3. Entrance Exam for admission in PhD programme.

It was discussed and unanimously decided that the entrance exam pattern need to be modified in the interest of the students of all streams and decided that there should be equal number of questions from all four core branches i.e. Pharm Chemistry, Pharmaceutics, Pharmacology and Pharmacognosy. The recommended question pattern is as follows

S.No.	Specialization	No of questions	Marks	Syllabus
1	Pharmaceutics	25	25	Syllabus of GPAT examination
2	Pharmaceutical Chemistry	25	25	
3	Pharmacology	25	25	
4	Pharmacognosy	25	25	
		Total marks	100	

INSTITUTE OF HOTEL & TOURISM MANAGEMENT

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Syllabus for Entrance Test: *Ph.D (Hotel & Tourism Management)*

• Guest Service Management (Front Office, F&B Service)	10
• Housekeeping Operations & Management	10
• Culinary Services & Management	10
• Travel & Tourism Management	10
• Transport Systems & Management	10
• Human Resource Mgt.	10
• Marketing Management	10
• Statistical Tools for Hospitality & Tourism	10
• Researching Hospitality & Tourism Mgmt	10
• Use of Computers and Software in Hospitality & Tourism	10
Total	100

Department of Computer Science & Engineering

UIET, MDU, Rohtak

Syllabus for PhD Entrance Examination   2015-16

1. **Digital Logic, Computer Organization and Architecture:** Logic functions, Minimization, Design and synthesis of combinational and sequential circuits; Number representation and computer arithmetic (fixed and floating point). 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. Basics of microprocessors 8085, 8086.

2. **Data Structures & Algorithms:** Functions, Recursion, Parameter passing, Scope, Binding; Abstract data types, Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps. 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. Asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds, Basic concepts of complexity classes P, NP, NP-hard, and NP-complete.

3. **Object Oriented Programming & Languages** Programming: Element of C, C++, Java - Tokens, Identifiers, Variable and constants, Data types, Control structure, Sequence selection and iteration, Structured data types in arrays, structure, union, string an pointers, Operator, O-O Programming concepts, Classes, Object, Inheritance, Polymorphism and overloading, Control Statement, Function parameter passing, Constructor and destructor, overloading, inheritance temples , exception handling, templates. Scripting Languages, HTML, DHTML, JavaScript, Perl CGI, XML, basic concepts of client-server computing, Server side programming, Web Applications, Advanced Web Applications, Crawlers and Search Engines, Advanced Interactive Tools.

4. **Theory of Computation & Compiler Design:** Regular languages and finite automata, Context free languages and Push-down automata, Recursively enumerable sets and Turing machines, Undecidability. Lexical analysis, Parsing, Syntax directed translation, Runtime environments, Intermediate and target code generation, Basics of code optimization.

5. **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, Windows, Linux and Unix.

6. **Databases:** ER-model, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL), File structures (sequential files, indexing, B and B+ trees), Transactions and concurrency control, Data Ware Housing, Data Mining.

7. **Information Systems and Software Engineering:** System development cycle(SDCL) information gathering, 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, Software Metrics, Software Project Management, Software Design.

8. **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, Wireless networks.

9. **Graphics & Multimedia:** Display system, input devise, 2D, geometry, Graphics operation, 3D Graphics, Visible surface detection methods, Animation Graphic Standard, Application concepts, Storage Devices, Input Tools, Authoring Tools, Application files, Multimedia Authoring & User Interface, Compression, Decompression, Applications of Computer Graphics & Multimedia.

10. **Artificial Intelligence:** Elements of symbolic logic- Propositional (Boolean)logic, Predicate Logic, Well-formed-formula, Deduction, Satisfiability and Tautology, Refutation method, Applications of Problem solving, State space representation of problems, Search Space representation of Problems, Search Technique, breadth-first, depth-first, A*, Knowledge Representation-Frame, script, semantic nets, production system, Fuzzy Systems-Definition Fuzzy set, Fuzzy logic, Fuzzy relation, Fuzzy Function, Fuzzy reasoning, Fuzzy Applications.

Syllabus of Mechanical Engineering For Ph.D Entrance examination

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 non-traditional 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.