

**MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR**  
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)  
**Department of Mechanical Engineering**

**Summary of Board of studies (ME/AU) meeting held on 22/12/2021**

**Detail of program/courses where syllabus revision was carried out**

<b>Course/ Subject Name</b>	<b>Code</b>	<b>Year/date of introduction</b>	<b>Year/date of revision</b>	<b>Percentage of content added or replaced</b>	<b>Item no.</b>	<b>Page. No.</b>
Engineering Thermodynamics	120414/ 190413	1957	22/12/2021	20%	11	12-13
Material Science	190211/120211	1957	22/12/2021	20%	18	14-15



**Dr. M. K. Gaur**

**HMED**

**MINUTES OF MEETING OF BOARD OF STUDIES (BoS)**

An online meeting of following members (external and internal) was held on 22<sup>nd</sup> December, 2021 at 11:00 AM through online mode (Google Meet Link meet.google.com/qpg-qwxg-qho)

Following members were present:

- |      |                             |  |
|------|-----------------------------|--|
| (1)  | Dr. M.K. Gaur               | Head of the Department and Chairman of the Committee |
| (2)  | Prof. A.K. Agrawal          | Professor, IIT BHU, AC Nominee                       |
| (3)  | Dr. Prashant Kumar Jain     | Professor, IITDM, Jabalpur, RGPV Nominee             |
| (4)  | Dr. Pavan Kumar Kankar      | Associate Professor, IIT, Indore, AC Nominee         |
| (5)  | Dr. Pratesh Jayaswal        | Member   |
| (6)  | Dr. Manish Ku. Sagar        | Member   |
| (7)  | Dr. C. S. Malvi             | Member   |
| (8)  | Mr. R. P. Kori              | Member   |
| (9)  | Mr. Vedansh Chaturvedi      | Member   |
| (10) | Dr. Jyoti Vimal             | Member   |
| (11) | Mr. Sharad Agrawal          | Member   |
| (12) | Mr. Vaibhav Shivhare        | Member   |
| (13) | Dr. Amit Aherwar            | Member   |
| (14) | Mr. Bhupendra K Pandey      | Member   |
| (15) | Dr. Nitin Upadhyay          | Member   |
| (16) | Dr. Surendra Ku. Chourasiya | Member   |
| (17) | Dr. Harbhajan Ahirwar       | Member   |
| (18) | Dr. Gavendra Norkey         | Member   |
| (19) | Dr. Dinesh Kumar Rathore    | Member   |
| (20) | Dr. Ashish Agrawal          | Member   |
| (21) | Soumya Shrivastava          | Student, III-year Mechanical                         |
| (22) | Shubham Chhipa              | Student, III year Mechanical                         |
| (23) | Somya Kanthariya            | Student, III year Automobile                         |

Following members were absent:

- |     |                         |  |
|-----|-------------------------|--|
| (1) | Prof. P. M. V. Subbarao | Professor, IIT, Delhi                                    |
| (2) | Dr. K. K. Jain          | Professor, NITTTR, Bhopal, AC Nominee                    |
| (3) | Mr. Rajesh Dixit        | Zonal Head, Yuken India Ltd, New Delhi                   |
| (4) | Er. Rajiv Singh Bais    | Chief Manager R&D, Siemens Ltd, Gurgaon, Industry Expert |

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The following agenda were discussed for UG (Mechanical and automobile engineering) and PG (Production Engineering and Product Design).

**Agenda of the BoS**

*(Approved by the Academic Development Cell for all BoS Meetings Scheduled during December 2021)*

Course where revision was carried out							
Course/Subject name	Course Code	Year/Date of introduction	Year/Date of revision	Percentage of content added or replaced	Agenda item No.	Page no.	Link of relevant documents/minutes
Engg. Thermodynamics	120414/190413	2020	22/12/2021	10% Added	Item ME 11	1-2	<a href="https://drive.google.com/file/d/1d-MdSsYd6M2vLkeLE73piD2j82tsPdOc/view?usp=sharing">https://drive.google.com/file/d/1d-MdSsYd6M2vLkeLE73piD2j82tsPdOc/view?usp=sharing</a>
Material Science	120211/190211	2020	22/12/2021	5% Removed 15 % Added	Item ME18	3-4	

Course focusing on employability/entrepreneurship/skill development						
Course/Subject name	Course Code	Activities/content which have a bearing on increasing skill and employability	Agenda item No.	Page no.	Link of relevant documents/minutes	
Internship/Project	120801/190801	Hands on practice/ latest trends in industries, various management/ technical skills	Item ME1	1-2	<a href="https://drive.google.com/file/d/17wWTB7MpySAeJkYVE126h5-QN8Rv247T/view?usp=sharing">https://drive.google.com/file/d/17wWTB7MpySAeJkYVE126h5-QN8Rv247T/view?usp=sharing</a>	
Fundamentals of Theoretical and Experimental Aerodynamics	190854	Design of aerodynamic systems for different vehicles	Item ME2	3-4		
Experimental Stress Analysis	190855	Behaviour of various material under different kind of stresses	Item ME2	5		
Applied Ergonomics	190856	Right body posture and movement	Item ME2	6		
Introduction to Soft Matter	190857	Study of synthetic and biological self-assembling material	Item ME2	7		
Sound and Structural Vibration	120854	Vibrational behaviour of different kind of component	Item ME2	8		
Carbon Materials and Manufacturing	120855	The relationship of various carbon materials	Item ME2	9-10		
Introduction to abrasive Machining and Finishing Processes	120856	Application of modern manufacturing in industrial application	Item ME2	11		



