VAAGDEVI COLLEGE OF ENGINEERING

AUTONOMOUS

Bollikunta, Khila Warangal (Mandal), Warangal Urban-506 005 (T.S)

DEPARTMENT OF MECHANICAL ENGINEERING

BOARD OF STUDIES MEETING

Minutes of meeting of Board of studies in Mechanical Engineering held on **29-01-2024** at **04.00** PM

Members Present:

S.No	Name and Address	Designation	Signature
1	Dr. P.Srinivasulu Head, MED, VCE, Warangal	Chairman	
2	Dr.E.Ramjee Professor, MED,JNTUH CEH	Member (Univ. Nominee)	
3	Mr.H.Yedukondala Rao DGM, Sriram Fuel Injection Works, Hyd.	Member (Representative from Industry)	
4	Dr.Y.Ravi Kumar Professor, MED, NIT, Warangal	Member (Subject Expert)	
5	Dr. L. Siva Rama Krishna Professor, MED,UCE, Osmania University, Hyd	Member (Subject Expert)	
6	Mr. Y. Umashankar Asst.Prof, MED, VCE, Warangal	Member (Teacher of the College)	
7	Ms. SD. Ruksar Begum Asst.Prof, MED, VCE, Warangal	Member (Teacher of the College)	
8	Mr. M. Anil Kumar Asst.Prof, MED, VCE, Warangal	Member (Teacher of the College)	
9	Mr. B.Akhil Graduate Trainee Engineer Hyundai Motor India Engineering, Hyd	Member (Representative from Alumni)	

The following decisions are taken:

1. Approved the Course structure of B.Tech III & IV Year (I-Semester & II-Semesters) under R22-Regulations.
2. Approved the Syllabus of B.Tech III & IV Year (I-Semester & II-Semester) under R22-Regulations.
3. Approved the substitute/additional subjects for R18 & R20 regulations students those who have been Re-admitted into R22 Regulation.

CHAIRMAN
Board of studies

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

Bollikunta, Khila Warangal (Mandal), Warangal Urban - 506 005 (T.S)

DEPARTMENT OF MECHANICAL ENGINEERING

SUBSTITUTE/ADDITIONAL SUBJECTS FOR READMITTED STUDENTS

The following substitute and additional subjects will be in force for the students who have been readmitted from **R18 Regulation into R22 Regulation (III & IV Year)**.

Branch	Year & Semester	Subjects studied in R18 and repeated Subjects in R22	Substitute/Additional subjects for R22
Mechanical Engineering	III - I	Nil	Nil
	III - II	Nil	Environmental Sciences (Additional Subject)
	IV- I	Refrigeration & Air-Conditioning (III – II) (Professional Elective - II)	Computational Fluid Dynamics
		Industrial Management (III-II) (Open Elective- II)	Entrepreneurship Development
	IV - II	Robotics (IV-I) (Professional Elective - IV)	Design for Manufacturing

1 2 3

4 5 6

7 8 9

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

Bollikunta, Khila Warangal (Mandal), Warangal Urban - 506 005 (T.S)

DEPARTMENT OF MECHANICAL ENGINEERING

SUBSTITUTE/ADDITIONAL SUBJECTS FOR READMITTED STUDENTS

The following substitute and additional subjects will be in force for the students who have been readmitted from **R20 Regulation into R22 Regulation (III & IV Year)**.

Branch	Year & Semester	Subjects studied in R20 and repeated Subjects in R22	Substitute/Additional subjects for R22
Mechanical Engineering	III - I	Nil	Nil
	III - II	Nil	Environmental Sciences (Additional Subject)
	IV- I	Refrigeration & Air-Conditioning (III – II) (Professional Elective - II)	Computational Fluid Dynamics
		Industrial Management (III-II) (Open Elective- I)	Intellectual Property Rights
	IV - II	Nil	Nil

1 2 3

4 5 6

7 8 9

VAAGDEVI COLLEGE OFENGINEERING
(AUTONOMOUS)
MECHANICAL ENGINNERING

COURSE STRUCTURE

(R22 Regulations applicable for the batches admitted from Academic Year 2022-2023)

