Mandatory Disclosures

The following information shall be given in the information Brochure besides being hosted on the Institution's official Website.

The onus of the authenticity of the information lies with the Institution ONLY and not on AICTE.

1. Name of the Institution

Nesamony Memorial Christian College, Marthandam - 629 165,

Kanyakumari District, Tamil Nadu, India.

Ph. No: 04651-272059

Mobile: 9443370257

E-mail: principalnmcc2014@gmail.com

2. Name and address of the Trust/ Society/ Company and the Trustees

C.S.I. TRUST ASSOCIATION, DENNIS STREET

NAGERCOIL, KANYAKUMARI

3. Principal, Nesamony Memorial Christian College

Dr. K. Paul Raj,

Ph. No: 04651-272059

Mobile: 9443370257

E-mail: principalnmcc2014@gmail.com

4. Name of the affiliating University

Manonmaniam Sundaranar University, Tirunelveli.

5. Governance

Members of the Board

- Rt. Rev. Dr. A.R. Chelliah, M.A., B.D., M.Th., D.Min.
- Dr. K. Paul Raj, M.Sc., M.Phil., Ph.D.

Dr. P. David Samuel, M.Sc., M.Phil., Ph.D.

- Mr. S. Franklin Swami Dhas
- Mr. R. Rajesh
- Mr. D.L. Baffin Lal
- Mr. C. Jebakumar
- Mr. R. Selvakumar
- Frequently of the Board Meeting and Academic Advisory Body

Once in Four months

- Organizational chart and processes
- Student Feedback on Institutional Governance/ Faculty performance

Feedback obtained from students

•Grievance Redressal mechanism for Faculty, staff and students

Grievance and Redressal mechanism for Faculty, staff and students were monitored by the Grievance and Redressal committee

Grievance Redressal Committee

Prof.D. Ashlin Melbha, Dept. of Management Studies

- Dr. D. S. Misbha, Dept. of Computer Application
- Dr. E. Jasmine Viji, Dept. of Tamil
- Prof. D. Jaspin Jeba, Dept. of Mathematics
- Prof. E.S. Beena, Dept. of English

Dr. S. Sunitha, Dept. of Economics

- Prof. S. Boving Sathya, Dept. of Management Studies
- Prof. H. Janelent Lina, Dept. of Tourism
- Mr. P. Sundaram, Supporting Staff
- Mr. G. Lazer, Supporting Staff

Establishment of Anti Ragging Committee

Dr.Beula Bell, Dept. of Computer Application

- Dr. Amutha Bhomini, Dept. of Computer Application
- Dr. T. Subitha, Dept. of English
- Dr. M. Vimala, Dept. of Botany
- Dr. Y.N. Adlin Beula, Dept. of Tamil
- Dr. V. Viji Kumar, Dept. of PG Commerce
- Dr. N. Arun Fred, Dept. of Management Studies
- Mr. C. Selva Raj, Supporting Staff
- Mr. Arul Raj, Supporting Staff
- Mr. S.S. Berlin Kumar, II MCA

Establishment of Internal Complaint Committee (ICC)

- Dr. S. Jeslin Sunitha Bai, Dept. of Physics
- Dr. P. Amudha Bhomini, Dept. of Computer Applications
- Dr. G. Robert Gixon, Dept. of Economics
- Dr. N.T. Niveditha, Dept. of Chemistry
- Dr. N. Maybel Starlin, Dept. of Botany
- Dr. G.D. Suresh, Dept. of Mathematics
- Dr. Adaline Selvaraj, Rtd. HoD of English

Mrs. J. Rajam, Supporting Staff

Establishment of Committee for SC/ST

- Dr. S. Starlin Jini, Dept. of Computer Application
- Dr. J. Evangelin Sheela Bell, Dept. of History
- Dr. C.L. Jeba Melvin, Dept. of Management Studies
- Dr. S. Sunitha, Dept. of English
- Dr. G. Sudhana, Dept. of Mathematics
- Dr. A. Vinu Kumar, Dept. of History
- Dr. G.M. Sunder Singh, Dept. of History
- Dr. D.S. Misbha, Dept. of Computer Applications
- Mr. K. Mohanan, Supporting Staff
- Mr. K. Geetha Kumar, Supporting Staff

Internal Quality Assurance Cell

- Dr. K. Paul raj, Principal, NMCC
- Prof. D. Christian Babu, Vice-President, C.S.I., K.K. Diocese
- Mr. M.P. Jaya Chandran, Correspondent
- Dr. R.S. Tibi Thomas, Dept. of English
- Dr. R. Sheela Christy, Vice-Principal
- Dr. G.D. Biji, Vice-Principal
- Dr. Y. Jacob Vetharaj, Bursar
- Dr. A. Vijayan, Research Co-ordinator
- Dr. S. Jayakumar, Senate Member/ Examination Convener

Prof. A. Jaisingh, AICTE

Er. Felix Anderson Christdhas, Dept. of Computer Science

Dr. N. Maybel Starlin, Dept. of Botany

Dr. E. Ebin Raja Merly, Dept. of Mathematics

Dr. T.F. Abbs Fen Reji, Dept of Chemistry

Dr. R. Edwin Sam, Dept. of History

Dr. N. Arun Fred, Dept. of Management of Studies

Prof. P. Prejith, Dept. of Management Studies

Dr. C. Paulson, Librarian

6. Programmes

Programmes approved by AICTE

MCA

MBA

Programmes Accredited by NBA

• Status of Accreditation of the Courses

Re-accredited with 'A' Grade by NAAC

Total number of Courses

2

- No. of Courses for which applied for Accreditation
- Status of Accreditation Preliminary

For each Programme the following details are to be given(Preferably in Tabular form):

- Name: MCA
- Number of seats: 35

- Duration: 2years
- Cut off marks/rank of admission during the last three years: 55%
- Fee (as approved by the state government): Rs. 21,705
- Placement Facilities

• Campus placement in last three years with minimum salary ,maximum salary and average salary

7. Faculty

- Course/Branch wise list Faculty members: MCA
- Permanent Faculty 9
- Adjunct Faculty 0
- Permanent Faculty: Student Ratio 8:1
- Number of Faculty employed and left during the last three years :0

8. Profile of Vice Chancellor/ Director/ Principal/Faculty

Principal

Dr. K. Paulraj M.Sc., M.Phil., M.Ed., Ph.D.



Faculty Details

Name	DOB	Unique ID	Education Qualification	Teaching Experience	Research Experience
A.Jaisingh	31/05/1968	1- 476913412	MCA	28 years	
Suresh I.C. Ananth	30/07/1967	1- 510717779	M.Sc	28 years	
Dr. A. Geetha	06/10/1972	1- 510717783	M.Sc.,M.Phil.,Ph.D	26 years	6
Dr. M.S. Premalatha	02/12/1973	1- 510717787	M.C.A.,,M.Phil.,Ph.D	24	6

			-		
Dr. P. Amudha Bhomini	30/07/1970	1- 510717791	MCA.,M.Phil.,Ph.D	22	7
Dr. T. Beula Bell	30/07/1974	1- 510717795	MCA.,M.Phil.,Ph.D	22	6
S. Starlin Jini	30/06/1989		MCA.,M.Phil	6 years 7 Months	
Dr D.S Misbha	07/09/1985	1- 3016033917	MCA,M.Phil,Ph.D	6years 7 months	5 years



9. Fee

- Details of Fee, as approved by State Fee Committee, for the Institution: Rs. 21,705
- Time schedule for payment of Fee for the entire Programme

Two months from start of the semester

- Estimated cost of Boarding and Lodging in Hostels: Rs. 3000per month
- Any other fee please specify

10. Admission

- Number of seats sanctioned with the year of approval :35
- Number of Students admitted :33
- Number of applications received during last two years for admission under

Management Quota and number admitted : 54

11. Admission Procedure

- Admissions are based on Tamilnadu Government guidelines
- Mention the admission test being followed, name and address of the Test

Agency/State Admission Authorities and its URL (website)

GOVERNMENT OF TAMIL NADU TAMIL NADU MBA / MCA ONLINE COUNSELLING ADMISSION - 2021 https://www.tn-mbamca.com/

Consortium of Self Financing Professional, Arts and Science Colleges in Tamilnadu

https://www.tnsf*consortium*.org

• Number of seats allotted to different Test Qualified candidate separately (AIEEE/ CET (State conducted test/ University tests/ CMAT/ GPAT)/ Association conducted test etc.)

TANCET -10

Consortium - 25

- Calendar for admission against Management/vacant seats
- Last date of request for applications : 9-8-2021
- Last date of submission of applications : 10-8-2021
- Dates for announcing final results : 13-8-2021

• Release of admission list (main list and waiting list shall be announced on the same day) :13-8-2021

• Date for acceptance by the candidate (time given shall in no case be less than 15days) : 28-8-2021

• Last date for closing of admission : 30-9-2021

• Starting of the Academic session : 1-10-2021

• The waiting list shall be activated only on the expiry of date of main list

• The policy of refund of the Fee, in case of withdrawal, shall be clearly notified

Once the student withdraw admission before closing admission the fee paid will be refunded. After that fifty percent of the fee will be refunded.

12. Criteria and Weightages for Admission

• Describe each criterion with its respective weightages i.e. Admission Test, marks in qualifying examination etc.

Fifty percent of admission test mark and fifty percent of qualifying exam mark will be used to calculate the weightage.

• Mention the minimum Level of acceptance, if any : 55%

• Display marks scored in Test etc. and in aggregate for all candidates who were admitted

13. List of Applicants

• List of candidate whose applications have been received along with percentile/ percentages core for each of the qualifying examination in separate categories for open seats. List of candidate who have applied along with percentage and percentile score for Management quota seats (merit wise)

Nesamony Memorial Christian College, Marthandam

Application List - 2021-2023 M.C.A

S. No.	Appln Number	Student Name	Mark Perc
1	21PGS1825	ANCY R	91.90
2	21PGS1555	AHILA H	89.60
3	21PGS1599	ANUBERGIN J S	87.80
4	21PGS1675	ANUSREE GOPAKUMAR G S	87.00
5	21PGS1570	GODJIN STEFFY S S	87.00
6	21PGS2304	PRAVIN F	83.90
7	21PGS1916	ЈОНИСҮ ЈОНИ	83.30
8	21PGS1674	ASHWINI K	83.10
9	21PGS1553	ASMITHA V V	83.10
10	21PGS2074	BENIN S	83.00
11	21PGS2234	BERLIN JOHNS M	82.40
12	21PGS1669	AHALYA M C	82.20
13	21PGS2155	ALINA S L	82.00
14	21PGS1704	SELCY S	81.80
15	21PGS2123	SHIBIN LAL S	80.00
16	21PGS1862	MEBEENA M	79.30
17	21PGS2365	GREESHMA RAJ J	79.00
18	21PGS2095	DIVYA R	78.30
19	21PGS1707	MONISHA S L	78.00
20	21PGS2245	ANUSUYA P	78.00
21	21PGS2266	FATHIMA REEZMA	77.60
22	21PGS1676	ANJITHA S	77.00
23	21PGS1722	BENITO JOSE	76.90
24	21PGS1703	JINISHA A S	76.00
25	21PGS1705	ANISHA W	76.00
26	21PGS2024	ADIDEV R	75.00
27	21PGS2232	ARUL RAJ S J	73.50
28	21PGS2054	SUVETHA T J	73.10

29	21PGS2364	JAMES RAJ J V	72.60
30	21PGS2120	MONISH R	72.10
31	21PGS1836	BERTILA ZENE W	71.30
32	21PGS2091	ATHIRA U R	70.40
33	21PGS2105	NIMA M B	70.00
34	21PGS1721	BIBINISHA R	70.00
35	21PGS2363	DANI D	70.00
36	21PGS2102	SAJITH R S	70.00
37	21PGS1736	RASHIKA R	69.10
38	21PGS1645	ANILA A	68.90
39	21PGS1735	NIVISHA K	68.70
40	21PGS1978	PRATHEBA R	68.00
41	21PGS2092	GODSON A R	66.10
42	21PGS1621	WILSON J	65.20
43	21PGS1745	JAYATHEES J	65.00
44	21PGS2226	GODSON BERNO M	63.80
45	21PGS2225	RUBUS C	63.50
46	21PGS1723	CIBIN CHRIST C B	63.40
47	21PGS2080	GLADSON SAM S	62.10
48	21PGS1734	JEEN S	60.70
49	21PGS2185	DURGA T	59.17
50	21PGS1637	ABINESH K	59.10
51	21PGS1620	SHEIK SHAHUL HAMEED J	59.00
52	21PGS2215	ASWIN P RAJAN	58.00
53	21PGS2032	ABIYA R	56.00
54	21PGS1972	ABIN RAJ M	55.00

14. Results of Admission Under Management seats/Vacant seats

• Composition of selection team for admission under Management Quota with the brief profile of members (This information be made available in the public domain after the admission process is over)

- Score of the individual candidate admitted arranged in order or merit
- List of candidate who have been offered admission

• Waiting list of the candidate in order of merit to be operative from the last date of joining of the first list candidate

• List of the candidate who joined within the date, vacancy position in each category before operation of waiting list

Nesamony Memorial Christian College, Marthandam

S. No.	Appln Number	Student Name	Gender
1	PSCA213701	ABIYA R	Female
2	PSCA213702	AHALYA M C	Female
3	PSCA213703	AHILA H	Female
4	PSCA213704	ALINA S L	Female
5	PSCA213705	ANCY R	Female
6	PSCA213706	ANISHA W	Female
7	PSCA213707	ANJITHA S	Female
8	PSCA213708	ANUBERGIN J S	Female
9	PSCA213709	ANUSREE GOPAKUMAR G S	Female
10	PSCA213710	ANUSUYA P	Female
11	PSCA213711	ASHWINI K	Female
12	PSCA213712	ASMITHA V V	Female
13	PSCA213713	BERTILA ZENE W	Female
14	PSCA213714	DANI D	Female
15	PSCA213715	FATHIMA REEZMA	Female
16	PSCA213716	GREESHMA RAJ J	Female
17	PSCA213717	JINISHA A S	Female
18	PSCA213718	JOHNCY JOHN	Female
19	PSCA213719	MEBEENA M	Female
20	PSCA213720	NIMA M B	Female
21	PSCA213721	PRATHEBA R	Female
22	PSCA213723	ABIN RAJ M	Male
23	PSCA213724	ADIDEV R	Male
24	PSCA213725	BENIN S	Male
25	PSCA213726	BENITO JOSE	Male
26	PSCA213727	BERLIN JOHNS M	Male
27	PSCA213728	CIBIN CHRIST C B	Male
28	PSCA213729	GLADSON SAM S	Male

29	PSCA213730	GODSON A R	Male
30	PSCA213731	JAMES RAJ J V	Male
31	PSCA213732	MONISH R	Male
32	PSCA213733	PRAVIN F	Male
33	PSCA213734	WILSON J	Male

15. Information of Infrastructure and Other Resources Available

- Number of Class Rooms and size of each : Two, 81sq.mt each
- Number of Tutorial rooms and size of each : one 54sq. mt
- Number of Laboratories and size of each : 189sq. mt
- Number of Drawing Halls with capacity of each
- Number of Computer Centres with capacity of each : one, fifty
- Central Examination Facility, Number of rooms and capacity of each : one, fifty
- Online examination facility (Number of Nodes, Internet bandwidth, etc.): 50
- Barrier Free Built Environment for disabled and elderly persons : yes
- Occupancy Certificate
- Fire and Safety Certificate : yes

TAMIL NADU FIRE – RESCUE SERVICE FIRE –LICENSE (See Section 13)

L.Dis.No:4697/ A / 2021

Date 29.07.2021

Licence is hereby granted under section 13 of the Tamil Nadu Fire Service Act. 1985 for Running College in the name of "M/s Nesamony Memorial Chiristian College" within the Jurisdiction Vilavancode Taluk at the Premises in Sy No:D3/6,D3/67 & D3/30, of Nalloor Village, Marthandam, Vilavancode Taluk, Kanyakumari District. Subject to the Condition noted thereon and such other condition as may be prescribed.

