



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY  
ANANTAPUR  
ANANTAPUR – 515 002**

**Advt.No.JNTUA/DA/PTPG Courses/2011**

**Dt.06.05.2011**

**ADMISSION TO PART TIME M.Tech PROGRAMS 2011-12**

Applications are invited from eligible candidates **who are employed in and around Anantapur** for admission into **Part Time M.Tech.** Programmes of **JNTUA ,Anantapur** for the academic year 2011-2012. The courses are offered in the Specializations of **(1) Structural Engineering (2) Electrical Power Systems (3) Refrigeration & Air Conditioning (4) Digital Systems and Computer Electronics and (5) Computer Science & Engineering.** Admissions will be made on the basis of performance in the entrance test to be conducted by the J.N.T. University Anantapur, Anantapur. Application form, the details of the courses and other information can be downloaded from the website [www.jntuanantapur.org](http://www.jntuanantapur.org). The application along with all necessary enclosures with a Demand Draft for Rs.2000/- ( Rupees Two Thousands Only) drawn on any Nationalized Bank in favour of **The Registrar, JNTUA , Anantapur** payable at **SBI, JNTUEC Branch, JNTUA Campus, Anantapur (Code:2723)**, should reach **The Director i/c, Admissions, JNTUA, Anantapur 515 002** on or before **25.05.2011( Wednesday) by 4.00pm.**

**Sd/- REGISTRAR i/c**



10. (a) Nationality & Religion  
 (b) Do you belong to Andhra Pradesh ? : YES / NO  
 (c) If not mention the State to which you belong :  
 (d) Place of Birth :

	Village	Mandal	District	State
(i) Candidate				
(ii) Father/Mother				

11. Particulars of Parent/Guardian :  
 (Guardian, only if Parent is not alive) :

- (a) Name:  
 (b) Relationship with the candidate :  
 (c) Profession and Designation :

12. Particulars of qualifying Examination (Enclose Xerox copies of provisional Certificates)

Name of the Qualifying Examination	Name of the University Or Board	Month & Year of Passing	Total Marks Obtained At the qualifying examination

13. Particulars of Employment (s) : since passing the qualifying examination (enclose service certificate in proof)

Name of the Post	Employer	Scale of Pay / Salary drawn	Period	
			From	to

**DECLARATION BY THE APPLICANT**

I declare that all the foregoing statements made in this application are true. I accept that any statement made in this application, if found incorrect on scrutiny, the application will be liable for rejection and admission, if granted on the basis of such incorrect information, will stand cancelled.

I declare that I have not joined and will not join any course of study of any University / Institute during the period of my study in this University and will abide by the rules and regulations of this University.

Date :

Place :

Signature of the Candidate

## CERTIFICATE OF EMPLOYMENT AND NO OBJECTION

(This Certificate is to be signed by the Head of the Office/Organisation in which the Applicant is employed)

This is to certify that Mr./Ms. \_\_\_\_\_  
S/o/Daughter of \_\_\_\_\_ a candidate  
applying for admission into Part Time M.Tech. \_\_\_\_\_ Course of JNTUA is currently employed  
in Full-Time service with \_\_\_\_\_ Designation in our Organisation. The Details  
of his/her employment are given below:

1. Name and Address of the Organisation :
2. Status of the Organisation : Govt. Department/Public Sector Undertaking/Recognised\*  
Private Sector Enterprises
3. Date of joining the Organisation :
4. (a) Present Position and date of appointment/promotion to this Post :  
(b) Scale of pay and total monthly Salary :
5. Total periods of full time service in this Organisation : \_\_\_\_\_ Years \_\_\_\_\_ Months
6. This Office/Organisation has **NO OBJECTION** to the candidate appearing for the Entrance and joining the part time M.Tech. Course of JNTUA, Anantapur if selected.

Date :

1. Name :

Place :

2. Designation :

Seal of Office

Signature of Head of the Organisation

Private Sector Organisation shall furnish documentary evidence for recognition, such as APGST Registration, Industry licence, Approval/licence from concerned Government or Public Sector Departments.

- Note :
1. Incomplete applications will be summarily rejected. No Correspondence in this regard will be entertained.
  2. Fee once paid will not be refunded under any circumstances.
  3. University will not be responsible for any postal delay/loss in transit.