III YEAR I SEMESTER

S. No.	Course Code	Title of the Course	L	T	P	Credits
1	B22ME20	Dynamics of Machinery	3	0	0	3
2	B22ME21	Design of Machine Elements	3	0	0	3
3	B22ME22	Metrology & Machine Tools	3	0	0	3
4	B22MB01	Business Economics & Financial Analysis	3	0	0	3
5	B22ME23	Steam Power & Jet Propulsion	3	0	0	3
6	B22ME24	CAD/CAM	2	0	0	2
7	B22ME25	Thermal Engineering Laboratory	0	0	2	1
8	B22ME26	Metrology & Machine Tools Laboratory	0	0	2	1
9	B22ME27	Kinematics & Dynamics Laboratory	0	0	2	1
10	B22MB06	Intellectual Property Rights	3	0	0	0
		Total	**20**	**0**	**6**	**20**

III YEAR II SEMESTER

S. No.	Course Code	Title of the Course	L	T	P	Credits
1	B22ME28	Machine Design	3	0	0	3
2	B22ME29	Heat Transfer	3	0	0	3
3	B22ME30	Finite Element Methods	3	0	0	3
4		Professional Elective-I	3	0	0	3
5		Open Elective-I	3	0	0	3
6	B22ME35	Heat Transfer Lab	0	0	2	1
7	B22ME36	Computer Aided Engineering Laboratory	0	0	2	1
8	B22EN03	Advanced English Communication Skills Laboratory	0	0	2	1
9	B22ME37	Industry Oriented Mini Project/Internship	0	0	4	2
10	B22CH03	Environmental Sciences	3	0	0	0
		Total	**18**	**0**	**10**	**20**

Environmental Science in IIIYr IISem Should be Registered by Lateral Entry Students Only

1 2 3

4 5 6

7 8 9

VAAGDEVI COLLEGE OFENGINEERING
(AUTONOMOUS)
MECHANICAL ENGINNERING

COURSE STRUCTURE

(R22 Regulations applicable for the batches admitted from Academic Year 2022-2023)

IV YEAR I SEMESTER

S. No.	Course Code	Title of the Course	L	T	P	Credits
1		Industrial Management	2	0	0	2
2	B22ME38	Refrigeration & Air Conditioning	3	0	0	3
3		**Professional Elective–II**	3	0	0	3
4		**Professional Elective–III**	3	0	0	3
5		**Professional Elective-IV**	3	0	0	3
6		**Open Elective-II**	3	0	0	3
7	B22ME51	Project Stage-I	0	0	6	3
		Total	**17**	**0**	**6**	**20**

IV YEAR II SEMESTER

S. No.	Course Code	Title of the Course	L	T	P	Credits
1		**Professional Elective–V**	3	0	0	3
2		**Professional Elective-VI**	3	0	0	3
3		**Open Elective-III**	3	0	0	3
4	B22ME60	Project Stage–II including seminar	0	0	22	11
		Total	**9**	**0**	**22**	**20**

1 2 3

4 5 6

7 8 9

VAAGDEVI COLLEGE OFENGINEERING
(AUTONOMOUS)
MECHANICALENGINNERING

COURSESTRUCTURE

(R22Regulationsapplicableforthebatchesadmittedfrom AcademicYear2022-2023)

PROFESSIONAL ELECTIVES OFFERED IN R22

Professional Elective-I

B22ME31	Unconventional Machining Processes
B22ME32	Production Planning & Control
B22ME33	Operations Research
B22ME34	Microprocessors in Automation

Professional Elective–II

B22ME39	Additive Manufacturing
B22ME40	Automation in Manufacturing
B22ME41	Artificial Intelligence in Mechanical Engineering
B22ME42	Mechatronics

Professional Elective–III

B22ME43	Power plant Engineering
B22ME44	Automobile Engineering
B22ME45	Non-Conventional Energy Sources
B22ME46	Solar Energy Technology

Professional Elective–IV

B22ME47	Re-Engineering
B22ME48	Computational Fluid Dynamics
B22ME49	Turbo Machinery
B22ME50	Fluid Power System

Professional Elective–V

B22ME52	Industrial Robotics
B22ME53	Mechanical Vibrations
B22ME54	Composite Materials
B22ME55	Energy Conservation and Management

1 2 3

4 5 6

7 8 9

Professional Elective–VI

B22ME56	Industry4.0
B22ME57	Fuzzy Logic and ANN
B22ME58	Electric and Hybrid Vehicles
B22ME59	Total Quality Management

Open Electives offered to other Departments

S.No	Course Code	Title of the Course	L	T	P	C
1	B22ME61	Non Conventional Energy Sources	3	0	0	3
2	B22ME62	Industrial Robotics	3	0	0	3
3	B22ME63	Mechatronics	3	0	0	3
4	B22ME64	3D Printing Technology	3	0	0	3

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
BOLLIKUNTA, WARANGAL

THERMAL ENGINEERING LAB

B. TECH - III Year I Sem: **L/T/P/C**
0/0/2/1

Pre-Requisite: Thermodynamics & Thermal Engineering - I

Objective: To understand the working principles of IC Engines, Compressors.