This Fire Licence is valid for one year from the date of issue of this license. CONDITIONS:

- 1) The Installed Fire Fighting Equipments should be maintained in good condition at all times.
- 2) All exits should be free of obstructions. Exits should be clearly visible and the routes to reach the exit shall be clearly marked.
- 3) Trained Fire personnel should be available to operate the Fire Fighting Equipments in case of any emergency
- 4) "Mock Drill Should be conducted periodically and the date of conduction should be informed to this office well in advance to enable the team to make suggestions if any
- 5) Dumping of waste materials anywhere should be avoided. Dust bin should be cleared frequently
- 6) Any erection of permanent or temporary structure should be intimated to this department.
- 7) Do s Don'ts in time of emergencies should be available in a laminated hanging card.
- 8 Permission should be obtained from the Local Planning Authority/ Town and Country Planning Authority.

JUL 202

Office Seal with Date

To

The Principal M/s Nesamony Memorial Chiristian College Marthandam, Kanyakumari District. 629 165

District Officer Fire & Rescue Services Kanyakumari District, Nagercoil

offici

- Hostel Facilities : Girls hostel with 120 capacity
- Library
- Number of Library books/ Titles/ Journals available(Programme-wise) : 5875, 612
- List of online National/ International Journals subscribed
- E- Library facilities
- National Digital Library(NDL) subscription details :
- Laboratory and Workshop
- List of Major Equipment/Facilities in each Laboratory/Workshop:

Computers 50 numbers

- Computing Facilities
- Internet Bandwidth : 150MBps
- Number and configuration of System :50
- Total number of system connected by LAN :50
- Total number of system connected by WAN :50
- Major software packages available

• Special purpose facilities available (Conduct of online meetings/Webinars/ Workshops, etc.)

• Facilities for conduct of classes/courses in online mode (Theory & Practical)

Online classes were conducted through Google classroom.

- Innovation Cell
- Social Media Cell

• Compliance of the National Academic Depository (NAD), applicable to PGCM/ PGDM Institutions and University Departments

• List of facilities available

ICT enabled classroom, Department Seminar hall, Language lab,

- Games and Sports Facilities
- Extra-Curricular Activities
- Soft Skill Development Facilities
- Teaching Learning Process
- Curricula and syllabus for each of the Programmes as approved by the University
- Academic Calendar of the University
- Academic Time Table with the name of the Faculty members handling the Course
- Teaching Load of each Faculty : 16hours per week
- Internal Continuous Evaluation System and place

Three internal test, Assignment and Seminar were considered for Internal Assessment

• Student's assessment of Faculty, System in place

Student feedback will be taken in each semester

- For each Post Graduate Courses give the following:
- Title of the Course : MCA
- Curricula and Syllabi

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI PG - COURSES – AFFILIATED COLLEGES

COURSE STRUCTURE FOR MASTER OF COMPUTER APPLICATIONS (MCA)

(Choice Based Credit System)

(With effect from the academic year 2021-22 onwards)

PROGRAMME EDUCATIONAL OBJECTIVES (PEO):

The Educational Objectives of MCA programmes are:

- To prepare the graduates as successful professionals in software industry, Government, academia, research, entrepreneurial pursuit.
- To prepare the graduates as broadly educated, expressive, ethical and Responsible citizens with proven expertise and contributors to the society.
- To make the graduates recognized through demonstration of good analytical, Design and implementation skills.
- ✤ To prepare the graduates as life-long learners to fulfil their goals.

PROGRAMME OUTCOMES (PO):

After completion of the MCA programme the students are expected to have the:

- Ability to apply the knowledge of computing techniques and other related Specialisation for the abstraction and conceptualisation of computing models From the user requirements
- ✤ Ability to select modern computing tools and techniques and use them Confidently
- Ability to transform complex business challenges into well-defined problems, Investigate, understand and propose integrated solutions using emerging Technologies
- Ability to understand the impact of system solutions in a contemporary, Global, economic, environmental, and societal context for sustainable Development
- Ability to function professionally with ethical responsibility as an individual as well as in multidisciplinary teams with positive attitude
- Ability to communicate the technical information effectively both orally and Practically
- Ability to appreciate the importance of goal setting and to recognize the need For lifelong learning
- * Ability to work collaboratively as a member or a leader in multidisciplinary teams

NORMS FOR ELIGIBILITY THIS PROGRAM

DURATION OF THIS M.C.A PROGRAMME:

Two Years

ELIGIBLITY FOR THIS M.C.A PROGRAMME:

Passed BCA / Bachelor Degree in Computer Science Engineering or equivalent degree. OR Passed B.Sc / B.Com/ B.A.with Mathematics at 10+2 level or at Graduation level (with additional bridge courses as per the norms of the concerned University). Obtained at least 50% marks (45% marks in case of candidates belonging to reserved category) in the qualifying Examination

SEMESTER WISE COURSE LIST

Sem.	Sub. No.	Subject Status	Subject Title	Contact Hrs./Week	Credit
(1)	(2)	(3)	(4)	(5)	(6)
	1	Core - 1	Mathematical Foundations for Computer Science	5	4
Т	2	Core - 2	Computer Organization and Architecture	5	4
-	3	Core - 3	Design and Analysis of Algorithms Using C++	4	4
	4	Core - 4	Advanced Java Programming	4	4
	5	Core - 5	Object Oriented Analysis and Design Using UML	4	4
	6	Core - 6 Practical - 1	Design and Analysis of Algorithms Using C++ - Lab	4	2
	7	Core - 7 Practical - 2	Advanced Java Programming - Lab	4	2
II	8	Core - 8	Financial and Management Accounting	5	4
	9	Core - 9	Machine Learning using Python	5	4
	10	Core - 10	Advanced Web Technology	4	4
	11	Core - 11	Advanced Data Base Management System	4	4

	12	Elective – 1 (Select any ONE)	Distributed Operating System/ Cloud Computing /Soft Computing /Cyber Security	4	3
	13	Core - 12 Practical - 3	Machine Learning using Python - Lab	4	2
	14	Core - 13 Practical - 4	Advanced Web Technology - Lab	4	2
	15	Core – 14	Data Science & Analytics	4	4
	16	Core – 15	Advanced Digital Image Processing	4	4
III	17	Core – 16	Principles of Compiler Design	4	4
	18	Core – 17	Research Methodology	4	4
	19	Elective – 2	Optimization Techniques/ Mobile Application Development/ Mobile Computing/ Professional Ethics	4	3
	20	Core - 18 Practical - 3	Data Science & Analytics using R Lab	4	2
	21	Core - 19 Practical - 4	Mini Project	6	6
IV	22	Core – 20	Major Project	30	16

Scheme of Examination

Theory Paper

Assessment Components (External : Internal – 75 : 25)

Internal Marks --25

Test	- 15 marks
Assignment	- 5 marks
Seminar	5 marks
Total	- 25 marks

External Marks - 75 marks

Section	Α	: 10X 1marks	= 10 marks
Section E	8	: 5X 5 marks	= 25 marks
Section C	2	: 5X 8 marks	= 40 marks
Total		7	5 marks

Practical Paper

Assessment Components (External : Internal – 50 : 50)

MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.1 / Core – 1

MATHEMATICAL FOUNDATIONS FOR COMPUTER SCIENCE

L T P C

4 0 0 4

OBJECTIES

- To provide the strong mathematical foundation that will help the students in writing programs.
- To improve the logical reasoning while programming with computer languages.

OUTCOMES

- Apply the fundamentals of set theory and matrices for the given problem.2.
- Apply the types of distribution, evaluate the mean and variance for the given case study/ problem.
- solve the given problem by applying the Mathematical logic concepts
- Model the given problem by applying the concepts of graph theory.
- Identify and list the different applications of discrete mathematical concepts in computer science.

UNIT – I SET THEORY AND MATRICES

Sets, Operations on sets, Cardinality of sets, inclusion-exclusion principle, pigeonhole Principle, matrices, finding Eigen values and Eigen vectors.(**12L**)

UNIT – II MATHEMATICAL LOGIC

Propositional Logic, Applications of Propositional Logic, Propositional Equivalences Predicates and Quantifiers, Nested Quantifiers, Rules of Inference Introduction to Proofs

(12L)

MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.1 / Core – 1

UNIT - III RELATIONS

Relations and Their Properties, n-ary Relations and Their Application, Representing Relations, Closures of Relations, Equivalence Relations, Partial Orderings(12L)

UNIT – IV RANDOM VARIABLE AND PROBABILITY DISTRIBUTION

Concept of random variable, discrete probability distributions, continuous probability Distributions, Mean, variance and co-variance and co-variance of random variables. Binomial And normal distribution, Exponential and normal distribution with mean and variables and Problems. (**12L**)

UNIT – V GRAPH THEORY

Graphs and Graphs models, Graph Terminology and Special Types of Graphs, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Shortest-Path Problems, Planar Graphs, Graph Coloring (**12L**)

TOTAL : 60 PERIODS

REFERENCES

- Kenneth H Rosen, "Discrete Mathematics and its Applications", McGraw Hill Publications, 8th edition, 2018
- 2. Wolpole Myers Ye "Probability and Statistics for engineers and Scientist" Pearson Education, 9th edition, 2017
- Narasingh Deo, Graph Theory with Applications to Engineering and Computer Sciencel, Prentice-Hall of India Private Limited, 2017.

MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.2 / Core – 2

COMPUTER ORGANIZATION AND ARCHITECTURE

L T P C 4 0 0 4

OBJECTIVES

- ✤ To understand the basic structure and operation of digital computer.
- ✤ To understand the basic processing concepts and bus organization.
- To understand the two types of control unit techniques and the concept of pipelining.
- To understand the different ways of communication with I/O devices and standard I/O interfaces

OUTCOMES

- ♦ Understand the functional units of a computer, bus structures and addressing.
- Analyze RAM, ROM, and cache memory and virtual memory concepts.
- ✤ Evaluate the modes.
- ✤ Know about single bus, multiple bus organization.
- Design and analyze the pipelining concepts and various I/O interfaces.

UNIT I

Introduction: Digital Computers-Basic Organization of a Computer-Historical Perspective.

Digital Logic Circuits:Digital Computers-Logic Gates-Boolean Algebra-Map Simplification-Combinational Circuits – flipflops.

Digital Components:Integrated Circuits – Decoders – Multiplexers – Registers-Shift Registers-Binary Counters.

Data Representation:Data Types – Complements-Fixed-Point Representation-Conversion of Fractions-Floating-Point Representation.

(12L)

UNIT II

Register Transfer and Microoperations:Register Transfer-Bus and Memory Transfers-Arithnietic Microoperations-Logic Microoperations-Shift Microoperations-Arithmetic Logic Shift Unit. MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.2 / Core – 2

Basic Computer Organization and Design: Instruction Codes-Computer Registers-Computer Instructions-Timing and Control-Instruction Cycle.

Programming the Basic Computer:Machine Language-Assembly Language-The Assembler–Subroutines.

UNIT III

Microprogrammed Control: Control Memory-Address Sequencing-Design of Control Unit.

Central Processing Unit: General Register Organization-Stack Organization-Instruction Formats-Addressing Modes-Data Transfer and Manipulation-Program Control-CISC Characteristics-RISC Characteristics.

Pipeline and Vector Processing: Parallel Processing – Pipelining – Arithmetic Pipeline – Instruction – RISC Pipeline – Vector processing – Array Processor.

(12L)

(12L)

UNIT IV

Computer Arithmetic: Addition and Subtraction-Multiplication Algorithms-Division Algorithms-Decimal Arithmetic Unit-Decimal Arithmetic Operations.

Input-Output Organization: Peripheral Devices-Input-Output Interface-Asynchronous Data Transfer-Modes of Transfer-Direct Memory Access (DMA)-Serial Communication-Bus Standards.

UNIT V

Memory Organization: Memory Hierarchy-Main Memory-Auxiliary Memory-Associative Memory-Cache Memory-Virtual Memory.

Multiprocessors: Characteristics of Multiprocessors-Interconnection Structures.

(12L)

(12L)

TOTAL: 60 PERIODS

MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.2 / Core – 2

Reference Books:

- 1. M. Morris Mano, Rajib Mall, "Computer System Architecture– Revised", Third Edition, Pearson India Education Services Pvt. Ltd., 2017.
- John P Heys, "Computer Architecture and Organiztion", 3rd Edition, McGraw Hill 1998.
- 3. William Stallings, "Computer Organiztion and Architecture Designing for Performance", 10th Edition, Pearson Education, 2016.
- 4. Alka Viswa, "Computer Organization and Architecture", Dreamtech Press, 2019.

MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.3 / Core – 3

DESIGN AND ANALYSIS OF ALGORITHMS USING C++

L T P C 4 0 0 4

OBJECTIVES

To learn effective problem solving in computing applications and analyze the algorithmic procedure to determine the computational complexity of algorithms.

OUTCOMES

✤ It gives stepwise procedure to solve problems.

- ✤ The Problems can be broken down into small pieces for program development.
- Efficient approach of solving problems by a model of computations

UNIT - I

Introduction: Algorithm-Specification-Performance Analysis. Data Structures: Lists- Stacks- Queues - Trees - Graphs - Dictionaries - Priority Queues.(12 L)

UNIT - II

Divide And Conquer: General Method-Binary Search- Finding the Maximum AndMinimum- Quicksort - Strassen's Matrix Multiplication.(12 L)

UNIT - III

The Greedy Method: General Method- 0/1 Knapsack Problem-Job Sequencing with Deadlines – Minimum-Cost Spanning Tree- Single-Source Shortest Paths.

