

**NORTH MAHARASHTRA UNIVERSITY,  
JALGAON (M.S.)**

**MASTER OF ENGINEERING (M.E.)**

**(MECHANICAL ENGINEERING)  
( MACHINE DESIGN)**

**W.E.F.: 2010-11**

**North Maharashtra University, Jalgaon**  
**M.E. (Machine Design)**  
**Examination scheme and Structure with effect from Year 2010-11**  
**First Year Term I**

Sr No	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Advanced Mechanical Engineering Design of Equipment	3	-	3	100	-	-	-
2	Computer Methods in Mechanical Design	3	-	3	100	-	-	-
3	Vibration Engineering	3	-	3	100	-	-	-
4	Tribology	3	-	3	100	-	-	-
5	Elective-I	3	-	3	100	-	-	-
6	Laboratory Practice-I	-	6	-	-	100	-	50
7	Seminar-I	-	4	-	-	100	-	-
	<b>Total</b>	<b>15</b>	<b>10</b>		<b>500</b>	<b>200</b>		<b>50</b>
	<b>Grand Total</b>	<b>25</b>			<b>750</b>			

**Elective I**

- 1) Design of Pressure Vessel
- 2) Instrumentation and Automatic Control System
- 3) Design of Material Handling Equipment

**First Year Term II**

Sr No	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Design and synthesis of Mechanism	3	-	3	100	-	-	-
2	Optimization Techniques in Design	3	-	3	100	-	-	-
3	Machine Tool Design	3	-	3	100	-	-	-
4	Mechatronic Product Design	3	-	3	100	-	-	-
5	Elective-II	3	-	3	100	-	-	-
6	Laboratory Practice-II	-	6	-	-	100	-	50
7	Seminar-II	-	4	-	-	100	-	-
	<b>Total</b>	<b>15</b>	<b>10</b>		<b>500</b>	<b>200</b>		<b>50</b>
	<b>Grand Total</b>	<b>25</b>			<b>750</b>			

**Elective II**

- 1) Automotive Design
- 2) Robotics
- 3) Design for Manufacture and Assembly

### Second Year Term I

Sr No	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Seminar-III	-	4	-	-	50	-	50
2	Project Stage-I	-	18	-	-	100	-	-
	<b>Total</b>	-	22	-	-	150		50
	<b>Grand Total</b>	22		200				

### Second Year Term II

Sr No	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Progress Seminar	-	-	-	-	50	-	-
2	Project Stage-II	-	18	-	-	150	-	100
	<b>Total</b>	-	18	-	-	200	-	100
	<b>Grand Total</b>	18		300				

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM I**  
**ADVANCED MECHANICAL ENGINEERING DESIGN OF EQUIPMENT**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Material selection in Mechanical design: - Design process, Engineering material and their properties, Material property charts, material selection procedure and case studies, Process selection procedure & case studies, Multiple constraints & objectives, selection of shape, designing hybrid materials.

Advanced Design: - Load analysis for two & three dimensional static, dynamic and vibrating loading, Deflection in beam, Castigliano's method, Torsion, Combined stress, Stress concentration, Failure theories, Von Mises – Hencky theory, Fracture mechanics, fatigue failure mechanism & models, Notches & stress concentration, Residual stress, design for high cycle fatigue, design for fully reversed uniaxial stress, Design for fluctuating uniaxial stress, Design for multiaxial stress

**Reference:**

- 1) Machine Design By Robert L Norton
- 2) Mechanical Engineering Design By J.E. Shigley & C R Mischke
- 3) Selection of engineering material by Gladius Levis

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM I**  
**COMPUTER METHODS IN MECHANICAL DESIGN**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Advanced Computer Graphics: - review of 2D & 3D geometric transformation, Modeling of curves, cubics, splines, beziers and b-splines, Modelling of surface, modeling of solids, brep, CSG, octree, feature based modeling, Windowing and view porting  
Finite Element Analysis : - Principle of potential energy, 1D elements, Derivation of stiffness & mass matrices for a bar, beam and shaft, solution for static problems, Case studies in stress analysis of mechanical components, FEA using 2D & 3D elements, plain strain & stress problems, FEA using plate & shell, Finite element mesh, Automatic meshing technique, case studies using FE for design of geometrics such as tapered bar, plate with hole, spanner etc. Introduction to dynamic analysis, Basic equation, undamped free vibration, damping, Harmonic response analysis, thermal problem, formulation procedure, 1D & 2D heat transfer problems.

