.00**	**1.20**	**1.00**	**2.20**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: IV
Subject Code: KME 402
Subject Name: Engineering Mechanics
Pre-requisites of course: KAS 101 Engineering Physics and KAS 103 Mathematics- I
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Simplify mechanics problems using free body diagrams and explain the concept of equilibrium to the force for rigid bodies 2d systems.	K5
CO2	Apply the concept of bending moment and shear force diagrams for design of beam and to analyze simple statically determinate structures such as beams, pin- jointed trusses and frames subject to various loading and support.	K4
CO3	Determine the centroid and moment of inertia for design of components.	K5
CO4	Apply the knowledge of kinetics and kinematics in solving the real time problems.	K6
CO5	Estimate and design structural members subjected to tension, compression, torsion, bending and combined stresses using the fundamental concepts of stress, strain and elastic behavior of materials.	K5

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO & PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO10	PO11	PO12
CO1	3	3	3	2	1	2	2
CO2	3	3	3	2	1	2	2
CO3	3	3	3	2	1	2	2
CO4	3	3	3	2	1	2	2
CO5	3	3	3	2	1	2	2
Course	**3.00**	**3.00**	**3.00**	**2.00**	**1.00**	**2.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: IV
Subject Code: KME 403
Subject Name: Manufacturing Processes
Pre-requisites of Course: Basic Knowledge of Physics, Chemistry and Math

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Explain and Analyze the various casting and metal forming process mechanics and evaluate the force and power requirements of forging, rolling and drawing etc..	K5
CO2	Analyze mechanics of metal cutting and various aspects of tools in the process of machining.	K5
CO3	Illustrate and differentiate various super finishing operations.	K2
CO4	Explain and distinguish different welding processes.	K2
CO5	Comprehend and classify various nonconventional machining	K5

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO12	PSO1	PSO2
CO1	3	3	3	2	3	2
CO2	3	3	1	2		
CO3	3	1		2		
CO4	3	3	2	2		
CO5	3	3	2	2		
Course	**3.00**	**2.60**	**2.00**	**2.00**	**3.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: IV
Subject Code: KNC 401
Subject Name: Computer System Security
Pre-requisites of Course:
Course Outcomes:

Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats.	K2
CO2	To discover cyber-attack scenarios to web browsers and web servers and to explain how to mitigate such threats.	K2
CO3	To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.	K4
CO4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios.	K4
CO5	To articulate the well-known cyber-attack incidents, explain the attack scenarios, and explain mitigation techniques.	K2

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO8
CO1	3	2	3	2
CO2	2	3	3	2
CO3	3	2	1	2
CO4	1	3	2	1
CO5	1	3	2	3
Course	**2.00**	**2.60**	**2.20**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Year / Semester: 3/V
Subject Code: KME501
Subject Name: HEAT AND MASS TRANSFER
Pre-requisites of Course: TD &ATD
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Formulate and solve governing differential equations for steady one-dimensional heat conduction.	K2
CO2	Apply and solve governing equations for conduction and convection for different fin configurations and examine transient heat transfer	K4
CO3	Apply the concepts of fluid flow and convection heat transfer to analyze the thermal system.	K3
CO4	Describe radiative interactions and properties of different kinds of surfaces and estimate radiative heat exchange between two or more	K2
CO5	Evaluate performance of heat exchangers using LMTD & effectiveness method and recognise basic mass transfer	K5

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO6	PO7	PO12	PSO1	PSO2
CO1	3	2	2	2	1	1	1	3	1
CO2	3	2	2	2	1	1	1	3	1
CO3	3	2	2	2	1	1	1	3	1
CO4	3	2	2	2	1	1	1	3	1
CO5	3	2	2	1	1	1	1	3	1
AVG	**3**	**2**	**2**	**1.8**	**1**	**1**	**1**	**3**	**1**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Year / Semester: III/V
Subject Code: KME-502
Subject Name: SOM

Pre-requisites of Course: Engineering Mechanics, Mathematics – I, Machine Drawing
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Explain different type of stress and strain states and their	K_2
CO2	Analyze the deflection, stresses in different type of beams.	.K_3
CO3	Analyze deflection for different type of spring like helical, laminated	K_4
CO4	Analyze the buckling load for various types of columns subjected to	K_4
CO5	Evaluate the value of stresses, strain and deformation produced in	K_5

