

MOOC MINOR LIST

AEROSPACE ENGINEERING

Flight Mechanics: Core Courses		
Sl. No	Course Name	Duration
01	Introduction to Airplane performance	8 weeks
02	Aircraft Stability and Control	12 weeks
03	Aircraft Design	12 weeks
04	OR Introduction to Aircraft Design	12 weeks
05	Introduction to Experiments in Flight	4 weeks
06	OR Introduction to Aerospace Engineering - Flight	12 weeks
07	Aerodynamic Design of Axial Flow Compressors & Fans	12 weeks

Elective Courses		
Sl. No	Course Name	Duration
01	Combustion in air breathing aero engines	12 weeks
02	Space Flight Mechanics	12 weeks
03	UAV Design - Part II	8 weeks
04	Introduction to Air breathing Propulsion	12 weeks

BIO-TECHNOLOGY AND BIO- SCIENCE/ BIO- ENGINEERING

1. Bio processes: Core Courses		
Sl. No	Course Name	Duration
01	Aspects of Biochemical Engineering	12 weeks
02	OR Bioreactor Design and Analysis	8 weeks
03	Downstream Processing	12 weeks
04	Material and Energy Balances	12 weeks
05	Transport Phenomena in Biological Systems	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Plant Cell Bio-processing	8 weeks
02	Bio-energy	8 weeks
03	Metabolic Engineering	8 weeks
04	Genetic Engineering: Theory and Application	12 weeks
05	Thermodynamics for Biological Systems : Classical and Statistical Aspect	12 weeks
06	Experimental Biotechnology	12 weeks
07	Fundamental of Fluid Mechanics for Chemical and Biomedical Engineers	12 weeks
08	Environmental Biotechnology	12 weeks

2. Bio- Engineering: Core Courses		
Sl. No	Course Name	Duration
01	Bioengineering: An Interface with Biology and Medicine	8 weeks
02	Cell Culture Technologies	8 weeks
03	Medical Biomaterials	8 weeks

Elective Courses		
Sl. No	Course Name	Duration
01	Tissue engineering	8 weeks
02	Drug Delivery: Principles and Engineering	12 weeks
03	Biomicrofluidics	4 weeks
04	Introduction to mechanobiology	8 weeks
05	Biomedical nanotechnology	4 weeks
06	Applications of interactomics using Genomics and proteomics technologies	8 weeks

07	Transport Phenomena in Biological Systems	12 weeks
08	Bio-interface Engineering	8 weeks
09	Fundamental of Fluid Mechanics for Chemical and Biomedical Engineers	12 weeks
10	Neural Science for Engineers	12 weeks
11	Organ Printing	8 weeks
12	Cellular biophysics: a framework for quantitative biology	8 weeks
13	Biomechanics	12 weeks
14	Enzyme Sciences and Technology	12 weeks

3. Bioscience: Core Courses		
Sl. No	Course Name	Duration
01	Biochemistry	12 weeks
02	OR Biochemistry - IITM	12 weeks
03	Structural Biology	12 weeks
04	Cell Biology: Cellular organization, division and processes	8 weeks
05	OR Introduction to Cell Biology	8 weeks
06	Basics of Biology	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Plant Developmental Biology	4 weeks
02	Cell Culture Technologies	8 weeks
03	Human Molecular Genetics	4 weeks
04	Experimental Biochemistry	12 weeks
05	Genetic Engineering: Theory and Application	12 weeks
06	Interactomics : Basics & Applications	12 weeks
07	Introduction to proteomics	8 weeks
08	Experimental Biotechnology	12 weeks
09	Introduction to Developmental Biology	12 weeks
10	Immunology	12 weeks
11	Fundamentals of Protein Chemistry	12 weeks
12	Neural Science for Engineers	12 weeks
13	Genome Editing and Engineering	12 weeks
14	RNA Biology	12 weeks
15	Enzyme Sciences and Technology	12 weeks
16	Host-Pathogen Interaction (Immunology)	12 weeks
17	Neurobiology	4 weeks

4. Computational Biology: Core courses		
Sl. No	Course Name	Duration
01	Bio Informatics: Algorithms and Applications	12 weeks
02	Programming, Data Structures and Algorithms in Python	8 weeks
03	OR MATLAB Programming for Numerical Computation	12 weeks
04	OR Introduction to R Software	8 weeks
05	Functional Genomics	4 weeks
06	Next Generation Sequencing Technologies : Data Analysis And Applications	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Computational Systems Biology	12 weeks
02	Computer Aided Drug Design	8 weeks
03	Introduction to Dynamical Models in Biology	4 weeks
04	Introduction to Proteogenomics	12 weeks
05	Algorithms for protein modelling and engineering	12 weeks
06	Computational Neuroscience	12 weeks
07	Data Analysis for Biologists	8 weeks

CHEMICAL ENGINEERING

1. Minor 1: Core Courses		
Sl. No	Course Name	Duration
01	Basic Principles and Calculations in Chemical Engineering	12 weeks
02	OR Material & Energy Balance Computations	12 weeks
03	Chemical Reaction Engineering-I	
04	Chemical Engineering Thermodynamics	12 weeks
05	OR Chemical Engineering Thermodynamics	12 weeks
06	OR Chemical Engineering Thermodynamics - IITKGP	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Mass Transfer Operations - I	12 weeks
02	OR Mass Transfer Operations II	12 weeks
03	OR Mechanical Unit Operations	12 weeks
04	Heat Transfer	12 weeks
05	OR Heat Transfer	12 weeks
06	Solid-Fluid Operations	12 weeks

2. Computational Chemical Engineering: Core Courses		
Sl. No	Course Name	Duration
01	Numerical Methods for Engineers	12 weeks
02	Process Control - Design, Analysis and Assessment	12 weeks
03	OR Chemical Process Control	8 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Optimization in Chemical Engineering	12 weeks
02	Computational Fluid Dynamics	12 weeks
03	Model Predictive Control: Theory and Applications	12 weeks
04	Computer Aided Applied Single Objective Optimization	12 weeks
05	Aspen Plus ♦ simulation software - a basic course for beginners	12 weeks
06	Mathematical modeling and simulation of chemical engineering process	12 weeks

3. Energy and Environment: Core Course		
Sl. No	Course Name	Duration
01	Environmental Quality Monitoring & Analysis	12 weeks
02	Non-Conventional Energy Resources	12 weeks
03	OR Renewable Energy Engineering: Solar, Wind and Biomass Energy Systems	12 weeks
04	Basic Environmental Engineering and Pollution Abatement	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Waste to Energy Conversion	8 weeks
02	Technologies for clean and renewable energy production	8 weeks
03	Energy conservation and waste heat recovery	12 weeks
04	Energy Economics and Policy	8 weeks
05	Electrochemical Technology in Pollution Control	8 weeks
06	Biomass Conversion and Biorefinery	12 weeks
07	Electrochemical Energy Storage	12 weeks
08	Physics of Renewable Energy Systems	12 weeks
09	Physico-chemical processes for wastewater treatment	12 weeks
10	Hydrogen Energy: Production, Storage, Transportation and Safety	12 weeks
11	Ecology and Environment	8 weeks
12	Energy Conversion Technologies (Biomass And Coal)	8 weeks
13	Sustainable Power Generation Systems	12 weeks
14	Sustainable Energy Technology	12 weeks