Dynamic Programming: General Method- All-Pairs Shortest Path- 0/1 Knapsack Problem. (12 L)

UNIT - IV

Basic Traversal and Search Techniques: Techniques for Binary Trees-Graphs-Connected Components and Spanning Trees.

Backtracking: General Method- N-Queen Problem- Hamiltonian Circuit Problem.

(12 L)

UNIT - V

Branch and Bound: Method- Assignment Problem - Knapsack Problem.

NP-Hard And NP-Complete Problem: Basic Concepts-Cook's Theorem- -Job Shop Scheduling. (12L)

TOTAL: 60 PERIODS

MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.3 / Core – 3

Reference Books:

- 1. Sandeep Sen and Amit Kumar Design and Analysis of Algorithms: A contemporary perspective, Cambridge University Press, 2019.
- 2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithms", 2nd Edition, Universities Press (India) Private Ltd., 2008
- 3. Aho, Hoporoft and Ullman, "The Design and Analysis of Computer Algorithm", Pearson Education, Delhi, 2001.
- 4. S.Sridhar, "Design and Analysis of Algorithms", Oxford University Press, 2015.
- 5. Basu S.K., "Design Methods and Analysis of Algorithms", PHI, 2006.
- M.A.Weiss, "Data Structures and algorithm Analysis in C++", Pearson Education, Asia, 2013.

MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.4 / Core – 4

ADVANCED JAVA PROGRAMMING

L T P C 4 0 0 4

OBJECTIVES

- ✤ To learn the advanced concepts in the java language and java programming environment.
- ✤ To design webpage.
- To develop webpage using scripting,

OUTCOMES

- ✤ Able to write java programs
- Understand the importance of JDBC
- Apply the Java programming techniques for providing the solution for the practical problems

UNIT I

OOP and Java: Introduction to Java Language – Object Oriented Programming -Classes and Objects – Methods – Constructor - Overloading Methods.

Inheritance:Introduction – Inheritance Types – General form of subclass – subclass constructor – method overriding – abstract and final classes.

Packages and Interfaces: Defining a package – import statement – setting class path – Interfaces – Defining an interface – implementing interfaces

Enumerations, Autoboxing and Annotations: Enumerations – Type Wrappers – Autoboxing – Annotations (metadata)

(12L)

UNIT II

Input/output : I/O Basics – Byte Streams and Character Streams – Predefined Streams – Reading console input and writing console output – PrintWriter class – Reading and writing Files –Closing a File MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.4 / Core – 4

Generics and Collections: Generics– Generics example – Generic class with two type parameters – Bounded types – Wildcard arguments – Generic method – Generic constructors – Generic interfaces

Collections :Collections – Collection interfaces – Collection classes – accessing a collection – Working with Maps –Arrays – Vector – Stack – Dictionary – Hashtable – Properties – Using Store () and load ().

UNIT III

Swing :Introduction – Components and Containers – Swing packages – simple Swing application – Event handling – JApplet – Painting in Swing – JLabel – JTextField – JButton – JCheckbox - JRadioButton – JTabbedPane – JScrollPane – JList – JComboBox – Dialogs – JTable – JMenu

JDBC: Java database connectivity, Types of JDBC drivers, Writing JDBC applications – Types of statement objects (Statement, PreparedStatement, and CallableStatement), Types of Resultset – Inserting and updating records – Using Transactions.

(12L)

(12L)

UNIT IV

NIO: NIO classes – Buffers – Channels – Path Interface – Files class – Paths class – File attribute interfaces – Reading and writing a File via a Channel – Stream-Based I/O – Path and File System operations

Networking: Networking Classes and Interfaces – InetAddress – TCP/IP – UDP

RMI: Introduction – Remote Interface – java.rmi package – Naming Class – RMI Exception – Creating a simple RMI Client/Server application.

(12L)

UNIT V

Java Beans: An overview of Java Beans – Properties, Events and Methods – Introspection - Builder Tools – BDK – Persistence – Java Beans API – A Bean Example

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Java Servlets :Java Servlets and CGI Programming – Life cycle of a Servlet – Tomcat – A Simple Servlet – javax.servlet - javax.servlet.http – Handling HTTP requests and responses – Working with Cookies – Tracking Sessions.

(12L)

TOTAL: 60 PERIODS

References:

- Herbert Schildt: Java The Complete Reference, Eleventh Edition, Tata McGraw-Hill, 2019
- 2. <u>Balagurusamy</u> : Programming with Java, Sixth Edition, Tata McGraw-Hill, 2019
- Jim Keogh: J2EE The Complete Reference, Second Edition, Tata McGraw-Hill, 2007
- Patrick Niemeyer and Daniel Leuck : Learning Java, Fourth Edition, O'Reilly Media, 2013

MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.5 / Core – 5 OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

L T P C 4 0 0 4

OBJECTIVES

- ✤ To understand objects, classes and OO concepts
- To study the various phases of software development, models and design methodologies
- To use UML diagrams for software design
- To develop applications using UML

OUTCOMES

- Analyze the Systems Development Life Cycle
- ✤ Identify the basic software requirements UML Modeling
- ✤ Apply software design with UML diagrams
- Develop applications using UML

UNIT I - INTRODUCTION

An overview - Object Basics - Object State and Properties – Behavior and Methods – Respond to Message – Encapsulation and Information Hiding – Class Hierarchy – Relationship and Associations – Aggregation – Advanced Topics – Object oriented system development life cycle (12L)

UNIT II – METHODOLOGY AND UML

Introduction – Survey – Rumbaugh ,Booch , Jacobson Methods – Patterns – Frameworks- Unified Modeling Language: Introduction - Static and dynamic Models – Modeling - UML Diagrams – UML Class Diagram – Use-case Diagram – UML Dynamic Modeling – Model Management – UML Extensibility

(12L)

UNIT III – OBJECT-ORIENTED ANALYSIS

Identifying Use cases: Introduction - Business Object Analysis – Use case driven Object oriented analysis – Use-case Model – Documentation – Classification: Introduction – Classification Theory – Naming Classes Language - Constraint– Introduction – Object-Oriented Design Philosophy –UML Object Identifying Object relationships, Attributes and Methods: Super sub class – A part of relationships aggregation – Object responsibility – Methods for ViaNet bank objects. (12L)

MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.5 / Core – 5

UNIT IV – OBJECT- ORIENTED DESIGN

Object Oriented Design process and Design axioms: Axioms – corollaries – Design Patterns – Designing Classes : Class visibility – Refining attributes – Methods and protocols – Object – relational system – Multi Database System – Designing Interface Object - Macro and Micro level process – Purpose of a view layer interface. (**12L**)

UNIT V – QUALITY AND TESTING

Quality Assurance – Testing Strategies – Impact of Object Orientation on Testing – Test Plan – Test cases system usability – Usability Testing.(12L)

TOTAL: 60 PERIODS

Reference Books:

- 1. Ali Bahrami, "Object Oriented Systems Development", McGraw Hill Education(India) Private Limited, Edition 2008.
- Jaya Mala, S. Geetha, "Object Oriented Analysis and Design using UML", McGraw Hill Education, 2013
- Atul Kahate, "Object Oriented Analysis and Design", Tata McGraw Hill Education, 2004.
- 4. Mahesh P.Matha, "Object-Oriented Analysis and Design Using UML", PHI Learning Private Limited, 2012.
- F. Margret Sharmila, N.Jayanthi, Dr.R.Vasanthi, A.Surya, Dr.R.Palson Kennedy, "Object Oriented Analysis & Design", Charulatha Publications Private Limited, 2019
MSU / 2021-22 / PG –Colleges / MCA/ Semester I / Ppr.no.6 / Practical -1

DESIGN AND ANALYSIS OF ALGORITHMS USING C++ - LAB

LTPC

0 1 4 2

Programs should include but not limited to:

- 1. Write a program that implements Stack
- 2. Write a program to implement Queue
- 3. Write a program that implements Singly Linked List.
- 4. Write a program to implement Evaluation of Postfix expression.
- 5. Write a program to implement Priority Queue.
- 6. Write a program that implements Binary Tree Traversals.
- 7. Write a program that implements BFS
- 8. Write a program that implements DFS
- 9. Write a program to implement Binary Search using DAC technique.
- 10. Write a program to implement Quick Sort using DAC technique.
- 11. Write a program that implements Strassen's matrix multiplication using Greedy Method.
- 12. Write a program that implements Knapsack problem using Greedy Method.
- 13. Write a program that implements Prim's Algorithm
- 14. Write a program that implements Kruskal's Algorithm
- 15. Write a program that implements All-pairs Shortest path problem
- 16. Write a program that implements N-Queen Problem

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ADVANCED JAVA PROGRAMMING - LAB

LTPC 0142

- 1. Write a Java application program to demonstrate class with constructors and method overloading.
- 2. Write a Java application program to demonstrate inheritance and method overriding.
- 3. Write a Java application program to demonstrate package with classes and interfaces.
- 4. Write a Java application program to read and write a file using file I/O.
- 5. Write a Java application program to find minimum and maximum of integers and characters using Generics.
- Write a Java application program to implement the Queue operations using the Linked List Class.
- 7. Write a Java program using the swing components with event handling.
- 8. Write a Java program using menus in swing.
- 9. Write a program in Java to create a table and insert and query records in the table.
- 10. Write a program in Java to read a file using Channel I/O.
- 11. Write a program in Java to implement a client/server environment using TCP/IP.
- 12. Write a program in Java to implement a client/server environment using UDP.
- 13. Write a program in Java to implement a client/server using RMI.
- 14. Write a program in Java to create a form and validate a password using Servlet.
- 15. Write a program in Java to develop a simple Java Bean.

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.8 / Core - 8

FINANCIAL AND MANAGEMENT ACCOUNTING

L T P C 4 0 0 4

OBJECTIVES

- To understand the fundamental accounting concepts, the elements of financial statements, and basic accounting vocabulary.
- To explain the basic features of accounting and reporting by organizations, including the principles underlying the design, integrity, and effectiveness of information systems

OUTCOMES

- Perform the accounting analysis
- Explain the basic features and issues in accounting.
- Prepare the financial statements.

UNIT I

Principles, Accounting concepts, Methods of Accounting, Types of Accounting – Accounting Rules. Journal, Rules for Debit and Credit, Compound Journal entry, Advantages of Journal, Ledger, Ledger Account, Ledger Posting, Process of Posting, Balancing of an Account, Significance of Balances, Relation between Journal and Ledger-Subsidiary Books.

(12L)

UNIT II

Trial Balance: Objects, Methods of Preparing Trial balance, how to locate errors, hints for the preparation of trial balance & problems. Trading account – individual items posted to the debit of trading account – individual items credited to trading account – advantages of trading account – profit & loss account - advantages of profit & loss account - balance sheet- classification of assets & liabilities

(12 L)

UNIT III

Ratio analysis: Meaning – classification of ratios – Liquidity ratios - Profitability ratios– Advantages – Limitations.

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.8 / Core - 8

Fund flow analysis: Meaning of the term fund – Working capital – statement of changes in working capital – preparation of fund flow statement.

(12 L)

UNIT IV

Cost accounting: meaning of costing – scope – importance – cost classification -Marginal costing – Nature – scope – importance Break-even-point – Break even chart – P/V ratio – Marginal costing and management decisions.

(12 L)

UNIT V

Standard costing and Variance analysis: Nature, scope, advantages - Limitations, computation and analysis of variances with reference to material cost and Labour cost.

Budget and Budgetary Control: Meaning – Budget – Budgetary control – Advantages – Limitations – classification of budgets - preparation of sales budget –Flexible budget.

(12 L)

TOTAL:60 PERIODS

Reference Books:

- N.P.Srinivasan M.Sakthivel Murugan, Accounting for Management S.Chand & Sons, New Delhi.
- 2. SP Jain and KL Narang Advanced Accounting Kalyani Publishers, New Delhi.
- 3. S P Iyengar Advanced Accounting Sultan Chand & Sons, New Delhi.
- S N Maheswari and C B Gupta Financial management Sultan Chand & Sons, New Delhi.
- S. N. Maheswari and C B Gupta Management Accounting Sultan Chand & Sons, New Delhi.

MSU / 2021-22 / PG -Colleges / MCA/ Semester II / Ppr.no.9 / Core - 9

MACHINE LEARNING USING PYTHON

L T P C 4 0 0 4

OBJECTIVES

- ✤ To Learn about Machine Intelligence and Machine Learning applications
- To identify and apply the appropriate machine learning technique to classification, pattern recognition, optimization and decision problems.
- ◆ To understand how to perform evaluation of learning algorithms and model selection.

OUTCOMES

- Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.
- Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.
- Be able to design and implement various machine learning algorithms in a range of real-world applications.

UNIT I

Introduction - Why Machine Learning? - Problems Machine Learning Can Solve -Knowing Your Task and Knowing Your Data - Why Python? - scikit-learn - Installing scikitlearn - Essential Libraries and Tools - Supervised Learning - Classification and Regression -Generalization, Over fitting, and Under fitting - Supervised Machine Learning Algorithms.

(12L)

UNIT II

Unsupervised Learning and Preprocessing - Types of Unsupervised Learning -Challenges in Unsupervised Learning - Preprocessing and Scaling - Dimensionality Reduction, Feature Extraction, and Manifold Learning – Clustering.

(12L)

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UNIT III

Representing Data and Engineering Features - Categorical Variables - Binning, Discretization, Linear Models, and Trees - Interactions and Polynomials - Univariate Nonlinear Transformations - Automatic Feature Selection – Utilizing Expert Knowledge.

(12L)

UNIT IV

Model Evaluation and Improvement - Cross-Validation - Grid Search - Evaluation Metrics and Scoring.

(12 L)

UNIT V

Algorithm Chains and Pipelines - Parameter Selection with Preprocessing - Building Pipelines - Using Pipelines in Grid Searches - The General Pipeline Interface - Grid-Searching Preprocessing Steps and Model Parameters -Grid-Searching Which Model To Use.

(12L)

TOTAL: 60 PERIODS

REFERENCE BOOKS:

- Andreas C. Müller, Sarah Guido, "Introduction to Machine Learning with Python", O'Reilly Media, Inc, October 2016.
- Jeremy Watt, Reza Borhani, Aggelos K. Katsaggelos, "Machine Learning Refined -Foundations, Algorithms, and Applications", Second Edition, Cambridge University Press, 2020.
- 3. Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar, Foundations of Machine Learning, Second Edition, the MIT Press, 2018.
- 4. John Paul Mueller and Luca Massaron, Machine Learning (in Python and R) For Dummies, John Wiley & Sons, 2016.

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.10 / Core - 10

ADVANCED WEB TECHNOLOGY

L T P C

4 0 0 4

OBJECTIVES

- Explore the backbone of web page creation by developing .NET skill.
- > Enrich knowledge about HTML control and web control classes
- Provide depth knowledge about ADO.NET
- Understand the need of usability, evaluation methods for web services

OUTCOMES

- Design a web page with Web form fundamentals and web control classes
- Recognize the importance of validation control, cookies and session
- Apply the knowledge of ASP.NET object, ADO.NET data access and SQL to develop a client server model.
- Recognize the difference between Data list and Data grid controls in accessing data.

