



Indian Institute of Information Technology Una [HP]

An Institute of National Importance under MoE

Saloh, Una (HP) – 177 209

Website: www.iiitu.ac.in

04.07.2022

ADVERTISEMENT

M.TECH. ADMISSIONS FOR NON STIPENDARY SEATS

Indian Institute of Information Technology Una (HP) is an Institute of National Importance established by the Act of Parliament in the year 2014-15. The institute is offering an M.Tech. Program in Computer Science and Engineering with specialization in Data Science/ Cyber Security from AY 2022-23 onwards. The institute invites applications for non-stipendiary M.Tech. (CSE) Admissions.

The interested candidates can submit their applications through Google Form Link latest by 26, Aug.'22 (17.00hrs) at the following Link: <https://forms.gle/SgHSwfMA9ACY9AVW6>

The complete details of institute counselling for non-stipendiary admission are as follows:

I. Registration Fee and Payment Procedure:

- A. Registration Fee (Non-Refundable): Rs.1000/- only.
- B. The step-by-step procedure for payment of Registration Fee using SBI Collect is as follows:
 - i Go to www.onlinesbi.com and select option SB Collect.
 - ii Click Accept terms and conditions and click Proceed further.
 - iii Select State of Corporate/Institute: Himachal Pradesh and Type of Corporate/Institute: Educational Institutions.
 - iv Select Educational Institutions Name: IIITU and click on submit button.
 - v Select payment category: 'PG APPLICATION PROCESSING FEES' and fill the details to proceed further.
 - vi After filling the Form, pay the amount and save a copy or take a print of the 'Proof Payment' for submission of application under non-stipendiary category.

II. Seat Matrix:

The following seat matrix is applicable for 15 non-stipendiary seats:

UR	08
OBC	03
SC	02
ST	01
EWS	01

III. Institute Counselling Schedule:

Sr.	Activities	Start Date	End Date
1.	Registration (Filling of Google Form and Payment of Non-Refundable Fee)	04, July'2022	26, Aug.'2022
2.	Publishing of the Shortlisted Candidates	29, Aug.'2022	
3.	Written Test and Counselling	03, Sept.'22	
4.	Commencement of in-person classes	12, Sept.'22	

IV. Venue and Detailed Schedule of Written Test, Counselling, and Admission (03, Sept. 2022):

Venue	Academic Block Computer Labs.
Reporting Time	09.30hrs.
Written Test	10.30 - 11.30hrs.
Result Declaration	14.00hrs.
Counselling and Admission	15.00hrs.
Seat Acceptance and Fee Payment	18.00hrs.

V. Eligibility Criteria for Institute-Written Test:

- a) Candidates should have Bachelor degree in Engineering, B.E./B.Tech. in CSE/IT disciplines with a minimum of 60% marks or CGPA 6.5 on a 10-point scale in the qualifying degree.
- b) Candidates having any pending backlog in the qualifying degree shall not be considered for admission.
- c) If the final semester result is awaited, candidates should have a minimum of 60% marks or CGPA 6.5 on a 10-point scale till pre-final semester and no existing backlog papers.
- d) Candidates should have a minimum of 60% or CGPA 6.5 on a 10-point scale in their X standard.
- e) Candidates should have a minimum of 60% or CGPA 6.5 on a 10-point scale in their XII standard.

VI. Counselling and Admission Process:

- a) Written Test is mandatory for admission through institute counselling.
- b) The change of date and time request will not be entertained.
- c) Admission through counselling shall be filled on the basis of merit prepared by giving 15% weightage to X performance, 15% weightage to XII performance, 30% weightage to B.E./B.Tech. performance, and 40% weightage to the institute-level written test.
- d) For GATE Qualified candidates, institute written test is exempted. However, 40% weightage of GATE performance will be considered in preparation of merit order.
- e) If a GATE qualified candidate desires to appear in the Institute written test, the best of the two will be considered in preparation of merit order.

VII. Publishing of Merit List, Seat Acceptance, and Fee Payment:

- a) The category wise merit list as per V.I.C will be prepared and published on the institute website/notice board at 14.00 hrs. on 03, Sept.'22.
- b) The seat acceptance and fee payment has to be made immediately after the result declaration but not later than 16.00hrs. on 03, Sept.'22.
- c) If the fee is not paid before the deadline, the seat will be declared as vacant. The vacant seats will be filled through remaining merit list order.