ADDRESS SLIP
Name :

ADDRESS SLIP
Name :

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ADDRESS SLIP
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ADDRESS SLIP
Name :

**ORIGINAL**

**HALL TICKET**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR, ANANTAPUR**

**ENTRANCE TEST FOR ADMISSION TO  
Part Time M.Tech. Programmes 2011**

Specialization in which admission is sought:

Hall Ticket No:

Centre of Examination:

**DATE OF EXAMINATION:**

**TIME:**

(To be filled in by the Candidate)

Name of the Candidate \_\_\_\_\_

Father's /Husband's Name \_\_\_\_\_

Identification Marks : (1) \_\_\_\_\_

(2) \_\_\_\_\_

Affix recent passport  
size  
Photograph duly  
attested  
by  
Gazetted Officer with  
official seal

Signature of Candidate

DIRECTOR i/c, Admissions  
JNTUA, ANANTAPUR.

**DUPLICATE**

**HALL TICKET**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR, ANANTAPUR**

**ENTRANCE TEST FOR ADMISSION TO  
Part Time M.Tech. Programmes 2011**

Specialization in which admission is sought:

Hall Ticket No:

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**DATE OF EXAMINATION:**

**TIME:**

(To be filled in by the Candidate)

Name of the Candidate \_\_\_\_\_

Father's /Husband's Name \_\_\_\_\_

Identification Marks : (1) \_\_\_\_\_

(2) \_\_\_\_\_

Affix recent passport  
size  
Photograph duly  
attested  
by  
Gazetted Officer with  
Official seal

Signature of Candidate

DIRECTOR i/c, Admissions  
JNTUA, ANANTAPUR.

**INSTRUCTIONS TO THE CANDIDATES APPEARING FOR THE ENTRANCE EXAMINATION:**

1. Candidates will not be admitted after the commencement of the examination and are not allowed to leave the hall until the end of the examination.
2. The Hall Ticket shall be produced at the time of examination, failing which the candidate will not be allowed to write the examination.
3. Answers must be written in black/blue ink.
4. THE HALL TICKET SHALL BE PRESERVED TILL THE TIME OF ADMISSION and shall be produced at the time of admission.
5. No travelling expenses will be paid for journey undertaken for appearing for the Entrance Examination/Counseling.
6. Adoption of any kind of unfair means or malpractice at the time of examination will render the applicant liable for cancellation of his/her performance in the examination. Decision of the the Chief Superintendent of the Examination Centre shall be final in all these matters.
7. Issue of Hall Ticket and appearance at the Entrance Examination does not automatically entitle a candidate for admission.
8. Mathematical Tables, Calculators, Pagers, Mobile Phones and any other electronic gadgets will not be allowed into the Examination Hall.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR  
ANANTAPUR 515 002 AP**

**ACKNOWLEDGEMENT OF APPLICATION**

The application of Mr./Ms. \_\_\_\_\_  
for admission into Part Time M.Tech. of JNTUA in the specialization of  
\_\_\_\_\_ is received on \_\_\_\_\_.  
The application No. is \_\_\_\_\_.

**Director i/c, Admissions**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR  
ANANTAPUR 515 002**

**ADMISSION TO PART TIME M.Tech. PROGRAMMES 2011-2012**

**INFORMATION TO THE CANDIDATES**

- a) **DETAILS OF THE COURSES :** Applications are invited for admission to the following Part Time M.Tech. Courses of JNTUA, Anantapur for the academic year **2011-2012**. The details of the courses and the eligibility criteria are given below:

<b>S.No.</b>	<b>Name of the Course</b>	<b>Eligibility Criteria</b>	<b>Intake</b>
1.	<b>M.Tech. Structural Engineering</b>	B.E/B.Tech/AMIE in Civil Engg./ Construction Engg.	25
2.	<b>M.Tech. Electrical Power Systems</b>	B.E/B.Tech/AMIE in Electrical and Electronics Engg.	25
3.	<b>M.Tech. Refrigeration &amp; Air Conditioning</b>	B.E/B.Tech/AMIE in Mechanical Engg./Automobile Engg./Mechanical Engg. (Mechatronics) /Mechanical Engg.(Production Engineering) / Aeronautical Engineering /Industrial Engg./Production Engg/Industrial & Production Engg./Marine Engg. (OR) equivalent	25
4.	<b>M.Tech. Digital Systems and Computer Electronics</b>	B.E./B.Tech in ECE/ AMIE (Electronics and Telecommunication Engg.) OR Equivalent	25
5.	<b>M.Tech. Computer Science &amp; Engineering</b>	B.E./B.Tech/AMIE in any branch of Engineering/ M.Sc. (Computers /Electronics/Mathematics)/M.C.A	25

**Note: The courses will be conducted in JNTUA College of Engineering, Anantapur . The candidates working in and around Anantapur only need to apply.**

- b) Candidates with requisite qualifications are only eligible to apply. Applications received in response to these notifications in the prescribed format will only be considered. No other request for admission will be entertained.
- c) Separate application must be submitted for each specialization.
- d) **FEE STRUCTURE :**  
Tuition fee is Rs.3000/- per subject per semester and Extra amount will be collected for the project work period.