4. Minor 2: Core Courses		
Sl. No	Course Name	Duration
01	Basic Principles and Calculations in Chemical Engineering	12 weeks
02	OR Material & Energy Balance Computations	12 weeks
03	Chemical Reaction Engineering-I	12 weeks
04	Chemical Engineering Thermodynamics	12 weeks
05	OR Chemical Engineering Thermodynamics	12 weeks
06	OR Chemical Engineering Thermodynamics - IITKGP	12 weeks

Elective Courses		
Sl. No	Course Name	Duration
01	Process Control - Design, Analysis and Assessment	12 weeks
02	Plant Design and Economics	12 weeks
03	Process Equipment Design	12 weeks
04	Principles and Practices of Process Equipment and Plant Design	12 weeks
05	Chemical Process Utilities	12 weeks
06	Advanced process dynamics	12 weeks
07	Chemical Process Technology	12 weeks

5. Minor 3: Core Courses		
Sl. No	Course Name	Duration
01	Basic Principles and Calculations in Chemical Engineering	12 weeks
02	OR Material & Energy Balance Computations	12 weeks
03	Chemical Reaction Engineering-I	12 weeks
04	Chemical Engineering Thermodynamics	12 weeks
05	OR Chemical Engineering Thermodynamics	12 weeks
06	OR Chemical Engineering Thermodynamics - IITKGP	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
	Transport phenomena	12 weeks
01	OR Continuum Mechanics and Transport Phenomena	12 weeks
02	OR Transport Processes	12 weeks
03	Fluid and Particle Mechanics	12 weeks
04	OR Fundamental of Fluid Mechanics for Chemical and Biomedical Engineers	12 weeks
05	Advanced Thermodynamics and Molecular Simulations	12 weeks
06	Introduction to interfacial waves	12 weeks
07	Advanced process dynamics	12 weeks
08	Advanced Reaction Engineering	12 weeks
09	Fundamentals Of Statistical Thermodynamics	12 weeks

CIVIL ENGINEERING

1. Construction Materials Technology: Core Courses

Sl. No	Course Name	Duration
01	Concrete Technology	12 weeks
02	Advanced Concrete Technology	12 weeks
03	Modern Construction materials	12 weeks
04	Basic construction materials	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Hydration, Porosity and Strength of Cementitious Materials	12 weeks
02	Advanced Topics in the Science and Technology of Concrete	12 weeks
03	Characterization of Construction Materials	12 weeks
04	Maintenance and Repair of Concrete Structures	12 weeks
05	Sustainable Materials and Green Buildings	12 weeks
06	Building Materials and Composites	12 weeks
07	Development and Applications of Special Concretes	12 weeks
08	Environmental Impact Assessment	12 weeks
09	Admixtures And Special Concretes	12 weeks

2. Structural Analysis: Core Courses

Sl. No	Course Name	Duration
01	Engineering Mechanics - Statics and Dynamics	8 weeks
02	Mechanics of Solids	12 weeks
03	Structural Analysis - I	12 weeks
04	Matrix Method of Structural Analysis	12 weeks
05	Structural Dynamics	8 weeks
06	OR Dynamics of Structures	12 weeks
07	Strength Of Materials - IITM	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Mechanics of Materials	12 weeks
02	OR Theory of Elasticity	12 weeks
03	Finite Element Method and Computational Structural Dynamics	12 weeks
04	Soil Structure Interaction	12 weeks

05	Sustainable Materials and Green Buildings	12 weeks
06	Advanced Soil Mechanics	12 weeks
07	Elastic Stability of Structures	12 weeks
08	Geotechnical Earthquake Engineering	12 weeks

3. Structural Design: Core Courses

Sl. No	Course Name	Duration
01	Engineering Mechanics - Statics and Dynamics	8 weeks
02	Mechanics of Solids	12 weeks
03	Structural Analysis - I	12 weeks
04	Matrix Method of Structural Analysis	12 weeks
05	Design of reinforced concrete structures	12 weeks
06	Design of Steel Structures	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Design of Masonry Structures	12 weeks
02	Bridge Engineering	12 weeks
03	Retrofitting and Rehabilitation of Civil Infrastructure	12 weeks
04	Design of connections in steel structures	4 weeks
05	Geotechnical Earthquake Engineering	12 weeks
06	Earth Sciences For Civil Engineering (Hindi)	8 weeks
07	Advanced Reinforced Concrete Design	12 weeks

4. Environment: Core Courses

Sl. No	Course Name	Duration
01	Applied Environmental Microbiology	12 weeks
02	Environmental Engineering- Chemical Processes	12 weeks
03	Integrated Waste Management for a Smart City	12 weeks
04	Life Cycle Assessment	8 weeks
05	Wastewater Treatment and Recycling	12 weeks
06	OR Water and waste water treatment	12 weeks
07	Air pollution and Control	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Electronic Waste Management - Issues And Challenges	4 weeks
02	Energy Efficiency, Acoustics and Day lighting in Building	12 weeks

03	Environmental Remediation of Contaminated Sites	12 weeks
04	Sustainable River Basin Management	8 weeks
05	Plastic Waste Management	8 weeks
06	Geographic Information Systems	12 weeks
07	Remote Sensing: Principles and Applications	12 weeks
08	Environmental Impact Assessment	12 weeks
09	Microwave Remote Sensing in Hydrology	12 weeks
10	Groundwater hydrology and management	12 weeks
11	Rural Water Resources Management	12 weeks
12	Environmental Science	12 weeks

MATHEMATICS

1. Foundation of Mathematics: Core Courses		
Sl. No	Course Name	Duration
01	Basic Calculus - 1	12 weeks
02	Linear Algebra	12 weeks
03	OR Linear Algebra	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Introduction to Abstract Group Theory	8 weeks
02	Complex Analysis	12 weeks
03	Introduction to Probability (with examples using R)	12 weeks
04	Discrete Mathematics	12 weeks
05	Computational Mathematics with SageMath	12 weeks
06	Introduction to Rings and Fields	12 weeks
07	Ordinary Differential equations	12 weeks

2. Algebra: Core Courses		
Sl. No	Course Name	Duration
01	Linear Algebra	12 weeks
02	OR Linear Algebra	12 weeks
03	Introduction to Abstract Group Theory	8 weeks
04	Introduction to Rings and Fields	8 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	A basic course in number theory	12 weeks

02	Computational Commutative Algebra	12 weeks
03	Introduction to Galois Theory	8 weeks
04	Rings and Modules	12 weeks
05	Computational Mathematics with SageMath	12 weeks
06	Combinatorics	12 weeks
07	Algebraic Combinatorics	12 weeks

FACULTY DISCIPLINE

1. Faculty Domain- Fundamental: Core Courses

Sl. No	Course Name	Duration
01	Effective Engineering Teaching in Practice	4 weeks
02	Ethics in Engineering Practice	8 weeks
03	Introduction to Professional Scientific Communication	4 weeks
04	OR Effective Writing	4 weeks
05	Teaching And Learning in Engineering (TALE)	4 weeks
06	OR Teaching and Learning in General Programs: TALG	4 weeks
07	Accreditation and Outcome Based Learning	8 weeks
08	OR Outcome Based Pedagogic Principles for Effective Teaching	4 weeks
09	OR NBA Accreditation and Teaching - Learning in Engineering (NATE)	12 weeks

Elective Courses

Sl. No	Course Name	Duration
01	Introduction to learning analytics	4 weeks
02	OR Learning Analytics Tools	12 weeks
03	Introduction to Research	8 weeks
04	Introduction to Basic Cognitive Processes	8 weeks
05	Designing learner-centric e-learning in STEM disciplines	4 weeks
06	Handling Large-Scale Unit Level Data Using STATA	8 weeks
07	Towards an Ethical Digital Society: From Theory to Practice	4 weeks
08	Research Methodology	12 weeks