New Course Added					
Course/Subject name	Course Code	Activities/content which have a bearing on increasing skill and employability	Agenda item No.	Page no.	Link of relevant documents/minutes
Fundamentals of Theoretical and Experimental Aerodynamics	190854	Design of aerodynamic systems for different vehicles	Item ME2	1-2	<a href="https://drive.google.com/file/d/IR-G_gNep4s_dFIBH_EYKJaN_ZsMf0OdIY/view?usp=sharing">https://drive.google.com/file/d/IR-G_gNep4s_dFIBH_EYKJaN_ZsMf0OdIY/view?usp=sharing</a>
Experimental Stress Analysis	190855	Behaviour of various material under different kind of stresses	Item ME2	3	
Applied Ergonomics	190856	Right body posture and movement	Item ME2	4	
Introduction to Soft Matter	190857	Study of synthetic and biological self-assembling material	Item ME2	5	
Sound and Structural Vibration	120854	Vibrational behaviour of different kind of component	Item ME2	6	
Carbon Materials and Manufacturing	120855	The relationship of various carbon materials	Item ME2	7-8	
Introduction to abrasive Machining and Finishing Processes	120856	Application of modern manufacturing in industrial application	Item ME2	9	

**Feedback on curriculum received from stakeholders: Analysis & ATR**

Stakeholder	Student	Faculty	Alumni	Employer
No. of responses	255	43	29	29
Link of analysis	<a href="https://drive.google.com/drive/folders/1spxeYI-VHfBma-2LAbJgq6wdkrli8baC">https://drive.google.com/drive/folders/1spxeYI-VHfBma-2LAbJgq6wdkrli8baC</a>	<a href="https://docs.google.com/spreadsheets/d/1NPZgw7S4KSdc7iKDYAz1s9fn541jNc73/edit?usp=sharing&amp;oid=110499483831438724131&amp;rtpof=true&amp;sd=true">https://docs.google.com/spreadsheets/d/1NPZgw7S4KSdc7iKDYAz1s9fn541jNc73/edit?usp=sharing&amp;oid=110499483831438724131&amp;rtpof=true&amp;sd=true</a>	<a href="https://docs.google.com/spreadsheets/d/1oP74Xk7EIAQ5XVseW2jtH-Z8P-xi4i6l/edit?usp=sharing&amp;oid=110499483831438724131&amp;rtpof=true&amp;sd=true">https://docs.google.com/spreadsheets/d/1oP74Xk7EIAQ5XVseW2jtH-Z8P-xi4i6l/edit?usp=sharing&amp;oid=110499483831438724131&amp;rtpof=true&amp;sd=true</a>	<a href="https://drive.google.com/file/d/1yXUJR4IQJbJiFIFn4bCJWHS6F8AdUS63/view?usp=sharing">https://drive.google.com/file/d/1yXUJR4IQJbJiFIFn4bCJWHS6F8AdUS63/view?usp=sharing</a>
ATR Link	<a href="https://drive.google.com/file/d/1yXUJR4IQJbJiFIFn4bCJWHS6F8AdUS63/view?usp=sharing">https://drive.google.com/file/d/1yXUJR4IQJbJiFIFn4bCJWHS6F8AdUS63/view?usp=sharing</a>	<a href="https://drive.google.com/file/d/1yXUJR4IQJbJiFIFn4bCJWHS6F8AdUS63/view?usp=sharing">https://drive.google.com/file/d/1yXUJR4IQJbJiFIFn4bCJWHS6F8AdUS63/view?usp=sharing</a>	<a href="https://drive.google.com/file/d/1yXUJR4IQJbJiFIFn4bCJWHS6F8AdUS63/view?usp=sharing">https://drive.google.com/file/d/1yXUJR4IQJbJiFIFn4bCJWHS6F8AdUS63/view?usp=sharing</a>	<a href="https://drive.google.com/file/d/1yXUJR4IQJbJiFIFn4bCJWHS6F8AdUS63/view?usp=sharing">https://drive.google.com/file/d/1yXUJR4IQJbJiFIFn4bCJWHS6F8AdUS63/view?usp=sharing</a>
Link showing Excel sheet of google form details of stakeholders	<a href="https://drive.google.com/drive/folder/1spxeYI-VHfBma-2LAbJgq6wdkrli8baC?usp=sharing">https://drive.google.com/drive/folder/1spxeYI-VHfBma-2LAbJgq6wdkrli8baC?usp=sharing</a>	<a href="https://docs.google.com/spreadsheets/d/1NPZgw7S4KSdc7iKDYAz1s9fn541jNc73/edit?usp=sharing&amp;oid=110499483831438724131&amp;rtpof=true&amp;sd=true">https://docs.google.com/spreadsheets/d/1NPZgw7S4KSdc7iKDYAz1s9fn541jNc73/edit?usp=sharing&amp;oid=110499483831438724131&amp;rtpof=true&amp;sd=true</a>	<a href="https://docs.google.com/spreadsheets/d/1oP74Xk7EIAQ5XVseW2jtH-Z8P-xi4i6l/edit?usp=sharing&amp;oid=110499483831438724131&amp;rtpof=true&amp;sd=true">https://docs.google.com/spreadsheets/d/1oP74Xk7EIAQ5XVseW2jtH-Z8P-xi4i6l/edit?usp=sharing&amp;oid=110499483831438724131&amp;rtpof=true&amp;sd=true</a>	<a href="https://docs.google.com/document/d/1tUEvXBIV3c5-zo2RasW6b_xv0HTg9S6/edit?usp=sharing&amp;oid=110499483831438724131&amp;rtpof=true&amp;sd=true">https://docs.google.com/document/d/1tUEvXBIV3c5-zo2RasW6b_xv0HTg9S6/edit?usp=sharing&amp;oid=110499483831438724131&amp;rtpof=true&amp;sd=true</a>