At the time of admission around Rs. 7300/- is to be paid towards miscellaneous fees like Caution Deposit etc.

e) **APPLICATIONS SHOULD BE ACCOMPANIED BY THE FOLLOWING:**

- i) A Demand Draft for Rs.2000/- (Rupees Two Thousands Only) drawn on any nationalized Bank in favour of Registrar, JNTUA, Anantapur, payable at SBI,JNTUEC Branch Anantapur. **This amount includes Application Fee and Registration Fee for Entrance Examination.**
- ii) Attested copy of Degree Certificate /Provisional Certificate of qualifying Examination
- iii) Attested copies of all Marks Memos pertaining to the qualifying Examination
- iv) Attested copy of Date of Birth Certificate
- v) Attested copies of all Study Certificates from IV Class to the qualifying Degree
- vi) Attested copy of Transfer Certificate from the Institution in which the candidate has last studied
- vii) Attested Copy of Migration Certificate from the University in which the candidate has last studied
- viii) Attested Copy of Integrated Permanent Community Certificate in case of SC/ST/BC in the prescribed proforma
- ix) Attested Copy of the Physically Handicapped Certificate in specified format from District Medical Board in case of PH Category
- x) Three self addressed envelopes of 25x10 cms. Size duly, stamped (affixing Rs.5.00 stamps)

**Note: The Originals of all the attested copies of the Certificates enclosed are to be produced at the time of admission without fail.**

- f) **The University will run a particular course only if 75% of the seats in that course are filled up.**
- g) The admissions are subject to the availability of minimum number of eligible candidates. The University reserves the right to offer or cancel a particular specialization depending upon the number of applicants.
- h) Application Fee and Registration fee will not be refunded under any circumstances.

- i) The University reserves the right to make alterations in the intake and rules for admission.
- j) Admission will be closed within one month of the commencement of the first semester class work irrespective of the vacancies.
- k) If it is detected that a candidate has been admitted due to any mistake made inadvertently in the processing of applications and during the admission stage, the University reserves the right to cancel the seat at any stage.
- l) Admission will be closed within two weeks of the commencement of the first semester class work irrespective of the vacancies.
- m) Appearance for the Entrance Examination does not automatically entitle the candidate for admission.
- n) If any dispute concerning admissions in the courses of JNTUA arises, the jurisdiction shall remain with the Courts in Anantapur only.
- o) **DURATION OF THE COURSE:** The duration of the course is six semesters including the Project Work.
- p) **ENTRANCE EXAMINATION SCHEDULE:**  
Entrance examination to any course will be conducted only if the number of eligible candidates who have applied for that course is more than the number of seats available in that course. In case, if the entrance examination is necessary, the entrance examination will be for one hour duration with 60 multiple choice questions. The candidates will be given ranks based on the marks obtained in the entrance examination and the ranks will be displayed in the JNTUA web site. The date of counseling and admission will be intimated to the eligible candidates and will also be displayed in the JNTUA web site.

SL.NO	SPECIALIZATION	DATE OF EXAMINATION	TIME OF EXAMINATION
1	Structural Engineering	15.06.2011	10.00 AM to 11.00 AM
2	Electrical Power Systems		
3	Refrigeration & Air Conditioning		
4	Digital Systems and Computer Electronics		
5	Computer Science & Engineering	15.06.2011	12.00 TO 1.00 PM

**Note:** The list of candidates eligible to appear for the entrance test will be displayed in the web site and the candidates have to collect the Hall Tickets one day prior to the entrance test from the Office of the Director i/c, Admissions between 10.00 am to 5.00 pm, if the Hall tickets are not received by Post.

**q) GENERAL:**

Application complete in all respects (in A4 size) accompanied with a Demand Draft for the required amount drawn in favor of “**THE REGISTRAR, JNTUA, ANANTAPUR**” payable at **SBI, JNTUEC Branch, JNTUA Campus, Anantapur (Code:2723)** is to be submitted to **Director i/c, Admissions, JNT University Anantapur, Anantapur 515 002**” either in person or by Registered post /Courier on or before **25.05.2011 (Wednesday) by 4.00.P.M.**

The University is not responsible for any delay or loss of application in transit. Incomplete applications or applications received after the last date will not be considered and fee paid will not be refunded.

