List of New Course(s) Introduced

Department : Mechanical Engineering

Programme Name : B.tech

Academic Year: 2022-23

List of New Course(s) Introduced

Sr. No.	Course Code	Name of the Course
01.	ME205THS02	Industrial Engineering & Economics
02.	ME205PRJ01	Modeling & Simulation Lab-I
03.	ME206TPE04	Measurement and Metrology
04.	ME206PPC01	M&M LAB

Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year: 2022-23

School : *School of Studies Engineering & Technology*

Department : *Mechanical*

Date and Time: *June. 08, 2022 – 04:00 pm*

Venue : *Online*

The scheduled meeting of members of the Board of Studies (BoS) of the Department of Mechanical Engineering, School of Studies of Engg. & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the B. Tech. III-year (V and VI semesters) scheme and syllabi.

The following members were present in the meeting:

1. Prof. Soumya Gangapadhyay (External Academic Expert BoS, Dept. of Mechanical Engg., IIT Bhilai)
2. Prof. Prof. T. V. Arjunan (Chairman, BoS, Dept. of Mechanical Engg., GGV.)
3. Dr. Pankaj Kumar Gupta (Member, BoS, Assoc. Prof., Dept. of Mech. Engg.)
4. Mrs. J. Poonam Ekka (Member BoS, Asst. Prof Professor, Dept. of Mech. Engg.)

The following points were discussed during the meeting:

The committee discussed and approved the scheme and syllabi. The course syllabi for 5th and 6th semesters of B.Tech. III Year was discussed. Furthermore, the Vision, Mission, Program Educational Objectives and Program Specific Outcomes were presented and discussed. Finally, a minor typographical error in the Scheme of Syllabus of I-Semester, M.Tech. Machine Design was corrected. With the consent of all the members, the course scheme and syllabi for the 5th and 6th semesters of B.Tech. III Year Mechanical Engineering was finalized, and new courses were added in the list of electives for Ph.D. course work.

The following were the salient features discussed in the meeting.

1. The topic on Belt-drives was removed from Machine Design-1 in 5th semester and the topic on Chain Drives was removed from Machine Design-II in 6th semester.
2. An overview on the basic of Control System is introduced/added in the fourth unit/module of the course on CAD/CAM in the 5th semester.
3. A component on modeling and simulation of manufacturing processes was added in the list of experiments in the Laboratory course - Modeling and Simulation-I in the 5th semester.
4. The Vision, Mission, PEOS and PSOS were discussed and was approved by the External experts.
5. The minor typographical error in the Scheme of Syllabus of I-Semester M.Tech. in Machine Design course was corrected.

These changes shall be effective from Academic session 2022-2023.

The detailed Scheme of Credits and Syllabi in the 5th and 6th semesters of III-year B.Tech. (Mechanical Engineering) courses.

The following new courses were introduced in the B. Tech. Final year (V and VI Semesters):

The committee discussed and approved the scheme and syllabi. The following courses were added in the B. Tech (V and VI Semesters) :

- ME205THS02 Industrial Engineering & Economics
- ME205PRJ01 Modeling & Simulation Lab-I
- ME206TPE04 Measurement and Metrology
- ME206PPC01 M&M LAB

Signature & Seal of HoD

Scheme and Syllabus

SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A CENTRAL UNIVERSITY)
CBCS-NEW, EVALUATION SCHEME
PROPOSED W.E.F. SESSION 2022-2023
B.Tech. III Year (SEMESTER V)
(Mechanical Engineering)

