

## ME Admission Rules, Entrance Test, etc.

### Rule 1.0

The admissions to the ME courses are effected vide the Rules for admission to Post-Graduate Degree Courses (M.E.) for all branches in Engineering & Technology as per the Dr. Babasheb Ambedkar Marathwada University, Aurangabad, Circulars No. ACAD/PR OF/ENGG/M.E./17/2001-02 of September 4, 2001 and ACAD//ENGG/43/2008 of 24-09-2008.

### Rule 2.0:

#### Eligibility

Non-GATE candidates including sponsored candidates having at least 55% marks at Bachelor Degree level as specified below and GATE candidates possessing valid GATE score in the respective subject mentioned below will be eligible for admission to the respective course.

Sr. No.	Title of PG Degree	Qualifying Examinations Degree	GATE subject
1	ME (Computer Science)	BE/B Tech in Computer Science & Engineering or IT or Computer Technology or equivalent.	Computer Science & Engineering or equivalent.
2	ME (Communication Engineering)	BE/B Tech in Electronics & Communication/Telecommunication Engineering or Electronics Engineering or equivalent. .	Electronics & Communication Engineering or equivalent.
3	ME (Manufacturing Engineering)	BE/B Tech in Mechanical Engineering, or Industrial Engineering, or Production Engineering/Technology or equivalent.	Mechanical Engineering or equivalent.
4	ME (software Engineering)	BE/B Tech in Computer Science & Engineering or IT or Computer Technology or equivalent.	Computer Science & Engineering or equivalent
5	ME (Heat Power)	BE/B Tech in Mechanical Engineering, or Industrial Engineering, or Production Engineering/Technology or equivalent.	Mechanical Engineering or equivalent.

### Rule 3.0

The distribution of seats for each course is:

Sr. No.	Category	No. of Seats
1	Open	06
2	NTD/SBC	01
3	NT2/NT3	01
4	OBC	02
5	SC	02
6	ST	01
7	Sponsored	05
<b>Total:</b>		<b>18</b>

**Rule 4.0**

The GATE candidates having valid GATE score in the respective subject will be given preference and are exempted from appearing Entrance Test and Interview/viva-voce.

**Rule 5.0**

When enough GATE qualified candidates in the respective branch are not available, the vacant seats will be offered to the non-GATE candidates, excluding sponsored candidates, as per the merit based on total marks secured out of 100 as indicated below:

- Entrance Test : Maximum 70 marks
- Interview/ viva-voce : Maximum 30 marks

**Total Performance 100 marks, minimum qualifying marks 40%.**

The Entrance Test, mostly objective type, of one hour followed by Interview will conducted as per the schedule already declared.

**Rule 6.0****Sponsored candidates**

The sponsored candidates will have also to appear for the Entrance test and Interview/viva-voce as applicable to Non-GATE candidates as mentioned under Rule No. 5.0.

**Rule 7.0**

The candidates whom admissions have been offered are required to confirm admissions as per schedule already declared. At the time of confirmation the candidates will have to submit all relevant original certificates with a set of Xerox copies thereof and if found valid, the candidate will be allowed to pay full fees of the course as per the schedule declared. If a candidate fails to fulfill both these conditions, the admission offered to him will be withdrawn and summarily cancelled and the waiting list will be operated.

**Rule 8.0****The Tentative fees structure is:**

- Tuition fees: Rs 66,000/- pa, interim subject to approval of Shikshan Shulka Samiti, Government of Maharashtra. The candidate will be charged fees as approved and refund will be affected if it is less than Rs 66,000/- pa or candidate will have to pay the difference in fees, immediately if the SSS approved fees is higher than Rs 66,000/- pa.
- Other Fees such as Admission fees, Security Deposit (Refundable), Eligibility fees, University other fees, etc., as prescribed by the University/Management from time to time.

**Rule 9.0****Cancellation of admission & Refund of fees:**

In case of cancellation of admission, Rules for Refund of Tuition Fees as prescribed by the Competent Authority will be operative.

**Rule 10.0**

The candidates admitted to various branches will have to adhere strictly to the rules of conduct, discipline, Library, dress code, anti-ragging, etc as prescribed by the Institute from time to time.

**Rule 11.0****Hostel Facility:**

There are two Lady's Hostel Halls and two Gent's Hostel Halls. PG students can apply for the Hostel Facility as per Hostel Rules and can be offered accommodation, if seats are available.