2. Faculty Domain- Advanced: Core Courses

Sl. No	Course Name	Duration
01	Effective Engineering Teaching in Practice	4 weeks
02	Ethics in Engineering Practice	8 weeks
03	Introduction to Professional Scientific Communication	4 weeks
04	Teaching And Learning in Engineering (TALE)	4 weeks
05	OR Teaching and Learning in General Programs:	4 weeks

	TALG	
06	Accreditation and Outcome Based Learning	8 weeks
07	OR Outcome Based Pedagogic Principles for Effective Teaching	4 weeks
08	OR NBA Accreditation and Teaching - Learning in Engineering (NATE)	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Designing Learner-Centric MOOCs	4 weeks
02	OR Designing learner-centric e-learning in STEM disciplines	4 weeks
03	Qualitative Research Methods and Research Writing	12 weeks
04	OR Learning Analytics Tools	8 weeks
05	Development Research Methods	12 weeks
06	Educational Leadership	12 weeks
07	OR Organization Development and Change in 21st Century	8 weeks
08	Introduction on Intellectual Property to Engineers and Technologists	8 weeks
09	OR Entrepreneurship and IP strategy	8 weeks
10	Intellectual Property	12 weeks
11	Patent Law for Engineers and Scientists	12 weeks
12	Patent Drafting for Beginners	4 weeks
13	Training of Trainers	12 weeks
14	Entrepreneurship	12 weeks
15	Towards an Ethical Digital Society: From Theory to Practice	4 weeks
16	Education for Sustainable Development	12 weeks
17	Training and Development	12 weeks
18	Leadership and Team Effectiveness	12 weeks

HUMANITIES AND SOCIAL SCIENCE

1. English Studies: Core Courses		
Sl. No	Course Name	Duration
01	Introduction to Cultural Studies	12 weeks
02	Literary Criticism (From Plato to Leavis)	12 weeks
03	OR Literary Theory and Literary Criticism	8 weeks
04	OR Introduction to Literary Theory	8 weeks
05	English Literature of the Romantic Period, 1798 - 1832	8 weeks
06	Feminist Writings	12 weeks
07	OR Gender and Literature	8 weeks
08	History of English Language and Literature	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Indian Fiction in English	12 weeks
02	OR Introduction to Modern Indian Drama	8 weeks
03	Twentieth Century Fiction	12 weeks
04	OR The Nineteenth-Century English Novel	12 weeks
05	American Literature & Culture	12 weeks
06	Disability Studies: An introduction	8 weeks
07	Introduction to Film studies	12 weeks
08	Postcolonial Literature	4 weeks
09	Introduction to World Literature	12 weeks
10	Literature and Life	12 weeks
11	Contextualizing Gender	12 weeks

2. Psychology: Core Courses		
Sl. No	Course Name	Duration
01	Introduction to Psychology	8 weeks
02	OR Positive Psychology	8 weeks
03	OR Human Behavior	8 weeks
04	Introduction to Cognitive Psychology	12 weeks
05	OR Introduction to Advanced Cognitive Processes	8 weeks
06	Introduction to Brain & Behaviour	8 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	How the Brain Creates Mind	4 weeks
02	OR Psychiatry - An Overview and How the Brain Creates Mind	8 weeks

03	OR Psychology of Everyday	4 weeks
04	Introduction to the Psychology of Language	8 weeks
05	OR The Psychology of Language	8 weeks
06	OR Perspectives on Neurolinguistic	4 weeks
07	OR Language and Mind	8 weeks
08	Consumer Psychology	8 weeks
09	Health research fundamentals	8 weeks
10	Disability Studies: An introduction	8 weeks
11	The Science of Happiness and Wellbeing	8 weeks
12	Yoga and Positive Psychology for Managing Career and Life	8 weeks

COMPUTER SCIENCE

1. Artificial Intelligence: Core Courses		
Sl. No	Course Name	Duration
01	Artificial Intelligence Search Methods For Problem Solving	12 weeks
02	OR An Introduction to Artificial Intelligence	12 weeks
03	Artificial Intelligence: Knowledge Representation and Reasoning	12 weeks
04	Programming, Data Structures and Algorithms in Python	8 weeks
05	OR Python for Data Science	4 weeks
06	Introduction to Machine Learning	8 weeks
07	OR Introduction to Machine Learning	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Deep Learning	12 weeks
02	OR Deep Learning	12 weeks
03	OR Deep Learning for Computer Vision	12 weeks
04	Reinforcement Learning	12 weeks
05	AI: Constraint Satisfaction	8 weeks
06	Computer Vision	12 weeks
07	Natural Language Processing	12 weeks
08	OR Applied Natural Language Processing	12 weeks
09	Practical Machine Learning with Tensorflow	8 weeks
10	Affective Computing	12 weeks

2. Data Science: Core Courses		
Sl. No	Course Name	Duration
01	Python for Data Science	4 weeks
02	OR Programming, Data Structures and Algorithms in Python	8 weeks
03	Introduction to Data Analytics	8 weeks
04	OR Data Science for Engineers	8 weeks
05	OR Data Analytics with Python	12 weeks
06	Introduction to Machine Learning	8 weeks
07	OR Introduction to Machine Learning	12 weeks
Elective Courses		
Sl. No	Course Name	Duration

01	Deep Learning	12 weeks
02	OR Deep Learning	12 weeks
03	OR Deep Learning for Computer Vision	12 weeks
04	Reinforcement Learning	12 weeks
05	Artificial Intelligence : Search Methods For Problem solving	12 weeks
06	OR An Introduction to Artificial Intelligence	12 weeks
07	Artificial Intelligence: Knowledge Representation and Reasoning	12 weeks
08	Computer Vision	12 weeks
09	Natural Language Processing	12 weeks
10	OR Applied Natural Language Processing	12 weeks
11	Practical Machine Learning with Tensor flow	8 weeks
12	Learning Analytics Tools	12 weeks
13	Probability for Computer Science	8 weeks

3. Programming: Core Courses

Sl. No	Course Name	Duration
01	Programming, Data Structures and Algorithms in Python	8 weeks
02	OR Data Structure and Algorithms using Java	12 weeks
03	Programming in C++	8 weeks
04	OR Programming in Modern C++	12 weeks
05	OR An Introduction to Programming through C++	12 weeks
06	Programming in Java	12 weeks
07	OR Object Oriented System Development using UML, Java and Patterns	12 weeks
08	Database Management System	8 weeks
09	OR Introduction to Database Systems	12 weeks

Elective Courses

Sl. No	Course Name	Duration
01	Data Science for Engineers	8 weeks
02	Cloud computing	12 weeks
03	Introduction to Internet of Things	12 weeks
04	Introduction to Machine Learning	8 weeks
05	OR Introduction to Machine Learning	12 weeks
06	Modern Application Development	12 weeks