UNIT – I OVERVIEW

OVERVIEW OF ASP.NET - The .NET framework – Learning the .NET languages Data types – Declaring variables- Scope and AccessibilityVariable operations- Object Based manipulation- Conditional Structures- Loop Structures- Functions and Subroutines. Types, Objects and Namespaces : The Basics about Classes- Value types and Reference types-Advanced class programming- Understanding name spaces and assemblies. Setting Up ASP.NET and IIS

(12L)

UNIT - II APPLICATIONS

Developing ASP.NET Applications - ASP.NET Applications: ASP.NET applications– Code behind- The Global. asax application file Understanding ASP.NET Classes- ASP.NET Configuration. Web Form fundamentals: A simple page applet-Improving the currency converter- HTML control classes- The page class- Accessing HTML

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server controls. Web controls: Web Control Classes – Auto PostBack and Web Control events- Accessing web controls. Using Visual Studio.NET: Starting a Visual Studio.NET Project- Web form Designer Writing code- Visual studio.NET debugging. Validation and Rich Controls: Validation- A simple Validation example- Understanding regular expressions- A validated customer form. State management - Tracing, Logging, and Error Handling.

(12L)

UNIT – III WORKING WITH DATA

Working with Data - Overview of ADO.NET - ADO.NET and data management-Characteristics of ADO.NET-ADO.NET object model. ADO.NET data access : SQL basics– Select , Update, Insert, Delete statements- Accessing data- Creating a connection- Using a command with a DataReader - Accessing Disconnected data - Selecting multiple tables – Updating Disconnected data. Data binding: Single value Data Binding- Repeated value data binding- Data binding with data bases. Data list – Data grid – Repeater – Files, Streams and Email – Using XML (12L)

UNIT – IV WEB SERVICES

Web Services - Web services Architecture: Internet programming then and now-WSDL–SOAP- Communicating with a web service-Web service discovery and UDDI. Creating Web services: Web servicebasics- The StockQuote web service – Documenting the web service- Testing the web service- Web service Data types- ASP.NET intrinsic objects. Using web services: Consuming a web service- Using the proxy class- An example with TerraService. (12L)

UNIT - V ADVANCED ASP.NET

Advanced ASP.NET - Component Based Programming: Creating a simple component – Properties and state- Database components- Using COM components. Custom controls: User Controls- Deriving Custom controls. Caching and Performance Tuning: Designing and scalability– Profiling- Catching- Output catching- Data catching. Implementing security: Determining security requirements- The ASP.NET security model-Forms authentication- Windows authentication.

(12L)

TOTAL : 60 PERIODS

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REFERENCES

- 1. Mathew Mac Donald, "ASP.NET Complete Reference", TMH 2017.
- 2. Web Technologies HTML, Javascript, PHP, Java, JSP, ASP.NET, XML and AJAX Black Book By: Kogent Learning Solutions Inc.

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.11 / Core - 11

ADVANCED DATA BASE MANAGEMENT SYSTEM

L T P C 4 0 0 4

OBJECTIVES

- Acquire Knowledge of Database Models, Applications of Database Models and Emerging Trends.
- To enable the students to understand the concepts behind the relational database management system and its design.

OUTCOMES

- * Know about the Various Data models and Works on Database Architecture
- ✤ Knowledge patterns, Object Oriented Databases are well equipped.
- Able to understand the database activities such as recovery, administration, backup, etc.

UNIT – I

Introduction: Purpose of data base systems – Data Models – Data abstraction -Database Languages – Functional components of a Database System - System structure – DBA – Database Users. Relational Model: Structure of Relational databases - Database schema – Keys – Schema diagram - Relational Algebra –Integrity constraints.

(12 L)

UNIT - II

Data Normalization: First, Second and Third normal forms – Boyce-Codd Normal Form – Fourth and fifth normal forms – Domain-Key normal form– Database Design.

E-R Model: Entity – Relationship - Attributes— mapping cardinalities – E-R Diagrams – Extended Entity Relationship Model.

Complex Data Types: Semi-structured data – objected-orientation – Textual data – Spatial data – Temporal data.

(12 L)

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UNIT – III

SQL: Introduction to SQL – SQL Data Definition – SQL Queries – where, order by – Set operations – Null values – Aggregate Functions – Nested subqueries – Insert, update, delete – Join – views – SQL data types and schemas – Index – Authorization – Procedures – Functions – Triggers – Advanced aggregation features

UNIT - IV

Transactions: Transaction Concept – A simple Transaction model – Storage Structure – Transaction Atomicity and Durability – Transaction Isolation – Serializability.

Concurrency Control: Lock based Protocols – Deadlock Handling – Multiple Granularity – Timestamp Based Protocols – Validation Based Protocols – Multiversion Schemes – Snapshot Isolation – Insert Operations, Delete Operations and Predicate Reads.

Recovery Systems: Failure Classification – Storage – Recovery and Atomicity – Recovery Algorithm – Buffer Management.

UNIT - V

Database System Architecture: Centralized and Client Server Architectures – Server System Architectures – Parallel Systems – Distributed Systems.

Parallel Databases: Introduction – I/O parallelism – Interquery parallelism – Intraquery parallelism – Intraoperation parallelism – Interoperation parallelism.

Distributed Databases: Homogeneous and Heterogeneous Databases – Distributed Data Storage – Distributed Transactions.

(12 L)

TOTAL: 60 PERIODS

Reference Books:

- Abraham Silberschatz, Henry F. Korth, Sudarshan S: Database System Concepts, Seventh Edition, McGraw-Hill, 2019
- 2. Kevin Loney: Oracle Database 11g The Complete Reference, McGraw-Hill, 2008.

(12 L)

(12 L)

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.11 / Core - 11

- 3. Mathews Leon and Alexis Leon: Database Management Systems, Vikas Publishing 2008.
- 4. Ramez Elmashree, Shamkant B.Navathe: Fundamentals of Database Systems, Pearson Education, 2011.
- 5. C. J. Date: Introduction to Database Systems, 8th Edition, Pearson Education, 2003
- 6. Rajesh Narang: Database Management Systems, 2nd Edition, PHI, 2012.

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.12 / Elective – 1 (a)

Elective 1: 1. DISTRIBUTED OPERATING SYSTEM

L T P C 4 0 0 4

OBJECTIVES

To study Distributed operating system concepts

✤ To understand hardware, software and communication in distributed OS

Practices to learn concepts of OS and Program the principles of Operating Systems

OUTCOMES

- Clear understanding on several resource management techniques like distributed shared memory and other resources
- Able to design and implement algorithms of distributed shared memory and commit protocols
- ♦ Able to design and implement fault tolerant distributed systems

UNIT – I

Fundamentals: What is Distributed Operating System? – Evolution of Distributed Computing System – Distributed Computing System Models – Why are Distributed Computing Systems gaining popularity? – What is a Distributed Computing System? – Issues in Designing Distributed Computing System – Introduction to Distributed Computing Environment (DCE). Computer Networks: Introduction– Network Types – LAN Technologies–WAN Technologies– Communication Protocols – Internetworking – ATM Technology.

UNIT - II

Message Passing: Introduction –Desirable features of Good Message Passing System – Issues in IPC Message Passing – Synchronization – Buffering – Multi datagram Messages – Encoding and Decoding of Message Data– Process Addressing – Failure Handling – Group Communication

(9L)

(9L)

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.12 / Elective – 1 (a) UNIT - III

Remote Procedure Calls : Introduction– The RPC Model – Transparency of RPC– Implementing RPC mechanism–Stub Generation–RPC Messages–Marshaling Arguments and Results–Server Management– Parameter Passing Semantic–Call Semantics– Communication Protocol for RPC's –Complicated RPC's –Client Server Binding–Exception Handling–Security–Some Special Types of RPC's –RPC in Heterogeneous Environments – Lightweight RPC. Distributed Shared Memory: Introduction – General Architecture of DSM Systems – Design and Implementation Issues of DSM – Granularity – Structure of Shared Memory – Consistency Models – Replacement Strategy – Thrashing–Other Approaches to DSM–Heterogeneous DSM –Advantages of DSM.

UNIT - IV

Synchronization: Introduction – Clock Synchronization – Event Ordering – Mutual Exclusion – Deadlock – Election Algorithms. Process Management: Introduction-Process Migration– Threads. (**9L**)

$\mathbf{UNIT} - \mathbf{V}$

Distributed File System: Introduction – Desirable features of a Good Distributed File System– File Models – File Accessing Models – File Sharing Semantics – File Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles.

(9L)

(9L)

TOTAL: 45 PERIODS

Reference Books:

- 1. Pradeep K Sinha,"Distributed Operating Systems", PHI Learning, 2012.
- 2. Andrew S Tanenbaum, "Distributed Operating Systems", First Edition, PHI 2002
- 3. George Coulouris, Gordon Blair, Jean Dollimore, Tim Kindberg, "Distributed Systems Concepts and Design", Fifth Edition Pearson 2017.
- Manish Varshney, Shanoo Agarwal, "Concepts of Distributed System", CBS Publisher and Distributors, 2016.
- 5. Abraham Silberchalz Peter B. Galvin, G.Gagne, "Operating Systems Concepts", Ninth edition, Addision Wesley Publishing Co., 2018.
- 6. Coulouris George, Dollimore Jean, Blair Gordon, "Distributed Systems- concepts and design", Pearson Education, 2017.

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.12 / Elective – 1 (b) CLOUD COMPUTING

L T P C 4 0 0 4

OBJECTIVES:

- ✤ To introduce the broad perceptive of cloud architecture and model
- To understand the concept of Virtualization and design of cloud Services
- ✤ To be familiar with the lead players in cloud.
- ✤ To learn to design the trusted cloud Computing system

OUTCOMES:

- Compare the strengths and limitations of cloud computing
- ✤ Identify the architecture, infrastructure and delivery models of cloud computing
- Address the core issues of cloud computing such as security, privacy and interoperability.

UNIT I CLOUD INFRASTRUCTURE

Scalable Computing over the Internet –Technologies for Network based Systems -System Models for Distributed and Cloud Computing –Software Environments for Distributed Systems and Clouds-NIST Cloud Computing Reference Architecture-Cloud Computing and Services Model –Public, Private and Hybrid Clouds –Cloud Eco System -IaaS -PaaS –SaaS

(9L)

UNIT II VIRTUALIZATION STRUCTURES

Implementation Levels of Virtualization -Virtualization Structures –Tools andMechanisms -Virtualization of CPU, Memory, I/O Devices -Virtual Clusters and ResourceManagement –Virtualization for Data-Center Automation(9L)

UNIT III CLOUD SYSTEM MODEL

Architectural Design of Compute and Storage Clouds –Layered Cloud Architecture Development –Design Challenges -Public Cloud Platforms-GAE, AWS, and Azure-Inter Cloud Resource Management –VM Management -Resource Provisioning and Platform Deployment -Global Exchange of Cloud Resources -Cloud Security and Trust Management.

(9L)

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.12 / Elective – 1 (b)

UNIT IV CLOUD SECURITY -MIDDLEWARE AND TESTING

Parallel and Distributed Programming Paradigms –MapReduce , Twister and Iterative MapReduce –Hadoop Library from Apache –Mapping Applications -Programming Support -Google App Engine, Amazon AWS -Cloud Software Environments -Eucalyptus, Open Nebula,OpenStack. CloudSim –Architecture -Cloudlets –VM creation –Broker –VM allocation –Hosts –Data Center. (9L)

UNIT V CLOUD APPLICATIONS AND CASE STUDIES

Cloud Computing Risk Issues –Cloud Computing Security Challenges –Cloud Computing Security Architecture –Trusted cloud Computing –Identity Management and Access Control –Autonomic Security. Using the Mobile Cloud-Dynamic Resource Allocation Using Virtual Machines for Cloud Computing Environment. (9L)

TOTAL: 45 PERIODS

REFERENCES:

- Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
- Ronald L. Krutz, Russell Dean Vines, "Cloud Security –A comprehensive Guide to Secure Cloud Computing", Wiley –India, 2010
- 3. Barrie Sosinsky, "Cloud Computing Bible", Wiley Publishing Inc., 2011.
- Ray.J.Rafaels, "Cloud Computing : From Beginning to End" Createspace Independent Publishing, 2015
- John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.
- George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud" O'Reilly, 2009
- Zhen Xiao, Weijia Song, And Qi Chen, "Dynamic Resource Allocation Using Virtual Machines For Cloud Computing Environment", IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, VOL. 24, NO. 6, JUNE 2013.
- 8. Rajkumar Buyya, Christian Vecchiola, S.Tamarai Selvi, "Mastering Cloud Computing", TMGH, 2013.

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.12 / Elective – 1 (b)

- Rodrigo N.Calheiros, Rajiv Ranjan, Anton Beloglazov, César A. F. De Rose, and Rajkumar Buyya, "CloudSim: A Toolkit for Modeling and Simulation of Cloud Computing Environments and Evaluation of Resource Provisioning Algorithms ", Cloud Computing and Distributed Systems (CLOUDS) Laboratory.
- 10. http://www.buyya.com/papers/CloudSim2010.pdf

SOFT COMPUTING

L T P C 4 0 0 4

OBJECTIVES

- Upon successful completion of the course, students will have an understanding of the basic areas of Soft Computing including Artificial Neural Networks, Fuzzy Logic and Genetic Algorithms.
- Provide the mathematical background for carrying out the optimization associated with neural network learning.

OUTCOMES

- Learn about soft computing techniques and their applications
- Analyze various neural network architectures Implement machine learning through neural networks
- Understand perceptrons and counter propagation networks.
- Understand fuzzy concepts and develop a fuzzy expert system to derive decisions
- Analyze the genetic algorithms and their applications and able to write genetic algorithms to solve optimization problem.