**Reference:**

- 1) Introduction to finite element method by C S Desai & J.F Abel
- 2) Concept & application of finite Element Analysis by Robert Cook
- 3) CAD/CAM by Groover & Zimmer

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM I**  
**VIBRATION ENGINEERING**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks

Min passing – 40 marks

Duration – 3 Hours

Introduction to vibration , free vibration and forced response solution of single and multiple degree freedom, of numerical method of finding natural frequencies and mode shape , vibration instrumentation ,vibration design and control, vibration isolation , passive control of , vibration absorber , active control of vibration , whole body vibration perception ,health effect of whole body vibration, motion sickness .

**Reference:**

- 1.Engineering vibration By Daniel .J. Inman
- 2.Mecanical vibration control engineering By S.Rao
- 3.Noise &vibration control engineering By Ver Beranek

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM I**  
**TRIBOLOGY**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Friction & Wear : -Types of wear ,theories of friction & wear, dry friction & boundary friction

Viscosity:- Petroff's law, Hagen Poisenille law, variation of viscosity ,

Hydrodynamic Lubrication: - Reynold's Eq. Solution for short & long finite bearing, load carrying capacity, flow rate, hydrodynamic thrust bearing, behaviour under variable laod, squeeze film, thermal equilibrium of sliding system, elasto hydrodynamic lubrication

Hydrostatic Lubrication: -Pressure distribution in hydrostatic thrust bearing, pumping power & capacity, hydrostatic formal & thrust bearing

Gas Lubrication: -Merits & Demerits, aerodynamic and aerostatic journal bearing ,Reynolds equation.

**Reference:**

- 1) Principles of tribology by J.Hamrock
- 2) Tribology in machine Design by T A solarski
- 3) Principles of Tribology by J.Hasting

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM I**  
**ELECTIVE – I**  
**DESIGN OF PRESSURE VESSEL**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Introduction: Revision of stress and strain in thick and thin cylinder and pressure vessel.  
Criteria in vessel design, excessive elastic deformation, plastic instability, brittle, rupture, creep

Design of pressure vessel, internal pressure, construction feature, code, design of shell, types of heads, thickness of heads.

Design of storage vessel, storage of non volatile liquids and gases, code for storage, bottom and shell design

Design of vessel under external pressure, vacuum stress analysis, stiffness , design of circumferential stiffeners, design of covers, pipes and tubing

Design of High Pressure Vessel, autoclave

Support for vessel, types, leg support skirt, support design.

**Reference:**

- 1) Process Equipment Design by N.V .Joshi
- 2) Process equipment design by L.E.Browr ,E.H.Yovng
- 3) Introduction to process Equipment Design by B.C. Bhattacharya

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM I**  
**ELECTIVE – I**  
**INSTRUMENTATION AND AUTOMATIC CONTROL SYSTEM**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Classification and representation of control systems, Influence of type control on steady state and transient response, Time and frequency domain analysis, Stability analysis using Rough Phi Nyquist criteria, Root locus method, Modern control theory, Sequence control and programmable logic controllers, Control components, Comparators, Hydraulic, Pneumatic and Electrical type of controllers, Servomotors.