4. Foundation for Computing: Core Courses

Sl. No	Course Name	Duration
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01	Discrete Mathematics	12 weeks
02	OR Discrete Mathematics	12 weeks
03	OR Discrete Mathematics	12 weeks
04	OR Discrete Mathematics - IIITB	12 weeks
05	Design and Analysis of Algorithms	8 weeks
06	Programming, Data Structures and Algorithms in Python	8 weeks
07	Theory of Computation	8 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Randomized Algorithms	12 weeks
02	Parallel Algorithms	12 weeks
03	Modern Algebra	8 weeks
04	Graph Theory	8 weeks
05	Computational Geometry	12 weeks
06	Arithmetic Circuit Complexity	12 weeks
07	Foundations of Cryptography	12 weeks
08	Computer Graphics	8 weeks
09	Computational Complexity Theory	12 weeks
10	OR Computational Complexity	12 weeks
11	Secure Computation: Part I	12 weeks
12	Parameterized Algorithms	12 weeks
13	Probability for Computer Science	12 weeks

5. Systems: Core Courses		
Sl. No	Course Name	Duration
01	Compiler Design	12 weeks
02	Introduction to Operating Systems	8 weeks
03	OR Operating System	12 weeks
04	OR Operating System Fundamentals	12 weeks
05	Computer Networks and Internet Protocol	12 weeks
06	Introduction to Database Systems	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Cloud computing	12 weeks
02	Information Security - 5 - Secure Systems Engineering	12 weeks
03	Introduction to parallel programming with OpenMP and MPI	8 weeks
04	Introduction to Internet of Things	8 weeks

05	Multi-Core Computer Architecture - Storage And Interconnects	12 weeks
06	Internetwork Security	12 weeks
07	Advanced Computer Architecture	8 weeks
08	OR Advanced computer architecture	12 weeks
09	Ethical Hacking	12 weeks
10	Introduction to Blockchain Technology and Applications	8 weeks
11	OR Block chain Architecture Design and Use Cases	12 weeks
12	GPU Architectures and Programming	12 weeks
13	C-Based VLSI Design	12 weeks
14	Real-Time Systems	12 weeks
15	Introduction to Computer and Network Performance Analysis using Queuing Systems	4 weeks
16	Foundation of Cloud IoT Edge ML	8 weeks
17	Design and Engineering of Computer Systems	8 weeks

ELECTRICAL ENGINEERING

1. VLSI Designs: Core Courses		
Sl. No	Course Name	Duration
01	Basic electrical circuits	12 weeks
02	OR Basic Electric Circuits	12 weeks
03	OR Network Analysis	12 weeks
04	Analog circuits	12 weeks
05	OR Analog Electronic Circuit	12 weeks
06	OR Analog Circuits	8 weeks
07	OR Analog Electronic Circuits	12 weeks
08	OR Microelectronics: Devices to Circuits	12 weeks
09	Digital Electronic Circuits	12 weeks
10	OR Digital Circuits	12 weeks
11	Fundamentals of semiconductor devices	12 weeks
12	OR Semiconductor Devices and Circuits	12 weeks
13	OR Introduction to Semiconductor Devices	12 weeks
14	Microprocessors and Microcontrollers	12 weeks
15	Analog Electronic Circuits - IITM	12 weeks
16	Analog VLSI Design	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Hardware modeling using verilog	8 weeks
02	VLSI Physical Design	12 weeks
03	Mapping Signal Processing Algorithms to Architectures	12 weeks
04	Digital IC Design	12 weeks
05	Power Management Integrated Circuits	12 weeks
06	Microprocessors and Interfacing	12 weeks
07	Introduction to Time - Varying Electrical Networks	12 weeks
08	System Design Through VERILOG	8 weeks
09	Circuit Analysis for Analog Designers	12 weeks
10	Design and Analysis of VLSI Subsystems	12 weeks
11	Physics of Nano scale Devices	12 weeks
12	Phase-locked loops	12 weeks
13	VLSI Interconnects	8 weeks
14	Semiconductor device modeling and Simulation	12 weeks
15	VLSI Design Flow: RTL to GDS	12 weeks

2. Communication and Signal Processing: Core Courses		
Sl. No	Course Name	Duration
01	Principles of Signals and Systems	12 weeks
02	OR Signals and Systems	12 weeks
03	Digital Signal Processing	12 weeks
04	OR Discrete Time Signal Processing	8 weeks
05	OR Digital Signal Processing and its Applications	12 weeks
06	Probability Foundations for Electrical Engineers	8 weeks
07	Principles of Communication Systems - I	12 weeks
08	Principles of Communication Systems: Part - II	8 weeks
09	OR Principles of Digital Communications	12 weeks
10	Applied Linear Algebra	12 weeks
11	Communication Networks	12 weeks
12	Signal Processing Techniques And Its Applications	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	An Introduction to Information Theory	8 weeks
02	OR An Introduction to Coding Theory	8 weeks
03	OR Information Theory	12 weeks
04	Introduction to Wireless and Cellular Communications	12 weeks
05	Digital Image Processing	12 weeks
06	OR Image Signal Processing	12 weeks
07	Multirate DSP	12 weeks
08	Principles and Techniques of Modern Radar Systems	12 weeks
09	Statistical Signal Processing	12 weeks
10	Stochastic Modeling and the Theory of Queues	12 weeks
11	Signal Processing for mm Wave communication for 5G and beyond	12 weeks
12	Concentration inequalities	8 weeks
13	Stochastic control and communication	12 weeks
14	Semiconductor device modeling and Simulation	12 weeks
15	Modern Computer Vision	12 weeks
16	डिजिटल स्विचिंग (Digital Switching)	8 weeks
17	Simulation Of Communication Systems Using Matlab	12 weeks
18	Introduction To Adaptive Signal Processing	8 weeks
19	Machine Learning And Deep Learning -- Fundamentals And Applications	12 weeks

3. Power Systems and Power Electronics: Core Courses

Sl. No	Course Name	Duration
01	Basic electrical circuits	12 weeks
02	OR Basic Electric Circuits	12 weeks
03	OR Network Analysis	12 weeks
04	Electrical machines - I	12 weeks
05	OR Electrical Machines	12 weeks
06	OR Electrical Machines - I	12 weeks
07	OR Electrical Machines - II	12 weeks
08	Power System Engineering	12 weeks
09	OR Power system analysis	12 weeks
10	Fundamentals of Power Electronics	12 weeks
11	OR Power Electronics	12 weeks

Elective Courses

Sl. No	Course Name	Duration
01	Control engineering	12 weeks
02	Electrical Measurement and Electronic Instruments	12 weeks
03	Computer Aided Power System Analysis	12 weeks
04	Fundamentals of Electric Drives	8 weeks
05	High Power Multilevel Converters- Analysis, Design and Operational Issues	12 weeks
06	Power Management Integrated Circuits	12 weeks
07	DC Power Transmission Systems	12 weeks
08	Design of Power Electronic Converters	8 weeks
09	Power System Protection and Switchgear	8 weeks
10	Power System Protection	12 weeks
11	Smart Grid: Basics to Advanced Technologies	12 weeks
12	Power Quality	12 weeks
13	Control and Tuning Methods in Switched Mode Power Converters	12 weeks
14	Operation and Planning of Power Distribution Systems	12 weeks
15	Digital Protection of Power System	8 weeks
16	Digital Control in Switched Mode Power Converters and FPGA-based Prototyping	12 weeks
17	Economic Operations And Control Of Power Systems	12 weeks
18	Design Of Electric Motors	12 weeks
19	Sustainable Power Generation Systems	12 weeks