UNIT - I NEURAL NETWORKS FUNDAMENTALS

Artificial Neural Network : Basic Concepts of Neural networks - Evolution of Neural networks - Basic Models of Artificial neural network - Terminologies of ANN- McCulloch -Pitts Neuron - Linear separability - Hebb Network - Applications of Neural networks. Supervised learning Network: Introduction – Perceptron Networks – Adaptive Linear Neuron – Multiple Adaptive Linear Neurons – Back propagation Network. (9L)

UNIT – II CATEGORIES OF NEURAL NETWORKS

Associative Memory Networks : Introduction – Training algorithms for pattern association –Auto associative Memory Network – Bidirectional Associative Memory – Hopfield Networks.Unsupervised Learning networks: Introduction – Fixed Weight Competitive Nets - Kohonen Self-Organizing Maps – Learning Vector Quantization – Adaptive Resonance Theory Network. (9L)

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UNIT – III BASIC CONCEPTS OF FUZZY SET

Introduction to Classical Sets and Fuzzy Sets: Introduction - Classical sets - Fuzzy Sets. Classical Relation and Fuzzy Relations: - Introduction - Cartesian product of a relation -Classical Relation - Fuzzy Relations. Membership Functions: Introduction - Features of Membership Functions – Fuzzification - Methods of Membership Value Assignments. Defuzzification: Introduction - Lambda-Cuts for Fuzzy Sets - Lambda-Cuts for Fuzzy Relations - Defuzzification Methods. (9L)

UNIT - IV FUZZY ARITHMETIC AND DECISION MAKING

Fuzzy Arithmetic and Fuzzy Measures: Introduction - Fuzzy Arithmetic - Extension principles – Fuzzy measures. Fuzzy Rule Base and Approximate Reasoning: Introduction-Truth values and Tables in fuzzy logic - Fuzzy properties - Formation of rules-Decomposition of rules - Aggregation of Fuzzy rules - Fuzzy reasoning - Fuzzy Inference Systems. Fuzzy Decision Making: Individual Decision Making - Multiperson Decision Making - Multiobjective Decision Making - Multiattribute Decision Making. Fuzzy Logic Control Systems: Introduction - Control System Design - Architecture and Operation of FLC System.

UNIT - V GENETIC ALGORITHMS

Genetic Algorithms : Introduction - Basic Operators and Terminologies in GAs -Traditional Algorithm vs. Genetic Algorithm - Simple GA - General Genetic algorithm - The Schema Theorem - Classification of Genetic Algorithm - Applications of Genetic Algorithm. Applications of Soft Computing : Introduction - A Fusion approach of Multispectral Images with SAR Image for Flood area Analysis - Optimization of TSP using Genetic Algorithm Approach. (9L)

TOTAL : 45 PERIODS

REFERENCES

- 1. Nirali Prakashan, "Soft Computing Techniques" Edition: 1st, 2016.
- 2. <u>Charu C. Aggarwal</u>, "Neural Networks and Deep Learning", Springer, 2018.
- Jang and Sun and Mizutani, "Neuro-Fuzzy and Soft Computing", Pearson India, 2015.

(9L)

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.12 / Elective – 1 (c)

- 4. <u>Lee Spector, Leigh Sheneman</u>, "Genetic Programming Theory and Practice XVI", Springer, 2019.
- 5. Timothy J.Ross, "Fuzzy Sets and Fuzzy Logic with Engineering Applications", Wiley, 2021.
- 6. <u>Sean Moriarity</u>, "Genetic Algorithms in Elixir: Solve Problems Using Evolution" The Pragmatic Programmers, N.Y., 2021

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.12 / Elective – 1 (d) CYBER SECURITY

LTPC

4 0 0 4

OBJECTIVES

- Exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an Organization.
- Understand principles of web security and to guarantee a secure network by monitoring and analyzing the nature of attacks through cyber/computer forensics software/tools

OUTCOMES

- Analyze and evaluate the cyber security needs of an organization
- Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.
- Measure the performance and troubleshoot cyber security systems

UNIT 1: INTRODUCTION TO CYBER SECURITY

Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats:- Cyber Warfare-Cyber Crime-Cyber terrorism-Cyber Espionage, Need for a Comprehensive Cyber Security Policy, Need for a Nodal Authority, Need for an International convention on Cyberspace.(**9L**)

UNIT 2: CYBER SECURITY VULNERABILITIES AND CYBER SECURITY SAFEGUARDS

Cyber Security Vulnerabilities-Overview, vulnerabilities in software, System administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness. Cyber Security Safeguards- Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management.(9L)

MSU / 2021-22 / PG –Colleges / MCA/ Semester II / Ppr.no.12 / Elective – 1 (d)

UNIT 3: INTRUSION DETECTION AND PREVENTION

Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management, Network Session Analysis, System Integrity Validation.(9L)

UNIT 4: CRYPTOGRAPHY AND NETWORK SECURITY

Introduction to Cryptography, Symmetric key Cryptography, Asymmetric key Cryptography, Message Authentication, Digital Signatures, Applications of Cryptography. Overview of Firewalls- Types of Firewalls, User Management, VPN Security Security Protocols: - security at the Application Layer- PGP and S/MIME, Security at Transport Layer- SSL and TLS, Security at Network Layer-IPSec.(**9L**)

UNIT 5: CYBERSPACE AND THE LAW

Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013. (9L)

TOTAL : 45 PERIODS

Reference Books:

- "Cryptography and Network Security Principles and Practice", William Stallings, Pearson Education, Seventh Edition 2017.
- Cyber Security Paperback, Prof. Amit Grag, Dr.Krishan Kumar Goyal, First edition, 2019.
- 3. 3. Cyber Security Paperback, Nina Godbole, Sunit Belapure, Wiley, 2011.
- 4. Cybersecurity for Dummies Paperback, Joseph Steinberg, 2020.
- "Information and Cyber Security", Gupta Sarika, Khanna Publishing House, Delhi, 2019

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Machine Learning using Python -Lab

L T P C 0 1 4 2

1. Visualize the dataset using the Python packages

(i) Matplotlib (ii) Seaborn

2. Implement binning operation for

(i) Numerical data (ii) Categorical data

- 3. Implement the Linear Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.
- 4. Implement the Logistic Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.
- 5. Write a program to demonstrate the working of the Decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
- 6. Write a program to implement the Naïve Bayes classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.
- 7. Write a program to implement the k-Nearest Neighbour classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets
- 8. Write a program to implement the Random Forest classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets
- 9. Write a program to implement the Neural Network classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets
- 10. Implement K- Means clustering algorithm for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets
- 11. Implement DBSCAN clustering algorithm for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets
- 12. Implement PCA for dimension reduction and study its impact in classification.
- 13. Demonstrate the use of cross validation in building a classifier. (use random forest, Naïve Bayes classifiers)
- 14. Demonstrate the Grid Search method for parameter selection in Random Forest and SVM classifier.

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Advanced Web Technology - Lab

- 1. Working with Web Forms in ASP.Net.
- 2. Working with HTML Server Controls in ASP.Net.
- 3. Simple Applications using Web controls:
- a) Finding factorial value.
- b) Finding roots of Quadratic Equation.
- c) Temperature Conversion.
- d) Login Control.
- 4. Working with Validation Control.
- 5. Access data source using ADO.Net.
- 6. Datalist Link Control.
- 7. Databinding using dropdownlist control.
- 8. Databinding using datalist control.
- 9. Datalist Control templates.
- 10. Databinding using datagrid.
- 11. Datagrid Control template.
- 12. Creating own table format using Datagrid.
- 13. Creating Web Services in .NET.
- 14. Creating SOAP Web Services in ASP.Net.
- 15. Using Proxy class in ASP.Net.
- 16. Component Based Programming in ASP.Net.
 - 17. Custom Controls in ASP.Net.
 - 18. Implementing Security in ASP.Net Web Application

MSU / 2021-22 / PG –Colleges / MCA/ Semester III / Ppr.no.15 / Core - 14

DATA SCIENCE & ANALYTICS

LTPC

4 0 0 4

OBJECTIVES

To enable the students to understand the techniques available in handling the voluminous data and to apply the concepts of data analytics to the challenges and issues available on hand.

OUTCOMES

- Understand the need for the big data analytics
- Appreciate the effectiveness of the techniques and algorithms that are available for handling big data
- > Apply the data analytic techniques for their data analysis

UNIT - I INTRODUCTION TO DATA SCIENCE

Introduction: Introduction of Data Science-Getting started with R- Exploratory Data Analysis- Review of probability and probability distributions- Bayes Rule Supervised Learning- Regressionpolynomial regression- local regression- knearest neighbors(**12L**)

UNIT – II UNSUPERVISED LEARNING

Unsupervised Learning- Kernel density estimationk-means- Naive Bayes- Data and Data Scraping Classification-ranking- logistic regression. Ethics- time seriesadvanced regression- Decision trees- Best practices feature selection.(12L)

UNIT – III BIG DATA FROM DIFFERENT PERSPECTIVES

Big data from business Perspective: Introduction of big data-Characteristics of big data-Data in the warehouse and data in Hadoop- Importance of Big data-Big data Use cases: Patterns for Big data deployment. Big data from Technology Perspective: History of HadoopComponents of Hadoop-Application Development in Hadoop-Getting your data in Hadoop-other Hadoop Component.(**12L**)

MSU / 2021-22 / PG –Colleges / MCA/ Semester III / Ppr.no.15 / Core - 14 UNIT – IV INFOSPHERE BIGINSIGHTS

Infosphere Big Insights: Analytics for Big data at rest-A Hadoop-Ready Enterprise-Quality file system-Compression –Administrative tooling-SecurityEnterprise Integration – Improved workload scheduling-Adaptive map reduce-Data discovery and visualization-Machine Analytics(**12L**)

UNIT – V INFOSPHERE STREAMS

Infosphere Streams: Analytics for Big data in motionInfosphere Streams Basicsworking of Infosphere Streams-Stream processing language-Operators-Stream toolkits-Enterprise class(**12L**)

TOTAL DURATION: 60 PERIOD

REFERENCES

- 1. Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data Hardcover, <u>EMC Education Services</u>, Wiley Publication, 2015
- 2. Big Data with Hadoop MapReduce: A Classroom Approach 1st Edition by Rathinaraja Jeyaraj, Ganeshkumar Pugalendhi, Anand Paul, CRC Press
- 3. The Data Science Handbook Hardcover Illustrated by Field Cady, 2017.

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ADVANCED DIGITAL IMAGE PROCESSING

L T P C 4 0 0 4

OBJECTIVES

To provide complete knowledge on Digital Image Processing methods, such as image processing methods in Spatial domain and Frequency domain, Edge detection, Compression, Segmentation, and Morphological concepts, which enable the students to understand the concepts and implement them empirically.

OUTCOMES

- Review the fundamental concepts of a digital image processing system and Analyze images in the frequency domain using various transforms.
- Evaluate the techniques for image enhancement and image restoration. Categorize various compression techniques.
- Interpret Image compression standards, and Interpret image segmentation and representation techniques.

UNIT - I

Fundamentals - The MATLAB Desktop - Using Mat lab Editor /Debugger getting help-saving and Retrieving work session data - Digital Image Representation - Image I/O and Display – Classes and Image Types - M-Function Programming.

Intensity Transformation and Spatial Filtering: Background - Intensity transformation - Histogram Processing and function Plotting - Spatial filtering - Image processing toolbox standard spatial filters. (12L)

UNIT - II

The 2-D Discrete Fourier transform - Computing and Visualizing the 2-D DFT in MATLAB – Filtering in the Frequency domain - Obtaining frequency domain filters from spatial filters - High pass (sharpening) frequency domain filters.

Image Restoration and Reconstruction: A model of the image degradation / restoration process - Noise models - Restoration in the presence of Noise only – Periodic

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Noise reduction using Frequency Domain Filtering – Modeling the Degradation Function -Direct Inverse Filtering - Wiener filtering. (12L)

UNIT - III

Colour image representation in MATLAB - converting to other color spaces - The basics of color image processing - Color transformation - Spatial Filtering of colour images. Working directly in a RGB vector space.

Wavelets: Background - The fast wavelet transform -Working with wavelet decomposition structures - The inverse wavelet transform- Wavelets in image processing.

UNIT - IV

Image Compression: Background - Coding Redundancy - Spatial Redundancy - Irrelevant information- JPEG Compression.

Morphological Image Processing: Preliminaries - Dialation and Erosion -Combining Dialation and erosion - Labelling connected components (12L)

UNIT - V

Image Segmentation: Point, line and edge detection - Line detection using the Hough transform – Thresholding – Region - Based segmentation using the Watershed transform.

Representation and Description: Background – Representation - Boundary Descriptors.

(12L)

TOTAL DURATION: 60 PERIOD

Reference Books:

- Rafael C.Gonzalez, Richard E.Woods, Steven L.Eddins, "Digital Image Processing Using MATLAB", Third Edition, Tata Mc Graw Hill Private Limited, New Delhi, 2011.
- Anil.K.Jain, "Fundamentals of Digital Image Processing", PHI Learning Pvt. Ltd., 2011.

(12L)

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- S.Jayaraman, S.Essakirajan & T.Veerakumar, "Digital Image Processing", Second Edition, McGraw Hill, 2020.
- 4. Rafael C.Gonzalez, Richard E. Woods, "Digital Image Processing", Fourth Edition, Pearson Education, 2018.

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PRINCIPLES OF COMPILER DESIGN

LTPC

4 0 0 4

OBJECTIVES

- Discover principles, algorithms and techniques that can be used to construct various phases of compiler.
- ✤ Acquire knowledge about finite automata and regular expressions
- ✤ Learn context free grammars, compiler parsing techniques.
- Explore knowledge about Syntax Directed definitions and translation scheme

OUTCOMES

 Use the knowledge of patterns, tokens & regular expressions for solving a problem in the field of data mining.

UNIT I

Introduction to Compiler: Language Processors – The Structure of Compiler – The Science of Building a Compiler – Application of Compiler Technology - Programming Language Basics.

A Simple Syntax – Directed Translator: Syntax Definition – Syntax Directed Translation – Parsing – A Translator of Simple Expression – Lexical Analysis – Symbol Table – Intermediate Code Generation.(12L)

UNIT II

Lexical Analysis: The Role of the Lexical Analyzer – Input Buffering – Specification of Tokens– Recognition of Tokens – The Lexical – Analyzer Generator Lex – Finite Automata – From Regular Expression to Automata – Design of a Lexical-Analyzer Generator – Optimization of DFA – Based Pattern Matchers.(**12L**) MSU / 2021-22 / PG –Colleges / MCA/ Semester III / Ppr.no.17 / Core - 16

UNIT III

Syntax Analysis: Introduction – Context-Free Grammars – Writing a Grammar – Top-Down Parsing – Bottom-Up Parsing – Introduction to LR Parsing: Simple LR – More Powerful LR Parsers – Using Ambiguous Grammars – The Parser Generator Yacc(12L)

UNIT IV

Syntax Directed Translation: Syntax-Directed Definitions – Evaluation Orders for SDD's – Applications of Syntax Directed Translation – Syntax Directed Translation Schemes

Intermediate-Code Generation: Variants of Syntax Trees – Three – Address Code – Types and Declarations – Translations of Expressions – Type Checking – Control Flow – Back patching – Switch Statements – Intermediate Code for Procedures(12L)

UNIT V

Run-Time Environments: Storage Organization – Stack Allocation of Space – Access to Nonlocal Data on the Stack.