Computer based data acquisition system, A-D and D-A converters, Microprocessor application in measurement and control, Static and dynamic analysis of instrument system, FFT analysers, Current development in measurement and control of motion, Force torque, pressure, temperature, flow, noise

**Reference:**

1. Measurement System By Ernest O Josbelin
2. Modern Control Systems By Richard C Dorf, Robert H Bishop

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**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM I**  
**ELECTIVE – I**  
**DESIGN OF MATERIAL HANDLING EQUIPMENT**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Introduction to material handling equipment, interplant transporting facilities, types of equipment,

Working principle, Construction and Design of: - Flexible hoisting application, pulley system, load handling equipment, arresting gears, hoisting gears, traveling gears, luffing gear, various types of drives, crane frame structure, stability of crane, elevators, electromagnetic hoisting equipment, various types of conveyors .

**Reference:**

- 1) Material handling equipment by Rudenko
- 2) Material handling equipment by John R Immer

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM I**  
**LABORATORY PRACTICE - I**

**Exam Scheme :**

Practical's – 06 hours/week.

Term-work – 100 marks

Oral- 50 marks

Experiments/Assignments based on

- 1) Computer Methods in Mechanical Design
- 2) Vibration Engineering
- 3) Tribology

The concerned subject in-charge should frame minimum of six laboratory Experiments / Assignments, two from each subject.

Note: Oral will be based on the prescribed term-work presented in the form of certified journal.

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM I**  
**SEMINAR-I**

Practical's – 06 hours/week.

Term-work – 100 marks

Seminar-I should be based on the literature survey on any topic relevant to Design Engineering. It may be leading to selection of a suitable topic of dissertation. Each student has to prepare a write-up of about 25 pages. The report typed on A4 sized sheets and bound in the necessary format should be submitted after approved by the guide and endorsement of the Head of Department. The student has to deliver a seminar talk in front of the teachers of the department and his classmates. The Guide based on the quality of work and preparation and understanding of the candidate shall do an assessment of the seminar

The report copies must be duly signed by the guide and Head of department (one copy for institute, one copy for guide and one copy for the candidate for certification). Attendance of all students for all seminars is compulsory

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM II**  
**DESIGN & SYNTHESIS OF MECHANISM**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Kinematics analysis of planer mechanism, graphical & analytical methods of velocity & acceleration analysis

Curvature Theorem, fixed & moving centroids, inflection circle, Euler Savary equation, Bobillier construction, cubic & stationary curvature, dwell mechanism

Kinematic synthesis, Dimensional synthesis, function generation, path generation, accuracy point, Chebychev spacing, graphical synthesis for function generation with two, three, four accuracy points, Bermester points

Analytical Synthesis of four bar and slider crank mechanism, Frendenstein equation.

Coupler Curves: - Equation of coupler curves, Robber Chebychev theorem, kinematics analysis of spatial mechanism, Denavit Hartenberg parameters, matrix method.

**Reference:**

- 1) Design of Machaniry- An introduction to synthesis & analysis of mechanics & machines by R.L.Norton
- 2) Mechanism Design - Analysis & synthesis by A.G.Edman & G.N.Sandor
- 3) Theory of Mechanics & Mechanism by J.E.Shigley & J.J.Ucker

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM II**  
**OPTIMIZATION TECHNIQUES IN DESIGN**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Optimum design formulation, Problem formulation process; Graphical optimisation; optimum design concepts, Global and local minima, Unconstrained optimum design problems, Constrained optimum design problems, Postoptimality analysis, Linear programming methods for optimum design numerical methods for unconstrained optimisation, Numerical method for constrained optimisation; Multiobjective optimum design concepts and methods, Genetic algorithms, Weighted sum method, Weighted minimum-maximum method; Global optimisation concepts and methods for optimum design, Deterministic method, Stochastic method

**Reference:**

1. Mechanical design of mechanical element-R.C.Thomson
2. Optimisation concept and application in engineering-Balegundu & Chandrupatla
3. Engineering optimisation-S.S.Rao

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM II**  
**MACHINE TOOL DESIGN**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Introduction, trends in machine tool design, design specification, working principle, Kinematics of machine tool, different drives, cutting speeds, gear boxes, ray diagram, Force analysis, forces for different machining operation, design of beds, columns, tables, support, rigidity consideration, Vibration in machine tool, vibration of column beds, vibration damping, Design of side ways & guide ways, types of guide, pressure distribution, wear, accuracy, lubrication .  
Design of power screws, design features, strength, rigidity, efficiency, backlash, Design of spindles, balancing of spindles, strength & wear resistance, CNC machine tool, CAD/CAM system, programming.