SN	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS
			L	T	P	IA	ESE	SUB-TOTAL	
THEORY									
1.	ME205TPC08	Machine Design-I	3	1	-	30	70	100	4
2.	ME205TPC09	Dynamics Of Machinery	2	1	-	30	70	100	3
3.	ME205TPE03	CAD/CAM	3	-	-	30	70	100	3
4.	ME205TPC10	Fluid and Turbo Machinery	3	1	-	30	70	100	4
5.	ME205THS02	Industrial Engineering & Economics	3	-	-	30	70	100	3
		TOTAL	14	3	-	150	350	500	17
PRACTICALS									
1.	ME205PPC01	TOM LAB	-	-	2	30	20	50	1
2.	ME205PPC02	FTMC LAB	-	-	2	30	20	50	1
3.	ME205PRJ01	Modeling & Simulation Lab-I	1	-	2	40	60	100	2
		TOTAL	1	-	6	100	100	200	4
		GRAND TOTAL	15	3	8	250	450	700	21

Total Credits: **21** Total Contact Hour: **25** Total Marks: **700**

L:LECTURE, T:TUTORIAL, P:PRACTICAL, IA: INTERNAL ASSESSMENT, ESE:END SEMESTER EXAMINATION
*INTERNAL ASSESSMENT- Two Class Test of 15 Marks each will be conducted.

SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A CENTRAL UNIVERSITY)
CBCS-NEW, EVALUATION SCHEME
PROPOSED W.E.F. SESSION 2022-2023
B.Tech. III Year (SEMESTER VI)
(Mechanical Engineering)

SN	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS
			L	T	P	IA	ESE	SUB-TOTAL	
THEORY									
1.	ME206TPC11	Machine Design-II	3	1	-	30	70	100	4
2.	ME206TPC12	Heat & Mass Transfer	3	1	-	30	70	100	4
3.	ME206TOE01	Open Elective - 1	3	-	-	30	70	100	3
4.	ME206THS03	Elective from Humanity Science - 1	3	-	-	30	70	100	3
5.	ME206TPE04	Measurement and Metrology	3	-	-	30	70	100	3
6.	ME206MC03	Mandatory Course	-	-	-				-
		TOTAL	15	2	-	150	350	500	17
PRACTICALS									
1.	ME206PPC01	M&M LAB	-	-	2	30	20	50	1
2.	ME206PPC02	HMT LAB	-	-	2	30	20	50	1
3.	ME206PRJ02	Modeling & Simulation Lab-II	1	-	2	40	60	100	2
		TOTAL	1	-	6	100	100	200	4
GRAND TOTAL			17	2	6	250	450	700	21

Total Credits: **21** Total Contact Hour: **25** Total Marks: **700**

L:LECTURE, T:TUTORIAL, P:PRACTICAL, IA: INTERNAL ASSESSMENT, ESE:END SEMESTER EXAMINATION
*INTERNAL ASSESSMENT- Two Class Test of 15 Marks each will be conducted.

Sub Code	L	T	P	Duration	IA	ESE	Total	Credits
ME205THS02	3	0	0	3	30	70	100	3

INDUSTRIAL ENGINEERING & ECONOMICS

Course Objectives:

1. To understand the basic thoughts of economics and role of decision making in production economics.
2. To gain the basic knowledge of methodologies of engineering economic analysis and inflation, replacement, value and depreciation analysis.
3. To aware from the history & development of industrial engineering and understand the productivity aspects.
4. To learn the process and application of method study and work measurement.
5. To understand the different wage & incentives scheme of workers.

Syllabus Contents:

UNIT-I:

Basic Economics-Introduction to Economics, Type of Economics, Theory of Economics, Principles of Economics and its scope, Law of supply and demand and its type and features, Economic efficiency.

Cost and Decision-Costs, Element of costs-fixed-variable and others, Capital, Assets and its Type, Role of Engineers in Decision Making, Decision Tree and Sequential Investment Decisions, Decision Making Techniques, Cash Flow Diagram.

UNIT-II:

Basic Methodologies of Engineering Economic Analysis- Introduction to Time Value of Money, Simple Interest, Compound Interest, Nominal Interest rate.

Measuring Inflation, equivalence calculation under Inflation, assets replacement and its policy, Comparative Analysis of Alternatives and its methods for analysis, Depreciation- Introduction and its types and methods, value analysis.