**Syllabi for Entrance Test are appended herewith for each branch.**

## **Syllabus for Entrance Test of M. E. (Manufacturing Engineering)**

**Linear Algebra:** Algebra of matrices, system of linear equations, eigen values and eigen vectors, Numerical methods: Solution of system of linear equations, interpolation, numerical integration Newton-raphson method, runge-kutta method.

**Engineering materials:** Structure and properties of engineering materials and their applications, heat treatment.

Stress and strain, Elastic constants, stress-strain relationship, Mohr's circle, Design for static and dynamic loading, fatigue strength, failure theories, design of bolted, riveted and welded joints

**Metal casting:** Casting processes- pattern making, moulds and cores, solidification, design of casting, casting defects.

**Metal working:** Stress-strain diagrams for ductile and brittle material, plastic deformation, mechanisms, fundamentals of hot and cold working processes-forging, extrusion, wire drawing, sheet metal working, punching, blanking, and bending.

**Machining Processes and Machine Tool Operation:** Mechanics of metal cutting, single and multipoint cutting tools, geometry and machining aspects, tool life, machinability, economics of machining, non- traditional machining processes.

**Production Tooling:** Single and multi-point cutting tools, Circular tools, Press Tools, Jigs & Fixtures.

**Computer Integrated Manufacturing:** Basic concepts of CAD, CAM, Group technology, FMS.

**Work Study:** Method study, work measurement, time study, works sampling, job evaluation, merit rating.

**Production planning and control:** Forecasting models, aggregate production planning, master scheduling, materials requirements planning (MTP-I & II), inventory management, materials management, Material Handling, Plant Layout, and Line balancing.

**Operations Research:** Linear programming, simplex and duplex method, transportation, assignment, Replacement Analysis, Theory of Games, PERT and CPM.

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## **Syllabus for Entrance Test of M. E. (Communication Engineering)**

### **NETWORK: Network graphs:**

Nodal and mesh analysis. Network theorems; Fourier series, Laplace and Z transforms:

### **ANALOG CIRCUITS:**

BJT, JFETs and MOSFET, biasing and bias stability of transistor and FET amplifiers. Amplifiers: single and multi-stage, differential, operational, feedback and power. Analysis of amplifiers: Simple op-amp circuits. Filters, Oscillators, Function generators and wave-shaping circuits, Power supplies.

### **DIGITAL CIRCUITS:**

Boolean algebra, logic gates, digital IC families (DTL, TTL, ECL, MOS, CMOS). Combinational circuits: arithmetic circuits, code converters, multiplexers and decoders. Sequential circuits: latches and flip-flops, counters and shift-registers. Comparators, timers, multivibrators. Sample and hold circuits, ADCs and DACs. Semiconductor memories. Microprocessor (8085): architecture, programming, memory and I/O interfacing.

### **CONTROL SYSTEMS:**

Basic control system components; block diagrammatic description, reduction of block diagrams, properties of systems: transfer function, stability analysis, Signal flow graphs, transient and steady state response.

### **COMMUNICATION SYSTEMS:**

Fourier analysis of signals, Analog modulation systems, Digital modulation systems, Wireless communication systems, Mobile communication systems. Computer networks.

### **ELECTROMAGNETICS:**

Maxwell's equation, Wave equation. Pointing vector. Plane waves; reflection and refraction, Wave guides, Antenna theory.

### **DSP & VLSI:**

Basic concepts of Fourier transforms & digital filters, CMOS VLSI fundamentals, modeling styles in VHDL & **Fundamentals of Embedded Systems**

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## Syllabus for Entrance Test of M.E. (Computer Science)

**Digital Logic:** Logic functions, Minimization, Design and synthesis of combinational and sequential circuits; Number representation and computer arithmetic (fixed and floating point).

**Discrete Mathematics:** Sets, Relations, Functions, Groups, Lattice, Boolean algebra, Induction, Recurrence relations, Permutations, Combinations

**Programming and Data Structures:** Programming in C; Functions, Recursion, Parameter passing, Scope, Binding; Abstract data types, Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps. Object Oriented Programming.

**Algorithms:** Analysis, Asymptotic notation, Notions of space and time complexity, Worst and average case analysis; Design: Greedy approach, Divide-and-conquer; Tree and graph traversals, Connected components, Spanning trees, Shortest paths; Hashing, Sorting, Searching. Asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds.

**Theory of Computation:** Regular languages and finite automata, Context free languages and Push-down automata, Recursively enumerable sets and Turing machines.