**Registrar i/c**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**ANANTAPUR 515 002 AP**  
**ADMISSIONS INTO PART TIME M.Tech. COURSES 2011-12**  
**SYLLABUS FOR ENTRANCE EXAMINATION**  
**STRUCTURAL ENGINEERING**

*ENGINEERING MATHEMATICS*

**Linear Algebra:** Matrix algebra, Systems of linear equations, Eigen values and Eigen vectors.

**Calculus:** Functions of single variable, limit, continuity and differentiability, mean value theorems, evaluation of definite and improper integrals, partial derivatives, total derivative, maxima and minima, Gradient Divergence and Curl, Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.

**Differential equations:** First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Cauchy's and Euler's equations, initial and boundary value problems, Laplace- transforms, Solutions of one dimensional heat and wave equations and Laplace equation.

**Complex variables:** Analytic functions, Cauchy's integral theorem, Taylor and Laurent series.

**Probability and Statistics:** Definitions of probability and sampling theorems, Conditional probability, Mean median, mode and standard deviation, Random variables, Poisson, Normal and Binomial distributions.

**Numerical Methods:** Numerical solutions of linear and non-linear algebraic equations Integration by trapezoidal and Simpson's rule, single and multi-step methods for differential equations.

*STRUCTURAL ENGINEERING*

**Mechanics:** Bending moment and shear force in statically determinate beam. Simple stress and strain relationship: Stress and strain in two dimensions, principal stresses, stress transformation, Mohr's circle Simple bending theory, flexural and shear stresses, unsymmetrical bending, shear center. Thin walled pressure vessels, uniform torsion, buckling of column, combined and direct bending stresses.

**Structural Analysis:** Analysis of statically determinate trusses, arches, beams, cables and frames, displacements in statically determinate structures and analysis of statically indeterminate structures by force / energy methods, analysis by displacement methods (slope deflection and moment distribution methods), influence lines for determinate and indeterminate structures. Basic concepts of matrix methods of structural analysis.

**Concrete Structures:** Concrete Technology- properties of concrete, basics of mix design. Concrete design basic working stress and limit state design concepts, analysis of ultimate load capacity and design of members subjected to flexure, shear, compression and torsion by limit state methods. Basic elements of prestressed concrete, analysis of beam sections at transfer and service loads.

**Steel Structures:** Analysis and design of tension and compression members, beams and beam columns, column bases. Connections- simple and eccentric, beam-column connections, plate girders and trusses plastic analysis of beams and frames.

## ***GEOTECHNICAL ENGINEERING***

**Soil Mechanics:** Origin of soils, soil classification, three - phase system, fundamental definitions; relationship and interrelationships, permeability and seepage, effective stress principle, consolidation, compaction, shear strength.

**Foundation Engineering:** Sub-surface investigations - scope, drilling bore holes, sampling, penetration test plate load test. Earth pressure theories, effect of water table, layered soils. Stability of slopes- infinite slopes finite slopes. Foundation types-foundation design requirements. Shallow foundations- bearing capacity effect of shape, water table and other factors, stress distribution, settlement analysis in sands and clays. Deep foundations - pile types, dynamic and static formulae, load capacity of piles in sands and clays, negative skin friction.

## ***WATER RESOURCES ENGINEERING***

**Fluid Mechanics and Hydraulics:** Properties of fluids, principle of conservation of mass, momentum, energy and corresponding equations, potential flow, applications of momentum and Bernoulli' s equation, laminar and turbulent flow, flow in pipes, pipe networks. Concept of boundary layer and its growth. Uniform flow, critical flow and gradually varied flow in channels, specific energy concept, hydraulic jump. Forces on immersed bodies, flow measurements in channels, tanks and pipes. Dimensional analysis and hydraulic modeling. Kinematics of flow, velocity triangles and specific speed of pumps and turbines.

**Hydrology:** Hydrologic cycle, rainfall, evaporation, infiltration, stage discharge relationships, unit hydrographs, flood estimation, reservoir capacity, reservoir and channel routing. Well hydraulics.