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**BoS Agenda Items**

**Item ME0** To Confirm the minutes of last BoS Meeting held.  
**The minutes of the last BoS held on 8<sup>th</sup> June 2021 were confirmed. The BoS Minutes were presented & approved in Academic Council Meeting held on 28<sup>th</sup> June, 2021.**

**Item ME1** To propose the **scheme structure of VIII Semester** with the provision of Two Departmental Electives and one Open Category (OC) Course, to be offered in **online mode** with credit transfer for the batch admitted in 2018-19.

S.No.	Subject Code	Category	Subject Name & Title
1.	DE*	DE	Departmental Elective (DE-5)
2.	DE*	DE	Departmental Elective (DE-6)
3.	OC*	OC	Open Category (OC-4)
4.	120801/190801	DLC	Internship/Project (DLC-9)
5.	120802*/190802	PD	Professional Development

Item ME1.docx

**Item ME2** To propose the list of courses which the students can opt from SWAYAM/NPTEL/ other MOOC Platforms/ Institution (MITS) MOOC, to be offered in **online mode under Departmental Elective (DE) category**, for credit transfer in the **VIII Semester** under the flexible curriculum (*Batch admitted in 2018-19*)

Automobile VIII Semester					
Departmental Elective (DE-5)			Departmental Elective (DE-6)		
S.No.	Subject Code	Subject Name	S.No.	Subject Code	Subject Name
1	190851	Wheeled Mobile Robots	1	190855	Experimental Stress Analysis
2	190852	Steam and Gas Power Systems	2	190856	Applied Ergonomics
3	190854	Fundamentals of Theoretical and Experimental Aerodynamics	3	190857	Introduction to Soft Matter
Mechanical VIII Semester					
Departmental Elective (DE-5)			Departmental Elective (DE-6)		
S.No.	Subject Code	Subject Name	S.No.	Subject Code	Subject Name
1	120851	Quality Design and Control	1	120854	Sound and Structural Vibration
2	120852	Robotics: Basics and Selected Advanced Concepts	2	120855	Carbon Materials and Manufacturing
3	120853	Steam and Gas Power Systems	3	120856	Introduction to abrasive Machining and Finishing Processes

Item ME2.docx

**Item ME3** To propose the list of courses which the students can opt from SWAYAM/NPTEL/MOOC Platform, to be offered in **online mode from SWAYAM/NPTEL/MITS MOOCs/ other MOOC Platforms) under Open Category (OC) Courses**, for credit transfer in the **VIII Semester** under the flexible curriculum (*Batch admitted in 2018-19*)

Open Category (OC-4)		
S.No.	Subject Code	Subject Name
1	900605	Waste to Energy Conversion
2	900609	Product Design and Manufacturing
3	900610	Automatic Control

Item ME3.docx

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**Item ME4**

To propose the course and syllabi of MITS MOOC Course along with the Course Outcomes for credit transfer in the VIII Semester under the flexible curriculum (Batch admitted in 2018-19)

S.No.	Name of Faculty	Name of MOOC offered	Nature of course
1	Dr. Surendra Chourasiya	Advanced Engineering Materials and Its Application	OC
2	Dr. Harbhajan Singh	Biomaterials and their Applications	OC

Item ME4.docx

**Item ME5**

To propose the list of "Additional Courses" which can be opted for getting an

(i) **Honours (for students of the host department)**  
(ii) **Minor Specialization (for students of other departments)**  
[These will be offered through SWAYAM/NPTEL/MOOC based Platforms for the VI semester (for the batch admitted in 2019-20) and for VIII semester students (for the batch admitted in 2018-19)]