**Reference:**

- 1) Machine tool design by N.K.Mehta
- 2) Design principles of metal cutting—machine tool by F Koenigs Berger

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM II**  
**MECHATRONIC PRODUCT DESIGN**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Introduction to mechanical system, principles of basic electronics, microprocessor and their application, integrated, circuits, sensors, actuators, other electrical / electronic hardware in mechatronic system communication .

Interfacing DA & AD converters, software and hardware principles and tools to build mechatronic system. Design and selection of mechatronic elements namely sensors like encoders and resolvers stepper and servomotor.

Role of controls in mechatronics role of modeling in mechatronics design, design optimizations of mechatronics systems. System interface, Data acquisition, Instrumentation system.

**Reference:**

- 1) Mechatronics by W. Bolton
- 2) Mechatronics System Design by Shetty D and Kolk R. A.

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM II**  
**ELECTIVE – II**  
**AUTOMOTIVE DESIGN**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Design requirements of automobile, engines as a system and its subsystem, lubrication system, fuel injection system, cooling system. Design requirements of automobile transmission, automatic transmission; Dynamic consideration in designing of suspension system, modern system of suspension, kinematic requirements of steering mechanism, need for power steering, braking requirements of automobile. Brake materials, modeling and simulation of different subsystems, instrumentation and control, microprocessor controlled units, safety and comfort in automotive component design.

**Reference:**

- 1) Design of Machinery By Robert L Norton
- 2) Machine Component Design By Willian Orthweein.

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM II**  
**ELECTIVE – II**  
**ROBOTICS**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Introduction: - Historical perspective, advantage, application

Basic component: -Manipulator sensory devices, controller, power conversion unit

Mechanical system: - translation & linear motion, motion conversion, modeling kinetic chain, end effectors

Control of actuator: - Closed loop control, control of robotics joint, stepper motor, direct drive, hydraulic actuator

Sensory devices: - Non-optical position sensor, optical position sensor, velocity sensor, accelerometer, proximity sensors, touch & slip sensor

Vision of robotics system: - Imaging component, picture coding, object recognition

Computer: -Hardware & software

**Reference:**

- 1) Robotics engineering by Richard Klafter
- 2) Robotics for Engineer by Yoram Korem
- 3) Robot Control by spong, lewis, Abdallah

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM II**  
**ELECTIVE – II**  
**DESIGN FOR MANUFACTURE AND ASSEMBLY**

**Exam Scheme :**

Lectures – 03 hours/week.

Theory – 100 marks  
Min passing – 40 marks  
Duration – 3 Hours

Life cycle of mechanical equipment design, Requirement of life cycle personnel like customer, management, marketing, manufacturing, transportation etc. Need to meet constraints of manufacturing, Advantages of designing for manufacturing and assembly to improve product quality, cost and time to market, Design for manufacture & assembly (DFMA) strategies, DFMA application and case studies, product design for manual assembly, Design for high speed automatic & robot assembly, design for machining, design for injection moulding, die casting and powder metal processing, Design for sheet metal for mechanical system design

**Reference:**

- 1) Process and Design for manufacturing by Sherif D EL Wakil
- 2) Manufacturing, Planning and control systems by Thomas E Vollmann,  
Willam L Beroy
- 3) Automation, Production System and Computer Integrated Manufacturing  
by Mikell P Groover.

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM II**  
**LABORATORY PRACTICE - II**

**Exam Scheme :**

Practical's – 06 hours/week.