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO12	PSO1	PSO2
CO1	3	3	1	1	1	2	1
CO2	3	3	1	3	1	2	1
CO3	3	3	1	1	1	2	1
CO4	3	3	1	1	-	2	1
CO5	3	2	1	2	-	2	1
	3	2.8	1	1.6	1	2	1

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Year / Semester: 3/V
Subject Code: KME 503
Subject Name: Industrial Engineering
Pre-requisites of Course: KAS302/KAS402 Mathematics-IV
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Understand the concept of production system, productivity, facility an d process planning in various industries	K2
CO2	Apply the various forecasting and project management techniques	K3
CO3	Apply the concept of breakeven analysis, inventory control and r esource	K3
CO4	Apply principles of work study and ergonomics for design of work syst ems	K3
CO5	Formulate mathematical models for optimal solution of industrial probl ems using linear programming approach	K4

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PSO1
CO1	1	1	1	2	2
CO2	2	3	2	3	3
CO3	2	3	2	3	3
CO4	1	3	3	3	3
CO5	1	3	3	3	3
Course	**1.40**	**2.60**	**2.20**	**2.80**	**2.80**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Year / Semester: 3/V
Subject Code: KAU 051
Subject Name: Automobile Engines & Combustion
Pre-requisites of Course: KME 301 Thermodynamics, KME 401 Applied Thermodynamics
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	**Explain the working principle, performance parameters and testing of IC Engine**	K2
CO2	**Understand the phenomena of combustion and its application in SI**	K2
CO3	**Understand the essential systems of IC engine**	K2
CO4	Understand the effect of engine emissions on environment and	K2
CO5	**Apply the concepts of thermodynamics to air standard cycle in IC**	K3
CO6	**Analyze the effect of various operating parameters on IC engine**	K4

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO6	PO7	PSO1	PSO2
CO1	3	2		1			3	2
CO2	3	1					3	2
CO3	3						3	2
CO4	3	2	1	1	2	3	3	2
CO5	3	2	2				3	2
CO6	3	2					3	2
Course	**3.00**	**1.80**	**1.50**	**1.00**	**2.00**	**3.00**	**3.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad

Department of Mechanical Engineering
Session 2020-21

Year / Semester: 3/V
Subject Code: KME 051
Subject Name: Computer Integrated Manufacturing
Pre-requisites of Course: Math IV KAS 402
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Understand the basic concepts of automation, computer numeric control.	K2
CO2	Understand the algorithms of line generation, circle generation, transformation.	K2
CO3	Understand group technology, computer aided process planning, flexible.	K2
CO4	Understand information system and material handling in CIM environment, rapid prototyping.	K2
CO5	Apply the algorithms of line & circle generation and geometric transformations.	K3
CO6	Develop CNC program for simple operations.	K3

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO12	PSO1	PSO2
CO1	3	2	1	1		2	3	2
CO2	3	3	3	2	2	2	3	3
CO3	3	2	2	2		2	3	2
CO4	3	2	2	2		2	3	2
CO5	3	3	3	3	2	2	3	3
CO6	3	2	3	3	2	2	3	3
Course	**3**	**2.33**	**2.33**	**2.16**	**2.00**	**2.00**	**3.00**	**2.50**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad

Department of Mechanical Engineering

Session 2020-21

Year / Semester: 3rd / Vth

Subject Code: KME 052

Subject Name: MECHATRONICS SYSTEMS

Pre-requisites of Course: Basic Electricals and Electronics Engineering

Course Outcomes:

Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Identify key elements of mechatronics and its representation by block diagram.	K2
CO2	Understand the concept of sensors and use of interfacing systems.	K2
CO3	Understand the concept and applications of different actuators	K2
CO4	Illustrate various applications of mechatronic systems.	K2
CO5	Develop PLC ladder programming and implementation in real life problem.	K5

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO11	PSO1	PSO2
CO1	3	2	1	1	1		1	2	3	2
CO2	3	1	2		2		1	2	3	2
CO3	3	1	1					2	3	2
CO4	3	2		1	1	1	1	2	3	2
CO5	3	3	2	2	2		1	2	3	2
Course	**3.00**	**1.80**	**1.50**	**1.33**	**1.50**	**1.00**	**1.00**	**2.00**	**3.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad

