## MCA INFORMATION BROCHURE

## 201417



UNIVERSITY DEPARTMENT OF MATHEMATICS
BASIC SCIENCE BUILDING
RANCHI UNIVERSITY
Morabadi Campus, Ranchi 834008, Jharkhand. (Ph. 0651-6555611)


## FROM THE DJRECTOR'S DESK

The world has become dynamic. As a result our country is facing a new spectrum of challenges brought out by adoption of new technologies, innovative thinking, business practices and global competition. The increased pressure on organizations to maximize the productivity of their work force through IT applications has immensely enhanced the significance and responsibility of IT professionals.

The MCA Course is meticulously planned to keep pace with the technological advancements and needs of the corporate world. The course is designed to prepare youngsters for various challenging assignments, develop their personalities and professional skills and last but not the least to be a responsible citizen of the country.


Dr. M. M. P. Singh
Director, MCA
Ranchi University, Ranchi


## RANCHI UNIVERSITY AT A GLANCE

Ranchi University was established on July 12,1960 with 10 PG Departments, One constituent college and 20 affiliated colleges spread ever an area of 65000 square Kilometers.

At present the University has 23 PG Departments, 15 constituent colleges, 14 affiliated colleges, 1 academic staff college, 1 adult continuing education \& extension Department ,1 medical college, 1 law college,4 technical institutes, 2 Institutes of neuropsychiatry and allied Science and Institute of Business Studies.

Besides regular courses RU also offers PG Level Self Financing/Professional courses namely MCA, MBA, M.Sc. Electronics \& Communication, PG Diploma in medicinal plant \& M.Sc. in Bio-Technology, Master in Mass Communication \& Journalism , Master in Rural Development, Master in Agro management, Public Administration, Diploma in Human Rights and other professional courses are running in this University.

Being located in predominantly tribal area the University has successfully lived up to the expectations and aspirations of people since its inception. It has been ranked $36^{\text {th }}$ among top 50 Universities in the Country.

## THE DEPARTMENT:

The University Department of Mathematics is one of the best Post Graduate Department in eastern region of India. It has a research team of teachers with long standing experience of teaching and research. The Department is actively engaged in
research and training to faculty and students. Every year 4-5 Ph.D.s are produced under the guidance and supervision of teachers of the Department. From July 2003, Department has started teaching of $M C A$ course as a self-financing course. The M.Phil course has been started in the department from July 2012 .

## MCA COURSE:

The MCA Course was started in the Department of Mathematics, Ranchi University, Ranchi in July 2003. The Course Curriculum has been designed to provide the students a solid conceptual foundation with extensive focus on application of these concepts to real life situations. The main aim of the program is to produce computer professionals to meet the demand of rapidly growing IT industry. We maintain discipline and decorum to keep pace with the professionalism proper dress code is being introduced.

## TEACHING AMBIENCE

The Department imparts computer education to MCA students through classroom lectures, seminars, Presentation through LCD projector, group discussions, guest lectures by eminent persons from IT field. The major emphasis is given in the area of Personality Development and communication skills. Subject experts are invited regularly to deliver lectures.

In addition to above facilities several other workshops and colloquiums such as industrial visits, mock interviews, topic presentations, IT related exhibitions etc are organized time to time in the Department. Department is continuously focusing on overall development of the students studying in MCA. Furthermore for improvement of Co-Curricular skills, the Department organizes numerous activities such as cultural programs, exhibitions, lectures and presentations in art and culture etc.

## INFRASTRUCTURE

The MCA Course is running in Institute of Basic Science building which is well consist of sufficient number of classrooms, Lecture Theaters, Seminar Halls and Laboratories.

## AUDITORIUM:

There is a well furnished auditorium named as "ARYABHATTA AUDITORIUM" within the premises of Basic Science Building. The seminars, cultural programs and other occasional celebrations are conducted there.

## BANKING FACILITY

There is a branch of CENTRAL BANK OF INDIA inside the Campus.


## COMPUTER LAB

In this IT dominated world, the department has well enabled computer Lab with LAN facility. The Computer Lab has latest software and the necessary hardware support to synchronize with the IT needs. The Lab has individual Computer facility, with Internet facility.

The systems in LAB are connected through local area network to share, discuss, develop and rectify programs in an
interactive manner. Practitioners can directly interact with master computer (with instructor) to solve queries immediately after occurrence. At present the LAB has more than 50 Desktops and three Servers.