4. Control and Instrumentation: Core Courses

Sl. No	Course Name	Duration
01	Principles of Signals and Systems	12 weeks
02	OR Signals and Systems	12 weeks
03	Basic electrical circuits	12 weeks
04	OR Basic Electric Circuits	12 weeks
05	OR Network Analysis	12 weeks
06	Control engineering	12 weeks
07	OR Control systems	12 weeks
08	Electrical Measurement and Electronic Instruments	12 weeks
09	Analog circuits	12 weeks
10	OR Analog Electronic Circuit	12 weeks
11	OR Analog Circuits	8 weeks
12	OR Analog Electronic Circuits	12 weeks
13	OR Microelectronics: Devices to Circuits	12 weeks
14	Microprocessors and Microcontrollers	12 weeks
15	Applied Linear Algebra	12 weeks
16	Transducers For Instrumentation	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Linear System Theory	12 weeks
02	OR Linear Dynamical Systems	8weeks
03	Control System Design	12 weeks
04	Industrial Instrumentation	12 weeks
05	Design for internet of things	8 weeks
06	OR Design for internet of things	8weeks
07	Advanced IOT Applications	8weeks
08	Sensors and Actuators	12 weeks
09	Statistical Signal Processing	12 weeks
10	Nonlinear System Analysis	12 weeks
11	Mathematical Aspects of Biomedical Electronic System Design	12 weeks
12	Introduction to Biomedical Imaging Systems	12 weeks

5. Photonics: Core Courses		
Sl. No	Course Name	Duration
01	Introduction to Photonics	12 weeks
02	Optical Engineering	12 weeks
03	Applied Electro magnetics For Engineers	12 weeks
04	OR Transmission Lines and Electromagnetic	12 weeks

	Waves	
Elective Courses		
Sl. No	Course Name	Duration
01	Optical Sensors	4 weeks
02	Optical communications	12 weeks
03	Computational Electro magnetics	12 weeks
04	Fiber Optics	8 weeks
05	Microwave Engineering	12 weeks
06	Photonic integrated circuit	12 weeks
07	Biophotonics	12 weeks
08	Fiber Optic Communication Technology	12 weeks
09	Semiconductor Optoelectronics	12 weeks
10	Ultrafast Optics and Spectroscopy	12 weeks
11	Laser: Fundamentals and Applications	8 weeks
12	Optical Spectroscopy and Microscopy : Fundamentals of optical measurements and instrumentation	12 weeks
13	Optical Fiber Sensors	12 weeks
14	Integrated Photonics Devices and Circuits	12 weeks
15	Advanced Microwave Guided-Structures and Analysis	12 weeks
16	Fundamentals Of Nano And Quantum Photonics	12 weeks
17	RF and Microwave Networks	12 weeks
18	Optical Wireless Communications for Beyond 5G Networks and IoT	12 weeks
19	Nanobiophotonics: Touching Our Daily Life	12 weeks
20	Nanophotonics, Plasmonics, And Metamaterials	12 weeks

MANAGEMENT

1. Marketing: Core Courses		
Sl. No	Course Name	Duration
01	Marketing Management-I	8 weeks
02	Marketing Management - II	8 weeks
03	Consumer Behaviour	8 weeks
04	Marketing research and analysis	8 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Services Marketing: A Practical Approach	4 weeks
02	Sales and Distribution Management	8 weeks
03	Management of Field Sales	4weeks
04	Global Marketing Management	12 weeks
05	Marketing Research and Analysis - II	12 weeks
06	Managing Services	8weeks
07	Customer Relationship Management	8 weeks
08	Retail Management	8 weeks
09	Introduction To Marketing Essentials	12 weeks
10	Integrated Marketing Communication	12 weeks
11	International Marketing	8 weeks

2. Operations: Core Courses		
Sl. No	Course Name	Duration
01	Introduction to probability and Statistics	4 weeks
02	OR Data Analysis and Decision Making - I	12 weeks
03	Introduction to Operations Research	8 weeks
04	Operations and Supply Chain Management	12 weeks
05	Introduction to Data Analytics	8 weeks
06	OR Business Statistics	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Project Management	8 weeks
02	OR Project management for managers	12 weeks
03	Total Quality Management - I	8 weeks
04	Total Quality Management - II	8 weeks
05	Strategy: An Introduction to game Theory	8 weeks
06	Six Sigma	12 weeks
07	Quality Design and Control	12 weeks

08	Supply Chain Analytics	8 weeks
09	Management of Inventory Systems	12 weeks
10	Decision modeling	8 weeks
11	Decision-Making Under Uncertainty	4 weeks
12	Design and Analysis of Experiments	12weeks
13	Practitioners Course In Descriptive, Predictive And Prescriptive Analytics	8 weeks
14	Business Analytics for Management Decision	12 weeks
15	Selected Topics in Decision Modeling	8 weeks
16	Data Analysis & Decision Making - II	12 weeks
17	Data Analysis & Decision Making - III	12 weeks
18	MCDM Techniques Using R	4 weeks
19	Manufacturing Strategy	8 weeks
20	Advanced Green Manufacturing Systems	12 weeks
21	Toyota Production System	8 weeks
22	The Future of Manufacturing Business: Role of Digital Technologies	8 weeks
23	The Future of Manufacturing Business: Role of Digital Technologies	8 weeks
24	Automation in Production Systems and Management	12 weeks
25	Decision making with spreadsheet	12 weeks

3. Marketing: Core Courses

Sl. No	Course Name	Duration
01	Introduction to Operations Research	8 weeks
02	Marketing Management-I	8 weeks
03	Operations and Supply Chain Management	12 weeks
04	Financial Accounting	8 weeks
05	OR Decision making using financial accounting	8 weeks
06	OR Financial accounting - IIT Mandi	12 weeks
07	Principles of Management	12 weeks
08	OR Principles of Management	12 weeks

4. Patents and Intellectual Property Rights: Core Courses

Sl. No	Course Name	Duration
01	Patent Law for Engineers and Scientists	12 weeks
02	Patent Search for Engineers and Lawyers	8 weeks
03	Patent Drafting for Beginners	4 weeks
04	Roadmap for patent creation	8 weeks

Elective Courses		
Sl. No	Course Name	Duration
01	Intellectual Property Rights and Competition Law	8 weeks
02	Innovation, Business Models and Entrepreneurship	8 weeks
03	Innovation by Design	4weeks
04	Managing Intellectual Property in Universities	4weeks

5. Economics: Core Courses		
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Sl. No	Course Name	Duration
01	An Introduction to Microeconomics	12 weeks
02	OR Microeconomics: Theory & Applications	12 weeks
03	Engineering Econometrics	12 weeks
04	OR Introduction to Econometrics	12 weeks
05	OR Applied Statistics and Econometrics	12 weeks
06	OR Applied Econometrics	12 weeks
07	OR Econometric Modelling	8 weeks
08	OR Applied Econometrics	12 weeks
09	Economic Growth and Development	8 weeks

Elective Courses		
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Sl. No	Course Name	Duration
01	Infrastructure Economics	8 weeks
02	Energy Economics and Policy	8 weeks
03	OR Energy Resources, Economics and Environment	12 weeks
04	Introduction to Environmental Economics	12 weeks
05	OR Environmental & Resource Economics	12 weeks
06	Economics of Health and Health Care	8 weeks
07	Game theory	8 weeks
08	OR Strategy: An Introduction to game Theory	8 weeks
09	Economics of IPR	4 weeks
10	Mathematics for Economics - I	12 weeks

6. Managerial Economics: Core Courses		
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Sl. No	Course Name	Duration
01	Foundation Course in Managerial Economics	8 weeks
02	OR Managerial Economics	12 weeks
03	An Introduction to Microeconomics	12 weeks
04	OR Microeconomics: Theory & Applications	12 weeks