Code Generation: Issues in the Design of a Code Generator – The Target Language – Address in the Target Code – Basic Blocks and Flow Graph. (12L)

TOTAL : 60 PERIODS

Reference Books:

- Alfred V.Aho, Monica S. Lam, Ravi Sethi, Jeffrey D.Ullman, "Compilers –Principles, Techniques and Tools", Pearson Education Asia, Second Edition, 2014
- Terence Halsey, Compiler Design Principles, Techniques and Tools, Larsen and Keller Education, 2018
- Dick Grune, Kees van Reeuwijk, Henri E.Bal Ceriel J.H Jacobs, Koen Langendoen : Modern Compiler Design, Second Edition, Springer 2012.
- Douglas Thain " Introduction to Compilers and Language Design" University of Notre Dame, 2019

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RESEARCH METHODOLOGY

LTPC

4 0 0 4

OBJECTIVES

*		To understand the importance
	of Research Methodology	
*		To apply the statistical testing
	to prove the hypothesis	
*		To make use of computer aids
	to analyze the data, prepare reports and presentations	Able to evaluate methodology
	of teaching	
OUTC	COMES	
*		Ability to apply different
	research approaches and methodologies	
*		Construct and document an
	appropriate research design	
*		
· • ·		

appropriate computer tools in each stage of research

Ability to perform ICT based

Teaching Methods

UNIT I

*

Introduction - Meaning of Research – Objectives of Research – Types of Research – Motivation of Research – Research approaches – Significance of Research – Research Methods versus Methodology – Research and Scientific method – Research process – Criteria of good Research – Problems encountered by Researchers in India.

Defining the Research Problem: What is a Research problem - Selecting the Problem – Technique involved Defining a problem.

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Research Design - Need for Research Design - Features of Good Design -Important concept relating to Research design - Different Research designs - BasicPrinciplesofExperimentalDesigns(12L)

UNIT II

Sampling Design : Census and Sample Survey – Implications of a sample design – Steps in sample design - Criteria of selecting a sampling procedure – Characteristics of a good sample design – Different types of sample design – How to select a random sample – Random sample from an infinite Universe – Complex random sampling designs.

Measurements and Scaling techniques : Measurement in Research – Measurement scales – Sources of error in Measurement – Test and sound Measurements – Technique of developing measurement tools – Scaling, Meaning of scaling – Scale classification bases – Important scaling techniques – Scale Construction techniques. (12L)

UNIT III

Chi-Square Test for large samples – Definition of Chi-Square – Limitations of Chi-Square test - Chi-Square test as a test of goodness of fit and as a test of independence – Yate's correction and its applications.

Analysis of Variance (ANOVA): Concept – One way ANOVA – ANOVA in test in Latin Square Design (12L)

UNIT IV

Data Collection: Methods of Data Collection – Collection of Primary Data – Observation Method – Interview method – Collection of data through Questionnaires – Collection of data through Schedules – Some other methods of data collection – Collection of secondary data – Selection of appropriate method for data collection. MSU / 2021-22 / PG –Colleges / MCA/ Semester III / Ppr.no.18 / Core - 17

Interpretation and Report Writing: Meaning of interpretation – Why interpretation – Technique of interpretation – Precaution in Interpretation – Significance of Report Writing

(12L)

$\mathbf{UNIT} - \mathbf{V}$

Introduction – Algorithmic Research Problems – Types of Solution Procedure/ Algorithm – Steps of Development of Algorithm – Steps of Algorithmic research – Design of Experiments and Comparison of Algorithms – Meta Heuristics for Combinational Problems. The Computer – Its role in Research – The Computer and Computer Technology – The Computer System – Important Characteristics - Computer Applications – Computer and Researchers.

(12L)

TOTAL : 60 PERIODS

Reference Books:

- C.R.Kothari, "Research Methodology Methods and Techniques", Second edition, New Age International Publishers, 2020.
- 2. R.Panneerselvam, "Research Methodology", PHI, 2009.
- 3. S.C Gupta and V.K Kapoor, "Fundamentals of Mathematical statistics", Sulthan Chand & Sons, Delhi, 2020.
- 4. Deepak Chawla and Neena Sondhi," Research Methodology: Concepts and Cases", Vikas Publishing House, 2016.
- David M.Levine, David F Stephen, e al., "Business Statistics", Pearson Publisher, 7th edition,2017.
- Ranjit Kumar "Research Methodology: A Step-by-step Guide for Beginners", Sage Publications Ltd, 2019.

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OPTIMIZATION TECHNIQUES

LTPC

4 0 0 4

OBJECTIVES

- > To understand the role and principles of optimization techniques in business world.
- > To understand the process of problem statement formulation of the business scenario.
- To understand the implementation of various decision making techniques in the process of decision making.
- To gain the techniques and skills on how to use optimization techniques to support the decision making in business world.

OUTCOMES

- > Apply problem solving techniques through OR approaches.
- > Formulate the problem using linear programming technique.
- To analyze the optimal solution for the given problem by applying Transportation problems.
- > To analyze the strategies with different players through game theory approach.
- \blacktriangleright To analyze the sequence of jobs to be executed by machines for the given problem.

UNIT - I LINEAR PROGRAMMING PROBLEM (LPP)

Introduction, structure of linear programming model, advantages, general model of Linear programming problem(LPP), examples of LP formulation, graphical solutions of LP problem and Solution of LPP by simplex method. (9L)

UNIT – II LINEAR PROGRAMMING PROBLEM (LPP)

Artificial variables-two-phase method, Big M method. Duality in linear programming, formulation of dual linear programming and examples.(9L)

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UNIT – III TRANSPORTATION AND ASSIGNMENT PROBLEMS

Mathematical model of transportation problem, methods of finding initial solution (Northwest corner rule, Least cost method, Vogel's approximation method), test for optimality in TP using MODI Method. Mathematical model of assignment problem, Hungarian method for solving assignment problem.(9L)

UNIT – IV THEORY OF GAMES

Introduction, two-person zero sum games, pure strategies (MinMax and MaxMin principles), mixed strategies. The rules of principles of dominance, algebraic method to solve games without saddle point, graphical methods to solve games.(9L)

UNIT – V NETWORK ANALYSIS

PERT and CPM, Network construction and determination of critical path, Calculation of ES, EF, LS, LF, TF, FF and IF, Crashing of a project, Scheduling of a project and resource levelling. (9L)

TOTAL: 45 PERIODS

REFERENCES

- 1. Operations Theory and Applications, J.K. Sharma, 5th edition, MacMillan publisher India, 2016
- 2. Operations Research An Introduction Taha H A- Pearson Edition ,7th edition,2017
- An Introduction to optimization Techniques Vikrant Sharma, Vinod Kumar Jain, Atul Kumar, Chapman and Hall/CRC, 2021.
MSU / 2021-22 / PG –Colleges / MCA/ Semester III / Ppr.no.19 / Elective – 2 (b)

MOBILE APPLICATION DEVELOPMENT

LTPC

4 0 0 4

OBJECTIVES

- Android Application Development course is designed to quickly get you up to speed with writing apps for Android devices.
- The student will learn the basics of Android platform and get to understand the application lifecycle

OUTCOMES

- > Develop effective user interfaces that leverage evolving mobile devices
- Develop applications using software development kits (SDKs), frameworks and toolkits.
- Implement suitable methods to integrate database and server-side technologies
- Design and develop open source software based mobile application to the given problem.
- Build and deploy competent mobile application to solve the societal/industrial problems

UNIT – I INTRODUCTION

Preliminary Considerations – Cost of Development – Importance of Mobile Strategies in the Business World – Effective use of Screen Real Estate – Understanding Mobile Applications: Understanding Mobile Applications Users – Understanding Mobile Information Design – Understanding Mobile Platforms – Using the Tools of Mobile Interface Design.

(9L)

UNIT – II GETTING STARTED WITH ANDROID PROGRAMMING

What is Android – Obtaining the required tools– Anatomy of an Android Application – Components of Android Applications – Activities – Fragments – Utilizing the Action Bar.

(9L)

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UNIT – III ANDROID UI DESIGN AND LOCATION BASED SERVICES

Views and View Groups – Basic Views – Fragments – Displaying Maps – Getting Location Data – Publishing for Publishing – Deploying APK Files(**9L**)

UNIT – IV ANDROID MESSAGING AND NETWORKING

SMS Messaging – Sending Email – Networking – Downloading Binary Data, Text files – Accessing Web Services – Performing Asynchronous Call – Creating your own services – Communicating between a service and an activity – Binding activities to services(9L)

UNIT - V FEEDBACK AND OSCILLATOR CIRCUITS

iOS – Obtaining the tools and SDK – Components of XCODE – Architecture of iOS – Building Derby App in iOS – Other useful iOS things – Windows Phone: Getting the tools you need – Windows Phone 7 Project Building Derby App in Windows Phone 7 – Distribution – Other useful Windows Phone Thing(**9L**)

TOTAL DURATION: 45 PERIOD

REFERENCES

- Android Application Development All-in-One for Dummies, 3rd Edition, <u>Barry Burd</u>, John Paul Mueller, Wiley Publications ISBN: 978-1-119-66045-3 July 2020
- 2. McWherter and Scott Gowell, "Professional Mobile Application Development", 3rd Edition, ISBN: 978-1-118-20390-3, 2012
- 3. Beginning Android 4 Application Development, by Wei-Meng Lee; ISBN: 978-1-1181-9954-1, 2017

MSU / 2021-22 / PG –Colleges / MCA/ Semester III / Ppr.no.19 / Elective – 2 (c) Elective 2: 3. MOBILE COMPUTING

LTPC

4 0 0 4

OBJECTIVE:

To impart knowledge to the students about the concepts of Mobile Technologies, Issues and Architecture provided by various Protocols.

OUTCOMES:

Student will be able to

- Understand concepts of Mobile Computing,
- ✤ Analyze various protocols used in mobile and wireless communication networks.
- Possess the basic skills in Developing Mobile Application

UNIT 1

Basics of Communication Technologies: Mobile Handsets, Cell Phone Systems, Components of Wieless Communication system, Architecture of Mobile Telecommunication system, Mobile Networking standards, WLANs, Bluetooth Technology

Introduction to Mobile Computing and Wireless Networking: Mobile Computing, Applications, Characteristics, Structure of Mobile Computing Application, Cellular Mobile Communication, GSM, GPRS, and UMTS.(9L)

UNIT 2

MAC Protocols: Properties, Issues in Wireless MAC Protocols, Fixed Assignment Schemes, Random Assignment Schemes, Reservation Based Schemes.

Support for mobility: 3 Wireless application protocol (version 1.x) – Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless Application Environment, Wireless Markup Language, WMLScript, iMode, SyncML, WAP 2.0,(**9**L)

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UNIT 3

Mobile Network Layer: Mobile IP, Entities and terminology, IP packet delivery, Agent discovery, Registration, Tunneling and encapsulation, Optimizations, Reverse tunneling, IPv6, Dynamic host configuration protocol, Mobile ad-hoc networks, Routing

Mobile Transport Layer: Traditional TCP- Congestion control, Slow start, Fast retransmit/fast recovery, Classical TCP improvements - Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission/time-out freezing, Selective retransmission, Transaction-oriented TCPTCP over 2.5/3G wireless networks. (9L)

UNIT 4

Mobile Databases: Issues in Transaction Processing- Centralized, Client-Server, Distributed, and Mobile Environment, Data Dissemination, Transaction Processing in Mobile Environment – Atomicity, Consistency, Isolation and Durability Relaxation, Data Replication, Mobile Transaction Models, Rollback Process, Two-Phase commit Protocol, Query Processing.

OS for Mobile Computing: Basic Concepts, Constraints and Requirements, Mobile Operating systems, Comparative study of Mobile OS.(9L)

UNIT 5

Mobile Application Development and Protocols: Mobile Devices as Web Clients, J2ME, Android Application Development – SDK, Features, Components, Stack Structure, Advantages of Android.

Mobile Commerce: Applications of M-Commerce – B2C, B2B, Structure of M-Commerce, Pros and Cons, Mobile Payment Schemes, Security Issues in M-Commerce.

(9L)

TOTAL : 45 PERIODS

MSU / 2021-22 / PG –Colleges / MCA/ Semester III / Ppr.no.19 / Elective – 2 (c)

REFERENCES:

- Fundamentals of Mobile Computing, Second Edition, By PATTNAIK, PRASANT KUMAR, MALL, RAJIB · 2015 (chapter 1, 2, 3, 6, 9, 10 and 11)
- Jochen H. Schiller, "Mobile Communcations", Second Edition, Pearson Education, 2007 (Chapter 8 9, and 10)
- 3. Asoke K Talukder, Hasan Ahmed and Roopa R Yavagal, "Mobile Computing : Technology, Applications and Service Creation", Second Edition, TMH, 2010
- 4. Raj Kamal, "Mobile Computing", Second Edition, Oxford University Press, 2012
- 5. Joseph Anderson, "Mobile Computing: Technology and Applications" Clanrye International publisher, 2020

MSU / 2021-22 / PG –Colleges / MCA/ Semester III / Ppr.no.19 / Elective – 2 (d) PROFESSIONAL ETHICS

L T P C 4 0 0 4

OBJECTIVES

- > To understand the concepts of computer ethics in work environment.
- > To understand the threats in computing environment
- To Understand the intricacies of accessibility issues
- > To ensure safe exits when designing the software projects

OUTCOMES

- Learn the moral issues and problems in engineering; find the solution to those problems.
- Learn the need for professional ethics, codes of ethics and roles, concept of safety, risk assessment.
- Gain exposure to Environment Ethics & computer ethics; know their responsibilities and rights

UNIT I COMPUTER ETHICS INTRODCUTION AND COMPUTER HACKING

A general Introduction – Computer ethics: an overview – Identifying an ethical issue – Ethics and law – Ethical theories - Professional Code of conduct – An ethical dilemma – A framework for ethical decision making - Computer hacking – Introduction – definition of hacking – Destructive programs – hacker ethics - Professional constraints – BCS code of conduct – To hack or not to hack? – Ethical positions on hacking. (9L)

UNIT II ASPECTS OF COMPUTER CRIME AND INTELLECTUAL PROPERTY RIGHTS

Aspects of computer crime - Introduction - What is computer crime – computer security measures – Professional duties and obligations - Intellectual Property Rights – The nature of Intellectual property – Intellectual Property – Patents, Trademarks, Trade Secrets, Software Issues, Copyright - The extent and nature of software piracy – Ethical and professional issues – free software and open source code. (9L)

MSU / 2021-22 / PG -Colleges / MCA/ Semester III / Ppr.no.19 / Elective - 2 (d)

UNIT III REGULATING INTERNET CONTENT, TECHNOLOGY AND SAFETY

Introduction – In defence of freedom expression – censorship – laws upholding free speech – Free speech and the Internet - Ethical and professional issues - Internet technologies and privacy – Safety and risk – assessment of safety and risk – risk benefit analysis – reducing risk. (9L)

UNIT IV COMPUTER TECHNOLOGIES ACCESSIBILITY ISSUES

Introduction – Principle of equal access – Obstacles to access for individuals – professional responsibility - Empowering computers in the workplace – Introduction – computers and employment – computers and the quality of work – computerized monitoring in the work place – telecommuting – social, legal and professional issues - Use of Software, Computers and Internet-based Tools - Liability for Software errors - Documentation Authentication and Control – Software engineering code of ethics and practices – IEEE-CS – ACM Joint task force. (9L)

UNIT V SOFTWARE DEVELOPMENT AND SOCIAL NETWORKING

Software Development – strategies for engineering quality standards – Quality management standards – Social Networking – Company owned social network web site – the use of social networks in the hiring process – Social Networking ethical issues – Cyber bullying – cyber stalking – Online virtual world – Crime in virtual world - digital rights management - Online defamation – Piracy – Fraud.(9L)

TOTAL DURATION: 45 PERIOD

REFERENCES

- 1. Caroline Whitback," Ethics in Engineering Practice and Research ", Cambridge University Press, 2011.
- 2. George Reynolds, "Ethics in Information Technology", Cengage Learning, 2018
- 3. Ethics in Computing Joseph Migga Kizza, Springer, Cham, 978-3-319-29106-2, 2019.
- 4. Ethics in engineering: Mike W.Martin Roland, McGraw Hill, 2017

MSU / 2021-22 / PG –Colleges / MCA/ Semester III / Ppr.no.20 / Practical -3

DATA SCIENCE & ANALYTICS USING R LAB

- **1.** R program to create a Sequence of numbers from 20 to 50 and find the Mean of numbers from 20 to 60 and Sum of numbers from 51 to 91.
- **2.** R program to create a Vector which contains 10 random integer values between -50 and +50.
- **3.** R program to get all Prime numbers up to a given number.
- 4. R program to read the .csv, .xls files and display the contents.
- 5. R program to use Built-in Mathematical Functions.
- **6.** R program to get the Statistical Summary and Nature of the data of a given data frame.
- 7. Find the Data Distributions using Box and Scatter Plot using R.
- 8. Plot the Histogram, Bar Chart and Pie Chart on sample data using R.
- **9.** Plot the Density and the Cumulative Probability Curve for a Normal Distribution with Mean= 2.5 and SD = 1.5 using R.
- **10.** Build the Correlation Matrix using R.
- **11.** Build a Decision Tree Classifier using R.
- **12.** Build a Naïve Bayes Classifier using R.

