Jabalpur Engineering College, Jabalpur

(Declared Autonomous by MP Govt., Affiliated to RGPV, Bhopal)

(AICTE Model Curriculum Based Scheme)

Bachelor of Technology (B.Tech.) V Semester (Computer Science & Engineering)

w.e.f. Juy 2023

S.No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Hours Per Week			Total Credits
				Theory			Practical						
				End. Sem.	Mid Sem. Exam.	Quiz/ Assignment	End Sem.	Lab Work		L	T	P	
1	CS51	PEC	Professional Elective Course-I	70	20	10	-	-	100	3	1	-	4
2	CS52	PCC	Deep Learning	70	20	10	30	20	150	3	-	2	4
3	CS53	PCC	Operating Systems	70	20	10	30	20	150	3	-	2	4
4	CS54	PCC	Computer Graphics & Multimedia	70	20	10	30	20	150	3	-	2	4
5	BT51	HSMC	Professional Ethics	70	20	10	-	-	100	3	1	-	4
			Total	**350**	**100**	**50**	**90**	**60**	**650**	**15**	2	**6**	**20**
6	CS56	DLC	Self-Learning Presentation (SWAYAM/NPTEL/MOOC)	-	-	-	-	-	-	-	-	-	8
7	CS57	MC	NSS/NCC/Swatchhata Abhiyan/Rural Outreach	Qualifier									
Additional Course for Honours or Minor Specialization				Permitted to opt for maximum 8 credits against additional MOOC courses in subject code CS56 for the award of Honours (Minor Specialization).									

Note: 01. Departmental BOS will decide list of three/four optional subjects those are available in MOOC as well for PEC.

02. MOOC/NPTEL subjects shall be taken with permission of HOD/Coordinator.

Professional Elective Course-I		
S.No.	**Subject Code**	**Subject Name**
1	CS51A	Theory of Computation
2	CS51B	Advance Computer Architecture
3	CS51C	Virtual Reality

1 hour lecture (L) = 1 credit	1 hour Tutorial (T) = 1 credit	2 hour Practical (P) = 1 credit

PEC: Professional Elective Course, PCC: Professional Core Course, HSMC: Humanities and Social Sciences including Management Course, DLC: Distance Learning Course, MC: Mandatory Course,

DEAN
Academic
JEC, Jabalpur (M.P.)

Jabalpur Engineering College, Jabalpur
(Declared Autonomous by MP Govt., Affiliated to RGPV, Bhopal)
(AICTE Model Curriculum based scheme)
B. Tech. V Sem. (Computer Science & Engineering)

W.e.f. July 2023

Subject code	Subject Name	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical			L	T	P	
		End Sem	Mid Sem Exam	Quiz, Assignment	End Sem	Lab Work	Total Marks				
CS51A	**Theory of Computation**	70	20	10	-	-	100	3	1	-	4

Course Contents:

Module-I : Introduction of Automata Theory:

Examples of automata machines, Finite Automata as a language acceptor and translator, Types of Finite Automata: Non Deterministic Finite Automata (NDFA), Deterministic finite automata machines, Equivalence of NDFA and DFA, minimization of automata machines, Moore mealy machines, Conversion from Mealy to Moore and vice versa.

Module-II: Regular Expressions and Languages:
Arden's theorem. Finite Automata and Regular Expressions, Converting from DFA's to Regular Expressions, Properties of Regular Languages, The Pumping Lemma for Regular Languages, Applications of the Pumping Lemma, Closure Properties of Regular Languages, Decision Properties of Regular Languages.

Module –III: Grammars:
Types of grammar, context sensitive grammar, and context free grammar, regular grammar. Derivation trees, ambiguity in grammar, simplification of context free grammar, conversion of grammar to automata machine and vice versa, Chomsky hierarchy of grammar, Eliminating null and unit productions. Chomsky normal form and Greibach normal form.

Module-IV: Push down Automata:
Examples of PDA, deterministic and non-deterministic PDA, conversion of PDA into context free grammar and vice versa, CFG equivalent to PDA.