Elective Courses		
Sl. No	Course Name	Duration
01	Engineering Econometrics	12 weeks
02	OR Introduction to Econometrics	12 weeks
03	OR Applied Statistics and Econometrics	12 weeks
04	OR Applied Econometrics	12 weeks
05	OR Econometric Modelling	8 weeks
06	OR Applied Econometrics	12 weeks
07	Game theory	8 weeks
08	OR Strategy: An Introduction to game Theory	8 weeks
09	Business Statistics	12 weeks
10	Decision making using financial accounting	8weeks
11	Financial Institutions and Markets	12 weeks
12	Introduction to Operations Research	8weeks
13	Decision-Making Under Uncertainty	4 weeks
14	Economics of IPR	4 weeks
15	Automation in Production Systems and Management	12 weeks
16	Business and Sustainable Development	4 weeks
17	Computer Aided Decision Systems - Industrial practices using Big Analytics	12 weeks
18	Organizational Design Change and Transformation	12 weeks
19	Mergers, Acquisitions and Corporate Restructuring	8weeks
20	Business Development: From Start to Scale	12 weeks
21	Investment Management	8weeks
22	Artificial Intelligence (AI) for Investments	12 weeks

7. Economics and Finance: Core Courses		
Sl. No	Course Name	Duration
01	An Introduction to Microeconomics	12 weeks
02	OR Microeconomics: Theory & Applications	12 weeks
03	Financial Mathematics	12 weeks
04	Behavioral and Personal Finance	8 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Decision making using financial accounting	8 weeks
02	Financial Institutions and Markets	12 weeks
03	Probability and Stochastics for Finance	8 weeks
04	OR Introduction to Probability Theory and Stochastic Processes	12 weeks

05	OR Introduction to Stochastic Processes	12 weeks
06	Corporate Finance	8 weeks
07	Security Analysis & Portfolio Management	12 weeks
08	Investment Management	8 weeks
09	Artificial Intelligence (AI) for Investments	12 weeks

METALLURGICAL AND MATERIALS ENGINEERING

1. Materials Joining: Core Courses		
Sl. No	Course Name	Duration
01	Weldability of Metals	8 weeks
02	OR Welding Metallurgy	12 weeks
03	Welding Processes	12 weeks
04	OR Joining Technologies For Metals	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Advances in Welding and Joining Technologies	8 weeks
02	Theory and Practice of Non Destructive Testing	8 weeks
03	Analysis and Modeling of Welding	8 weeks
04	Welding of Advanced High Strength Steels for Automotive Applications	4weeks
05	Thermo-Mechanical and Thermo-Chemical Processes	8 weeks
06	Aqueous Corrosion and Its Control	12 weeks
07	Cathodic Protection Engineering	4 weeks
08	Finite element modeling of welding processes	12 weeks
09	Corrosion Failures and Analysis	8 weeks
10	Mechanical Behaviour of Materials (Part ♦ I)	12 weeks

2. Electronics Materials: Core Courses		
Sl. No	Course Name	Duration
01	Physics of Materials	12 weeks
02	Fundamentals of electronic device fabrication	4 weeks
03	Fundamentals of electronic materials and devices	8 weeks
04	OR Fundamentals of semiconductor devices	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Solar Photovoltaics: Principles, Technologies & Materials	8 weeks
02	Material Characterization	12 weeks
03	Solid State Physics	8 weeks
04	Mechanical Behaviour of Materials (Part ♦ I)	12 weeks

3. Materials Characterization : Core Courses		
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Sl. No	Course Name	Duration
01	X-ray Crystallography & Diffraction	12 weeks
02	Fundamentals of X-ray diffraction and Transmission electron microscopy	8 weeks
03	Fundamentals of optical and scanning electron microscopy	8 weeks
04	Techniques of Material Characterization	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Elementary Stereology for Quantitative Metallography	4 weeks
02	Theory and Practice of Non Destructive Testing	8 weeks
03	Analytical chemistry	12 weeks
04	Texture in Materials	12 weeks
05	Mechanical Behaviour of Materials (Part ♦ I)	12 weeks

4. Minor in Metallurgy : Core Courses

Sl. No	Course Name	Duration
01	Iron making and Steelmaking	12 weeks
02	Aqueous Corrosion and Its Control	12 weeks
03	Mechanical Behavior of Materials	12 weeks
04	Material Characterization	12 weeks
05	Introduction to Materials Science and Engineering	12 weeks
06	Thermodynamics And Kinetics Of Materials	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Modeling of Tundish Steelmaking Process in Continuous Casting	8 weeks
02	Introduction to Mineral Processing	12 weeks
03	Corrosion/Environmental Degradation/Surface Engineering	12 weeks
04	Welding Processes	12 weeks
05	Powder Metallurgy	12 weeks
06	Corrosion - Part II	8 weeks
07	Thermo-Mechanical and Thermo-Chemical Processes	8 weeks
08	Dealing with Materials Data : Collection, Analysis and Interpretation	12 weeks
09	Properties of Materials (Nature and Properties of Materials : III)	8 weeks

10	Diffusion in Multi component Solids	12 weeks
11	Corrosion Failures and Analysis	8 weeks
12	Mechanical Behavior of Materials (Part \blacklozenge I)	12 weeks

MECHANICAL ENGINEERING

1. Computational Engineering: Core Courses		
Sl. No	Course Name	Duration
01	Engineering Mechanics	12 weeks
02	Numerical Methods for Engineers	12 weeks
03	Basics of Finite Element Analysis-I	8 weeks
04	OR Introduction to Finite Volume Methods I	8 weeks
05	Finite Element Method: Variational Methods to Computer Programming	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Foundations of Computational Materials Modelling	12 weeks
02	A short lecture series on contour integration in the complex plane	4 weeks
03	Fundamentals of Compressible Flow	12 weeks
04	High Performance Computing for Scientists and Engineers	8 weeks
05	Fundamentals of Convective Heat Transfer	12 weeks
06	Computational Fluid Dynamics using Finite Volume Method	12 weeks
07	Optimization from fundamentals	12 weeks
08	Evolutionary Computation for Single and Multi-Objective Optimization	8 weeks
09	Tools in Scientific Computing	8 weeks

2. Computational Thermo Fluids: Core Courses		
Sl. No	Course Name	Duration
01	Introduction to Fluid Mechanics	12 weeks
02	OR Advanced Fluid Mechanics	12 weeks
03	OR Advanced Concepts in Fluid Mechanics	12 weeks
04	OR Viscous Fluid Flow	12 weeks
05	OR Conduction And Convection: Fundamentals And Applications	12 weeks
06	OR Conduction And Convection: Fundamentals And Applications	12 weeks
07	Numerical methods	8 weeks
08	Computational Fluid Dynamics	12 weeks
09	OR Foundation of Computational Fluid Dynamics	8 weeks
10	OR Computational Fluid Dynamics for	12 weeks

	Incompressible Flows	
11	OR Computational Fluid Dynamics using Finite Volume Method	12 weeks
12	OR Computational Fluid Dynamics and Heat Transfer	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Turbulent Combustion: Theory and Modelling	12 weeks
02	Fundamentals of Compressible Flow	12 weeks
03	Fundamentals of Convective Heat Transfer	12 weeks
04	Computational Continuum Mechanics	12 weeks
05	Optimization from fundamentals	12 weeks
06	Evolutionary Computation for Single and Multi-Objective Optimization	8 weeks
07	Fundamentals of Combustion	12 weeks
08	Interfacial Fluid Mechanics	12 weeks