UNIT-III:

Introduction history & development of industrial engineering: F.W.Taylor and Frank & Lillian Gilberth their contribution industrial engineering.

Productivity: Productivity definition; means of increasing productivity; productivity vs production, Productivity index and its types, numerical.

UNIT-IV:

Method Study: Definition & basic procedure, selection of jobs, recording technique; and Principle of motion economy.

Work Measurement: Definition, objectives, application, time study equipment, performance rating; allowances; number of cycle to be studied; determination of standard time, numerical.

Sub Code	L	T	P	Duration	IA	ESE	Total	Credits
ME205PRJ01	1	-	2	3-Hours	40	60	100	2

MODELLING AND SIMULATION – I LAB

Course Objectives

1. To practice basic programming features in SCILAB/MATLAB
2. To write program codes for solving elementary level problems in mechanical engineering
3. To develop GUI based codes for solving elementary problems in mechanical engineering
4. To apply the fundamentals of various courses and solve elementary engineering problems using computers

List of Laboratory activities

1. Introduction to SCILAB/MATLAB – features
2. Simple constructs
3. Loop constructs
4. Engineering mathematics-based problem-1
5. Engineering mathematics-based problem-2
6. Mechanics problem-1
7. Mechanics problem-2
8. Fluid flow problem – 1
9. Fluid Flow problem – 2
10. Designing problem using GUI

Text/Reference Books

1. An Engineer's Guide to MATLAB, EB Magrab, GC Walsh, Prentice Hall
2. MATLAB for Engineers, H Moore, Pearson
3. Creating GUI in MATLAB, Mathworks

Course Outcomes

At the end of the course, the student shall be able to
CO1: apply basic programming concepts in SCILAB/MATLAB to solve simple problems
CO2: develop simple programming codes in SCILAB/MATLAB for solving elementary problems
CO3: design simple GUI for solving elementary problems in mechanical engineering

Course Outcomes and their mapping with Programme Outcomes:

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	3	-	-	-	1	1	-	3	2	2	2
CO2	3	3	2	2	3	-	-	-	2	1	-	3	3	3	3
CO3	3	3	3	2	3	-	-	-	2	1	-	3	3	3	3

Weightage: 1-Sightly; 2-Moderately; 3-Strongly

Sub Code	L	T	P	Duration	IA	ESE	Total	Credits
ME206TPE04	3	-	-	3 hours	30	70	100	3

MEASUREMENT AND METROLOGY

Course Objectives:

1. To provide an understanding of measurement system and its functional elements.
2. To impart knowledge of measurement of pressure and measurement of strain.
3. To impart knowledge of flow measurement, vibration measurement and data acquisition system.
4. To study about linear and angular measurement devices, measurement of geometrical forms, optical projectors, tool maker microscope and autocollimators.
5. To study about interferometer, comparators, screw thread and gear measurement and coordinate measuring machine.

Syllabus Content:

UNIT-I:

Generalized Measurement System: Introduction to measurement and measuring instruments, Generalized measuring system and functional elements, static and dynamic performance characteristics of measurement devices, Calibration, Error- concept and sources, statistical analysis of errors, Sensors and Transducers– Types of sensors, type of transducers and their characteristics.

UNIT-II:

Measurement of pressure: Pressure standard, Bourdon tubes, Diaphragm and bellows, Measurement of very low pressure- McLeod gauge and Pirani gauge.

Measurement of Strain: Type of strain gauges and their working, temperature compensation. Strain rosettes. Measurement of temperature by thermometers, bimetallic, thermocouples, thermistors and pyrometers-total radiation and optical pyrometry.

UNIT-III:

Measurement of flow: Variable head meters, hot wire and magnetic meters, ultrasonic flow meters.

Vibration measurement: Seismic instruments, vibration pickups.

Data acquisition system: Introduction to data acquisition systems, single and multi- channel systems, Input – output devices signal transmission and Processing.