**Irrigation:** Duty, delta, estimation of evapotranspiration. Crop water requirements. Design of: lined and unlined-canals, waterways, head works, gravity dams and spillways. Design of weirs on permeable foundation. Types of irrigation system, irrigation methods. Water logging and drainage, sodic soils.

## ***ENVIRONMENTAL ENGINEERING***

**Water requirements:** Quality standards, basic unit processes and operations for water treatment. Drinking water standards, water requirements, basic unit operations and unit processes for surface water treatment, distribution of water. Sewage and sewerage treatment, quantity and characteristics of wastewater. Primary, secondary and tertiary treatment of wastewater, sludge disposal, effluent discharge standards. Domestic wastewater treatment, quantity of characteristics of domestic wastewater, primary and secondary treatment Unit operations and unit processes of domestic wastewater, sludge disposal.

**Air Pollution:** Types of pollutants, their sources and impacts, air pollution meteorology, air pollution control, air quality standards and limits.

**Municipal Solid Wastes:** Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/recycle, energy recovery, treatment and disposal).

**Noise Pollution:** Impacts of noise, permissible limits of noise pollution, measurement of noise and control of noise pollution.

## ***TRANSPORTATION ENGINEERING***

**Highway Planning:** Geometric design of highways, testing and specifications of paving materials, design of flexible and rigid pavements.

**Traffic Engineering:** Traffic characteristics, theory of traffic flow, intersection design, traffic signs and signal design, highway capacity.

## ***SURVEYING***

Importance of surveying, principles and classifications, mapping concepts, coordinate system, map projections, measurements of distance and directions, leveling, theodolite traversing, plane table surveying, errors and adjustments, curves.

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**ADMISSIONS INTO PART TIME M.Tech. COURSES 2011-12**  
**SYLLABUS FOR ENTRANCE EXAMINATION**  
**ELECTRICAL POWER SYSTEMS**

***ENGINEERING MATHEMATICS***

**Linear Algebra:** Matrix Algebra, Systems of linear equations, Eigen values and Eigen vectors.

**Calculus:** Mean value theorems. Theorems of integral calculus, Evaluation of definite and improper integrals, Partial Derivatives, Maxima and minima. Multiple integrals, Fourier series. Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.

**Differential equations:** First order equation (linear and nonlinear). Higher order linear differential equations with constant coefficients, Method of variation of parameters, Cauchy's and Euler's equations. Initial and boundary value problems, Partial Differential Equations and variable separable method.

**Complex variables:** Analytic functions, Cauchy's integral theorem and integral formula, Taylor's and Laurent' series, Residue theorem, solution integrals.

**Probability and Statistics:** Sampling theorems, Conditional probability, Mean, median, mode and standard deviation, Random variables, Discrete and continuous distributions, Poisson, Normal and Binomial distribution, Correlation and regression analysis.

**Numerical Methods:** Solutions of non-linear algebraic equations, single and multi-step methods for differential equations.

**Transform Theory:** Fourier Transform, Laplace transform, Z-transform.

***ELECTRICAL ENGINEERING***

**Electric Circuits and Fields:** Network graph, KCL, KVL, node and mesh' analysis, transient response of dc and ac networks; sinusoidal steady-state analysis, resonance, basic filter concepts; ideal current and voltage sources, Thevenin's, Norton's and Superposition and Maximum Power Transfer theorems, two-port networks, three phase circuits; Gauss Theorem, electric field and potential due to point, line, plane and spherical charge distributions; Ampere's and Biot-Savart's laws; inductance; dielectrics; capacitance.

**Signals and Systems :** Representation of continuous and discrete-time signals; shifting and scaling operations; linear, time-invariant and causal systems; Fourier series representation of continuous periodic signals; sampling theorem; Fourier, Laplace and Z transforms.

**Electrical Machines:** Single phase transformer - equivalent circuit, phasor diagram, tests, regulation and efficiency; three phase transformers - connections, parallel operation; auto transfer men energy conversion principles; DC machines - types, windings, generator characteristics, armature reaction and commutation, starting and speed control of motors; three phase induction motors - principles, types, performance characteristics, starting and speed control; single phase induction motors; synchronous machines - performance, regulation and Parallel operation of generators, motor starting, characteristics and applications; servo and stepper motors.

**Power Systems:** Basic power generation concepts; transmission line models and performance; cable performance, insulation; corona and radio interference; distribution systems; per-unit quantities; bus impedance and admittance matrices; load flow; voltage control; power factor correction; economic operation; symmetrical components; fault analysis; principles of overcurrent, differential and distance protection; solid state relays and digital protection; circuit breakers; system stability concepts, swing curves and equal area criterion; HVDC transmission and FACTS concepts.