Term-work – 100 marks

Oral- 50 marks

Experiments/Assignments based on

- 1) Mechatronic Product Design
- 2) Design and Synthesis of Mechanism
- 3) Optimization Techniques in Design

The concerned subject in-charge should frame minimum of six laboratory Experiments / Assignments, two from each subject.

Note: Oral will be based on the prescribed term-work presented in the form of certified journal.

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**FIRST YEAR TERM II**  
**SEMINAR-II**

**Exam Scheme :**

Practical's – 06 hours/week.

Term-work – 100 marks

Seminar-II should be based on the literature survey on any topic relevant to Design Engineering. It may be leading to selection of a suitable topic of dissertation. Each student has to prepare a write-up of about 25 pages. The report typed on A4 sized sheets and bound in the necessary format should be submitted after approved by the guide and endorsement of the Head of Department. The student has to deliver a seminar talk in front of the teachers of the department and his classmates. The Guide based on the quality of work and preparation and understanding of the candidate shall do an assessment of the seminar

The report copies must be duly signed by the guide and Head of department (one copy for institute, one copy for guide and one copy for the candidate for certification). Attendance of all students for all seminars is compulsory

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**SECOND YEAR TERM I**  
**SEMINAR-III**

**Exam Scheme :**

Practical's – 04 hours/week.

Term-work – 50 marks

Oral – 50 marks

Seminar - III should be based on the literature survey on any topic relevant to Design Engineering. It may be leading to selection of a suitable topic of dissertation. The report shall contain some contribution by the candidate in the form of experimental results, deductions, compilation and inferences etc.

Each student has to prepare a write-up of about 25 pages. The report typed on A4 sized sheets and bound in the necessary format should be submitted after approved by the guide and endorsement of the Head of Department. The student has to deliver a seminar talk in front of the teachers of the department and his classmates. The Guide based on the quality of work and preparation and understanding of the candidate shall do an assessment of the seminar.

The report copies must be duly signed by the guide and Head of department (one copy for institute, one copy for guide and one copy for the candidate for certification). Attendance of all students for all seminars is compulsory

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**SECOND YEAR TERM I**  
**PROJECT STAGE - I**

**Exam Scheme :**

Practical's – 18 hours/week.

Term-work – 100 marks

The candidate shall submit the synopsis of the dissertation work to the evaluation committee at the starting of FIRST YEAR TERM III.

It shall include the problem definition, literature survey, approaches for handling the problem, finalizing the methodology for the dissertation work and design calculations / experimental design etc.

A report of the work shall be submitted at the end of Semester III after approval by the Guide and endorsement of the Head of Department. It will be assessed for term work, by the evaluation committee appointed by the Head of the Department, for appropriateness, sufficiency of contents and offer suggestions if any.

The candidate shall prepare a report of about 50 pages. The report typed on A4 sized sheets and bound in the prescribed format shall be submitted after approval by the Guide and endorsement of the Head of Department. It will be assessed for term work by the evaluation committee appointed by the Head of the Department.

The report copies must be duly signed by the guide and Head of department (one copy for institute, one copy for guide and one copy for the candidate for certification). Attendance of all students for all seminars is compulsory

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**SECOND YEAR TERM II**  
**PROGRESS SEMINAR**

**Exam Scheme :**

Practical's – 04 hours/week.

Term-work – 50 marks

Progress Seminar shall be based on topic of the Dissertation Work. It may include literature review, required theoretical input, study and comparison of various approaches for the proposed dissertation work. The candidate shall prepare a report of about 25 pages. The report typed on A4 sized sheets and bound in the prescribed format shall be submitted after approval by the Guide and endorsement of the Head of Department. It will be assessed for term work by the evaluation committee appointed by the Head of the Department.

The report copies must be duly signed by the guide and Head of department (one copy for institute, one copy for guide and one copy for the candidate for certification). Attendance of all students for all seminars is compulsory

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**  
**M.E. (MACHINE DESIGN)**  
**W.E.F.: 2010-11**  
**SECOND YEAR TERM II**  
**PROJECT STAGE - II**

**Exam Scheme :**

Practical's – 18 hours/week.