Honours

Sem	VI (For the batch admitted in 2019-20)	VIII (For the Batch Admitted in 2018-19)
Course Name	1. Conduction and convection heat transfer (12 Weeks) 2. Robot motion planning (8 Weeks) 3. Theory and Practice of Non-Destructive Testing (8 weeks)	1. Fundamentals of Nuclear Power Generation (12 Weeks) 2. Modelling and simulation of dynamic systems (12 Weeks) 3. Computer integrated Manufacturing (12 Weeks)

Minor Specialization

Sem	VI (For the batch admitted in 2019-20)	VIII (For the Batch Admitted in 2018-19)
Course Name	1. Transport Processes I: Heat and Mass Transfer (12 weeks) 2. Introduction to Mechanical Micro Machining (12 weeks)	1. Computational Fluid Dynamics for Incompressible Flows (12 weeks) 2. Mechanics of Machining (8 weeks)

Item ME5.docx

**Item ME6**

To review and finalize the syllabi for all Departmental Core (DC) Courses of VI Semester (for batches admitted in 2019-20) under the flexible curriculum along with their COs

Mechanical Engineering VI Sem (for batch admitted 2019-20)				Automobile Engineering VI Sem (for batch admitted 2019-20)		
S.No.	Subject Code	Category Code	Subject Name	Subject Code	Category Code	Subject Name
1.	120601	DC	Advance Production Technology	190601	DC	Automotive Transmission

Item ME6.docx

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**Item ME7**

To review and finalize the courses & syllabi to be offered (for batches admitted in 2019-20) under *Departmental Elective (DE) Courses* in the VI Semester

DE-1 (Through Traditional Mode) Mechanical Engineering			DE-1 (Through Traditional Mode) Automobile Engineering	
S.No.	Subject Code	Subject Name	Subject Code	Subject Name
1	120611	Vibration and Noise Engineering	190611	Automotive Materials
2	120612	Statistical Quality Control	190612	Work Study and Ergonomics
3	120613	Work Study and Ergonomics	190613	Automotive Pollution and Control
4	120614	Turbo Machinery	190614	Automotive Component Design

Item ME7.docx

**Item ME8**

To propose the list of courses from SWAYAM/NPTEL/MOOC Platforms to be offered (for batches admitted in 2019-20) in online mode under *Departmental Elective (DE) Courses* with credit transfer, in the VI Semester

DE-2 (Through Online Mode) Mechanical Engineering			DE-2 (Through Online Mode) Automobile Engineering	
S.No.	Subject Code	Subject Name	Subject Code	Subject Name
1	120652	Fundamental of Welding Science and Technology	190652	Robotics and Control: Theory and Practice
2	120654	Viscous Fluid Flow	190653	Fundamental of Automotive System
3	120655	Properties of Materials (Nature and Properties of Material: III)	190654	Viscous Fluid Flow

Item ME8.docx

**Item ME9**

To review and finalize the courses & syllabi to be offered (for batches admitted in 2019-20) under the *Open Category (OC) Courses* (in traditional mode) for VI semester students of other departments along with their COs

Open Category (OC-1)		
S.No.	Subject Code	Subject Name
1	900101	Robotics
2	900102	Product Design

Item ME9.docx

**Item ME10**

To review and finalize the Experiment list/ Lab manual for Laboratory Courses to be offered in VI semester (for batches admitted in 2019-20)

120601: Advance Production Technology	190601: Automotive Transmission
1. CNC Programming and Simulation. 2. Setting up of workpiece zero position and machining in Modular Vertical 3 Axis CNC Milling machine. 3. Machining in Semi production Vertical 3 Axis CNC machine 4. Setting up of workpiece zero position and machining in Modular CNC Turning machine. 5. Write a manual part program for the linear interpolation for the given part and execute. 6. Write a manual part program for the taper turning for the given part and execute. 7. Write a manual part program for chamfering and step	1. Study of transmission of front and rear engine vehicles 2. Study of front and rear-wheel-drive vehicle 3. Study of four wheel-drive vehicles 4. Study of various gear boxes and pre synchronization systems 5. Study of fluid couplings, hydrodynamic drives and torque converters 6. Automatic transmission system study

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- turning for the given part and execute.  
8. Write a manual part program for slotting operation for the given part and execute.  
9. Write a manual part program for drilling operation for the given part and execute.