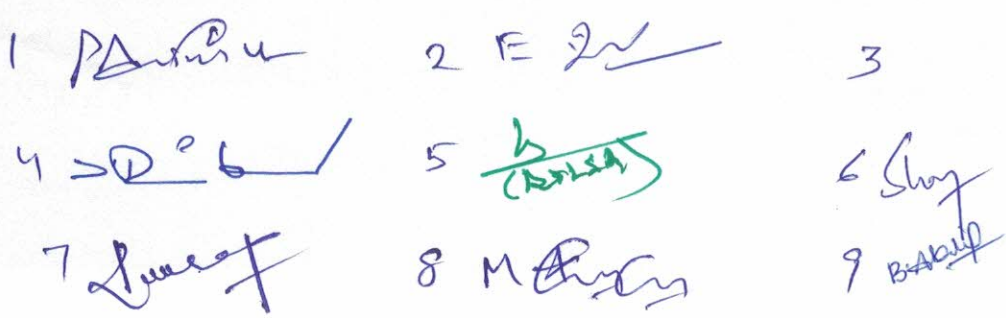
List of Experiments

1. I.C. Engines Valve / Port Timing Diagrams
2. I.C. Engines Performance Test for 4 Stroke SI engines
3. I.C. Engines Performance Test for 2 Stroke SI engines
4. I.C. Engines Morse, Retardation, Motoring Tests
5. I.C. Engine Heat Balance – CI/SI Engines
6. I.C. Engines Economical speed Test on a SI engine
7. I.C. Engines effect of A/F Ratio in a SI engine
8. Performance Test on Variable Compression Ratio Engine
9. IC engine Performance Test on a 4S CI Engine at constant speed
10. Volumetric efficiency of Air – Compressor Unit
11. Dis-assembly / Assembly of Engines
12. Study of Boilers

Note: Perform a minimum of any 10 out of the 12 Exercises.

COURSE OUTCOMES:
The students will be able to

1. Identify various types of engines and their parts.
2. Understand the power of different engine and where they can be used.
3. Estimate the performance of different engine and analyze them.
4. Analyze engines to set better efficiencies by knowing Brake specific fuel consumption of the engines.



VAAGDEVI COLLEGE OF ENGINEERING

(AUTONOMOUS)

BOLLIKUNTA, WARANGAL

METROLOGY & MACHINE TOOLS LAB

B. TECH -III Year I Sem: **L/T/P/C**

0/0/2/1

Prerequisites: Theoretical exposure to Metrology and machine tools.

Course Objectives:

1. To import practical exposure to the metrology equipment & Machine Tools
2. To conduct experiments and understand the working of the same.

List of Experiments:

1. Step turning on lathe machine
2. Taper turning on lathe machine
3. Thread cutting and knurling on lathe machine (2 exercises)
4. Measurement of cutting forces on lathe
5. Machining of holes using Drilling and boring machines.
6. Gear cutting on the Milling machine
7. Grinding of Tool angles using Cylindrical / Surface Grinding
8. Measurement of lengths, heights, diameters by Vernier calipers, micrometers.
9. Measurement of Diameter of bores by internal micrometers and dial bore indicators.
10. Use of gear teeth Vernier calipers for checking the chordal addendum and chordal height ofthe spur gear.
11. Angle and taper measurements by bevel protractor and sine bars.
12. Thread measurement by 2-wire and 3-wire methods.
13. Surface roughness measurement by Tally Surf.
14. Use of mechanical comparator

Note: Perform a minimum of any 10 out of the 14 Exercises.

COURSE OUTCOMES:

After completion of the course, the student will be able to

1. Identify parts of Lathe and perform different operations on Lathe
2. Identify parts of drilling machine and perform operations on drilling machine
3. Identify parts of Milling Shaping and Planning machine and perform operations on Milling, Shaping and Planning machine and Measure surface finish of machined components.
4. Identify various measuring instruments and use them appropriately.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
BOLLIKUNTA, WARANGAL

KINEMATICS & DYNAMICS LAB

B. TECH -III Year I SEM: **L/T/P/C 0/0/2/1**

Pre-requisites: Kinematics of Machinery & Dynamics of Machinery

Course Objectives: The objective of the lab is to understand the kinematics and dynamics of mechanical elements such as linkages, gears, cams and learn to design such elements to accomplishdesired motions or tasks.