Term-work – 100 marks

The candidate shall submit the detailed report as per the synopsis approved by the evaluation committee, of the dissertation work in the prescribed format after approval by the Guide and endorsement by the Head of the Department. It will be assessed for term work by the evaluation committee appointed by the Head of the Department, for completion of the proposed work.

**Note:** - The evaluation committee shall consist of the Guide, one senior expert faculty member and the Head of the Department or his/her representative.

## **Rules and Regulations for M.E. in ((Machine Design):-**

1. The post graduate degree in engineering consisting of 2 years (4 terms) shall be designated as Master of Engineering in Mechanical Engineering.
2. A candidate may be permitted to register him/her self for the M.E. degree in (Machine Designing) under the faculty of engineering & technology of North Maharashtra University, Jalgaon only if the candidate holds a bachelor's degree in Engineering & technology of North Maharashtra University, Jalgaon or its equivalent in Appropriate/Allied branch, recognized by AICTE/UGC & North Maharashtra University, Jalgaon.
3. The student shall be admitted to First Year Term II if his/her Term I is granted.
4. The student shall be admitted to the Second Year when ever he/she clears all the theory papers of First Year. The student in any case should not be allowed to start project work before passing all the subjects of first year. The student will have to work on his/her project for minimum one year after passing first year subjects. He/she will not be allowed to submit his/her thesis/dissertation before that.
5. Every student will be required to produce a record of laboratory work in the form of journal, duly certified for satisfactory completion of the term work by the concerned teacher & head of the department.
6. A student whose term is not granted on account of less attendance (Minimum 75%) or non-submission of term work is required to repeat the term.
7. Any approved guide will not be allowed to guide more than 5 students in a particular batch.
8. Each student is required to present Seminar-I in the First Year Term I on any related state of the art topic of his own choice approved by the department.
9. The term-work & presentation of the Seminar-I will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
10. Each student is required to present Seminar-II in the First Year Term II on any related state of the art topic of his own choice approved by the department.
11. The term-work & presentation of the Seminar-II will be evaluated by the departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
12. Each student is required to present Seminar-III in the Second Year Term I on special topic. The topic should be on any of the area not included in the regular curriculum. The report should include detailed study of specific concept (i.e. analysis, design & implementation). This can be a theoretical study or practical implementation approved by the department/guide.
13. Guidelines for the dissertation Seminar-III in Second Year Term-I:
  1. Seminar-III should be conducted at the end of Second Year Term I.
  2. The term-work of the Seminar-III will be evaluated by departmental committee consisting of guide & two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
  3. Seminar-III presentation will be evaluated by examiners appointed by University, one of which should be guide.
  4. Student must submit the Seminar Report in the form of soft bound copy.

5. The marks of Seminar-III should be submitted at the end of Second Year Term I to the University.
14. Guidelines for the Progress Seminar in Second Year Term-II:
  1. Progress seminar should be conducted in the middle of Second Year Term-II.
  2. The Progress Seminar Term-Work will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
  3. Student must submit the Progress Report in the form of soft bound copy.
  4. The marks of Progress Seminar should be submitted along with the marks of Project Stage-II.
15. Minimum passing marks for all Theory shall be 40% and for Term-Work and Oral shall be 50%.
16. He/she has to present/publish at least one paper in reputed National/International Journal/Conference on his/her Project work before submission of his/her Thesis/Dissertation.
17. The Term-Work of Project Stage-II will be assessed jointly by the pair of Internal & External examiner along with oral examination of the same.
18. The class will be awarded on the basis of aggregate marks of all four terms, giving equal weightage to all terms as shown below:
  - a) Less than 50% : Fail
  - b) 50% to less than 60% : Second Class
  - c) 60% to less than 70% : First Class
  - d) 70% & above : First Class with Distinction.
19. Each student is required to complete his/her master's degree within Five academic years from the date of admission, failing which he/she will be required to take fresh admission in first year.

