# COURSE OUTCOMES - 2020 SCHEME (PG)

## 1st SEMESTER

| Subject: | Mathematical Methods In Engineering | | |
|---|---|---|---|
| Subject Code: | 20MMD11 | NBA Code: | MMD101 |
| CO1 | Acquire the idea of significant figures, types of errors during numerical computation. | | |
| CO2 | Understand statistical and probabilistic concepts required to test the hypothesis and designing the experiments using RBD. | | |
| CO3 | Learn various numerical methods to solve system of linear equations | | |
| CO4 | Understand the roots of algebraic/transcendental equations and solve PD's numerically. | | |
| CO5 | Analyze and solve PD's related to wave equation arising in vibration analyst. | | |

| Subject: | Design Of Vibration Control In Engineering | | |
|---|---|---|---|
| Subject Code: | 20MMD12 | NBA Code: | MMD102 |
| CO1 | CO1. Apply Newton's equation of motion and energy methods to model basic vibrating mechanical system, model undamped and damped mechanical systems and structures for free and harmonically forced vibrations. | | |
| CO2 | Model single-and multi-degree of freedom for free and forced vibrations and determine response to vibration, natural frequencies and modes of vibration. | | |
| CO3 | Apply the fundamentals of vibration to its measurement and analysis. | | |
| CO4 | Solve realistic vibration problems in mechanical engineering design that involves application of most of the course syllabus. | | |
| CO5 | Ability to design and develop vibrations and noise control systems | | |

| Subject: | Continuum Mechanics | | |
|---|---|---|---|
| Subject Code: | 20MMD13 | NBA Code: | MMD103 |
| CO1 | Treat general stresses and deformations in continuous materials | | |
| CO2 | Formulate and solve specific technical problems of displacement, strain and stress. | | |
| CO3 | Perform experiments with stresses and deformations. | | |
| CO4 | Model and analyse the stresses and deformations of simple geometries under an arbitrary load in solids | | |

| Subject: | Fracture Mechanics | | |
|---|---|---|---|
| Subject Code: | 20MMD14 | NBA Code: | MMD104 |
| CO1 | Develop basic fundamental understanding of the effects of crack like defects on the performance of aerospace, civil, and mechanical engineering structures. | | |
| CO2 | Be able to select appropriate materials for engineering structures to insure damage tolerance. | | |
| CO3 | Learn to employ modern numerical methods to determine critical crack sizes and fatigue crack propagation rates in engineering structures. | | |
| CO4 | Understand the relationship between crack tip opening displacement, SIF and ERR and application of such parameters for ductile and brittle materials. | | |
| CO5 | Understanding of experimental techniques to determine the critical values of parameters at crack tip. Understand and appreciate of the status of academic research in field of fracture mechanics. | | |

| Subject: | Dynamics And Mechanism Design | | |
|---|---|---|---|
| Subject Code: | 20MMD15 | NBA Code: | MMD105 |
| CO1 | Apply the tools of analytical dynamics with the main goal of developing mathematical models that describe the dynamics of systems of rigid bodies. | | |
| CO2 | Formulate equations of motion for complicated mechanical systems /linkages and holds for solving these equations. | | |
| CO3 | Understand multi body dynamics in mechanical engineering design Question paper | | |

| Subject: | Research Methodology And IPR | | |
|---|---|---|---|
| Subject Code: | 20RMI16 | NBA Code: | MMD106 |
| CO1 | Discuss research methodology and the technique of defining a research problem | | |
| CO2 | Explain the functions of the literature review in research, carrying out a literature search, developing theoretical and conceptual frameworks and writing a review. | | |
| CO3 | Explain various research designs, sampling designs, measurement and scaling techniques and also different methods of data collections. | | |
| CO4 | Explain several parametric tests of hypotheses, Chi-square test, art of interpretation and writing research reports | | |
| CO5 | Discuss various forms of the intellectual property, its relevance and business impact in the changing global business environment and leading International Instruments concerning IPR. | | |

# COURSE OUTCOMES - 2020 SCHEME (PG)

## 2nd SEMESTER

| **Subject:** | **Advanced Finite Element Analyses** | | |
|---|---|---|---|
| **Subject Code:** | **20MMD21** | **NBA Code:** | **MMD107** |
| **CO1** | Explain the fundamentals of finite element methods | | |
| **CO2** | Develop the knowledge to analyses, structures under static and dynamic conditions. | | |
| **CO3** | Selection of numerical techniques for solving engineering problems | | |
| **CO4** | Explore the use of finite element method knowledge to implement industrial project. | | |

| **Subject:** | **Advanced Machine Design** | | |
|---|---|---|---|
| **Subject Code:** | **20MMD22** | **NBA Code:** | **MMD108** |
| **CO1** | Apply state of the art design methodology namely design by analysis and damage tolerant design to mechanical components. | | |
| **CO2** | Distinguish different design criteria and their procedure to carry out the design of mechanical components. | | |
| **CO3** | Design machine components which are subjected to fluctuating loads. | | |
| **CO4** | Design machine components using techniques like stress life approach, Strain life approach and Fracture mechanics approach. | | |
| **CO5** | Define the various statistical aspects of fatigue using different probability distribution plots | | |

| **Subject:** | **Tribology And Bearing Design** | | |
|---|---|---|---|
| **Subject Code:** | **20MMD23** | **NBA Code:** | **MMD109** |
| **CO1** | Design or choose efficient tribological systems such as rolling element bearings, hydrodynamic<br>bearings, and dry sliding bearings, for the needs of a specific application. | | |
| **CO2** | Select compatible materials for minimizing friction and wear in machinery. | | |
| **CO3** | Explain the concepts advanced bearings like magnetic bearings, porous bearings and gas lubricated bearings. | | |