Item ME10.docx

To review and finalize the scheme and syllabi of **B. Tech. IV Semester (for batches admitted in 2020-21)** under the flexible curriculum along with their COs

Mechanical Engineering				Automobile Engineering		
S. No.	Subject Code	Category Code	Subject Name	Subject Code	Category Code	Subject Name
1.	100003	BSC	Mathematics- III (BSC-4)	100003	BSC	Mathematics- III (BSC-4)
2.	120411	DC	Theory of Machines –II (DC-6)	190411	DC	Theory of Machines –I (DC-6)
3.	120412	DC	Design of Machine Elements (DC-7)	190412	DC	Automotive Electrical and Electronics System (DC-7)
4.	120413	DC	Metal Cutting and Machine Tools (DC-8)	190413	DC	Engineering Thermodynamics (DC-8)
5.	120414	DC	Engineering Thermodynamics (DC-9)	190414	DC	Manufacturing Process (DC-9)
6.	100004	MC	Cyber Security (MC)	100004	MC	Cyber Security (MC)
7.	120415*	DLC	Production Lab (DLC-2)	190415*	DLC	Production Lab (DLC-2)
8.	200XXX	CLC	Novel Engaging Course	200XXX	CLC	Novel Engaging Course
9.	1000002	MAC	Biology for Engineers	1000002	MAC	Biology for Engineers

Item ME11.docx

To review and finalize the Experiment list/ Lab manual for Laboratory Courses to be offered in IV (for batch admitted in 2020-21)  
*The experiment list of following subjects was reviewed and finalized*

Mechanical Engineering IV Sem (for batch admitted 2020-21)				Automobile Engineering IV Sem (for batch admitted 2020-21)		
S.No.	Subject Code	Category Code	Subject Name	Subject Code	Category Code	Subject Name
1.	120411	DC	Theory of Machines –II	190411	DC	Theory of Machines –I
2.	120412	DC	Design of Machine Elements	190412	DC	Automotive Electrical and Electronics System
3.	120415	DLC	Production Lab	190415	DLC	Production Lab

Item ME12.docx

To review and finalize the suggestive list of projects which can be assigned under the 'Skill based mini-project' category in various laboratory courses to be offered in Jan - June 2022 semester during IV Semester (for the batch admitted in 2020-21).

120412: Design of Machine Elements	120415/190415: Production Lab	120411/190411 Theory of Machine I/ II	190412: Automotive Electrical and Electronics System
1. FEA of lap joint based on various geometrical parameters to study the behaviour of weld strength 2. Simulation of welding to study	1.Design and simulation of venting passages to prevent blow hole defect. 2.Development of low-cost experimental setup to study metal flow through gating channels. 3.Preparation of different types of patterns by using wax/wood material.	1.Investigation of gyroscopic couple for self-balancing vehicle 2.Understanding of balancing and alignment 3. Development of various toy mechanism	1. To understand and sketch the electrical and electronics systems of any four-wheeler. 2. To submit

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<p>residual stress and distortions 3. Analysis of composite multi leaf spring using ANSYS 2020 R1 4. Heat Transfer analysis for different materials of ball bearing using ANSYS 2020 R1 5. Numerical analysis of Modified tooth in Spur Gear for increasing the performance by reducing the assembly errors and gear slippage in the axial direction during dynamic loading.</p>	<p>4. Fabrication of working model of brazing and soldering setup. 5. Preparation of educational wooden model of different types of furnaces. 6. Working model of the coining machine and prepare the die for the coining. 7. Fabrication of plastic injection molding machine by using extrusion principle. 8. Preparation of educational model of powder metallurgy setup. 9. Demonstration model of MIG and TIG setup. 10. Battery operated working model of lathe machine. 11. Working setup of Arduino CNC plotter. 12. Working model of foot operated hammering machine for forging purpose.</p>	<p>4. Understanding of Gear based quick return mechanism. 5. Investigation and understanding of geared cycle. 6. Understanding of gear mechanism used in watch. 7. Design of easy (make/use) cycle. 8. Working model of epicyclical gear train. 9. Investigation and understanding of sports cycle.</p>	<p>video make by you, which clearly shows the explanation of electrical system of any two-wheeler.</p>																																
<p>Item ME13.docx</p>																																			
<p><b>Item ME14</b></p>	<p>To ratify the <i>Scheme &amp; Syllabi, list of experiments and skill based mini projects of First semester of the newly started B. Tech. programmes in the emerging areas (AI &amp; ML, AI &amp; DS, CSD) (started from 2021-22 Session) {Applicable for the concerned departments}</i> NA</p>																																		
<p><b>Item ME15</b></p>	<p>To ratify the <i>Scheme &amp; Syllabi, list of experiments and skill based mini projects of First Semester B. Tech. programmes [admitted batch 2021-22 Session] (if any)</i> NA</p>																																		
<p><b>Item ME16</b></p>	<p>To prepare and recommend the <i>Scheme &amp; Syllabi (along with the Course Outcomes) of II semester of the newly started B. Tech. programmes in the emerging areas (AI &amp; ML, AI &amp; DS, CSD) (started from 2021-22 Session) {Applicable for the concerned departments}</i> NA</p>																																		
<p><b>Item ME17</b></p>	<p>To prepare and recommend the list of experiments and skill based mini projects of <i>II semester of the newly started B. Tech. programmes in the emerging areas (AI &amp; ML, AI &amp; DS, CSD) (started from 2021-22 Session) {Applicable for the concerned departments}</i> NA</p>																																		
<p><b>Item ME18</b></p>	<p>To review and finalize the <i>Scheme &amp; Syllabi (along with the Course Outcomes) of II semester B. Tech. programmes (batch admitted 2021-22 Session)</i> <b>Mechanical/Automobile engineering II Semester</b></p> <table border="1" data-bbox="363 1576 1321 1868"> <thead> <tr> <th>S.No.</th> <th>Subject Code</th> <th>Category Code</th> <th>Subject Name</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>120211/190211</td> <td>DC</td> <td>Material Science (DC-1)</td> </tr> <tr> <td>2.</td> <td>100020</td> <td>ESC</td> <td>Basic Civil Engineering &amp; Mechanics (ESC-4)</td> </tr> <tr> <td>3.</td> <td>100021</td> <td>ESC</td> <td>Basic Mechanical Engineering (ESC-5)</td> </tr> <tr> <td>4.</td> <td>100022</td> <td>ESC</td> <td>Basic Electrical and Electronics Engineering (ESC-6)</td> </tr> <tr> <td>5.</td> <td>100012</td> <td>BSC</td> <td>Engineering Chemistry (BSC-2)</td> </tr> <tr> <td>6.</td> <td>100024</td> <td>ESC</td> <td>Manufacturing Practices (ESC-7)</td> </tr> <tr> <td>7.</td> <td>120026</td> <td>ESC</td> <td>Basic Mechanical Engineering Lab (ESC-8)</td> </tr> </tbody> </table> <p>Item ME18.docx</p>			S.No.	Subject Code	Category Code	Subject Name	1.	120211/190211	DC	Material Science (DC-1)	2.	100020	ESC	Basic Civil Engineering & Mechanics (ESC-4)	3.	100021	ESC	Basic Mechanical Engineering (ESC-5)	4.	100022	ESC	Basic Electrical and Electronics Engineering (ESC-6)	5.	100012	BSC	Engineering Chemistry (BSC-2)	6.	100024	ESC	Manufacturing Practices (ESC-7)	7.	120026	ESC	Basic Mechanical Engineering Lab (ESC-8)
S.No.	Subject Code	Category Code	Subject Name																																
1.	120211/190211	DC	Material Science (DC-1)																																
2.	100020	ESC	Basic Civil Engineering & Mechanics (ESC-4)																																
3.	100021	ESC	Basic Mechanical Engineering (ESC-5)																																
4.	100022	ESC	Basic Electrical and Electronics Engineering (ESC-6)																																
5.	100012	BSC	Engineering Chemistry (BSC-2)																																
6.	100024	ESC	Manufacturing Practices (ESC-7)																																
7.	120026	ESC	Basic Mechanical Engineering Lab (ESC-8)																																