3. Advanced Mechanics: Core Courses		
Sl. No	Course Name	Duration
01	Engineering Mechanics	12 weeks
02	Solid Mechanics	12 weeks
03	Vibrations of structures	12 weeks
04	OR Introduction to Mechanical Vibration	8 weeks
05	OR Vibration and Structural Dynamics	8 weeks
06	Basics of Finite Element Analysis-I	8 weeks
07	OR Basics of Finite Element Analysis - II	8 weeks
08	OR Finite Element Method: Variational Methods to Computer Programming	12 weeks
09	Basics of Materials Engineering	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Numerical Methods for Engineers	12 weeks
02	Foundations of Computational Materials Modelling	12 weeks
03	A short lecture series on contour integration in the complex plane	4 weeks
04	Dynamic Behaviour of Materials	12 weeks
05	Theory of Elasticity	12 weeks
06	Computational Continuum Mechanics	12 weeks
07	Theory of Composite Shells	8 weeks
08	Finite element modeling of welding processes	12 weeks

09	Advanced Dynamics	12 weeks
10	Mechanics and Control of Robotic Manipulators	8 weeks
11	Engineering fracture mechanics	12 weeks
12	Experimental Stress Analysis	12 weeks
13	Vibrations of Plates and Shells	12 weeks
14	Dynamics and Control of Mechanical Systems	12 weeks
15	Nonlinear Adaptive Control	12 weeks

4. Propulsion: Core Courses

Sl. No	Course Name	Duration
01	Thermodynamics	12 weeks
02	Fundamentals of Combustion for Propulsion	8 weeks
03	OR Fundamentals of Combustion - I	8 weeks
04	OR Fundamentals of Combustion (Part 2)	8 weeks
05	OR Fundamentals of Combustion	12 weeks
06	OR Advanced Thermodynamics and Combustion	12 weeks
07	Aircraft Propulsion	12 weeks
08	Rocket Propulsion	12 weeks
09	Applied Thermodynamics for Engineers	12 weeks
10	OR Applied Thermodynamics	12 weeks
11	Fluid Mechanics	12 weeks

5. Energy Systems: Core Courses

Sl. No	Course Name	Duration
01	Thermodynamics	12 weeks
02	Applied Thermodynamics for Engineers	12 weeks
03	OR Applied Thermodynamics	12 weeks
04	Fluid Dynamics and Turbo machines	8 weeks
05	Heat Transfer	12 weeks
06	OR Heat Transfer	12 weeks
07	OR Conduction and Convection Heat Transfer	12 weeks
08	OR Transport Processes I: Heat and Mass Transfer	12 weeks
09	OR Fundamentals of Conduction and Radiation	12 weeks
10	OR Conduction And Convection: Fundamentals And Applications	12 weeks
11	Power Plant Engineering	8 weeks

Elective Courses

Sl. No	Course Name	Duration
01	Energy conservation and waste heat recovery	12 weeks
02	Bioenergy	8 weeks

03	OR Waste to Energy Conversion	8 weeks
04	Energy Economics and Policy	8 weeks
05	Non-Conventional Energy Resources	12 weeks
06	OR Technologies for clean and renewable energy production	8 weeks
07	Aircraft Propulsion	12 weeks
08	Selection of Nano materials for Energy Harvesting and Storage Application	4 weeks
09	Steam Power Engineering	8 weeks
10	Elements of Solar Energy Conversion	12 weeks
11	Fundamentals of Convective Heat Transfer	12 weeks
12	Advanced Thermodynamics and Combustion	12 weeks

6. Manufacturing Processes and Technology: Core Courses		
Sl. No	Course Name	Duration
01	Manufacturing Process Technology I & II	12 weeks
02	OR Manufacturing Process Technology - II	8 weeks
03	OR Theory of Production Processes	12 weeks
04	OR Production Technology: Theory and Practice	12 weeks
05	Manufacturing System Technology Part 1 & 2	12 weeks
06	Mechanics of Machining	8 weeks
07	Industrial Automation and Control	12 weeks
08	OR Automation in Manufacturing	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Introduction to Mechanical Micro Machining	12 weeks
02	Metal Cutting and Machine Tools	4 weeks
03	Machinery Fault Diagnosis and Signal Processing	12 weeks
04	Non Traditional Abrasive Machining Processes- Ultrasonic, Abrasive Jet and Abrasive Water Jet Machining	4 weeks
05	Sustainability through Green Manufacturing Systems: An Applied Approach	8 weeks
06	Rapid Manufacturing	12 weeks
07	Theory and Practice of Non Destructive Testing	8 weeks
08	Operations Management	12 weeks
09	Mathematical Modeling Of Manufacturing Processes	12 weeks
10	Design for Quality, Manufacturing and Assembly	8 weeks
11	Principles of Industrial Engineering	12 weeks
12	Computer Integrated Manufacturing	12 weeks

13	Machining Science	4 weeks
14	Plastic Working of Metallic Materials	12 weeks
15	Engineering Drawing and Computer Graphics	12 weeks
16	Mechatronics	8 weeks
17	Finite element modeling of welding processes	12 weeks
18	Manufacturing Processes - Casting and Joining	4 weeks
19	Wheeled Mobile Robots	8 weeks
20	Oil Hydraulics and Pneumatics	12 weeks
21	Robotics: Basics and Selected Advanced Concepts	12 weeks
22	OR Introduction to Robotics	12 weeks
23	Welding Application Technology	8 weeks
24	Fundamentals of Additive Manufacturing Technologies	12 weeks
25	Design of Mechatronic Systems	12 weeks
26	Laser Based Manufacturing	8 weeks
27	Metal Additive Manufacturing	12 weeks

7. Product Design: Core Courses		
Sl. No	Course Name	Duration
01	Manufacturing Guidelines for Product Design	8 weeks
02	Product Design and Development	4 weeks
03	Product Design and Manufacturing	12 weeks
04	Design Practice	8 weeks
05	Basics of Materials Engineering	12 weeks
06	Production Technology: Theory and Practice	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Design Practice - II	8 weeks
02	Ergonomics in Automotive Design	4 weeks
03	OR Ergonomics Workplace Analysis	4 weeks
04	System Design for Sustainability	12 weeks
05	Digital Human Modeling and Simulation for Virtual Ergonomics Evaluation	8 weeks
06	Gear and Gear Unit Design : Theory and Practice	8 weeks
07	Design for Quality, Manufacturing and Assembly	8 weeks
08	Robotics and Control : Theory and Practice	8 weeks
09	OR Robotics: Basics and Selected Advanced Concepts	12 weeks
10	OR Introduction to Robotics	12 weeks
11	Turbulent Combustion: Theory and Modelling	12 weeks
12	Engineering Drawing and Computer Graphics	12 weeks

13	Mechatronics	8 weeks
14	Manufacturing Processes - Casting and Joining	4 weeks
15	Wheeled Mobile Robots	8 weeks
16	Welding Application Technology	8 weeks
17	Fundamentals of Additive Manufacturing Technologies	12 weeks
18	Design of Mechatronic Systems	12 weeks