Module-V: Turing Machine:
Techniques for construction. Universal Turing machine Multitape, multihead and multidimensional Turing machine, N-P complete problems. Decidability and Recursively Enumerable Languages, decidability, decidable & undecidable languages, Halting problem of Turing machine & the post correspondence problem.

Suggested Books:

1. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, "Introduction to Automata Theory Languages and Computation", Pearson Education, India.
2. K. L. P Mishra, N. Chandrashekaran "Theory of Computer Science-Automata Languages and Computation", Prentice Hall of India.
3. Harry R. Lewis & Christos H. Papadimitriou, , "Element of the Theory computation ", Pearson.
4. Cohen, D.I. and Cohen, D.I., "Introduction to computer theory" , Wiley.

Theory of Computation(CS51A)

Course Outcomes:

CO1: Outline the concept of Finite Automata and Regular Expression.
CO2: Illustrate the design of Context Free Grammar for any language set.
CO3: Demonstrate the push down automaton model for the given language.
CO4: Make use of the Turing machine concept to solve the simple problems.
CO5: Explain decidability or undecidability of various problems.

DEAN
Academic
JEC, Jabalpur (M.P.)

Jabalpur Engineering College, Jabalpur
(Declared Autonomous by MP Govt., Affiliated to RGPV, Bhopal)
(AICTE Model Curriculum based scheme)
B. Tech. V Sem. (Computer Science & Engineering)

w.e.f. July 2023

Subject code	Subject Name	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical			L	T	P	
		End Sem	Mid Sem Exam	Quiz, Assignment	End Sem	Lab Work	Total Marks				
CS51B	**Advance Computer Architecture**	70	20	10	-	-	100	3	1	-	4

Course Contents:

Module I: Fundamentals:
Flynn's Classification, System Attributes to Performance, Parallel computer models - Multiprocessors and multicomputers, Multivector and SIMD Computers. Data and resource dependencies, Hardware and software parallelism,Program partitioning and scheduling, Grain size and latency, Control flow, data flow and Demand driven mechanisms. Static interconnection networks, Dynamic interconnection Networks: Bus Systems, Crossbar Switch, Multiport Memory, Multistage and Combining Networks.

Module II: Memory Organization:
Instruction set architecture, CISC Scalar Processors , RISC Scalar Processors, VLIW architecture, Memory Hierarchy, Inclusion, Coherence and Locality, Memory capacity planning. Interleaved memory organization- memory interleaving, pipelined memory access, Bandwidth and Fault Tolerance. Backplane Bus System: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt.

Module III: Pipelining:
Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, pipeline hazards, Dynamic instruction scheduling- score boarding and Tomosulo's algorithm, Branch handling techniques, Arithmetic Pipeline Design, Static arithmetic pipeline, Multifunctional arithmetic pipelines. Superscaler pipeline design, Super pipeline processor design.

Module IV: Vector Processing & Memory models:
Cache coherence, Snoopy protocols, Directory based protocols. Message routing schemes in multicomputer network, deadlock and virtual channel. Vector Processing Principles, Vector instruction types, Vector-access memory schemes. Vector supercomputer architecture, SIMD organization: distributed memory model and shared memory model. Principles of Multithreading: Multithreading Issues and Solutions, Multiple-Context Processors

Module V: Programming models:
Parallel Programming Models, Shared-Variable Model, Message-Passing Model, Data-Parallel Model, Object-Oriented Model, Functional and Logic Models, Parallel Languages and Compilers, Language Features for Parallelism, Parallel Programming Environment, Software Tools and Environments.

Suggested Books:

1. John L Hennessey, David A Patterson, "Computer Architecture: A Quantitative Approach", Elsevier.
2. Kai Hwang and Faye Briggs, "Computer Architecture and Parallel Processing", McGraw-Hill.
3. Sima D, Fountain T and Kacsuk P, "Advanced Computer Architectures: A Design Space" Addison Wesley

Advance Computer Architecture (CS51B)

Course Outcomes (COs):After completion of the course, Students will be able to:

CO1: Demonstrate concepts of parallelism in hardware/software.
CO2 : Discuss memory organization and mapping techniques.
CO3 : Describe architectural features of advanced processors.
CO4 : Interpret performance of different pipelined processors.
CO5 : Development of software to solve computationally intensive problems.