**Control Systems:** Principles of feedback; transfer function; block diagrams; steady-state errors; Routh and Nyquist techniques; Bode plots; root loci; lag, lead and lead-lag compensation; state space model; state transition matrix, controllability and observability.

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**Electrical and Electronic Measurements:** Bridges and potentiometers; PMMC, moving iron, dynamometer and induction type instruments; measurement of voltage, current, power, energy and power factor; instrument transformers; digital voltmeters and multimeters; phase, time and frequency measurement; Q-meters; oscilloscopes; potentiometric recorders; error analysis.

**Analog and Digital Electronics:** Characteristics of diodes, BJT, FET; amplifiers - biasing, equivalent circuit and frequency response; oscillators and feedback amplifiers; operational amplifiers - characteristics and applications; simple active filters; VCOs and timers; combinational and sequential logic circuits; multiplexer; Schmitt trigger; multi-vibrators; sample and hold circuits; A/D and D/A converters; 8-bit microprocessor basics, architecture, programming and interfacing.

**Power Electronics and Drives:** Semiconductor power diodes, transistors, thyristors, triacs GTOs, MOSFETs and IGBTs - static characteristics and principles of operation; triggering circuits; phase control rectifiers; bridge converters - fully controlled and half controlled; principles of choppers and inverters; basic concepts of adjustable speed dc and ac drives.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**ANANTAPUR 515 002 AP**

**ADMISSIONS INTO PART TIME M.Tech. COURSES 2011-12**  
**SYLLABUS FOR ENTRANCE EXAMINATION**

**REFRIGERATION AND AIR CONDITIONING**

***ENGINEERING MATHEMATICS***

**Linear Algebra:** Matrix algebra, Systems of linear equations, Eigen values and Eigen vectors.

**Calculus:** Functions of single variable, Limit, continuity and differentiability, Mean value theorems, Evaluation of definite and improper integrals, Partial derivatives, Total derivative, Maxima and minima, Gradient, Divergence and Curl, Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.

**Differential equations:** First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Cauchy's and Euler's equations, Initial and boundary value problems, Laplace transforms, Solutions of one dimensional heat and wave equations, and Laplace equation.

**Complex variables:** Analytic functions, Cauchy's integral theorem, Taylor and Laurent series.

**Probability and Statistics:** Definitions of probability and sampling theorems, Conditional probability, Mean, median, mode and standard deviation, Random variables, Poisson, Normal and Binomial distributions.

**Numerical Methods:** Numerical solutions of linear and non-linear algebraic equations Integration by trapezoidal and Simpson's rule, single and multi-step methods for differential equations.

***APPLIED MECHANICS AND DESIGN***

**Engineering Mechanics:** Free body diagrams and equilibrium; trusses and frames; virtual work; kinematics and dynamics of particles and of rigid bodies in plane motion, including impulse and momentum (linear and angular) and energy formulations; impact.

**Strength of Materials:** Stress and strain, stress-strain relationship and elastic constants, Mohr's circle for plane stress and plane strain, thin cylinders; shear force and bending moment diagrams; bending and shear stresses; deflection of beams; torsion of circular shafts; Euler's theory of columns; strain energy methods; thermal stresses.

**Theory of Machines:** Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of slider-crank mechanism; gear trains; flywheels.

**Vibrations:** Free and forced vibration of single degree of freedom systems; effect of damping; vibration isolation; resonance, critical speeds of shafts.

**Design:** Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; principles of the design of machine elements such as bolted, riveted and welded joints, shafts, spur gears, rolling and sliding contact bearings, brakes and clutches.

***FLUID MECHANICS AND THERMAL SCIENCES***

**Fluid Mechanics:** Fluid properties; fluid statics, manometry, buoyancy; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations 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:** Zeroth, First and Second laws of thermodynamics; thermodynamic system and processes; Carnot cycle. Irreversibility and availability; behaviour of ideal and real gases, properties of pure substances, calculation of work and heat in ideal processes; analysis of thermodynamic cycles related to energy conversion.

**Applications:** *Power Engineering:* Steam Tables, Rankine, Brayton cycles with regeneration and reheat. *I. C. Engines:* air-standard Otto, Diesel cycles. *Refrigeration and air-conditioning:* Vapour refrigeration cycle, heat pumps, gas refrigeration, Reverse Brayton cycle; moist air: psychrometric chart, basic psychrometric processes. *Turbomachinery:* Pelton-wheel, Francis and Kaplan turbines - impulse and reaction principles, velocity diagrams.

