



DELHI TECHNOLOGICAL UNIVERSITY

Established by Govt. of Delhi vide Act 6 of 2009
GOVERNMENT OF NCT OF DELHI
SHAHBAD DAULATPUR, BAWANA ROAD, DELHI

Discipline wise Syllabi of Screening Test for the post of Assistant Professors advertised vide Advt. No. F.DTU/Rectt./Asso. Prof./ Astd. Prof./2019 dated 01.07.2019.

S. No.	Name of Discipline	Syllabus
1	Software Engineering	Same as for GATE 2019 for Computer Science and Information Technology
2	Computer Engineering	
3	Information Technology	
4	Applied Physics	Same as for GATE 2019 for Physics
5	Engineering Physics	
6	Bio Technology	Same as for GATE 2019 for Bio Technology
7	Electronics & Communication Engineering	Same as for GATE 2019 for Electronics and Communication Engineering
8	Electrical Engineering	Same as for GATE 2019 for Electrical Engineering
9	Management (DSM)	<u>Unit-I</u>
10	Management (USME)	<p>Managerial Economics-Demand Analysis, Production Function, Cost-output relations, Market structures, Pricing theories, Advertising, Macro-economics, National Income concepts, Infrastructure-Management and Policy, Business Environment, Capital Budgeting.</p> <p><u>Unit-II</u></p> <p>The concept and significance of organizational behaviour-Skills and roles in an organization-Classical, Neo-classical and modern theories of organizational structure-Organizational design-Understanding and Managing individual behaviour personality-Perception-Values-Attitudes-Leaning-Motivation. Understanding and managing group behaviour, Processes-Inter-personal and group dynamics-Communication-Leadership-Managing change-Managing conflicts. Organizational development</p> <p><u>Unit-III</u></p> <p>Concepts and perspectives in HRM; HRM.in changing environment, Human resource planning-Objectives, Process and Techniques, Job analysis-Job description, Selecting human resources Induction, Training and Development, Exit policy and implications, Performance appraisal and evaluation, Potential assessment, Job evaluation, Wage determination, Industrial</p>



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		<p>Relations and Trade Unions, Dispute resolution and Grievance management, Labour Welfare and Social security measures</p> <p><u>Unit-IV</u></p> <p>Financial management-Nature and Scope, Valuation concepts and valuation of securities, Capital budgeting decisions-Risk analysis, Capital structure and Cost of capital, Dividend policy-Determinants, Long-term and short-term financing instruments, Mergers and Acquisitions</p> <p><u>Unit-V</u></p> <p>Marketing environment and Environment scanning.. Marketing Information, Systems and Marketing research; Understanding consumer and industrial markets; Demand Measurement and Forecasting; Market Segmentatton=- Targeting and Positioning; Product decisions, Product mix, Product Life Cycle; New product development; Branding and Packaging; Pricing methods and strategies, Promotion decisions-Promotion mix; Advertising; Personal selling; Channel management; Vertical marketing systems; Evaluation and control of marketing effort: Marketing of services; Customer. relation management; Uses of internet as a marketing medium-other related issues like branding, market development, Advertising and retailing on the net. New issues in Marketing.</p> <p><u>Unit-VI</u></p> <p>Role and scope of production management; Facility location; Layout planning and analysis; Production planning and. control-production process analysis; Demand forecasting. for operations; Determinants of product mix; Production scheduling; Work measurement; Time and motion study; Statistical Quality Control. Role and scope of Operations Research; Linear Programming; Sensitivity analysis; Duality; Transportation model; Inventory control; Queueing theory; Decision theory; Markov analysis; .PERT/CPM.</p> <p><u>Unit-VII</u></p> <p>Probability theory: Probability distributions-Binomial. Poisson, Normal and Exponential; Correlation and Regression analysis; Sampling. theory; Sampling distributions; Tests of Hypothesis; Large and small samples; t; z, F, Chi-square tests. Use of Computers in Managerial applications; . Technology issues and</p>
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		<p>Data processing in organizations; Information systems: MIS and Decision making; System analysis and design; Trends in Information Technology; Internet and Internet-based applications.</p> <p><u>Unit-VIII</u></p> <p>Concept of corporate strategy; Components of strategy formulation; Ansoff's growth vector; BCG Model; Porter's generic strategies; Competitor analysis; Strategic dimensions and group mapping; Industry analysis; Strategies in industry evolution, fragmentation, maturity and decline; Competitive strategy and corporate strategy; Transnationalization of world economy; Managing cultural diversity; Global Entry strategies; Globalisation of financial system and services; Managing international business; Competitive advantage of nations: R^mFP and WfO.</p> <p><u>Unit-IX</u></p> <p>Concepts-Types, Characteristics; Motivation; Competencies and its development; Innovation and Entrepreneurship; Small business--Concepts Government policy for promotion of small tiny enterprises; Process of business opportunity identification; Detailed business plan preparation; Managing small enterprises; Planning for growth; Sickness in Small Enterprises; Rehabilitation of sick enterprises; Intrapreneurship (organisational entrepreneurship).</p> <p><u>Unit-X</u></p> <p>Ethics and Management system; Ethical issues and analysis in management; Value based organisations; Personal framework for ethical choices; Ethical pressure on individual in organisations; Gender issues; Ecological consciousness; Environmental ethics; Social responsibilities of business; Corporate governance and ethics.</p>
11	Economics (USME)	<p>1. Micro – Economic Analysis</p> <ul style="list-style-type: none"> • Demand Analysis – Marshallian, Hicksian and Revealed preference approaches. • Theory of Production and Costs. • Pricing and output under different forms of market structure. • Factor Pricing analysis. • Elements of general equilibrium and new welfare

