Department of Computer Science & Engineering
Jadavpur University

Post Graduate Admission Procedure

1 Master of Computer Science & Engg. (MCSE) Course

Provisional Selection list for admission to MCSE course will be prepared as per the following criteria:

For GATE candidates, 70% weight will be given to his/her valid and qualified GATE Score (Marks out of 1000) and rest 30% to marks obtained in the admission test.

For sponsored candidates 40% weight will be given to marks obtained by a candidate in his/her B.E/B.Tech or equivalent examination, 40% weight will be given to marks obtained in the admission test, 10% to experience (at least 2 years relevant experience after obtaining the qualifying degree and up to 31st July 2011, 1 mark per year of experience up to the maximum of 10) and the rest 10% weight will be given to his /her valid and qualified GATE Score (Marks out of 1000), if available.

For self sponsored candidates 40% weight will be given to marks obtained by a candidate in his/her B.E/B.Tech or equivalent examination, 40% weight will be given to marks obtained in the admission test and rest 20% weight will be given to his /her valid and qualified GATE Score (Marks out of 1000) if available.

The merit position of the candidates in self-sponsored category whose results of the B.E/B.Tech or equivalent examination are awaited on the date of admission test will be determined based on results of B.E/B.Tech or equivalent examinations declared so far (3rd year 2nd sem. / 4th year 1st sem. etc.).

1.1 Admission Test

Each applicant has to appear for the admission test. The test will be of 60 minutes duration and will carry a full mark of 50. The question paper will have 15 questions of 2 marks and 20 questions of 1 mark each. Each question will be of multiple-choice type and will be based on the following syllabus. Candidates should not carry programmable calculators / mobile phones during the test.
1.2 Syllabus


**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 datapath, 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. Asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds, Basic concepts of complexity classes P, NP, NP-hard, NP-complete.

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

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

**Information Systems and Software Engineering**: 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.

**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.

**Graph Theory**: Connectivity, Spanning trees; Cut vertices and edges; Covering; Matching; Independent sets; Colouring; Planarity; Isomorphism.

## 2 Schedule of Admission Test

**Venue**: Dept. of Computer Sc. & Engg., Jadavpur University Main Campus.

All candidates are directed to bring original and attested photocopies of all marksheets / gradecards and certificates, including the certificates for age verification.

<table>
<thead>
<tr>
<th>MCSE Course</th>
<th>Admission Test</th>
<th>June 15, 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>11:00 A.M.</td>
</tr>
<tr>
<td>Counseling &amp; Verification of</td>
<td></td>
<td>June 16, 2011</td>
</tr>
<tr>
<td>testimonials</td>
<td></td>
<td>11:00 A.M.</td>
</tr>
</tbody>
</table>