## ***MANUFACTURING AND INDUSTRIAL ENGINEERING***

**Engineering Materials:** Structure and properties of engineering materials, heat treatment, stress strain diagrams for engineering materials.

**Metal Casting:** Design of patterns, moulds and cores; solidification and cooling; riser and gating design, design considerations.

**Forming:** Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging rolling, extrusion, drawing) and sheet (shearing deep drawing bending) metal forming processes; principles of powder metallurgy.

**Joining:** Physics of welding, brazing and soldering; adhesive bonding; design considerations in welding.

**Machining and Machine Tool Operations:** Mechanics of machining single and multi-point cutting tools, tool geometry and materials, tool life and wear, economics of machining; principles of nontraditional machining processes; principles of work holding, principles of design of jigs and fixtures

**Metrology and Inspection:** Limits, fits and tolerances; linear and angular measurements; comparators; gauge design; interferometry, form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly.

**Computer Integrated Manufacturing:** Basic concepts of CAD/CAM and their integration tools. Production Planning and Control: Forecasting models, aggregate production planning scheduling materials requirement planning.

**Inventory Control:** Deterministic and probabilistic models; safety stock inventory control systems

**Operations Research:** Linear programming, simplex and duplex method, transportation, assignment, network flow models, simple queuing models, ***PERT and CPM.***

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**ADMISSIONS INTO PART TIME M.Tech. COURSES 2011-12**  
**SYLLABUS FOR ENTRANCE EXAMINATION**

**DIGITAL SYSTEMS AND COMPUTER ELECTRONICS**

***ENGINEERING MATHEMATICS***

**Linear Algebra:** Matrix Algebra, Systems of linear equations, Eigen values and Eigen vectors.

**Calculus:** Mean value theorems, Theorems of integral calculus, Evaluation of definite and improper integrals, Partial Derivatives, Maxima and minima, Multiple integrals, Fourier series. Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.

**Differential equations:** First order equation (linear and nonlinear), Higher order linear differential equations with constant coefficients, Method of variation of parameters, Cauchy's and Euler's equations, Initial and boundary value problems, Partial Differential Equations and variable separable method.

**Complex variables:** Analytic functions, Cauchy's integral theorem and integral formula, Taylor's and Laurent series, Residue theorem, solution integrals.

**Probability and Statistics:** Sampling theorems, Conditional probability, Mean, median, mode and standard deviation, Random variables, Discrete and continuous distributions, Poisson, Normal and Binomial distribution, Correlation and regression analysis.

**Numerical Methods:** Solutions of non-linear algebraic equations, single and multi-step methods for differential equations.

**Transform Theory:** Fourier transform, Laplace transform, Z-transform.

***ELECTRONICS AND COMMUNICATION ENGINEERING***

**Networks:** Network graphs: matrices associated with graphs; incidence, fundamental cut set and fundamental circuit matrices. Solution methods: nodal and mesh analysis. Network theorems: superposition, Thevenin and Norton's maximum power transfer, Wye-Delta transformation. Steady state sinusoidal analysis using phasors. Linear constant coefficient differential equations; time domain analysis of simple RLC circuits, Solution of network equations using Laplace transform: frequency domain analysis of RLC circuits. 2-port network parameters: driving point and transfer functions. State equations for networks.

**Electronic Devices:** Energy bands in silicon, intrinsic and extrinsic silicon. Carrier transport in silicon: diffusion current, drift current, mobility, and resistivity. Generation and recombination of carriers, p-n junction diode, Zener diode, tunnel diode, BJT, JFET, MOS capacitor, MOSFET, LED, p-I-n and avalanche photo diode, Basics of LASERS. Device technology: integrated circuits fabrication process, oxidation, diffusion, ion implantation, photolithography, n-tub, p-tub and twin tub CMOS process.

**Analog Circuits:** Small Signal Equivalent circuits of diodes, BJTs, MOSFETs and analog CMOS. Simple diode circuits, clipping, clamping, rectifier. Biasing and bias stability of transistor and FET amplifiers. Amplifiers: single and multi-stage, differential and operational, feedback, and power. Frequency response of amplifiers. Simple op-amp circuits. Filters. Sinusoidal oscillators; criterion for oscillation; single-transistor and op-amp configurations. Function generators and wave shaping circuits, 555 Timers. Power supplies.