8. Advanced Dynamics and Vibration: Core Courses		
Sl. No	Course Name	Duration
01	Engineering Mechanics	12 weeks
02	Vibrations of structures	12 weeks
03	OR Introduction to Mechanical Vibration	8 weeks
04	Advanced Dynamics	12 weeks
05	Nonlinear Vibration	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Robotics and Control : Theory and Practice	8 weeks
02	Fundamentals of Acoustics	12 weeks
03	OR Acoustic and Noise Control	12 weeks
04	Acoustic Materials and Metamaterials	8 weeks
05	A short lecture series on contour integration in the complex plane	4 weeks
06	Computational Continuum Mechanics	12 weeks
07	Muffler Acoustics-Application to Automotive Exhaust Noise Control	12 weeks
08	Mechanics and Control of Robotic Manipulators	8 weeks
09	Vibrations of Plates and Shells	12 weeks
10	Dynamics and Control of Mechanical Systems	12 weeks
11	Nonlinear Adaptive Control	12 weeks

9. Computational Mechanics: Core Courses		
Sl. No	Course Name	Duration
01	Engineering Mechanics	12 weeks
02	Numerical Methods for Engineers	12 weeks
03	Basics of Finite Element Analysis-I	8 weeks

04	OR Finite Element Method	12 weeks
05	OR Introduction to Finite Volume Methods I	8 weeks
06	Finite Element Method: Variational Methods to Computer Programming	12 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Foundations of Computational Materials Modelling	12 weeks
02	A short lecture series on contour integration in the complex plane	4 weeks
03	Optimization from fundamentals	12 weeks
04	Computational Continuum Mechanics	12 weeks
05	Finite element modeling of welding processes	12 weeks
06	Evolutionary Computation for Single and Multi-Objective Optimization	8 weeks
07	Tools in Scientific Computing	8 weeks
08	Advanced Dynamics	12 weeks
09	Dynamics and Control of Mechanical Systems	12 weeks
10	Nonlinear Adaptive Control	12 weeks

10. Robotics: Core Courses		
Sl. No	Course Name	Duration
01	Introduction to robotics	12 weeks
02	OR Robotics	8 weeks
03	OR Mechanism and Robot Kinematics	8 weeks
04	OR Robotics and Control : Theory and Practice	8 weeks
05	OR Introduction to Robotics	12 weeks
06	OR Mechanics and Control of Robotic Manipulators	8 weeks
07	Wheeled Mobile Robots	8 weeks
Elective Courses		
Sl. No	Course Name	Duration
01	Sensors and Actuators	12 weeks
02	Microprocessors and Microcontrollers	12 weeks
03	Digital Image Processing	12 weeks
04	Fundamentals of Power Electronics	12 weeks
05	OR Power Electronics	12 weeks
06	Embedded Systems Design	12 weeks
07	OR Ethical Hacking	12 weeks
08	Industrial Automation and Control	12 weeks
09	Kinematics of Mechanisms and Machines	8 weeks

10	OR Mechanics of Human Movement	12 weeks
11	Modelling and Simulation of Dynamic Systems	8 weeks
12	Design of Mechatronic Systems	12 weeks
13	Fundamentals of Artificial Intelligence	12 weeks
14	OR An Introduction to Artificial Intelligence	12 weeks
15	Introduction to Machine Learning	8 weeks
16	OR Introduction to Machine Learning	12 weeks
17	OR Practical Machine Learning with Tensorflow	8 weeks
18	OR Machine Learning, ML	8 weeks
19	Reinforcement Learning	12 weeks
20	Deep Learning	12 weeks
21	OR Deep Learning	12 weeks
22	Robot Motion Planning	8 weeks

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Sl. No	Course Name
1	Artificial Intelligence for real world application
2	Machine Learning for Real World Applications
3	Applications of Deep Learning and Neural Networks
4	Data Mining and Warehousing
5	Data Analytics & Reporting
6	Data Modelling & Visualization
7	IoT and its Applications using Raspberry Pi
8	IoT Application Development on Cloud
9	Applied Cloud Computing
10	Cloud Development
11	Cloud Architecture
12	Information Security - A Practioner's perspective
13	Practical Approach to Cyber Security
14	Advanced Cyber Security - An Application Approach
15	Intelligent Game Design and its Applications
16	Augmented Reality and its Applications
17	Virtual Reality and its Applications
18	Data Analysis using Excel
19	Practical Approach to Data Mining and Analytics
20	Data Analytics & Reporting
21	Fintech Primer
22	Basic Econometrics
23	Blockchain in Fintech
24	Fintech Primer
25	Blockchain in Fintech
26	Ethereum and Smart Contracts: DApps Development
27	Fintech Primer
28	RPA - Developer Foundation
29	RPA in Fintech
30	Payment Systems
31	Retail & Commercial Banking
32	International Banking
33	Credit Analysis & Risk Management
34	Investment Banking
35	Treasury & Forex
36	Insurance Fundamentals
37	Life Insurance Basics
38	Life Insurance Advanced
39	General Insurance

40	Health Insurance
41	Reinsurance
42	Fundamental Analysis
43	Basics of Valuation & Credit
44	Equity & Other Asset Class
45	Corporate Finance
46	Portfolio Management
47	FSA & Derivatives

COURSERA

Sl. No	Course Name	Discipline	Duration
1	Big Data Foundations & Analytics	All	270
2	Block Chain Technologies and Applications	All	270
3	Data Analysis Using Excel	All	270
4	Design Thinking & Innovation	All	270
5	Digital Marketing	All	318
6	Discrete Mathematics	All	270
7	Emerging Technologies - Interdisciplinary	All	270
8	Engineering Design	All	271
9	Entrepreneurship	All	270
10	Essential Mathematics for Machine Learning	All	270
11	Practical Machine Learning with Tensorflow	All	270
12	Sustainable Business Strategy	All	270
13	Product Design and Development	All	270
14	Nanomaterials	All	270
15	Applied Thermodynamics	Aerospace, Civil, Mechanical	270
16	Electrical Engineering and Electronics Foundations	Aerospace, Civil, Mechanical	270
17	Logistics and Supply Chain Management	Aerospace, Civil, Mechanical	270
18	Construction Management	Aerospace, Civil, Mechanical	270
19	Advanced Spacecraft Dynamics and Control	Aerospace, Civil, Mechanical	270
20	Digital Signal Processing	Aerospace, Civil, Mechanical	270
21	Data Mining and Warehousing	CSE	326
22	Data Visualization with Python	CSE	270
23	Deep Learning for Computer Vision	CSE	270
24	Machine Learning with Python	CSE	270
25	Reinforcement Learning	CSE	270
26	Computer Vision	CSE, ECE, Aerospace	270

27	Neural Networks and Fuzzy Logic	CSE, ECE, Aerospace	270
28	Operating Systems	CSE, ECE, Aerospace	270
29	Software Testing & Quality Assurance	CSE, ECE, Aerospace	270
30	Microelectronics: Devices to Circuits	CSE, ECE, Aerospace	270
31	Wireless Sensor Networks	CSE, ECE, Aerospace	270
32	Optical Engineering	CSE, ECE, Aerospace	270
33	Battery Technologies	CSE, ECE, Aerospace	270
34	Computer Architecture	CSE, ECE, Aerospace	270
35	Digitalisation in Aeronautics and Space	ECE, Aerospace	270
36	FPGA Design for Embedded Systems	ECE, Aerospace	270
37	VLSI System Design	ECE, Aerospace, Civil, Mechanical	270
38	Computer Graphics	ECE, Aerospace, Civil, Mechanical	270
39	Management Information Systems	ECE, Aerospace, Civil, Mechanical	270
40	High Performance Computing	ECE, Aerospace, Civil, Mechanical	270