Mechanical Engineering  
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To review and finalize the *list of experiments and skill based mini projects of II semester B. Tech. programmes (batch admitted 2021-22 Session)*

**Item  
ME19**

**100021: Basic Mechanical Engineering Lab**

1. Study of vertical boilers.
2. Study of Locomotive boilers.
3. Study of Babcock and Wilcox boilers.
4. Study of Lancashire, Cornish and Cochran boilers.
5. Study of boiler mounting and accessories.
6. Study of 2 stroke diesel and petrol engines.
7. Study of 4 stroke diesel and petrol engines.
8. Study of steam engines.
9. Study of Lathe machine.
10. Study of Vernier and Micrometer.
11. Study of Internal Combustion Engine Parts

**100024: Manufacturing Practice**

1. To draw diagram of different tools used in different shops.
2. To prepare T joint in carpentry shop.
3. To prepare flat surface of given workpiece in fitting shop.
4. To prepare mould in foundry shop.
5. To prepare casting of given material in prepared mould.
6. To prepare screw driver and ring in welding shop.

**Skill Based Projects**

1. Measurement and calibration using slip gauges
2. Performing energy audit using stroboscope and lux meter
3. Make a Free energy Steam Engine at home
4. Make an Air Compressor at home
5. Mini Bench Tapping machine project
6. Make a Robotic Arm
7. Tornado in a bottle
8. Make a Hydraulic Lift
9. Thermal Expansion project
10. Make a positive displacement pump
11. Make a mini thermal power plant
12. Make a fire hydrant.
13. How an airplane wing creates lift and how wind turbine blades are spun by the wind. Make a model.
14. To make a model for measuring the pressure distribution in a convergent – divergent duct to confirm Bernoulli's equation.
15. Make a digital hydraulic bench.
16. To make a model for induced draught and natural draught

Item ME19.docx

**Item  
ME20**

To propose the course "Economics Entrepreneurship & Management" and its syllabi along with the Course Outcomes (COs) for the V Semester B.Tech. (Batch admitted 2020-21 onwards).  
*{to be proposed and recommended by Management Department}*  
NA

**Item  
ME21**

To revise and recommend the course "Energy, Environment, Ecology & Society" and its syllabi along with the Course Outcomes (COs) for the III Semester B.Tech. (Batch admitted 2021-22 onwards).  
**{inclusion of contents related to "Sustainability" is to be done}**  
*{to be proposed and recommended by the Civil Engineering Department}*  
NA