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

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**Signals and Systems:** Definitions and properties of Laplace transform, continuous-time and discrete-time Fourier series, continuous-time and discrete-time Fourier Transform, DFT and FFT, z-transform. Sampling theorem. Linear Time-Invariant (LTI) Systems: definitions and properties; causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structure, frequency response, group delay, phase delay. Signal transmission through LTI systems. .

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**Control Systems:** Basic control system components; block diagrammatic description, reduction of block diagrams. Open loop and closed loop (feedback) systems and stability analysis of these systems. Signal flow graphs and their use in determining transfer functions of systems; transient and steady state analysis of LTI control systems and frequency response. Tools and techniques for LTI control system analysis: root loci, Routh-Hurwitz criterion, Bode and Nyquist plots. Control system compensators: elements of lead and lag compensation, elements of Proportional-Integral-Derivative (PID) control. State variable representation and solution of state equation of LTI control systems.

**Communications:** Random signals and noise: probability, random variables, probability density function, autocorrelation, power spectral density. Analog communication systems: amplitude and angle modulation and demodulation systems, spectral analysis of these operations, superheterodyne receivers; elements of hardware, realizations of analog communication systems; signal-to-noise ratio (SNR) calculations for amplitude modulation (AM) and frequency modulation (FM) for low noise conditions. Fundamentals of information theory and channel capacity theorem. Digital communication systems: pulse code modulation (PCM), differential pulse code modulation (DPCM), digital modulation schemes: amplitude, phase and frequency shift keying schemes (ASK, PSK, FSK), matched filter receivers, bandwidth consideration and probability of error calculations for these schemes. Basics of TDMA, FDMA and CDMA and GSM.

**Electromagnetics:** Elements of vector calculus: divergence and curl; Gauss' and Stokes' theorems, Maxwell's equations: differential and integral forms. Wave equation, Poynting vector. Plane waves: propagation through various media; reflection and refraction; phase and group velocity; skin depth. Transmission lines: characteristic impedance; impedance transformation; Smith chart; impedance matching; parameters, pulse excitation. Waveguides: modes in rectangular waveguides; boundary conditions; cut-off frequencies; dispersion relations. Basics of propagation in dielectric waveguide and optical fibers. Basics of Antennas: Dipole antennas; radiation pattern; antenna gain.

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**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**ANANTAPUR 515 002 AP**

**ADMISSIONS INTO PART TIME M.Tech. COURSES 2011-12**  
**SYLLABUS FOR ENTRANCE EXAMINATION**

**COMPUTER SCIENCE AND ENGINEERING**

*ENGINEERING MATHEMATICS*

**Mathematical Logic:** Propositional Logic; First Order Logic.

**Probability:** Conditional Probability; Mean, Median, Mode and Standard Deviation; Random Variables; Distributions; uniform, normal, exponential, Poisson, Binomial.

**Set Theory & Algebra:** Sets; Relations; Functions; Groups; Partial Orders; Lattice; Boolean Algebra.

**Combinatorics:** Permutations; Combinations; Counting; Summation; generating functions; recurrence relations; asymptotics.

**Graph Theory:** Connectivity; spanning trees; Cut vertices & edges; covering; matching; independent sets; Colouring; Planarity; Isomorphism.

**Linear Algebra:** Algebra of matrices, determinants, systems of linear equations, Eigen values and Eigen vectors.

**Numerical Methods:** LU decomposition for Systems of linear equations; numerical solutions of non-linear algebraic equations by Secant, Bisection and Newton-Raphson Methods; Numerical integration by trapezoidal and Simpson's rules.

**Calculus:** Limit, Continuity & differentiability, Mean value Theorems, Theorems of integral calculus, evaluation of definite & improper integrals, Partial derivatives, Total derivatives, maxima & minima.

*COMPUTER SCIENCE AND ENGINEERING*

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

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

**Computer Organization and Architecture:** Machine instructions and addressing modes, ALU and data path, CPU control design, Memory interface, I/O interface (Interrupt and DMA mode), Instruction pipelining, Cache and main memory, Secondary storage.

**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.

**Algorithms:** Analysis, Asymptotic notation, Notions of space and time complexity, Worst and average case analysis; Design: Greedy approach, Dynamic programming, Divide-and-conquer; Tree and graph traversals, Connected components, Spanning trees, Shortest paths; Hashing, Sorting, Searching.

**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, dead-lock, 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), File structures (sequential files, indexing, Band B+ trees), Transactions and concurrency control.

**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.