## LIBRARY

(i) The department has a well stocked MCA library of its own. The departmental library comprises of varied extensive collection of more than 5000 books, journals, research reports and case study materials. Besides, the students have access to the University Central Library.
(ii) The Department has an NBHM (National Board of Higher Mathematics) library consisting more than 3 thousand books for higher research work in field of higher Mathematics and Computer Science.
(iii) The Department also has an UGC (University Grants Commission) library consisting of more than three thousand books for M.sc/MCA level courses.

Seminar Hall is equipped with plasma T.V.

## BRIEF COURSE PROFILE OF MCA:

|  | SEMESTER $\mathbf{1}^{\text {st }}$ | $\begin{gathered} \text { SEMESTER } \\ 2^{\text {nd }} \end{gathered}$ | $\begin{gathered} \text { SEMESTER } \\ 3^{\text {rd }} \end{gathered}$ | SEMESTER $4^{\text {th }}$ | $\underset{5^{\text {th }}}{\text { SEMESTER }}$ | SEMESTER $6^{\text {th }}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PAPER $1^{\text {st }}$ | IT 11: <br> FUNDAMENTAL OF COMPUTER SCIENCE \& APPLICATION | IT 21: <br> DATA STRUCTURE | IT 31: <br> DATA BASE MANAGEMENT SYSTEMS | IT 41: COMPUTER NETWORKS | IT 51: <br> A. I. and APPLICATIONS | IT61 S: <br> SEMINAR |
| PAPER $2^{\text {nd }}$ | IT 12: <br> COMPUTER <br> ORGANIZATION <br> \& ARCHITECTURE | IT22: <br> OPERATING SYSTEMS | IT 32: <br> ANALYSIS DESIGN OF ALGORITHM | IT 42: COMPUTER GRAPHICS | IT 52: <br> NETWORK SECURITY \& CRYPTOGRAPHY | IT62 P: PROJECT |
| PAPER $3^{\text {nd }}$ | IT 13: <br> PROGRAMMING <br> LANGUAGE <br> THROUGH C | BM 21: <br> FINANCIAL ACCOUNTING | IT 33: OBJECT ORIENTED PROGRAMMING | IT 4E: COMPILER DESIGN | IT 5E: <br> DATA WARE HOUSING \& DATA MINING |  |
| PAPER $4^{\text {th }}$ | BM 11: <br> BUSINESS COMMUNICATION | $\overline{\text { MT 21: }}$ <br> NUMERICAL ANALYSIS | BM 31: <br> ENTERPRISE <br> RESOURCE <br> PLANNING | BM 41: <br> PROJECT <br> MANAGEMENT \& SOFTWARE ENGINEERING | BM 5E: ORG. BEHAVIOUR |  |
| PAPER $5^{\text {th }}$ | MT 11: <br> DISCRETE MATHEMATICS | LAB IT 21L: <br> LAB BASED ON PROGRAMMING IN DATASTRUCTURE | MT 31: <br> AUTOMATA THEORY | BM 4E: e-COMMERCE | MT 51: OPTIMIZATIONS RESEARCH |  |
| PAPER $6^{\text {th }}$ | LAB IT11L: <br> LAB BASED ON COMPUTER FUNDAMENTALS | LAB IT22L: <br> LAB BASED ON OS | LAB IT31L: <br> LAB BASED ON DATA BASE MGT. | LAB IT41L: LAB BASED ON CASE TOOLS | LAB IT51L: LAB BASED ON A.I. |  |
| PAPER $7^{\text {th }}$ | LAB IT 12L: <br> LAB BASED ON PROGRAMMING IN C |  | LAB IT32L: <br> LAB BAISED ONPROGRAMMING IN JAVA | LAB IT42L: CASE TOOLS LAB | LAB MT5IL: LAB BASED ON WEB DESIGN |  |
| PAPER $8^{\text {th }}$ |  |  |  |  | LAB IT5IIL: INDUSTRIAL THECHNIQUES LAB |  |
| PAPER $9^{\text {th }}$ |  |  |  |  | LAB IT5IS: <br> SEMINAR |  |
| PAPER $10^{\text {th }}$ |  |  |  |  | LAB IT5IP: PROJECT |  |