MSU / 2021-22 / PG –Colleges / MCA/ Semester III / Ppr.no.21 / Practical -4

Mini Project

MSU / 2021-22 / PG –Colleges / MCA/ Semester IV / Ppr.no.22 / Project

• Laboratory facilities exclusive to the Post Graduate Course

Computer Lab with fifty computers are exclusively available for MCA students

- Special Purpose
- Software, all design tools in case
- Academic Calendar and framework

MANONMANIAM SUNDARANAR UNIVERSITY

Dr. R. MARUTHAKUTTI REGISTRAR i/c



ABISHEKAPATTI TIRUNELVELI - 627 012

Ref: MSU/R/BoS/Academic Calendar /Even Sememster /Affiliated College/2021-22/O-07.02.2022

То

The Principals of all Affiliated Colleges / MSU Colleges / Constituent Colleges

Sir / Madam,

Sub : MSU – Even Semester Academic Calendar – for the academic year 2021-2022 - Affiliated Colleges - Intimation – reg

I am by direction, to send herewith the Even Semester Academic Calendar of Affiliated colleges for the Academic year 2021-2022 for implementation.

This may kindly brought to the notice of the staff & students accordingly.

Yours faithfully

REGISTRAR i/c

Encl : As above

Manonmaniam Sundaranar University



Tirunelveli -627 012, Tamil Nadu, India (Re-accredited with " A " Grade by NACC (3rd Cycle)

Academic Calendar 2021 – 2022 (Even Semester) [For U.G / P.G / M.Phil. Degree Programmes of Affiliated Colleges]

Month	CALENDAR	Date	SCHEDULE
BRUARY 2022	S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 Holidays Nill Nill Nill Nill Nill	1 st February	Commencement of Even Semester Classes for all U.G, P.G and M.Phil students
RCH 2022 FI	S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	Before 11 th 14 th	Subject Allocation for all U.G, P.G and M.Phil students First internal test / Mark entry closing date for all U.G, P.G and M.Phil students
MA	<u>Holidays</u> Nil		

	S M T W T F S 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	01 St 13 th	Exam fee payment without penalty – Portal Opening for all U.G, P.G and M.Phil students Exam fee payment without penalty – Portal Closing for all U.G, P.G and M.Phil students
	Holidays 02 nd Telugu New Year's Day 14 th Tamil New Year / Dr.Ambedkar's Birthday/ Mahaveer Jayanthi	11 th	Second internal test / Mark entry closing date for all U.G, P.G and M.Phil. students
UL 2022	15" Good Friday	16 th	Exam fee payment with penalty – Portal Opening for all U.G, P.G and M.Phil students
APR		21 st	Exam fee payment with penalty – Portal Closing for all U.G, P.G and M.Phil students
		05 th	Commencement of Practical Exam / Project Evaluation for U.G, P.G and M.Phil. students
	S M I W I I S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	05 th	Third internal test / Mark entry closing date for all U.G, P.G, M.Phil. students
	22 23 24 25 26 27 28 29 30 31	21 st	Last working day for all U.G, P.G and M.Phil. students
MAY 2022	Holidays 01 st May Day 03 rd Ramazan	23 rd	Commencement of University Examinations for all U.G, P.G and M.Phil. students

		 Valuation of End-Semester Examples : Last week of June Re- Valuation of Result : Within 15 days after Result Publication Special Supplementary Examinations: within 10 days after Result Publications Consolidated Mark Statements : Week after Result Publication Provisional Certificate : 10 days after Mark Statements distribution Degree Certificates : After Convocation
•	Local holidays if any will be compensated The University has the right to change the So any time	subsequently chedule of the Academic Calendar at

- programmes
- There shall be only one test in a day and also on every consecutive working days
 Each tests for all the theory courses shall be conducted during the first period
- After the completion of each test in a day, the regular classes shall be conducted as per the class time-table of the Department.
- The tests for practical courses shall be conducted during the sessions as per the respective class time –tables
- The question paper patterns shall be followed as per the resolutions of the SCAA and their amendments as available.
- The classes / sessions for the mandatory and extra credit courses on "Computers for Digital Era" (Semester – IV) shall be conducted during Saturdays or as per the convenience of the colleges.

The Principals of the Colleges, are requested to follow the schedule and the guidelines strictly.

REGISTRAR i/c Hober

17. List of Research Projects/ Consultancy Works

- Number of Projects carried out, funding agency, Grant received
- Publications (if any) out of research in last three years out of masters projects
- Industry Linkage
- MoUs with Industries (minimum3(10))



02-12-2018

То

The Principal, Nesamony Memorial Christian College, Marthandam - 629 165, Kanyakumari District Tamil Nadu, INDIA

Sub: Collaboration in Education, Corporate Training and Placement-reg.

Memorandum of Understanding

Between the Department of Computer Applications, Nesamony Memorial Christian College, and beneficial collaboration of Ozias Technologies

For the purpose of collaborating in Education, Corporate Training, and Placement. Ozias Technologies has tie-up with various colleges, companies, and linkages within India and Abroad for promoting education and research in the software field.

This Memorandum of Understanding is a genuine and beneficial collaboration. We, Ozias Technologies, welcome the Mission and Vision of the Department of Computer Applications of Nesamony Memorial Christian College, Marthandam. The establishment of this MoU is for cooperation and we jointly agree to the provision as set above. This MoU will be effective from the date of signing.

Thanks & Regards For Ozias Team

For Nesamony Memorial Christian College

CEO



Dr. K. Paul Raj PRincipal NESAMONY MEMORIAL CHRISTIAN COLLEGE MARTHANDAM

SMART CLASS WEB APPLICATION SOFTWARE DEVELOPMENT CCTV IT SECURITY SOLUTIONS

John plaza, Near SETC Depot, Pammam, marthandam- 629165

info@ozias.in



То The Principal, Nesamony memorial Christian College, Marthandam 629165 Kanyakumari district.

Sub: Collaborating in education, corporate training and Placement reg.

Memorandum of Understanding between Department of Computer Applications, Nesamony Memorial Christian College and Acharya Virtual Solutions Private Limited

For the purpose of Collaborating in Education, Corporate Training and placement have tie up with various Colleges and Companies in the Software field.

This Memorandum of Understanding is genuine and beneficial Collaboration. We Acharya Virtual Solutions Private Limited welcome the Mission and vision of Department of Computer Applications of Nesamony memorial Christian college. The establishment of this MoU for cooperation and jointly agree to the provision as set above.

This MOU will be effective from the date of signing.

Regards For Acharya Virtual Solutions (P) Ltd

Sob11 SENTHIL MURUGAN R Director





Paul Rai

Principal Nesamony Memorial Christian College Marthandam









IT & IT ENABLED SERVICES **Acharya Virtual Solutions Private Limited**

MONY MEM

MARTHANDAM

STIAN COL

Reg. off : 2nd floor, Muruga Building, TVM Road, Kaliakkavilai, K.K.Dist, Kanyakumari - 629153 Corporate Office : Novel Tech Park, Kudlu Gate, GB Palya, Bangalore - 560068

🖀 + 91 9442 007 700 📵 + 080 - 42127 0 47 🛞 www.acharyavirtualsolutions.com 🖂 info@acharyavirtualsolutions.com

24/04/2019

Memorandum of Understanding(MOU)

This Agreement is made on this the 24th day of Apr 2019 between

1) I.R.Jebakumar, aged about 46 years S/o:INBARAJ, Managing Director, HiTech Solution, Nagercoil, No.55, II Floor, Padagalingam Building, Cape Road, Nagercoil-1(herein after called as the **First Party**)

And

2) Dr.Paul Raj, Principal, Nesamony Memorial Christian College, Marthandam, who is running Nesamony Memorial Christian College, Marthandam (herein after called as the **Second Party**)

The First Party is named as **Hitech Solutions** at Nagercoil. The SECOND PARTY approached the FIRST PARTY for granting permission to conduct training classes and practicals in Vocational Education Programmes with Terms and conditions.

The First Party will provide exclusive training programmes for the benefits of the students in the area of Multimedia, Graphics, Animation, Networks, Photoshop, Software Testing, Phython and Data mining. The scope of the agreement covers Vocational Education Programs of all Levels in the following Sectors and specializations.

Sl.No	Sector	Specialization
1	Computer Science	Graphics and Multimedia
2	Computer Science	Software Development

The First Party has agreed for the proposal of the second Party for a period of 3 years from 24th Feb 2020 to 23rd Febr 2023 on the terms and conditions below herewith:

First Party

1. The First Party is the Administrator of the particular activities done by the second party.

2. Computer, Classrooms, Electricity and other related requirements should be arranged by the First Party.

- 3. The First Party should satisfy the technical requirements of the students in all respects (Training, Guidance, etc).
- 4. The First Party and Second Party will be sharing the facilities from both sides as discussions.
- 5. The Parties can terminate the agreement at any time if both the parties are not in cooperation with each other.

Second Party

- 1. The Second Party should cooperate with the first party in all respects.
- 2. The Second Party shall plan the Vocational Education Programs to be offered in the Academic Year concerned and inform the First Party about the same at least two months prior to the date of commencement of the program[s].
- 3. The Second Party should cooperate in all aspects with the First Party.
- 4. If the First Party is not satisfied with the second party in the duration, then the second party should give a request letter to the First Party for cancellation with the completion of the allotted works.
- 5. The Second Party should complete the works before the agreement ends.

Signature of

First Party

Second Party

K. Paul Raj Principal Nesamony Memorial Christian College

Marthandam

04:2019

ASAMONY MEMORIA MARTHANDAM



Ref No :

Date : 13-09-2021

MEMORANDAM OF UNDERSTANDING

We are happy to announce the collaboration between Nesamony Memorial Christian College, Marthandam and Dhina Technologies, Kazhakuttam, Trivandrum, We are Providing opportunity to conduct awareness program on latest softwares, free of cost to all students of the department of Computer Application, Nesamony Memorial Christian College, Marthandam.

Nesamony Memorial Christian College will -

- Appoint a faculty advisor in the department of Computer Application, who will interact with us, send notification/circulars for activities related to awareness program on latest softwares.
- Incorporate the relevant softwares for students training whenever feasible in the department of Computer Application.

As a partner, Dhina Technologies will -

- Work as a mentor for the Department of Computer Application, Nesamony Memorial Christian College, Marthandam.
- Provide the promotional material like posters, brochures, banners etc. to the department of Computer Application, Nesamony Memorial Christian College, free of cost.

2" Floor, Jose Building, Opp. R.D.O. Office, Thuckalay ↓ +91 9994849499 ➤ info@dhinatechnologies.com ♀ www.dhinatechnologies.com





Ref No :

10

Date :

Support the research activities of students and staff of the department of Nesamony Memorial Christian College, Marthandam.

General

This agreement can be modified from time to time.Ifnecessary,based on mutual agreement

For and on behalf of the Nesamony

For and on behalf of Dhina Technologies

Memorial Christian College,

Kazhakuttam, Trivandrum

Marthandam

Dr. K.Paulraj, Principal

Signing Authority Dr. K. Paul Raj Date : Principal Mesamony Memorial Christian College Marthandam Place :

Mr.A.S.Selvakumar, CEO

Signific Authority OLOGIES 2nd Floor, Jose Building, Date: Date:

Place :



2" Floor, Jose Building, Opp. R.D.O. Office, Thuckalay ↓ +91 9994849499 ➡ info@dhinatechnologies.com ♥ www.dhinatechnologies.com LOA and subsequent EOA till the current academic year



अखिल भारतीय तकनीकी शिक्षा परिषद् ALL INDIA COUNCIL FOR TECHNICAL EDUCATION (भारत सरकार का एक सांविधिक संस्थान) (A STATUTORY BODY OF THE GOVERNMENT OF INDIA)

ifors to shall be established with adequate non

411/TN-25/APR(CS)/BOS/95 7th September, 1995

The Registrar, Manonmaniam Sundaranar University. Tirunelveli - 627 009

Sub : Approval for MCA programme.

Sir.

I am to convey the approval of the All India Council for Technical Education (AICTE), New Delhi, for the conduct of the following programme at

state Computer Centre Fith Terminals, Printers as, per

N.M. Christian College, Martandam, the one constantion ing Kanyakumari Dist.

NAME OF COURSE

ENTRY LEVEL

ANNUAL INTAKE

PERIOD OF APPROVAL

1995=96

Master in Computer Application (MCA)

12 (Full Bachelor Degree in any discipline Time) with mathemtics as compulsory subject at the state of the 1042 level.

Institute is required to fulfill conditions given overleaf before making admissions to above programme.