**Compiler Design:** Lexical analysis, Parsing, Syntax directed translation, Runtime environments, Intermediate and target code generation, Basics of code optimization.

**Operating System:** Processes, Threads, Inter-process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems, I/O systems, Protection and security.

**Databases:** ER-model, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL), Transactions and concurrency control.

**Software Engineering:** Requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project, design, coding, testing, implementation, maintenance.

**Computer Networks:** ISO/OSI stack, LAN technologies (Ethernet, Token ring), Flow and error control techniques, Routing algorithms, Congestion control, TCP/UDP and sockets, IP(v4), Application layer protocols (icmp, dns, smtp, pop, ftp, http); Basic concepts of hubs, switches, gateways, and routers. Network security - basic concepts of public key and private key cryptography, digital signature, firewalls.

**Computer Graphics:** Hardware and software components of graphics systems. Output and filled data primitives. 2D and 3D geometric transformations. Two dimensional viewing: viewing pipeline, clipping, and windowing. Three dimensional viewing: viewing pipeline, viewing parameters, projections, viewing transformations, clipping, visible surface detection.

**Artificial Intelligence and Neural Networks :** Problems and Search, Problems, Problem Spaces, and Search, Heuristic Search Techniques, Knowledge Representation, Using Predicate Logic, Representing Knowledge Using Rules, Activations and Signals, Activation Models, Unsupervised Learning, Supervised Learning, Network Architecture.

**Web technologies:** HTML, XML, basic concepts of client-server computing.

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## Syllabus for Entrance Test of M.E. (Software Engineering)

**Software Engineering:** Requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project, design, coding, implementation, maintenance.

### **Software Requirements Modeling**

Use Case Modeling, Analysis Models, Dataflow diagram, state transition diagram, class diagrams, Object analysis, Problem Frames

### **Software Testing Techniques**

Black-Box, Boundary value, Bottom-up, Branch coverage, Inspections, Prototyping, Random Testing, Risk-based Testing, Regression Testing, Structured Walkthroughs, Performance Testing, White-Box Testing

### **Project Management Concepts:**

The Management Spectrum, People, Problem, Process, Project, Software Process & Project Metrics, Software Scope, Resources, Software Project Estimation, Decomposition Techniques, Empirical Estimation Model.

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## Syllabus for Entrance Test - M.E. (Heat Power)

**Fluid Mechanics:** Fluid properties, fluid statics, manometry, buoyancy -- Control-volume analysis of mass, momentum and energy, fluid acceleration -- Differential equation of continuity and momentum -- Bernoulli's equation -- Viscous flow of incompressible fluids -- Boundary layer, Elementary turbulent flow -- Flow through pipes, head losses in pipes, bends etc.

**Heat Transfer:** Modes of heat transfer -- One dimensional heat conduction, resistance concept, electrical analogy, unsteady heat conduction, fins -- Dimensionless parameters in free and forced convective heat transfer, Various correlations for heat transfer in flow over flat plates and through pipes -- Thermal boundary layer -- effect of turbulence -- Radiative heat transfer, black and grey surfaces, shape factors, network analysis -- Heat exchanger performance, LMTD and NTU methods.

**Thermodynamics:** Basics of Thermodynamics, Zeroth, First and Second laws of thermodynamics -- Thermodynamic system and processes -- Irreversibility and availability -- Behaviour of ideal and real gases, Properties of pure substances, calculation of work and heat in AD\_OSC ideal processes -- Analysis of thermodynamic cycles related to energy conversion -- Carnot, Rankine, Otto, Diesel, Brayton and Vapour compression cycles.

**Power Plant Engineering:** Steam generators -- Steam power cycles -- Steam turbines -- impulse and reaction principles, velocity diagrams, pressure and velocity compounding -- Reheating and reheat factor -- Condensers and feed heaters.

**IC Engines:** Requirements and suitability of fuels in IC engines, fuel ratings, fuel-air mixture requirements -- Normal combustion in SI and CI engines -- Engine performance calculations.

**Refrigeration and Air-conditioning:** Refrigerant compressors, expansion devices, condensers and evaporators -- Properties of moist air, psychrometric chart, basic psychrometric processes.

**Turbomachinery:** Components of gas turbines -- Compression processes, Centrifugal and Axial flow compressors -- Axial flow turbines, elementary theory -- Hydraulic turbines -- Euler-Turbine equation -- Specific speed, Pelton-wheel, Francis and Kaplan turbines -- Centrifugal pumps.

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