1.Dr. M.M.P.Singh (Head Mathematics \& Director, MCA)
2. Dr. M.K.Singh (University Professor)
3. Dr. N.K.Agrawal (University Professor)
4. Dr. (Mrs.)Smita Dey (Associate Professor, Course Coordinator, MCA)
5. Dr. Sahdeo Mahto (Associate Professor)
6. Dr.C.S.P.Lugun (Associate Professor)
7. Miss Swagata Ghosh (Faculty, MCA)
8. Mr. Ashish Mohan (Faculty, MCA)
9. Mr. Abhishek Kant (Faculty, MCA)
10. Miss Nazia Hasan (Faculty, MCA)
11. Mr.Mithilesh Kumar (Faculty, MCA)

## PLACEMENT CELL

The Department has its own placement cell under the Supervision of $R$ U Placement Cell. The primary objective of the placement cell is to provide opportunities to the students to secure good jobs in private as well as public sectors.

The placement cell is well organized to place our students in the well reputed organizations.

## FEE STRUCTURE

The Tuition fee is Rs. 18,500/= per semester for all category of students except BPL Category. The department provides free ship education to 2 BPL students. The examination fee is Rs. 800/- per semester.

## SELECTION PROCEDURE

At present there are 72 seats in MCA including 2 seats for BPL category students.

Candidates are selected on the basis of:
(i) Marks scored in all India Centralized Eligibility Test (CET), Conducted by R.U. Ranchi.
(ii) Academic Career Record

## (iii) Interview conducted by the Department

Appropriate reservation policy of state is being followed at the time of finalizing the merit list selection.

## SCHEDULE FOR MCA ADMISSION 2014-17

Date of CET- 2014 exam 20.06 .2014
Date of Interview 26.06.2014 to 28.06.2014
Tentative date of publication
of first list of result 07.07.2014
Commencement of classes 14.07.2014
Centralized Eligibility Test (CET) of Ranchi University, Ranchi.

The fee for Information Brochure and Application forms etc. is Rs. 1000/- (demand draft) in favour of MCA-Vocational-A1 A/C, R.U, Ranchi.

## (For MCA Entrance)

## Subjects

The test will consist of three sections A, B and C with the following distribution of (equal value) questions.

| Section | Subject | No. of Questions |
| :---: | :---: | :---: |
| (A) | Mathematics | 70 |
| (B) | Reasoning | 20 |
| (C) | Computer awareness | 15 |
| Total number of Questions: |  | 105 |

## Test Pattern

1. The total time allotted for the answers is three hours.
2.Each question has 4 choices for answer. A candidate has to select the most appropriate choice.
2. Each correct answer will be awarded 4 marks and each incorrect answer will carry a penalty of 1 mark. No attempt to a question will carry 0 Marks.
3. The question will be uniformly distributed over the entire syllabus in each subject as far as possible.
5.Calculation aids and electronic device (e.g. calculators, calculating watches, slide rules, etc), log table graph paper etc, will not be allowed at the Test Centre.
4. If two candidates secure equal total of marks, the candidate securing more marks in Mathematics will be given preference in selection.

## Detailed syllabus of the Subjects

## Section A (Mathematics) (based on + two level of CBSE)

## 1.Set Theory

a.Algebra of Sets
b. Cartesian product of sets and binary relations c.Mapping and binary operations

## 2. Algebra

a.Elementary algebra: indices, algebra of polynomials, logarithms
b. Quadratic and polynomial equations and inequalities c. Determinant and matrices including the solution of a system of linear equations

## 3. Discrete Mathematics

a. Counting principles: Addition and multiplication principles, inclusion exclusion principle
b. Counting arrangements: Counting linear, circular and 3-dimensional arrangements, to count different types of mappings from a given set $A$ to a given set $B$, counting with conditions on neighbors or ordering of objects.
c. Counting selections: Counting sets and relations, To count geometrical objects formed by joining given points or by the intersection of given system of lines, counting partitions and distributions.
d. Sequence: general properties of a sequence, special sequences viz. A.P., G.P. and H.P.
e. Finite series: Methods of summing finite series. Binomial series and its application in summation of finite series.
f. Infinite series: Formal methods of summing infinite geometric and binomial series, logarithmic and exponential series.

## 4. Probability theory

a. Probability of an event; finite sample space and events, computing probability form combinatorial reasoning.
b. Conditional probability: independent events and multiplication theorem.
c.Mutually exclusive and exhaustive events: Theorem on total probability and Bay's theorem.
d. Discrete distributions: and Poison's distributions and its mean, median and mode.