VIII. Written Test Syllabus Details:

- a) Total Questions: 50
- b) Duration: 1 hour.
- c) Test Type: MCQs.
- d) There will be no negative marking in the written test.
- e) The syllabus for the written test is attached in Annexure I.

IX. Institute Fee and Payment Procedure:

- a) Institute Fee is Rs.57,900/- per semester irrespective of the social/financial category.
- b) The instructions for hostel fee payment will be given to the admitted students and same shall be payable before occupation of hostel.
- c) The step-by-step procedure for payment of Institute Fee using SBI Collect is as follows:
 - i. Go to www.onlinesbi.com and select option SB Collect.
 - ii. Click Accept terms and conditions and click Proceed further.
 - iii. Select State of Corporate/Institute: Himachal Pradesh and Type of Corporate/Institute: Educational Institutions.
 - iv. Select Educational Institutions Name: IITU and click on submit button.
 - v. Select payment category: 'M.TECH. FEES' and fill the details to proceed further.
 - vi. After filling the Form, pay the amount and save a copy or take a print of the 'Proof Payment' for submission during course registration.

Annexure I
M.Tech. in Computer Science and Engineering
Written Examination Syllabus

Design and Analysis of Algorithms

- Unit-I **Algorithm Design paradigms**
Motivation, concept of algorithmic efficiency, run time analysis of algorithms, Asymptotic Notations. Structure of divide-and-conquer algorithms: sets and disjoint sets, Union and Find algorithms, quick sort, Finding the maximum and minimum, Quick Sort, Merge sort, Heap and heap sort.
- Unit-II **Greedy Algorithms**
Optimal storage on tapes, Knapsack problem, Job sequencing with deadlines, Minimum Spanning trees: Prim's algorithm, Kruskal's algorithm, Huffman codes.
- Unit-III **Dynamic programming**
Overview, difference between dynamic programming and divide and conquer, Matrix chain multiplication, Traveling salesman Problem, longest Common sequence, 0/1 knapsack.
- Unit-IV **Backtracking**
Queen Problem, Sum of subsets, graph colouring, Hamiltonian cycles. Branch and bound: LC searching Bounding, FIFO branch and bound, LC branch and bound application: 0/1 Knapsack problem, Traveling Salesman Problem.
- Unit-V **Computational Complexity**
Complexity measures, Polynomial Vs non-polynomial time complexity; NP-hard and NP-complete classes, examples.

Computer Organization

- Unit-I **General System Architecture**
Stored Program control concept (Von-Neumann architecture principle), Flynn's Classification of computers (SIMD, MISD, MIMD), Structure organization (CPU, Caches, Main memory, Secondary memory unit and I/O), Register Transfer Operation, Micro-operations, Addressing Modes, Operation instruction set (Arithmetic and logical, Data transfer, Control flow), Instruction set format, Instruction Set Architecture (Instruction set based classification of processor i.e., RISC, CISC, RISC vs CISC Comparison).
- Unit-II **Processor Design**
Arithmetic and logic unit, Stack organization, CPU Architecture types, Accumulator Based- Register, Stack Memory, Register, Detailed data path of a typical register-based CPU, Fetch, Decode, and Execute Cycle.
- Unit-III **Computer Arithmetic and Control Design**
Addition and Subtraction, Multiplication Algorithms (Booth's Multiplication Algorithm), Division Algorithm, Floating point arithmetic operations.

Control Design: Microprogrammed and Hard-wired control options, Hard-wired design methods, State table method, Multiplier control, CPU control unit. Microprogrammed, Basic concepts, control Memory, Address Sequencing.

Unit-IV **Memory Hierarchy & I/O Organization**
Memory Hierarchy, need for Memory Hierarchy, locality of reference principle, cache memory, main & secondary, Memory parameters, access cycle time, cost per unit, concept of virtual memory. Programmed, Interrupt driven I/O, Direct Memory Access, Synchronous and asynchronous data transfer.

Unit-V **Introduction to Parallelism**
Goals of parallelism, Instruction level parallelism, pipelining, super scaling, Processor level parallelism, Multiprocessor system overview.