DEAN
Academic
JEC, Jabalpur (M.P.)

Jabalpur Engineering College, Jabalpur
(Declared Autonomous by MP Govt., Affiliated to RGPV, Bhopal)
(AICTE Model Curriculum based scheme)
B. Tech. (AICTE) V Sem. (Computer Science & Engineering)

w.e.f. July 2023

Subject code	Subject Name	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical			L	T	P	
		End Sem	Mid Sem Exam	Quiz, Assignment	End Sem	Lab Work	Total Marks				
CS51C	**Virtual Reality**	70	20	10	-	-	100	3	1	-	4

Course Contents:

Module I: Introduction to Virtual Reality:
Introduction, Computer graphics, Real time computer graphics, Flight Simulation, Virtual environment requirement, benefits of virtual reality, Historical development of VR, Scientific Landmark 3D Computer Graphics: Introduction, The Virtual world space, positioning the virtual observer, the perspective projection, human vision, stereo perspective projection, Colour theory, Simple 3D modelling, Illumination models, Reflection models.

Module II: Geometric Modelling:
Introduction, From 2D to 3D, 3D space curves, 3D boundary representation. Geometrical Transformations: Introduction, Frames of reference, Modelling transformations, Instances, Picking, Flying, Scaling the VE, Collision detection.

Module III: Virtual Environment
Virtual Environment: Introduction, Model of interaction, VR Systems, The dynamics of numbers, Linear and Nonlinear interpolation, the animation of objects, linear and non-linear translation, shape & object in between, free from deformation, particle system. Physical Simulation: Introduction, Objects falling in a gravitational field, Rotating wheels, Elastic collisions, projectiles, simple pendulum, springs, Flight dynamics of an aircraft.

Module IV: VR Hardware and Software
Human factors: Introduction, the eye, the ear, the somatic senses. VR Hardware: Introduction, sensor hardware, Head-coupled displays, Acoustic hardware, Integrated VR systems. VR Software: Introduction, Modelling virtual world, Physical simulation, VR toolkits, Introduction to VRML

Module V: VR Applications
Introduction, Engineering, Entertainment, Science, Training. The Future: Virtual environment, modes of interaction.

Suggested Books:

1. John Vince, "Virtual Reality Systems ", Pearson Education Asia
2. Anand R., "Augmented and Virtual Reality", Khanna Publishing House, Delhi.
3. Adams, "Visualizations of Virtual Reality", Tata McGraw Hill
4. Grigore C. Burdea, Philippe Coiffet , "Virtual Reality Technology", Wiley Inter Science.
5. William R. Sherman, Alan B. Craig, "Understanding Virtual Reality: Interface, Application and Design", Morgan Kaufmann.

Virtual Reality (CS51C)

Course Outcomes: After completion of the course, Students will be able to:

CO1: Understand the historical and modern overview and perspectives on virtual reality.
CO2: Describe important issues of VRML ,3D objects , Human Computer Interaction
CO3: Analysis of VR applications for Education, Medical, and learning environments.
CO4: Apply various types of hardware and software to virtual reality systems.

DEAN
Academic
JEC, Jabalpur (M.P.)

Jabalpur Engineering College, Jabalpur
(Declared Autonomous by MP Govt., Affiliated to RGPV, Bhopal)
(AICTE Model Curriculum based scheme)
B. Tech. V Sem. (Computer Science & Engineering)

w.e.f. July 2023

Subject code	Subject Name	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical			L	T	P	
		End Sem	Mid Sem Exam	Quiz, Assignment	End Sem	Lab Work	Total Marks				
CS52	**Deep Learning**	70	20	10	30	20	150	3	-	2	4

Course Contents:

Module I: Basics: Biological Neuron, Idea of computational units, McCulloch–Pitts unit and Thresholding logic, Linear Perceptron, Perceptron Learning Algorithm, Linear separability. Convergence theorem for Perceptron Learning Algorithm.