Department of Mechanical Engineering

Year / Semester: 3/V
Subject Code: KME 054
Subject Name: I C ENGINE FUEL & LUBRICANTS
Pre-requisites of Course: KME301 Thermodynamics - III, KME401 Applied Thermodynamics-IV, KME302 Fluid Mechanics & Fluid Machines - III
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Explain the working principle, performance parameters and testing of IC Engine.	K2
CO2	Understand the combustion phenomena in SI and CI engines and factors influencing the design	K2
CO3	Understand the essential systems of IC engine and latest trends and developments in IC Engines.	K2
CO4	Understand the effect of engine emissions on environment and human health and methods of reducing it.	K2
CO5	Apply the concepts of thermodynamics to air standard cycle in IC Engines	K3
CO6	Analyze the effect of various operating parameters on IC engine performance.	K4

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO6	PO7	PO12	PSO1	PSO2
CO1	3	2		1			1	3	2
CO2	3	1					1	3	2
CO3	3		1				1	3	2
CO4	3	2	2	1	2	3	2	3	2
CO5	3	2					1	3	2
CO6	3	2		1	2		1	3	2
Course	**3.00**	**1.50**	**1.50**	**1.00**	**2.00**	**3.00**	**1.17**	**3.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad

Department of Mechanical Engineering

Session 2020-21

Year / Semester: 3/ VI

Subject Code: KME056

Subject Name: Programming, Data Structures and Algorithms Using Python

Pre-requisites of Course: KNC302: Python Programming

Course Outcomes:

Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Understand the numbers, math's function, strings, list, tuples, and dictionaries in pythons	K2
CO2	Apply conditional statement and functions in python	K3
CO3	Apply file handling techniques in python	K3
CO4	Analyze the graphical demonstration in python	K4
CO5	Apply techniques of Classes and Object Concept in Python.	K3

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO12	PSO1	PSO2
CO1	3	3	1	1	3	2	1	2	3	2
CO2	3	3	1	2	3	2	1	2	3	2
CO3	3	3	1	1	3	2	1	2	3	2
CO4	3	3	1	2	3	2	1	2	3	2
CO5	3	3	1	2	3	2	1	2	3	2
Course	**3.00**	**3.00**	**1.00**	**1.60**	**3.00**	**2.00**	**1.00**	**2.00**	**3.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad

Department of Mechanical Engineering

Session 2020-21

Year / Semester: 3rd/ 5th

Subject Code: KME 057

Subject Name: MECHANICAL VIBRATIONS

Pre-requisites of Course: KME 502Strength of Material, KME402 Engineering Mechanics

Course Outcomes:

Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Describe fundamentals of mechanical vibrations along with their classification.	K2
CO2	Differentiate among single, two and multiple degree of freedom (DOF) systems.	K2
CO3	Analyze, predict and measure the performance of systems undergoing single, two and multiple DOF.	K4
CO4	Design systems with optimized vibration absorption capabilities.	K4
CO5	Apply the fundamentals to the real-life problems like whirling of shaft	K3
CO6	Solve complicated mathematical models using Numerical methods and software applications.	K4

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO12	PSO1	PSO2
CO1	3	2	2	1		2	3	2
CO2	3	2	2	2		2	3	2
CO3	3	3	3	3		2	3	2
CO4	3	3	3	3		2	3	2
CO5	3	3	3	3		2	3	2
CO6	3	3	3	3	2	2	3	2
Course	**3.00**	**2.67**	**2.67**	**2.50**	**2.00**	**2.00**	**3.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad

Department of Mechanical Engineering

Session 2020-21

Year / Semester: 3rd / Vth

Subject Code: KAU 052

Subject Name: AUTOMOTIVE CHASSIS AND SUSPENSION

Pre-requisites of Course: Engineering Mechanics, Elements of mechanical engineering, Theory of Machines

Course Outcomes:

Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Understand different types of automotive chassis and frames used in automobiles.	K2
CO2	Understand transmission system, drive line components, Steering system and axles used in automobile.	K2
CO3	Understand the constructional features of barking, suspension system, wheels and tyres in automobile applications.	K2
CO4	Understand the recent advancements made in chassis components of automobile.	K2
CO5	Apply the concepts of braking and steering system to design the same for automobile application.	K3

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO11	PSO1	PSO2
CO1	3	2	1	1	1		1	2	3	2
CO2	3	1	2				1	2	3	2
CO3	3	1	1					2	3	2
CO4	3	2		1	1		1	2	3	2
CO5	3	2	2	1	2	2	2	2	3	2
Course	**3.00**	**1.60**	**1.50**	**1.00**	**1.33**	**2.00**	**1.25**	**2.00**	**3.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: VII
Subject Code: ROE 074
Subject Name: Understanding the Human Being Comprehensively – Human Aspirations and its Fulfillment
Pre-requisites of Course: RVE301 UHV & PE
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Identify the basic human aspirations and their fulfillment in the light of resolution.	K2
CO2	Recognize the harmony of the human being in nature or existence.	K5
CO3	Differentiate between activities and potential comprehensively of the self and body of a human being.	K5
CO4	Define the process of inner evolution, specifically awakening to activities of the self: Realization, understanding and contemplation	K6
CO5	Recognize different aspects of four orders of human living from self to nature and entire existence.	K2