**Item  
ME22**

To propose a new course: **Universal Human Values & Professional Ethics (HVPE)** & its syllabi along with the Course Outcomes (COs), as Mandatory Course (MC) for the batch admitted in 2020-21 onwards  
**{A portion on 'gender sensitization' also to be included in the syllabus of this course}**  
*{to be proposed and recommended by Humanities Department}*  
NA



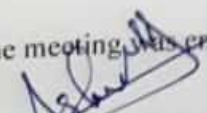
<b>Item ME23</b>	To review the CO attainments, to identify gaps and to suggest corrective measures for the improvement in the CO attainment levels for (i) 1 year April–September 2021 Semester (ii) January-June 2021 Session for II to IV year students.			
	<b>Total Number of courses</b>	<b>Total Number of COs</b>	<b>Number of COs not Attained</b>	<b>Percentage of COs not Attained</b>
	48	288	22	7.6%
	Item ME 23 & 25.xlsx			
<b>Item ME24</b>	To review curricula feedback from various stakeholders, its analysis and impact  {Stakeholder feedback analysis must also contain an action taken report (ATR) and the details/data of the stakeholder who have responded through GOOGLE form (such as Name, organization, mail id, phone no if available) must also be shared along with the feedback for the alumni/employer.} <u>Item ME24.docx</u>			
<b>Item ME25</b>	To review Course Outcomes (COs) feedback of various courses, its analysis and impact <b>Data is attached in item no. 23</b>			
<b>Item ME26</b>	Any other matter			

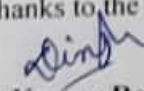
Apart from the above points, the following points were discussed/Suggested in meeting;


1. Syllabus of Material Science (120211/190211) II semester is revised for 2021-22 admitted batch.
2. Syllabus of Engg. Thermodynamics (120414/190413) IV semester is revised for 2020-21 admitted batch.
3. In Basic Mechanical Engineering Lab (120026) word "Simple" should be removed from name of experiments.
4. In Basic Mechanical Engineering Lab (120026) new experiments may be added in place of Vernier Calliper and Micrometre. As students had some idea of these measurement techniques in school level.
5. Track (Thermal, Design, and Production) may be offer in Departmental Electives (online mode) through NPTEL as per the availability of subjects.


It is decided that, suggestions may be incorporated as it is or with some modifications as per applicability in the syllabus or scheme at the time of finalization in academic council.


The meeting was ended with vote of thanks to the chairperson and committee members.


  
**Dr. Ashish Agrawal**  
(BoS Member)

  
**Dr. Dinesh Kumar Rathore**  
(BoS Member)

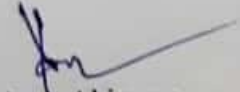
  
**Dr. Gavendra Norkey**  
(BoS Member)


  
**Dr. Harbhajan Ahirwar**  
(BoS Member)

  
**Dr. Nitin Upadhyay**  
(BoS Member)

  
**Dr. Surendra Ku. Chourasiya**  
(BoS Member)

  
**Mr. B. K. Pandey**  
(BoS Member)

  
**Dr. Amit Ahirwar**  
(BoS Member)

Mechanical Engineering 

BoS Meeting\_22/12/2021

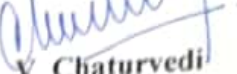
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**Mr. V. Shivhare**  
(BoS Member)

  
**Mr. Sharad Agrawal**  
(BoS Member)

  
**Dr. Jyoti Vimal**  
(BoS Member)

  
**Mr. V. Chaturvedi**  
(BoS Member)

  
**Mr. R. P. Kori**  
(BoS Member)

**Dr. C. S. Malvi**  
(BoS Member)

**Dr. M. K. Sagar**  
(BoS Member)

  
**Dr. Pratesh Jayaswal**  
(BoS Member)

*online present*  
**Prof. Prashant K. Jain**  
(RGPV Nominee)

*online present*  
**Dr. Pavan Ku. Kankar**  
(AC Nominee)

*on line present*  
**Prof. A.K. Agrawal**  
(AC Nominee)

  
**Dr. M. K. Gaur**  
(BoS Chairman)

**DEAN (ACADEMICS)**  
**M.I.T.S**  
**GWALIOR**

**For batches admitted in Academic Session 2020-21**

**Engineering Thermodynamics**

Category	Title	Code	Credit-3			Theory Paper
Departmental Core-DC	Engineering Thermodynamics	120414/ 190413	L	T	P	Max.Marks-50 Min.Marks-16 Duration-3hrs.
			2	1	-	

**Course Objective:** To make students able to:

1. Understand the nature and role of the various thermodynamic properties of matter.
2. Represent a thermodynamic system by a control mass or control volume and identify work and/or heat interactions between the system and surroundings.
3. Recognize the different forms of energy and restrictions imposed by the laws of thermodynamics on conversion from one form to another.