Module II: Feedforward Networks: Multilayer Perceptron, Gradient Descent, Backpropagation, Empirical Risk Minimization, regularization, autoencoders. **Deep Neural Networks:** Difficulty of training deep neural networks, Greedy layerwise training. **Better Training of Neural Networks:** Newer optimization methods for neural networks (Adagrad, adadelta, rmsprop, adam, NAG), second order methods for training, Saddle point problem in neural networks, Regularization methods (dropout, drop connect, batch normalization).

Module III: Convolutional Neural Networks: LeNet, AlexNet. **Recurrent Neural Networks:** Back propagation through time, Long Short Term Memory, Gated Recurrent Units, Bidirectional LSTMs, Bidirectional RNNs.

Module IV: Generative models: Restricted Boltzmann Machines (RBMs), Introduction to MCMC and Gibbs Sampling, gradient computations in RBMs, Deep Boltzmann Machines.

Module V: Recent trends: Variational Autoencoders, Generative Adversarial Networks, Attention Mechanism, Multi-task Deep Learning, Multi-view Deep Learning

Reference Books

1) Deep Learning, Ian Goodfellow and Yoshua Bengio and Aaron Courville, MIT Press.
2) Neural Networks: A Systematic Introduction, Raúl Rojas.
3) Pattern Recognition and Machine Learning, Christopher Bishop.
4) Satish Kumar, Neural Networks - A ClassRoom Approach, Second Edition, Tata McGraw-Hill.
5) B. Yegnanarayana, Artificial Neural Networks, Prentice- Hall of India

Deep Learning (CS52)
Course Outcomes: After completion of the course, Students will be able to:

CO1: Understand basic neural networks, including perceptron and learning algorithms.

CO2: Explain deep learning principles and challenges, focusing on optimization and regularization.

CO3: Analyze convolutional and recurrent neural networks, including LSTMs and GRUs.

CO4: Explore generative models like Restricted Boltzmann Machines.

CO5: Evaluate recent deep learning advancements like GANs and Attention Mechanisms.

DEAN
Academic
JEC, Jabalpur (M.P.)

Jabalpur Engineering College, Jabalpur
(Declared Autonomous by MP Govt., Affiliated to RGPV, Bhopal)
(AICTE Model Curriculum based scheme)
B. Tech. V Sem. (Computer Science & Engineering)

w.e.f. July 2023

Subject code	Subject Name	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical			L	T	P	
		End Sem	Mid Sem Exam	Quiz, Assignment	End Sem	Lab Work	Total Marks				
CS53	**Operating Systems**	70	20	10	30	20	150	3	0	2	4

Course Content:

Module I: Introduction: Concept of Operating Systems, Generations of Operating systems, Types of Operating Systems, OS Services, System Calls, Structure of an OS - Layered, Monolithic, Microkernel Operating Systems.

Module II: Processes: Definition, Process Relationship, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching. **Thread:** Definition, states, Types of threads, Concept of multi threads and its benefit. **Process Scheduling**: Foundation and Scheduling objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time; CPU Scheduling Algorithms.

Module III: Inter-process Communication and Deadlock: Critical Section, Race Conditions, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer\ Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dining Philosopher Problem etc. **Deadlocks:** Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery.

Module IV: Memory Management: Basic concept, Logical and Physical address map, Memory allocation, Fragmentation and Compaction, Paging, Protection and sharing, Disadvantages of paging. **Virtual Memory**: Basics of Virtual Memory, page fault, Demand paging, Page Replacement Algorithms.

Module V: Device Management: File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods, Free-space management, directory implementation, efficiency and performance.

I/O Hardware: I/O devices, Device controllers, Direct memory access Principles of I/O Software, Secondary-Storage Structure. **Disk Management:** Disk structure, Disk Scheduling Algorithms, Disk reliability, Disk formatting,Case study on UNIX and WINDOWS Operating System.