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO3	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO2
CO1	2	3	3	2	1	2	2	3	2
CO2	2	2	3	2	1	2	1	3	2
CO3	2	2	3	3	2	2		3	2
CO4	2	3	3	2	1	1		3	2
CO5	2	2	3	2	1	2		3	2
Course	**2.00**	**2.40**	**3.00**	**2.20**	**1.20**	**1.80**	**1.50**	**3.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: VII
Subject Code: RME 071
Subject Name: POWER PLANT ENGINEERING
Pre-requisites of Course: THERMODYNAMICS, APPLIED THERMODYNAMICS, IC ENGINES & COMPRESSORS

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Solve the problems related with power plant economics.	K3
CO2	Analyze the efficiency of Rankine and modified Rankine cycles used in steam power plants under variable operating conditions.	K4
CO3	Compare the working principle of diesel and gas turbine power plants with steam power plant.	K2
CO4	Examine the feasibility of using non-conventional power plants.	K4
CO5	Discuss the instrumentation required for power plants and means of pollution control.	K2

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO12	PSO1	PSO2
CO1	2	1		1			1	3	2
CO2	3	2	2	2				3	2
CO3	3	2	2	1			1	3	2
CO4	1	2		1	1	2	1	3	2
CO5	2	1	2		1	3	1	3	2
Course	**2.2**	**1.6**	**2.00**	**1.25**	**1.00**	**2.50**	**1.00**	**3.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: VII
Subject Code: RME 072
Subject Name: SUPPLY CHAIN MANAGEMENT
Pre-requisites of Course: MANAGERIAL ECONOMICS, INDUSTRIAL MANAGEMENT

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Discuss the concepts of logistics and supply chain in business operations.	K2
CO2	Recognize drivers of supply chain performance.	K4
CO3	Analyze the role of forecasting in a supply chain.	K4
CO4	Identify factors influencing network design and understand the role of aggregate planning, inventory, IT, and coordination in a supply chain.	K2
CO5	Plan Warehouse and Logistics operations for optimum utilization of resources.	K6

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO9	PO11	PO12	PSO1
CO1	2	1						1	1	
CO2	1	1					1		1	
CO3	2	2		2	1				1	3
CO4	2	1	1	1	3		2	1	2	
CO5	1	1	1	1		1		1	1	
Course	**1.60**	**1.20**	**1.00**	**1.33**	**2.00**	**1.00**	**1.50**	**1.00**	**1.20**	**3.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: VII
Subject Code: RME 073
Subject Name: Additive Manufacturing
Pre-requisites of Course: 1. Manufacturing Science I (RME 402) 2. Manufacturing Science II (RME 502) 3. Computer Aided Manufacturing (NME 033)

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Identify the need of development of novel manufacturing techniques such as additive manufacturing/rapid prototyping etc and its	K3
CO2	Analyze different methods of additive manufacturing and its parameters	K4
CO3	Discuss various types of software/hardware/processes used and their advantages.Study the additive manufacturing processes in real time	K2

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO12	PSO1	PSO2
CO1	2		1			1	2	2
CO2	2	1		2		1	3	3
CO3	2	1		2	1	1	2	2
Course	**2.00**	**1.00**	**1.00**	**2.00**	**1.00**	**1.00**	**2.33**	**2.33**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad

Department of Mechanical Engineering

Session 2020-21

Semester: VII
Subject Code: RME 075
Subject Name: Operations Research
Pre-requisites of course: RAS402 Mathematics - IV, RAS501 Managerial Economics RAS601 Industrial Management
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Formulate, solve and optimize real-world problems using linear programming model (LPP).	K5
CO2	Solve specialized linear programming problems using transportation and assignment model.	K4
CO3	Analyze and evaluate game and sequencing theory with the help of practical problems.	K5
CO4	Formulate stochastic inventory models and compute with the help of various simulation models for important performance measures.	K6
CO5	Analyze and compare PPC techniques such as PERT and CPM. Discuss different waiting line models for solving queuing problems.	K5