**Course Prerequisites:** Basic Mechanical Engineering

**Syllabus**

**Unit-I Basic Concepts:** Thermodynamics, Property, Equilibrium, State, Process, Cycle, Zeroth law of thermodynamics, Statement and significance, Concept of an Ideal gas, Gas Laws, Avogadro's Hypothesis, Heat and work transfer. First law of thermodynamics –Statement of first law of thermodynamics, first law applied to closed system undergoing a cycle, Process analysis of closed system flow process, Flow energy, Steady flow process analysis of closed system processes, Limitations of first law of thermodynamics.

**Unit –II Properties of pure substances:** - P-V-T surfaces, h-s, T-S, P-V, P-h, T-V diagrams of pure substance, saturated and sub-cooled liquid, superheated vapour, quality of steam, Mollier diagram, steam table, different processes, measurement of quality of steam

**Unit –III Second law of thermodynamics:** Heat engine, Heat reservoir, Refrigerator, Heat pump, COP, Carnot's theorem, Carnot's cycle, Efficiency of Carnot's cycle, Statement of second law, Reversible and Irreversible processes, Consequences of Second law.

**Unit –IV Availability and Irreversibility:** Entropy, Entropy changes of Ideal gas, Available energy, T-S diagram, Availability and Irreversibility.

**Thermodynamics Relations:** Thermodynamics relations, e.g Maxwell relations and their applications.

**Unit- V Air Standard Cycles:** Carnot, Sterling, Ericsson, Otto, Diesel, Dual cycles and determination of their air standard efficiencies and their comparison. Brayton cycle, Atkinson cycle. PVT relationship, Mixture of ideal gases Properties of mixture of gases. **(Added)**

*M - 3* *max* *at* *Bar* *P.L* *1* *2* *3* *4*





**For batches admitted in Academic Session 2021-22**

## Material Science

Category	Title	Code	Credit-3			Theory Paper
Departmental Core-DC	Material Science	190211/120211	L	T	P	Max.Marks-50 Min.Marks-16 Duration-3hrs.
			3			

**Course Objectives:** To make the students to understand:

1. The basic fundamentals of materials science and engineering.
2. The different classes of materials, their properties, structures and imperfections present in them.
3. The functional properties of materials and the roles of microstructure, heat treatment defects and environment play in typical engineering applications.

## Syllabus

### Unit-I Structure of materials

Fundamentals of crystal structures and crystal system, crystallographic planes and directions, linear and planar density, single crystal, polycrystalline material and non-crystalline materials, Homogeneous and heterogeneous solidifications, Crystal imperfections: point, line, surface and volume defects.

### Unit-II Material testing and mechanical properties

Mechanical properties in static tensile, compression and bending tests, Hardness: Rockwell, Brinell, Vicker's, Impact toughness and fracture toughness.

Role of dislocations in plastic deformation, slip and twinning processes. Mechanism of ductile and brittle fracture. Fatigue: Cyclic stresses, S-N curve, crack initiation and propagation, factors affecting fatigue life; Creep: Generalized creep behavior, stress and temperature effects.

### Unit-III Engineering Materials

Ferrous (Steels and Cast irons with role of different alloying elements) and non-ferrous metals and alloys (Aluminum, Magnesium, Titanium, Copper, Nickel alloys), Nano-materials, Ceramic material, Composite material with their properties and applications, Smart materials, Bio-materials

### Unit-IV Phase diagrams and phase transformation of metal alloys

Concept of phases, **Gibb's phase rule**, Lever-rule, binary isomorphous and eutectic phase diagrams, Eutectoid, Peritectic and Peritectoid systems, allotropy in iron, Fe-Fe<sub>3</sub>C phase diagram; Isothermal transformation of austenite, continuous cooling transformation of austenite, Objectives of heat treatments, Annealing, Normalizing, Hardening (bulk and surface)

P.L.

### Unit-V Environmental consideration and some case studies

Corrosion: Introduction, types & its prevention; generalized material selection process, material selection for torsionally-stressed cylindrical shaft, Automotive valve spring, orthopedic implants, Integrated circuit and etc.

**Course Outcomes:** After successful completion of this course students will be able to:

**CO1. State** fundamental relationship between structure and properties of materials.

**CO2. Discuss** mechanical properties of materials

**CO3. Compare** the different processes to alter the material properties.

**CO4. Determine** the effect of different phases, impurities on the behavior of materials.

**CO5. Analyze** crystal structure and composition of different materials.

**CO6. Create** the different engineering materials and alloys.

#### Text & Reference Books

1. Material Science and Engineering: An Introduction, William D. Callister, John Wiley & Sons Inc., 7th edition
2. Elements of Material Science and Engineering **by** Lawrence, H. Vanvlackdison; Wesley. Mention the Year or the Edition and Publisher and Place of Publication
3. Material Science and Engineering **by** Raghvan, V; Prentice Hall of India.
4. Introduction to Engineering Materials **by** Agrawal, B.K; Tata McGraw Hill, N. Delhi.

#### NPTEL Link for Material Science

[https://onlinecourses.nptel.ac.in/noc18\\_mm05/preview](https://onlinecourses.nptel.ac.in/noc18_mm05/preview)



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