Suggested books:

1. Operating Systems, 3rd Edition by H.M.Deitel, P.J. Deitel And D.R.Choffnes. Pearson Publications Prentice Hall.
2. Modern Operating Systems, 4th Edition by Andrew S. Tanenbaum. Pearson publication.
3. Operating System Concepts Essentials, 9th Edition by Avi Silberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.
4. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings, Prentice Hall of India.
5. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, Irwin Publishing.
6. Operating Systems: A Modern Perspective, 2nd Edition by Gary J. Nutt, Addison-Wesley.
7. Design of the UNIX Operating Systems, 8th Edition by Maurice Bach, Prentice-Hall of India.
8. Understanding the Linux Kernel, 3rd Edition, Daniel P. Bovet, and Associates.

Operating Systems (CS53)
Course Outcomes: After completion of the course, Students will be able to:

CO1: Understand the fundamental concepts, types, structures and architectures of operating systems.

CO2: Apply process management concepts, including process states, scheduling algorithms, and the benefits of multithreading.

CO3: Analyze inter-process communication mechanisms and strategies for deadlock prevention, avoidance, and recovery.

CO4: Implement memory management techniques, including paging, fragmentation, and virtual memory, to optimize system performance.

CO5: Evaluate file and device management methods, including file system structures, disk scheduling algorithms, and I/O device management.

DEAN
Academic
JEC, Jabalpur (M.P.)

Jabalpur Engineering College, Jabalpur
(Declared Autonomous by MP Govt., Affiliated to RGPV, Bhopal)
(AICTE Model Curriculum based scheme)
B. Tech. (AICTE) V Sem. (Computer Science & Engineering) w.e.f. July 2023

Subject code	Subject Name	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical			L	T	P	
		End Sem	Mid Sem Exam	Quiz, Assignment	End Sem	Lab Work	Total Marks				
CS54	**Computer Graphics & Multimedia**	70	20	10	30	20	150	3	-	2	4

Course Content:

Module-I : Fundamentals:
Introduction to Raster Scan displays, Pixels, Frame buffer, Vector & Character generation, Random Scan systems, Display devices, Scan Conversion techniques, Line Drawing: simple DDA, Bresenham's Algorithm, Circle Drawing Algorithms: Midpoint Circle drawing and Bresenham's Algorithm, Polygon fill algorithm: Boundary-fill and Flood-fill algorithms

Module-II : 2-D Transformation:
Translation, Rotation, Scaling, Shearing, Reflection. Inverse Transformation, Homogenous coordinate system, Matrices Transformation, Composite Transformation. Windowing & Clipping: World Coordinate System, Screen Coordinate System, Viewing Transformation, Line Clipping & Polygon Clipping Algorithms.

Module-III : 3-D Transformations:
Translation, Rotation and Scaling. Parallel & Perspective Projection: Types of Parallel & Perspective Projection, Hidden Surface elimination: Depth comparison, Back face detection algorithm, Painter's Algorithm, Z-Buffer Algorithm.

Module-IV : Curve Generation and color model:
Curve generation, Bezier and Bspline methods. Basic Illumination Model: Diffuse reflection, Specular reflection, Phong Shading, Gouraud shading, Ray Tracing, Color models like RGB, YIQ, CMY, HSV.

Module-V : Multimedia & Animation:
Text –Types, Unicode Standard ,text Compression, Text file formats, Audio file formats , Image file formats , Digital Video processing, Video file formats. Compression techniques. Animation: Principles of Animation, Computer based animation, 2D and 3D Animation, Animation file formats, Animation software.

Suggested Books:

1. Rogers, "Procedural Elements of Computer Graphics", Tata McGraw Hill.
2. Donald Hearn and M.P. Becker "Computer Graphics" Pearson Pub.
3. Parekh "Principles of Multimedia" Tata McGraw Hill .
4. Maurya, "Computer Graphics with Virtual Reality System " , Wiley India.
5. Pakhira,"Computer Graphics ,Multimedia & Animation",PHI learning.
6. Andleigh, Thakral , "Multimedia System Design " PHI Learning.