## 5. Basic Statistics

a. Mean, median and mode of frequency distributions
b. Dispersion and deviation: mean and standard deviation, coefficient of dispersion and deviations.

## 6.2-dimensional Co-ordinates Geometry.

a. Cartesian co-ordinates: distance and section formulas, formula for the area of a triangle.
b. Equations of one or more straight lines.
c. Circles: Equations of circle, points and line associated points and lines.
d. Standard equation of a parabola, ellipse and hyperbola and the equations of points about origin, orthogonal reflection of a point in a line, translation and rotation of axes.

## 7.Trigonometry

a.Trigonometry identities: Identities involving compound angles, multiple and sub multiple angles.
b. Evaluation of trigonometric expressions.
c. Solutions of trigonometric equations
d. Properties of triangle
e. Inverse circular functions.
f. Computations of Heights and distances.

## 8.Differential calculus

a.Real functions
b. Limit, Continuous and differentiable functions c. Properties of continuous and differentiable function of one and several variables.
d. Maxima and minima of a continuous function of one and several variables.
e. Geometric application of differentiability's: tangent and normal to a curve, application of Roles and Mean value theorem.

## 9.Integral calculus and differential equation

a.Evaluation of indefinite integral
b.Evaluation of definite integral
c.Application of definite integral: Evaluation of area bounded by one or more curves, summation of certain infinite series
d. Differential equation and properties of its solution. e.Solution of First order and first degree differential equation
f.Geometrical applications of differential equations.
10. Vectors and 3-dimensional Co-ordinate geometry
a.Linear operation on Vectors and their geometric meaning
b. Scalar and vector products of two and three vectors and their geometric and mechanical applications.

## SECTION - B (Reasoning)

## 1.Quantitative Reasoning

a.Arithmetic reasoning
b. Problem solving
c. Data sufficiency

SECTION - C (Computer Awareness)

## 1. Computer Basic

a.Organization of computer: Central processing Unit (CPU), input/ output devices, computer memory, memory organization, back-up devices.

## 2.Data Representation

a.Representation of characters, integers and fractions, binary and hexadecimal representation
b. Binary Arithmetic: Addition, Subtractions, Multiplication and division of binary numbers, single and two complement arithmetic.

## 3.The basics of C-programming:

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a.Variables and expressions
b.Basic input and output
c.Control Structures
d.Debugging a program
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## Specimen questions

1. The set $(x: x=x)$ may be equal to
a. $\{0\}$
b. $\{1\}$
c. $\{3\}$
d. $\}$
$\square$
2. Which of the following has only one subset?
a. $\{0\}$
b. $\{1\}$
c. $\{3\}$
d. $\}$
3. If $A=\{1,2,5\}$ and $B=\{3,4,5\}$ then $A \Delta B$ is equal to
a. $\{1,2,5,9\}$
b. $\{1,2,3,4,9\}$
c. $\{1,2,3,4,5,9\}$
d. None
4. If $A=\{1,2,4\}, B=\{2,4,5\}, C=\{2,5\}$ then $(A-C) X(B-C)$ is equal to
a. $\{(1,4)\}$
b. $\{(1,4),(4,4)\}$
c. $\{(4,1),(4,4)\}$
d. None $\square$
5. If $n(A)=4$ and $n(B)=7$, then the minimum and maximum value of $n(A \cup B)$ are respectively
a. 4,11
b. 4,7
c. 7,11
d. None
$\square$
6. Solution of $(x-1)^{2}(x-4)<0$ is
a. $(-\infty, 1)$
b. $(-\infty,-4)$
c. $(-1,4)$
d. $(1,4)$ $\square$
7. $\sqrt{2 i}$ equals
a. $1+1$
b. 1-।
c. $-\sqrt{2} i$
d. None
$\square$
8. The smallest positive integer $n$ for which $\left\{\frac{1+i}{1-i}\right\}^{n}=-1$ is
a. 1
b. 2
c. 3
d. 4
9. If the sum of $p$ terms of an A.P. is $q$ and he sum of $q$ terms is $p$ then the sum of $p+q$ terms will be
a. 0
b. $p-q$
c. $p+q$
d. $-(p+q)$
$\square$
10. If the $10^{\text {th }}$ term of a G.P. is 9 and $4^{\text {th }}$ term is 4 , then $i t^{\prime} s 7^{\text {th }}$ term is
a. 16
b. 14
c. $27 / 14$
d. 56