Operating Systems

Unit-I Introduction

Operating Systems, Definition, Types, Functions, Abstract view of OS, System Structures, System Calls, Virtual Machines, Process Concepts, Threads, Multithreading.

Unit-II **Process Management**

Process Scheduling, Process Co-ordination, Synchronization, Semaphores, Monitors Hardware, Synchronization, Deadlocks, Methods for Handling Deadlocks.

Unit-III **Memory Management**

Strategies, Contiguous and Non-Contiguous allocation, Virtual memory Management, Demand Paging, Page Placement and Replacement Policies

Unit-IV **File System**

Basic concepts, File System design and Implementation, Case Study: Linux File Systems, Mass Storage Structure, Disk Scheduling, Disk Management, I/O Systems, System Protection and Security.

Unit-V **Distributed Systems**

Introduction, Distributed operating systems, Distributed file systems, Distributed Synchronization.

Database Management Systems

Unit-I Introduction

Purpose of Database System, Views of data, data models, database management system, three- schema architecture of DBMS, components of DBMS. E/R Model, Conceptual data modelling, motivation, entities, entity types, attributes, relationships, relationship types, E/R diagram notation, examples.

Unit-II **Relational Model**

Relational Data Model - Concept of relations, schema-instance distinction, keys, referential integrity and foreign keys, relational algebra operators, SQL - Introduction, data definition in SQL, table, key and foreign key definitions, update behaviours. Querying in SQL, notion of aggregation, aggregation functions group by and having clauses, embedded SQL.

- Unit-III Database Design**
Dependencies and Normal forms, dependency theory - functional dependencies, Armstrong's axioms for FD's, closure of a set of FD's, minimal covers, definitions of 1NF, 2NF, 3NF and BCNF, decompositions and desirable properties of them, algorithms for 3NF and BCNF normalization, 4NF, and 5NF
- Unit-IV Transactions**
Transaction processing and Error recovery - concepts of transaction processing, ACID properties, concurrency control, locking based protocols for CC, error recovery and logging, undo, redo, undo- redo logging and recovery methods.
- Unit-V Implementation Techniques**
Data Storage and Indexes - file organizations, primary, secondary index structures, various index structures - hash-based, dynamic hashing techniques, multi-level indexes, B+ trees.

Computer Networks

- Unit-I Layered Network Architecture**
ISO-OSI Model, TCP/IP, Data Communication Techniques: Pulse Code Modulation (PCM), Differential Pulse Code Modulation (DPCM), Delta Modulation (DM), Data Modems, Multiplexing Techniques, Frequency Division, Multiplexing Hierarchies, Transmission Media, Error Detection: Parity Check Codes, Cyclic Redundancy Codes.
- Unit-II Data Link Protocols**
Stop and Wait protocols, Noise free and Noisy Channels, Performance and Efficiency, Sliding Window protocols, MAC Sublayer: The Channel Allocation Problem, Carrier Sense multiple Access Protocols, Collision Free Protocols, FDDI protocol, Distributed Queue Dual Bus (DQDB) protocol, Virtual LAN.
- Unit-III Network Layer protocols**
Design Issues: Virtual Circuits and Datagrams, Routing Algorithms, Optimality principle, shortest path routing Algorithms, Flooding and Broadcasting, Distance Vector Routing, Link State Routing, Flow Based Routing, Multicast Routing; Flow and Congestion Control: General Principles, Congestion control in datagram subnets, Choke Packets, Load Shedding, Jitter Control, RSVP. Interworking: Bridges, Routers and Gateways, IP packet, IP routing
- Unit-IV Transport Layer Protocols**
Design Issues, Quality of Services, Introduction to sockets, Connection Management: Addressing, Connection Establishment and Releases, Use of Timers, Flow Control and Buffering, Multiplexing, The internet Transport Protocols: User Datagram protocol UDP/TCP Layering, Segment Format, Checks Sum, Timeout Connection Management.
- Unit-V Session Layer Protocol**
Dialog Management, Synchronization, OSI Session primitives, Connection Establishment. Introduction to network management: Remote Monitoring Techniques: polling, Traps performance management, Class of service, Quality of service, Security Management, Firewalls.