Computer Graphics & Multimedia (CS54)

Course Outcomes: On successful completion of the course, the students will be able to:

CO1: Explain the basic concepts used in Computer Graphics, Multimedia and Animation.

CO2: Build and apply various algorithms for Scanning, Geometrical transformations, Area filling & Clipping.

CO3: Develop Curve Generation Algorithm, conclude for Illumination Model and select Color Model .

CO4: Design computer Graphics applications, Animation, Virtual Reality and Multimedia applications.

DEAN
Academic
JEC, Jabalpur (M.P.)

Jabalpur Engineering College, Jabalpur
(Declared Autonomous by MP Govt., Affiliated to RGPV, Bhopal)
(AICTE Model Curriculum based scheme)
B. Tech. V Sem. (Computer Science & Engineering)

w.e.f. July 2023

Subject code	Subject Name	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical			L	T	P	
		End Sem	Mid Sem Exam	Quiz, Assignment	End Sem	Lab Work	Total Marks				
BT51	**Professional Ethics**	70	20	10	-	-	100	3	1	-	4

Course Contents:

Module I: HUMAN VALUES

Morals, values and Ethics - Integrity - Work ethics-Service learning - Civics virtue - respect for others-Living peacefully-Caring-Sharing-Honesty-Courage Valuing time - Cooperation - Commitment - Empathy - Self confidence - Character - Spirituality Introduction to Yoga and meditation for professional excellence and stress management.

Module II: ENGINEERING ETHICS

Sensors of 'Engineering Ethics' - Variety of moral issues - Types of inquiry Moral dilemmas - Moral Autonomy - Kohiberg's theory-Gilligan's theory - Consensus and Controversy - Models of Professional roles - Theories about right action- Self-interest Customs and Religion - Uses of Ethical Theories.

Module III: ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as Experimentation - Engineering as responsible Experimenters - Codes of Ethics - A Balanced Outlook on Law.

Module IV: SAFETY, RESPONSIBILITIES AND RIGHT

Safety and Risk Assessment of Safety and Risk - Risk Benefit Analysis and Reducing Risk - Respect for Authority - collective Bargaining - Confidentially - Conflicts of interest - Occupational Crime Professional Rights - Employee Rights intellectual Property Rights (IPR) - Discrimination

Module V: GLOBAL ISSUES

Multinational Corporations - Environment Ethics Computer Ethics - Weapons Development - Engineering as Managers - Consulting Engineers - Engineering as Expert Witnesses and Advisors - Moral Leadership-Code of Conduct - Corporate Social Responsibility

Suggested Books:

1. Mike W.Martin and Roland Schinzinger, " Ethics in Engineering" Tata Mc-Graw Hill New Delhi, 2003
2. Govindarajan M, Natarajan S, Senthil Kumar V.S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004
3. A Textbook on Professional Ethics and Human Values, R S Nagarajan, New Age International Publishers
4. Charies B. Feddemann, "Engineering Ethics" Pearson Prentics Hall, New Jersey, 2004
5. Charies E. Herris, Michael S. Pritchard and Michael J. Rabins "Engineering Ethics - Concepts and Cases", Learning, 2009
6. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003
7. Edumund G Seebauer and Robert L. Barry," Fundamental of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001
8. Laura P. Hartman and joe Desjardins, " Business Ethics: Decision Making for Personal Integrity and Social Responsibility" Mc Graw Hill education India Pvt. Ltd., New Delhi 2013.
9. World Community Service Centre, " Value Education ", Vethathiri publication, Erode, 2011

Professional Ethics (BT51)

Course Outcome:After completion of the course, Students will be able to:

CO1. Understand the importance of Values and Ethics in their Personal lives and professional careers.
CO2. Explain the awareness of professional ethics and human values.
CO3. Know professional rights and responsibilities of an Engineer, safety and risk benefit analysis of an Engineer.
CO4. Know their role in technological development.

DEAN
Academic
JEC, Jabalpur (M.P.)