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economics.

2. Macro – Economic Analysis

- Determination of output and employment – Classical approach, Keynesian approach, Consumption hypotheses.
- Demand for Money – Fisher and Cambridge versions, Approaches of Keynesian, Friedman, Patinkin, Baumol and Tobin.
- Supply of Money, Determinants of money supply, High – powered money, Money multiplier.
- Phillips Curve analysis.
- Business cycles – Models of Samuelson, Hicks and Kaldor.
- Macro – economic Equilibrium – Relative roles of monetary and fiscal policies

3. Development and Planning

- Economic Growth, Economic Development and sustainable Development – Importance of institutions – Government and markets – Perpetuation of underdevelopment – Vicious circle of poverty, circular causation, structural view of underdevelopment – Measurement of development conventional, HDI and quality of life indices.
- Theories of Development – Classical, Marx and Schumpeter; Economic Growth – Harrod – Domar model, instability of equilibrium, Neoclassical growth – Solow's model, steady state growth. Approaches to development : Balanced growth, critical minimum effort, big push, unlimited supply of labour, unbalanced growth, low income equilibrium trap.
- Indicators and measurement of poverty.
- Importance of agriculture and industry in economic development – choice of techniques and appropriate technology – Investment criteria – Elementary idea of cost – benefit analysis.
- Trade and Aid – International trade as 'engine of growth' – Globalization and LDC's Objectives and role of monetary and fiscal policies in economic development Techniques of planning; Plan Models in



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India; planning in a market – oriented economy.

4. Public Finance

- Role of the Government in Economic activity – Allocation, distribution and stabilization functions; Private, Public and Merit goods.
- The Public Budgets – Kinds of Budgets, Zero – base budgeting, different concepts of budget deficits; Budgets of the Union Government in India Public Expenditure – Hypotheses; effects and evaluation.
- Public Revenue – Different approaches to the division of tax burden, incidence and effects of taxation; elasticity and buoyancy; taxable capacity Public Debt – Sources, effects, burden and its management.
- Fiscal Federalism – Theory and problems; Problems of Centre – State Financial relations in India.
- Fiscal Policy – Neutral and compensatory and functional finance; balanced budget multiplier.
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5. International Economics

- Theories of International Trade : Empirical verification and Relevance International Trade under Imperfect competition Terms of Trade and Economic Growth – Secular Deterioration of Terms of Trade Hypothesis – a critical review.
- Equilibrium / disequilibrium in Balance of Payment – Traditional, Absorption and Monetary approaches for adjustment in the Balance of Payments, Foreign Trade multiplier.
- Impact of Tariffs, Partial and general equilibrium analysis; Political economy of Non-Tariff Barriers.
- Theory of regionalism at Global level – Collapse of Bretton – Wood System – Recent.
- Monetary reforms.
- Trade Policy and Reforms in India.