UNIT-IV:

Metrology: Standards of measurement; Limits, Fits and Tolerances; Linear and angular measurement devices and systems limit gauges, gauge blocks. Measurement of geometric forms like straightness, flatness, roundness and circularity, surface texture measurement, principles and application of optical projectors, tool makers microscope, autocollimators etc. Go-NO GO Gauge

UNIT-V:

Sheet-metal working: Metrology: Principle and use of interferometry, Comparators, Screw Threads Measurement, and Measurement of Gears tooth. Coordinate measuring machine (CMM): need, construction, types and application.

Role of sheet metal Components, description of cutting processes-blanking, piercing, stripper and stock guide, description of forming processes like bending, cup drawing, coining, embossing.

Text/Reference Books:

1. Mechanical Measurements, Thomas G. Beckwith, Pearson Education.
2. Mechanical Measurements and Control, D.S. Kumar, S.K. Kataria and Sons.
3. Engineering Metrology, R.K. Jain, Khanna Publishers.
4. Metrology and Quality Control, A.M. Badadhe, Technical Publication.
5. Measurement systems, Application Design, E. O. Deoblein, McGraw hill.
6. Engineering Metrology, K.J. Hume, MacDonald and Company.
7. Engineering Metrology, I.C. Gupta, Dhanpat Rai and Sons.
8. Mechanical and Industrial Measurements, R.K. Jain, Khanna Publishers.

Course Outcome:

Students will try to learn:

1. Describe the functional elements of measurement system and its performance characteristics
2. Describe measurement of pressure, strain and temperature.
3. Describe flow measurement, vibration measurement and data acquisition system.
4. Describe linear and angular measurement devices, measurement of geometrical forms, optical projectors, tool maker microscope and autocollimators.
5. Describe interferometer, comparators, screw thread and gear measurement and coordinate measuring machine.

Course Outcomes and their mapping with Programme Outcomes:

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1								3	3	3	3
CO2	3	2	3	2								3	3	2	3
CO3	3	3	3	3								3	3	3	2
CO4	3	3	3	3								3	3	2	2
CO5	3	3	3	3								3	3	3	2

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

Sub Code	L	T	P	Duration	IA	ESE	Total	Credits
ME206PPC01	-	-	2	2 hours	30	20	50	1

MEASUREMENT AND METROLOGY LAB

Course Objectives:

1. To provide an understanding of measurement system and its functional elements.
2. To impart knowledge of measurement of pressure and measurement of strain.
3. To impart knowledge of flow measurement, vibration measurement and data acquisition system.
4. To study about linear and angular measurement devices, measurement of geometrical forms, optical projectors, tool maker microscope and autocollimators.
5. To study about interferometer, comparators, screw thread and gear measurement and coordinate measuring machine.

LIST OF EXPERIMENTS:

1. Measurement of length, height, diameter by Vernier Callipers, Vernier Height Gauge, Micrometres
2. Measurement of various angles using Bevel Protractor, Sine Bar & Combination Set.
3. Determination of the Surface Flatness and Contour using Interferometer.
4. Determination of the Effective diameter of screw threads by using two wire & three wire methods.
5. Measurement of Gear Elements using Profile Projector and image analyser.
6. Measurement of Tool Angles of a Single Point Cutting Tool by using Tool Makers Microscope.
7. Measurement of Pressure Using Bourdon Pressure Gauge.
8. Measurement of Displacement Using LVDT.
9. Measurement of Temperature Using Thermistor.
10. Measurement of Angle Using Angular Sensor.
11. Measurement of Torque Using Torque Transducer
12. Measurement of Temperature Using Thermo Couple
13. Experimentation using Data Acquisition System.

Course Outcome:

Students will try to learn:

1. Describe the functional elements of measurement system and its performance characteristics
2. Describe measurement of pressure, strain and temperature.
3. Describe flow measurement, vibration measurement and data acquisition system.
4. Describe linear and angular measurement devices, measurement of geometrical forms, optical projectors, tool maker microscope and autocollimators.
5. Describe interferometer, comparators, screw thread and gear measurement and coordinate measuring machine.