Shivaji University

(Faculty of Engineering & Technology)

Implemented from Academic year 2013- 14

Bridge course for Direct Second Year admitted students of MCA (Engg.) through lateral entry.

The students admitted to direct second year MCA (Engg) course should undergo the bridge course as mentioned below and should complete the course before award of MCA degree.

Bridge Course Structure:

Sr. No.	Name of the Subject	Theory Marks
1	Computer Organization	100
2	Computer oriented Numerical & Statistical Methods	100
3	System Programming	100
	Total	**300**

Note:-

1. The syllabi for above subjects and question paper pattern will be same as that of existing MCA Part I and Part II (Engg.) course.

2. The students should attend the lectures of the said subjects during Part I and Part II with regular MCA First Year students OR the bridge course should be conducted by the respective college separately. To accommodate these students, suitable arrangements in timetable (if necessary) should be done by the respective college. However, the college shall not charge any fees for conducting the bridge course.

3. Examination will be conducted by Shivaji University.

4. Exam fees are applicable as per Shivaji University rules.

COMPUTER ORGANIZATION

Lectures: 4 Hours Per Week   Theory: 100 Marks

Section – I

1. Basic Structure of Computers: Computer types, functional units, Basic functional concepts, Bus structures; historical prospective, machine instruction and programs, numbers, arithmetic operations and characters, memory locations and addresses, memory operations, addressing modes subroutine.

2. Processing Unit; Pentium: Register and addresses, program flow control, I/O operations, subroutines, other instructions.

3. Input-Output Organization: Accessing I/O Devices, Interrupts, handling multiple devices, direct memory access, buses, interface circuit, standard I/O interfaces.

Section – II

4. Memory Systems: Semiconductor RAM/ROM memories, cache memories, Virtual memory, memory management requirement .

5. Secondary Memory: Basic Concepts in memory hierarchy, medias HDD, FDD, CD, DVD & allies, Optical Memory, their Physical Organization and working.

6. Other Peripherals: Scanners, Sound Cards and Microphone Interface, Speaker Interfaces, Modems, Their characteristics & working, Case study of Motherboards.

Text Books:
   1. Computer Organization by Carl Hamacher, 5/e (Mc-Graw Hill)
   2.
Reference Books:

1. Structured computer organization, A.S. Tenenbaum, (PHI)
2. Computer Organization by W. Stallings (PHI)

Standard Scheme for setting question paper :
1. There should be two sections in the question paper (50 marks each).
2. Each section consists of five questions at least one per unit as per syllabus.

COMPUTER ORIENTED NUMERICAL & STATISTICAL METHODS

Lectures: 4 Hours Per Week   Theory: 100 Marks

Section – I

1. Solution of transcendental polynomial equations-Bisection method, False-position method, N-R method. (Implementation of these methods using 'C' language) .

2. Linear equations- Cramer's rule, Gauss elimination method, Gauss Jordon method, Gaussseidel iterative method (Implementation of these methods using 'C' language) .

3. Interpolation- Lagrange's method, Newton's forward and backward formulae, sterling interpolation. (Implementation of these methods using 'C' language).

4. Numerical Integration- Trapezoidal, Simpson's Rule 1/3, Simpson's Rule 3/8, Romberg's method (Implementation of these methods using 'C' language) .

Section – II

5. Ordinary differential equations: Euler's method, Taylor series method, Runge-Kutta method (Implementation of these methods using 'C' language).

6. Frequency distributions- Mathematical expectations, moment generating and cumulative functions discrete probability distribution, least square co-relation and regression method.

7. Sampling and test- Introduction, types of sampling, sampling distribution, standard error, test of significance, null hypothesis, test of significance for large samples, test for difference of proportions, test for single mean and difference of standard deviation, CHI square distribution, CHI square variate, test for population variates.

8. Data validation and information abstraction- Method of collecting data, efficiently gathering information from data, charting, deciding between alternatives, estimating cost of uncertainty, forecasting technique.

Text Books :
1. Computer oriented Numerical methods by V.Rajaraman, PHI
2. Introductory methods of Numerical Analysis by S.S. Sastry, PHI

Reference Books:
1. Numerical Methods for engineers by S.C. Chapra TMH
2. Fundamentals of mathematical statistics by S.C.Gupta, V.K Kapoor, S. Chand.
Standard Scheme for setting question paper :

1. There should be two sections in the question paper (50 marks each).
2. Each section consists of five questions at least one per unit as per syllabus.

SYSTEM PROGRAMMING

Lectures: 4 Hours Per Week   Theory: 100 Marks

Section – I

1. Assemblers – General design procedure- Design of assembler, statement of problem, data structure, format of databases, algorithm and flowchart of various passes of assembler.

2. Macro-processor – Macro-instructions, Features of a Macro facility -Macro-instruction argument, Conditional macro expansion, macro calls within macros, macro instructions defining macros, implementation.

3. Loaders – Loading schemes – Compile and go, General loader, absolute loader, subroutine linkages, Relocating loaders, Direct linking loaders, Binders, linking loaders, Overlays, Dynamic Binders, Design of an absolute loader and designing of direct linking loader.

Section –II

4. Compilers: Statement of problem, Phases of Compiler.

5. Compiler: Data Structures, recursion call and return statement, storage classes, implementation, block structure, complier writing tools.

6. Softwares tools: text editors, Interpreters and program generator, debug monitors, Incremental complier, programming environments.

Text Book:

1. System Programming by J.J.Donovan, TMH (For Unit 1 to 4)
2. System programming and operating system by D.M.Dhamdhere, PHI (For Unit 5,6)

Reference Books:
1. Introduction to system software by D.M.Dhamdhere, TMH

Standard Scheme for setting question paper :

1. There should be two sections in the question paper (50 marks each).
2. Each section consists of five questions at least one per unit as per syllabus.