| **Subject:** | **Material Handling And Equipment Design** | | |
|---|---|---|---|
| **Subject Code:** | **20MMD243** | **NBA Code:** | **MMD110** |
| **CO1** | Select appropriate equipment for material handling and understand the basic roles of the different equipment. | | |
| **CO2** | Apply appropriate techniques for improving existing material handling systems; recognize the importance of safety and applications of optimization techniques to material handling. | | |

| Subject: | Automobile System Design | | |
|---|---|---|---|
| Subject Code: | 20MMD251 | NBA Code: | MMD111 |
| CO1 | Gain an insight into aspects of vehicle design, operation and maintenance, which will be useful for taking up a position in the automotive industry. | | |
| CO2 | Apply the knowledge in creating a preliminary design of automobile subsystems. | | |
| CO3 | . Identify construction, working, preventive maintenance, trouble shooting and diagnosis of various<br>Automobile Systems. | | |
| CO4 | Identify Modern technology and safety measures used in Automotive Vehicles. | | |

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## 3rd SEMESTER

| Subject: | Design For Manufacture And Assembly | | |
|---|---|---|---|
| Subject Code: | 20MMD31 | NBA Code: | MMD201 |
| CO1 | Describe the different types of manufacturing systems and compare their suitability for economic production of various components and products. | | |
| CO2 | Identify factors and causing mechanisms of the defects likely to occur with different manufacturing processes in producing mechanical products and the relevant design approaches to rectify them. | | |
| CO3 | Identify factors and causing mechanisms of the defects likely to occur with different manufacturing processes in producing mechanical products and the relevant design approaches to rectify them. | | |

| Subject: | Composite Material Technology | | |
|---|---|---|---|
| Subject Code: | 20MMD323 | NBA Code: | MMD202 |
| CO1 | Understandtheuseoffibre-reinforcedcompositesinstructuralapplications. | | |
| CO2 | Develop a basic understanding of the use of composite materials, micromechanics of layered composites ,analysis and design of composite structures and failure analysis of laminated panels. | | |
| CO3 | Apply the basic micro-mechanics the orison the design of fiber reinforced composites | | |
| CO4 | Analyze the performance of composites in engineering applications | | |

| Subject: | Smart Materials And Structure | | |
|---|---|---|---|
| Subject Code: | 20MMD331 | NBA Code: | MMD203 |
| CO1 | Understand the behavior and applicability of various smart materials. | | |
| CO2 | Design simple models for smart structures & materials. | | |
| CO3 | Devise experiments to verify the predictions. | | |
| CO4 | Judge the appropriate application of smart materials with respect to the feasibility of their fabrication and implementation, and to the economic aspects. | | |

| Subject: | Project Work Phase -1 | | |
|---|---|---|---|
| Subject Code: | 20MMD34 | NBA Code: | MMD204 |
| CO1 | Demonstrate a sound technical knowledge of their selected project topic. | | |
| CO2 | Undertake problem identification, formulation, and solution. | | |
| CO3 | Design engineering solutions to complex problems utilising a systems approach. | | |
| CO4 | Communicate with engineers and the community at large in written an oral forms. | | |
| CO5 | Demonstrate the knowledge, skills and attitudes of a professional engineer. | | |

| **Subject:** | **Mini Project** | | |
|---|---|---|---|
| **Subject Code:** | **20MMD35** | **NBA Code:** | **MMD205** |
| **CO1** | Present the mini-project and be able to defend it. | | |
| **CO2** | Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task. | | |
| **CO3** | Habituated to critical thinking and use problem solving skills. | | |
| **CO4** | Communicate effectively and to present ideas clearly and coherently in both the written and oral forms. | | |
| **CO5** | Work in a team to achieve common goal. | | |
| **CO6** | Learn on their own, reflect on their learning and take appropriate actions to improve it | | |

| **Subject:** | **Internship** | | |
|---|---|---|---|
| **Subject Code:** | **20MMDI36** | **NBA Code:** | **MMD206** |
| **CO1** | Gain practical experience within industry in which the internship is done. | | |
| **CO2** | Acquire knowledge of the industry in which the internship is done. | | |
| **CO3** | Apply knowledge and skills learned to classroom work. | | |
| **CO4** | Develop a greater understanding about career options while more clearly defining personal career goals. | | |
| **CO5** | Experience the activities and functions of professionals. | | |
| **CO6** | Develop and refine oral and written communication skills. | | |
| **CO7** | Identify areas for future knowledge and skill development. | | |
| **CO8** | Expand intellectual capacity, credibility, judgment, intuition. | | |
| **CO9** | Acquire the knowledge of administration, marketing, finance and economics. | | |

# COURSE OUTCOMES - 2020 SCHEME (PG)

## 4th SEMESTER

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|---|---|---|---|
| **Subject:** | **Project Work Phase -2** | | |
| **Subject Code:** | **20MMD41** | **NBA Code:** | **MMD207** |
| **CO1** | Present the project and be able to defend it. | | |
| **CO2** | Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task. | | |
| **CO3** | Habituated to critical thinking and use problem solving skills | | |
| **CO4** | Communicate effectively and to present ideas clearly and coherently in both the written and oral forms. | | |
| **CO5** | Work in a team to achieve common goal | | |
| **CO6** | Learn on their own, reflect on their learning and take appropriate actions to improve it. | | |