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO & PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO7	PO9	PO11	PO12	PSO1	PSO2
CO1	3	3	1	1	1		3	2	3	2
CO2	3	3	1	2	1		2	2	3	2
CO3	3	3	1	1	1		3	2	3	2
CO4	3	3	1	2	1		2	2	3	2
CO5	3	3	1	2	1	2	3	2	3	2
Course	**3.00**	**3.00**	**1.00**	**1.60**	**1.00**	**2.00**	**2.60**	**2.00**	**3.00**	**2.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: VII
Subject Code: RME 078
Subject Name: Automation & Robotics
Pre-requisites of Course: RAS402 Mathematics - IV

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Identify and classify various elements of Industrial Automation.	K2
CO2	Select an appropriate automation technique for a specific manufacturing application.	K3
CO3	Classify different robots and evaluate robotic motions.	K6
CO4	Select drive system and end effectors required for robot system	K5
CO5	Use various robot inputs and outputs to control operation sequence	K5

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO9	PSO1	PSO2
CO1	3	1	1			1	1	1	3	2
CO2	3	1				1	1	1	3	2
CO3	3	1	3	3				1	3	2
CO4	3	1						1	3	2
CO5	3	1			3			1	3	2
Course	3.00	1.00	2.00	3.00	3.00	1.00	1.00	1.00	3.00	2.00

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester:VII
Subject Code: RME 701
Subject Name: CAD/CAM
Pre-requisites of Course: RME501 Machine Design – I, RME603 Machine Design – II, CAEG

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Explain the basic concepts of Computer Aided Design and compare graphics standards, software & functions to perform the geometric	K3
CO2	Illustrate the representation of points, curves, surface and solids to apply in real time engineering problems.	K4
CO3	Analyse problems of bar, beam & 2D truss elements using Finite Element Analysis.	K5
CO4	Select type of CNC machine for particular operation and create NC part programme for given constructional details.	K6
CO5	Classify and integrate modern manufacturing techniques and methods by integrating various robot configurations for applications in	K4

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO7	PO12	PSO1	PSO2
CO1	3	3	2		2	1	1		
CO2	3	3	3		2	1	1		
CO3	3	3	3		2	1	1	3	3
CO4	3	3	2	2	2	1	1		
CO5	3	3	1	2	2	1	1		
Course	**3.00**	**3.00**	**2.20**	**2.00**	**2.00**	**1.00**	**1.00**	**3.00**	**3.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester:VII
Subject Code: RME 702
Subject Name: AUTOMOBILE ENGINEEEING
Pre-requisites of Course: Engineering Mathematics, IC Engines and Compressors, Material Science, Electrical Machines, Theory of Machines, Basic Thermodynamics
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Enable the students to attain the knowledge about main components of an automobile with the understanding of the design and gearbox assembly.	**K5**
CO2	Enable the students to attain the knowledge about the transmission system, steering system, differential mechanism and wheel balancing	**K3**
CO3	Enable the students to acquire the knowledgeabout the electrical and ignition systems applicable in vehicles, and to understand the mechanism of fuel injection systems	**K5**
CO4	Describe different electrical, ignition and fuel injection systems.	**K2**
CO5	Enable the students to acquire the knowledge about the emission standards and pollution control methodologies applicable in our country	**K2**

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)

K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes/PSOs	PO1	PO2	PO3	PO4	PO6	PO7	PO8	PO10	PO12
CO1	3	3	2	2	1			1	1
CO2	3	3	2		2				1
CO3	3	3	2		2	1			1
CO4	3	3	2		2	2	1		1
CO5	2	2	3		2	3	2		1
Course	2.80	2.80	2.20	2.00	1.80	2.00	1.50	1.00	1.00

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: VIII
Subject Code: ROE 088
Subject Name: Values, Relationship & Ethical Human Conduct - For a Happy & Harmonious Society
Pre-requisites of Course: RVE301 UHV & PE
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Apply the right understanding for the importance and types of relationship.	K3
CO2	Analyse the right expressions with respect of relationship.	K4
CO3	Evaluate the competence to think about the conceptual framework of undivided society.	K5
CO4	Understand conceptual framework of universal human order.	K2
CO5	Develop the exposure for transition from current state to the undivided society and universal human order.	K6