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		<p>6. Indian Economy</p> <ul style="list-style-type: none">• Basic Economic indicators – National income, performance of different sectors Trends in prices and money supply.• Agriculture – Institutional and technological aspects, new agricultural policy Industry – New industrial policy and liberalization.• Money and banking – Concepts of money supply, inflation, monetary policy and financial sector reforms.• Public finance – Trends in revenue and expenditures of the Central and State Governments, Public debt; analysis of the Union Budget.• Foreign trade – Trends, Balance of payments and trade reforms.• Poverty, unemployment, migration and environment. <p>7. Statistical Methods</p> <ul style="list-style-type: none">• Measures of Central tendency, dispersion, skewness and kurtosis.• Elementary theory of probability – Binomial, Poisson and Normal distributions.• Simple correlation and regression analysis.• Statistical inferences – Applications, sampling distributions (t, x^2 and F tests) sampling of attributes, testing of Hypothesis.• Index numbers and time series analysis.• Sampling and census methods, types of sampling and errors.
12	Mathematics & Computing	<p>Set, relation and function. Derivative and its applications. Definite integral and its applications. Sequences and series. First and second order linear differential equations with constant coefficients. Determinants and matrices. Laplace Transform. Fourier Series. Functions of several variables, Partial derivative and its applications.</p> <p>Multiple integrals and their applications. Differential equations with variable coefficients, series solution of differential equations. Formation of partial differential</p>



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equations, Lagrange's equation, Charpit's method, wave equation, heat equation. Differential and Integral vector calculus. Functions of complex variables, analytic function, conformal mapping, complex integration, Taylor series, Laurent series and the Residue theorem.

Numerical solution of algebraic and transcendental equations. Numerical differentiation and Integration. Iterative method for solution of system of simultaneous linear equations, numerical methods for solution of ordinary differential equations. Finite dimensional vector spaces, Linear transformation and their matrix representation, Cayley-Hamilton Theorem, Hermitian, skew hermitian and unitary matrices. Inner product space, Metric space, Completeness, Weierstrass approximation theorem, compactness. Group, sub group, Normal subgroup, cyclic group, Homomorphism, Isomorphism. Rings and their homomorphism, Ideal.

Programming fundamental & C/C++ Programming, Object oriented programming concepts using C++/Java. **Data Structures & algorithms**: Analysis algorithms, arrays, stack, queues, linked lists, trees, Binary search tree, Graphs, Sorting and searching. **Digital logic design**: Boolean algebra, logic functions, combinational & sequential circuit design, registers and counters, logic families. **Computer organization & architecture**: Introduction, CPU design, control unit design, memory organization, I/O devices, Computer Network-OSI, TCP/IP, Brief overview at OSI layers, IPv4, IPv6. **Database Management Systems**: Basic concepts, models and Languages, Database design and normalization, file organization, transaction Processing, concurrency control. **Theory of Computation**: Regular expression, Finite automata, context free grammar, pushdown automata, Turing machines.



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Operating system: Types, system structure, process management, CPU scheduling, deadlocks, memory management, I/O management, disk scheduling, file systems.

Computer graphics: Line, circle, ellipse drawing algorithms, line and polygon clipping, arc filling, curves and surfaces, transformations, projections. **Logic and Graphs:**

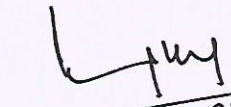
Propositional and predicate logic, Normal forms, theory of inference, Lattice and Boolean algebra. Basic concepts of graphs, connectivity, path and circuits, shortest path algorithms, tree, Spanning tree, planar graph and coloring, cut vertices and edges.

Probability and Statistics: Probability space, conditional probability, Baye's Theorem. Expectation and moments. Joint and conditional distributions. Correlation and regression, Binomial, Poisson, hypergeometric, normal and exponential distribution. Exact sampling distributions. Hypothesis testing, Large and small sampling. Analysis of Variance (ANOVA). **Basics of Stochastic Processes:**

Classification, Birth and Death process, Markov Chains. **Statistical Quality Control:** Control charts for

measurements and attributes. Components and analysis of a time series. **Linear programming:** Simplex method, Duality. Transportation and assignment problems. PERT and CPM. **Basics of financial mathematics:** Derivative

securities, Forward price formula, future pricing, value of commodity swap, Basics of option pricing and portfolio optimization.


08.7.19
Registrar