List of Experiments: (A Minimum of 10 experiments are to be conducted)

1. To determine the state of balance of machines for primary and secondary forces
2. To determine the frequency of Torsional vibration of a given rod
3. Determine the effect of varying mass on the centre of sleeve in porter and Proell governor
4. Find the motion of the follower of the given profile of the cam
5. The balance masses statically and dynamically for single rotating mass systems
6. Determine the critical speed of a given shaft for different n-conditions
7. For a simple pendulum determine time period and its natural frequency
8. For a compound pendulum determine time period and its natural frequency
9. Determine the effect of gyroscope for different motions
10. Determine time period, amplitude and frequency of undamped free longitudinal vibration ofsingle degree spring mass systems.
11. Determine the pressure distribution of lubricating oil at various load and speed of a Journalbearing.
12. Determine time period, amplitude and frequency of damped free longitudinal vibration of singledegree spring mass systems.

Note: Perform a minimum of any 10 out of the 12 Exercises

COURSE OUTCOMES:

Students should be able to:

1. Understand types of motion
2. Analyze forces and torques of components in linkages
3. Understand static and dynamic balance
4. Understand forward and inverse kinematics of open-loop mechanisms

1 2 3

4 5 6

7 8 9.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
BOLLIKUNTA, WARANGAL

HEAT TRANSFER LAB

B. TECH – III Year II Sem: **L/T/P/C**

0/0/2/1

Pre-requisite: Thermodynamics

Course Objectives: To enable the student to apply conduction, convection and radiation heat transfer concepts to practical applications

List of Experiments: (Minimum ten experiments from the following are to be conducted)

1. Composite Slab Apparatus – Overall heat transfer co-efficient.
2. Heat transfer through lagged pipe.
3. Heat Transfer through a Concentric Sphere
4. Thermal Conductivity of given metal rod.
5. Heat transfer in pin-fin
6. Experiment on Transient Heat Conduction
7. Heat transfer in forced convection apparatus.
8. Heat transfer in natural convection
9. Parallel and counter flow heat exchanger.
10. Emissivity apparatus.
11. Stefan Boltzmann Apparatus.
12. Critical Heat flux apparatus.
13. Study of heat pipe and its demonstration.
14. Film and Drop wise condensation apparatus

COURSE OUTCOMES:

Student will be able to

1. Perform steady state & Transient heat conduction experiments to estimate thermal conductivity of different materials
2. Estimate heat transfer coefficients in forced convection, free convection, condensation and correlate with theoretical values
3. Obtain variation of temperature along the length of the pin fin under forced and free convection
4. Perform radiation experiments: Determine surface emissivity of a test plate and Stefan-Boltzmann's constant and compare with theoretical value

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
BOLLIKUNTA, WARANGAL

COMPUTER AIDED ENGINEERING LAB

B. TECH -III Year II Sem: **L/T/P/C**

0/0/2/1

Course Objectives:

1. To be able to understand and handle design problems in a systematic manner.
2. To be able to apply CAD in real life applications.
3. To understand the basic principles of different types of analysis.

List of Experiments:

Note: Conduct any TEN exercises from the list given below:

1. Drafting: Development of part drawings for various components in the form of orthographic and isometric. Representation of dimensioning and tolerances.
2. Part Modeling: Generation of various 3D Models through Protrusion, revolve, sweep. Creation of various features. Study of parent child relation. Feature based and Boolean based modeling and Assembly Modeling. Study of various standard Translators. Design of simple components.
3. Determination of deflection and stresses in 2D and 3D trusses and beams.
4. Determination of deflections, principal and Von-Mises stresses in plane stress, plane strain andAxi-symmetric components.
5. Determination of stresses in 3D and shell structures (at least one example in each case)
6. Estimation of natural frequencies and mode shapes, Harmonic response of 2D beam.
7. Study state heat transfer analysis of plane and axi-symmetric components.
8. Development of process sheets for various components based on Tooling and Machines.
9. Study of various post processors used in NC Machines.
10. Development of NC code for free form and sculptured surfaces using CAM software.
11. Machining of simple components on NC lathe and Mill by transferring NC Code / from CAMsoftware.

COURSE OUTCOMES:

Student will be able

1. To understand the analysis of various aspects in design
2. To have exposure to usage of software tools for design and manufacturing.
3. To acquire the skills needed to analyze and simulate engineering systems.
4. To understand the machining of simple components on NC lathe & Milling Machine.