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO3	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	3	2	1	2	2	3		
CO2	2	2	3	2	1	2	1	3		
CO3	2	2	3	3	2	2		3	3	3
CO4	2	3	3	2	1	1		3		
CO5	2	2	3	2	1	2		3	3	3
Course	**2.00**	**2.40**	**3.00**	**2.20**	**1.20**	**1.80**	**1.50**	**3.00**	**3.00**	**3.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: VIII
Subject Code: RME 080
Subject Name: Non-Destructive Testing Management
Pre-requisites of course: 1. Material science (RME 301) 2. Manufacturing science I (RME 402)

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Describe and distinguish between the various destructive and non-destructive testing techniques	**K3**
CO2	Define different types of defects occurring in various manufacturing techniques through non-destructive /destructive testing.	**K2**
CO3	Discuss various equipment and methods used in non-destructive testing.	**K4**
CO4	Select and analyze different NDT methods by discussing limitations and advantages of each methods.	**K4**
CO5	Describe and distinguish between the various destructive and non-destructive testing techniques	**K4**

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)

K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO12	PSO1	PSO2
CO1	2	2			2			1	2	2
CO2	3	3			2			1	2	2
CO3	3	3	1		3	1	1	1	2	2
CO4	2	2	1	1	2			1	3	3
Course	**2.50**	**2.50**	**1.00**	**1.00**	**2.25**	**1.00**	**1.00**	**1.00**	**2.25**	**2.25**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: VIII
Subject Code: RME 081
Subject Name: Advance Welding
Pre-requisites of course: 1. Material science (RME 301) 2. Manufacturing science I (RME 402)

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Describe the theory/process to fabrication of products	**K3**
CO2	Explain the influence of the operating parameters for the welding machines/process.	**K2**
CO3	Estimate the heat flow in welding process.	**K4**
CO4	Describe the concept of weldability and steps for maintenance of joints.	**K3**
CO5	Discuss the various types of weld design.	**K4**

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)

K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO & PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO8	PO12	PSO1	PSO2
CO1	3					1		
CO2	2					1		
CO3	2	2		1		1	3	3
CO4	1		1			1		
CO5	3		1		1	1		
Course	**2.20**	**2.00**	**1.00**	**1.00**	**1.00**	**1.00**	**3.00**	**3.00**

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: VIII

Subject Code: RME 083

Subject Name: Energy Conservation & Management

Pre-requisites of course:

Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Identify energy management skills and strategies in the energy management system.	**K3**
CO2	Describe various energy conservation methods used in a particular industry.	**K2**
CO3	Select appropriate energy conservation method for the critical area identified.	**K4**
CO4	Prepare an energy audit report.	**K3**

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)

K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	1	1	1		1		
CO2	3	2	2	1	1	1	1		1		
CO3	2	3	2	2	1	1	1		1		
CO4	1	1	1	1	1	1	1	2	1	3	3
Course	2.25	2.00	1.75	1.50	1.00	1.00	1.00	2.00	1.00	3.00	3.00

3 – High; 2 – Medium; 1 – Low

ABES Engineering College, Ghaziabad
Department of Mechanical Engineering
Session 2020-21

Semester: VIII
Subject Code: RME 085
Subject Name: Total Quality Management
Pre-requisites of Course: Industrial Sociology, Industrial Management
Course Outcomes:
Upon the Completion of this course, the student will be able to:

Course Outcome No.	Statement	Knowledge Level, KL
CO1	Identify the contribution of quality gurus in TQM journey and acknowledge the importance of customers in manufacturing.	K2
CO2	Explain and analyze quality systems and organizational structures to apply quality principles in different processes	K4,
CO3	Design an effective performance measurement system to optimize standard statistical process control techniques	K5
CO4	Describe and analyze various reliability methods / tests and the associated failure analysis methods	K6
CO5	Apply the concepts of ISO - 9000 and ISO -14000 standards in auditing techniques such as JIT and Taguchi Method.	K3

KL- Bloom's Knowledge Level (K_1, K_2, K_3, K_4, K_5, K_6)
K_1-Remember, K_2- Understand, K_3- Apply, K_4- Analyze, K_5- Evaluate, K_6- Create

CO-PO& PSO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1		1	1			1	1	2	1				
CO2	1		2			1	1	2	3	2	1		
CO3	3	3	3	3		1					1	3	3
CO4	3	3	3	3			1				1		
CO5	1	1	3	1	2	3	3	2	1	1	2		
Course	**2.00**	**2.00**	**2.40**	**2.33**	**2.00**	**1.50**	**1.50**	**2.00**	**1.67**	**1.50**	**1.25**	**3.00**	**3.00**

3 – High; 2 – Medium; 1 – Low