Yours faithfully, 0

(Wg. Cdr. R.N. Chaturvedi) Director

CONDITIONS FOR APPROVAL (P)

- The infrastructural, instructional and other facilities including teaching staff, equipment etc. shall be provided as per AICTE norms prescribed from time to time.
- A library shall be established with adequate number of titles, books journals (both Indian & Foreign) etc.
- 3. A separate Computer Centre with Terminals, Printers as per AICTE norms shall be provided exclusively for this programme.
- No increase in intake shall be made in this course without prior approval of the AICTE.
- The teaching staff shall be in the pay-scales as per the AICTE guidelines prescribed from time to time.
- 6. The faculty shall be recruited as per norms, procedure, qualifications etc. as prescribed by the AICTE from time to time and the selection committee for recruitment shall have the representation of the University and the AICTE.
- 7. a) The Admissions shall be made only after adequate infrastructure and all other facilities are made available as per norms and guidelines of the AICTE.
 - b) All Admissions shall be through an admission test as per the norms and guidelines of the AICTE.
- The tuition and other fees shall be charged as prescribed by the Competent Authority within the overall criteria prescribed by the AICTE from time to time.
- 9. There shall be a separate governing Council for the Institution and it shall be constituted as per the guidelines prescribed by the AICTE from time to time.
- 10. The administrative, academic and financial records including accounts shall be maintained for this programme. The accounts shall be audited annually by a Chartered Accountant and all the records and reports shall be open for inspection by the AICTE or its nominee.
- The curricula of the courses procedure for evaluation/ assessment of students shall be in accordance with the norms prescribed by the AICTE or concerned University.
- 12. The endownment fund of Rs. 10.00 lacs shall be created exclusively for the above programme in the combined name of the society and nominee of the Director, Technical Education of respective State Govt.

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- 13. The Management shall fulfill all conditions as laid down by the Council from time to time and a registered legal undertaking (as per performa) in original to this effect shall be submitted to the Council.
- 14. The Institute should submit a proof of affiliation, with recognised University for this programme before making admissions.
- 15. The Institute by virtue of this approval shall not become claimant to any financial grant or assistance from the Central State Government or any other funding agency.
- 16. All information furnished in respect of this programme should be factual and correct. In the event of any information found to be false, misleading or suppressed the Council reserves right to withdraw the approval without any notice.
- The Institute shall not charge any capitation fee or donation for admission or any additional charges from the students or their guardians in any form.
- 18. The Central/State Govt. policies for admissions of SC/ST other weaker sections of society etc. shall be followed by the Institutions as and wherever applicable.
- 19. This approval is further subject to full-compliance as per AICTE Regulation No. 476 (E) dated 20.05.1995.
- 20. In the event of non-compliance of conditions by the society with regards to guidelines, norms and conditions laid down by AICTE from time to time, the AICTE or a body/person authorised by it will be free to take measures for withdrawal of its approval without consideration of any related issues and that all liabilities arising out of such a withdrawal would solely be that of the concerned society.
- 21. The Institute is required to submit compliance report on above conditions within six months from the date of issue of this letter. Failing which the Council reserves right to withdraw the approval.
- 22. An Expert Committee of this Council shall visit the Institute to verify the compliance of these conditions and to make necessary recommendations regarding further extension of approval.

(Wg. Cdr. R.N. Chaturvedi)

Director



All India Council for Technical Education (A Statutory body under Ministry of HRD, Govt. of India)

7th Floor, Chandralok Building, Janpath, New Delhi- 110 001 PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 www.aicte-India.org

F.No. Southern/1-2864400751/2016/EOA

Date: 30-Apr-2016

To,

The Principal Secretary (Higher Education) Govt. of Tamil Nadu, N. K. M. Bld. 6th Floor Secretariat, Chennai-600009

Sub: Extension of approval for the academic year 2016-17

Ref: Application of the Institution for Extension of approval for the academic year 2016-17

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations 2012 notified by the Council vide notification number F-No.37-3/Legal/2012 dated 27/09/2012 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to

Regional Office	Southern	Application Id	1-2864400751
Name of the Institute	N M CHRISTIAN COLLEGE	Permanent Id	1-415293922
Name of the Society/Trust	C.S.I. TRUST ASSOCIATION	Institute Address	MARTHANDAM KANYAKUMARI DISTRICT, NALLOOR, KANYAKUMARI, Tamil Nadu, 629165
Institute Type	Unaided - Private	Society/Trust Address	DENNIS STREET NAGERCOIL,NAGERCOIL,KANYAKUMARI,Tamil Nadu,629001

Opted for change from Women to Co-ed and Vice versa	No	Opted for change of name	No	Opted for change of site	No
Change from Women to Co-ed approved and Vice versa	Not Applicable	Change of name Approved	Not Applicable	Change of site Approved	Not Applicable

To conduct following courses with the intake indicated below for the academic year 2016-17

Program	-2864400	Level	Course	Full/Part Time	Affiliating Body	Intake Approved for 2016-17	NRI Approval status	PIO / FN / Gulf quota Approval status	Foreign Collaborarion/Twining Program Approval status
MCA	1st Shift	POS T GRA DUA TE	MASTER OF COMPUTER APPLICATIONS	FULL TIME	Manonmaniam Sundarnar University, Tirunelvelli	50	NA	NA	NA

Application Number: 1-2864400751 Note: This is a Computer generated Report.No signature is required.

Page 1 of 2 Letter Printed On:5 May 2016

Printed By : ae26032031





7th Floor, Chandralok Building, Janpath, New Delhi- 110 001 PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 www.aicte-India.org

The above mentioned approval is subject to the condition that N M CHRISTIAN COLLEGE shall follow and adhere to the Regulations, guidelines and directions issued by AICTE from time to time and the undertaking / affidavit given by the institution along with the application submitted by the institution on portal.

In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.

Strict compliance of Anti-Ragging Regulation:- Approval is subject to strict compliance of provisions made in AICTE Regulation notified vide F. No. 37-3/Legal/AICTE/2009 dated July 1, 2009 for Prevention and Prohibition of Ragging in Technical Institutions. In case Institution fails to take adequate steps to Prevent Ragging or fails to act in accordance with AICTE Regulation or fails to punish perpetrators or incidents of Ragging, it will be liable to take any action as defined under clause 9(4) of the said Regulation.

Note: Validity of the course details may be verified at www.aicte-india.org

Prof. Alok Prakash Mittal Member Secretary, AICTE

Copy to:

- The Regional Officer, All India Council for Technical Education Shastri Bhawan 26, Haddows Road Chennai - 600 006, Tamil Nadu
- 2. The Director Of Technical Education, Tamil Nadu
- 3. The Registrar, Manonmaniam Sundarnar University, Tirunelvelli
- 4. The Principal / Director, N M CHRISTIAN COLLEGE MARTHANDAM KANYAKUMARI DISTRICT, NALLOOR,KANYAKUMARI, Tamil Nadu,629165
- 5. The Secretary / Chairman, C.S.I. TRUST ASSOCIATION DENNIS STREET NAGERCOIL, NAGERCOIL,KANYAKUMARI, Tamil Nadu,629001
- 6. Guard File(AICTE)



(A Statutory body under Ministry of HRD, Govt. of India)

Date: 30-Mar-2017

Nelson Mandela MargVasant Kunj, New Delhi-110067 PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 www.aicte-India.org

F.No. Southern/1-3328373521/2017/EOA

To,

The Principal Secretary (Higher Education) Govt. of Tamil Nadu, N. K. M. Bld. 6th Floor Secretariat, Chennai-600009

Sub: Extension of approval for the academic year 2017-18

Ref: Application of the Institution for Extension of approval for the academic year 2017-18

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations 2016 notified by the Council vide notification number F.No.AB/AICTE/REG/2016 dated 30/11/2016 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to

Permanent Id	1-415293922	Application Id	1-3328373521
Name of the Institute	N M CHRISTIAN COLLEGE	Institute Address	MARTHANDAM KANYAKUMARI DISTRICT, NALLOOR, KANYAKUMARI, Tamil Nadu, 629165
Name of the Society/Trust	C.S.I. TRUST ASSOCIATION	Society/Trust Address	DENNIS STREET NAGERCOIL,NAGERCOIL,KANYAKUMARI,Tamil Nadu,629001
Institute Type	Unaided - Private	Region	Southern

Opted for change from Women to Co-ed and Vice versa	No	Opted for change of name	No	Opted for change of site	No
Change from Women to Co-ed approved and Vice versa	Not Applicable	Change of name Approved	Not Applicable	Change of site Approved	Not Applicable
Opted for Conversion from degree to diploma	No	Opted for Conversion from diploma to degree	No	Conversion (degree to diploma or vice-a- versa) Approved	Not Applicable

To conduct following courses with the intake indicated below for the academic year 2017-18

Application Id: 1 Program	-3328373	Level	Course	Full/Part Time	Affiliating Body	Intake Approved for 2016-17	Intake Approved for 2017-18	NRI Approval status	PIO / FN / Gulf quota/ OCl/ Approval status	Foreign Collaborarion/Twining Program Approval status
MCA	1st Shift	POS T GRA DUA TE	MASTER OF COMPUTER APPLICATIONS	FULL TIME	Manonmania m Sundaranar University, Tirunelveli	50	50	NA	NA	NA

Printed By : ae26032031



(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela MargVasant Kunj, New Delhi-110067 PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 www.aicte-India.org

The above mentioned approval is subject to the condition that

N M CHRISTIAN COLLEGE

shall follow and adhere to the Regulations, guidelines and directions issued by AICTE from time to time and the undertaking / affidavit given by the institution along with the application submitted by the institution on portal.

In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.

Strict compliance of Anti-Ragging Regulation:- Approval is subject to strict compliance of provisions made in AICTE Regulation notified vide F. No. 37-3/Legal/AICTE/2009 dated July 1, 2009 for Prevention and Prohibition of Ragging in Technical Institutions. In case Institution fails to take adequate steps to Prevent Ragging or fails to act in accordance with AICTE Regulation or fails to punish perpetrators or incidents of Ragging, it will be liable to take any action as defined under clause 9(4) of the said Regulation.

Note: Validity of the course details may be verified at www.aicte-india.org

Prof. A.P Mittal Member Secretary, AICTE

Copy to:

- 1. The Regional Officer, All India Council for Technical Education Shastri Bhawan 26, Haddows Road Chennai - 600 006, Tamil Nadu
- 2. The Director Of Technical Education**, Tamil Nadu
- 3. The Registrar**, Manonmaniam Sundaranar University, Tirunelveli
- 4. The Principal / Director, N M CHRISTIAN COLLEGE MARTHANDAM KANYAKUMARI DISTRICT, NALLOOR,KANYAKUMARI, Tamil Nadu,629165
- 5. The Secretary / Chairman, C.S.I. TRUST ASSOCIATION DENNIS STREET NAGERCOIL, NAGERCOIL,KANYAKUMARI, Tamil Nadu,629001
- 6. Guard File(AICTE)

Note: ** - Approval letter copy will not be communicated through post/email. However, provision is made in the portal for downloading Approval letter through Authorized login credentials allotted to concerned DTE/Registrar.



(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela MargVasant Kunj, New Delhi-110067 PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 www.aicte-India.org

(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela Marg, Vasant Kunj, New Delhi-110070 Website: www.aicte-india.org

APPROVAL PROCESS 2018-19

Extension of Approval (EoA)

F.No. Southern/1-3512928973/2018/EOA

To,

The Principal Secretary (Higher Education) Govt. of Tamil Nadu, N. K. M. Bld. 6th Floor Secretariat, Chennai-600009

Sub: Extension of Approval for the Academic Year 2018-19

Ref: Application of the Institution for Extension of approval for the Academic Year 2018-19

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations 2016 notified by the Council vide notification number F.No.AB/AICTE/REG/2016 dated 30/11/2016 and amended on December 5, 2017 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to

Permanent Id	1-415293922	Application Id	1-3512928973
Name of the Institute	N M CHRISTIAN COLLEGE	Name of the Society/Trust	C.S.I. TRUST ASSOCIATION
Institute Address	MARTHANDAM KANYAKUMARI DISTRICT, NALLOOR, KANYAKUMARI, Tamil Nadu, 629165	Society/Trust Address	DENNIS STREET NAGERCOIL,NAGERCOIL,KANYAK UMARI,Tamil Nadu,629001
Institute Type	Unaided - Private	Region	Southern

Opted for Change from	No	Change from Women to Co-Ed	NA
Women to Co-Ed and vice		and vice versa Approved or	
versa		Not	
Opted for Change of Name	No	Change of Name Approved or	NA
-		Not	
Opted for Change of Site	No	Change of Site Approved or	NA
		Not	
Opted for Conversion from	No	Conversion for Degree to	NA
Degree to Diploma or vice		Diploma or vice versa	
versa		Approved or Not	
Opted for Organization Name	No	Change of Organization Name	NA
Change		Approved or Not	

To conduct following Courses with the Intake indicated below for the Academic Year 2018-19

Program	Shift	Level	Course	FT/PT+	Affiliating Body (Univ/Body)	Intake Approved for 2018-19	NRI Approval Status	PIO / FN / Gulf quota/ OCl/ Approval Status	Foreign Collaboration /Twining Program Approval Status*
MCA	1st	POST GRADUATE	MASTER OF COMPUTER APPLICATIONS	FT	Manonmaniam Sundaranar University, Tirunelveli	50	NA	NA	NA

+FT -Full Time,PT-Part Time



Date: 04-Apr-2018

Deficiencies Noted based on Self Disclosure

Particulars	Deficiency
Other Details Deficiency	
Are all approved teaching faculty being paid as per VI pay commission?	Yes
Fees to be charged, Reservation policy, Admission policy and Document retention policy are uploaded in Institute's	Yes
Website?	
Anti-Ragging Related Deficiency	
Undertaking obtained from parents of students staying in Hostel	Yes
Other Facilities Deficiency	
Compliance of the National Academic Depository(NAD) as per MHRD Directives	Yes
Provision to watch MOOCS Courses through Swayam	Yes
Insurance for Students	Yes
Online Grievance Rederssal Mechanism	Yes
Amenities Area Deficiency	
Boys Common Room	Yes
Cafeteria	Yes
Computational Facilities	
Legal Application S/W	Yes
Legal System S/W	Yes
Legal Application S/W-Applied Intake	Yes
Legal System S/W-Applied Intake	Yes
Library Facilities	
Volumes	Yes
Titles	Yes
National Journals	Yes
Instructional Area- MCA	
Laboratories-All	Yes

*Please refer Deficiency Report for details

N M CHRISTIAN COLLEGE is hereby informed to submit the compliance of the deficiencies mentioned above to the Regional Office within a period of **6 months** from the date of issuance of this letter failing which the council shall initiate strict action as defined in Approval Process Handbook 2018-19 during the subsequent Academic Year.

In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.

Strict compliance of Anti-Ragging Regulation: - Approval is subject to strict compliance of provisions made in AICTE Regulation notified vide F. No. 37-3/Legal/AICTE/2009 dated July 1, 2009 for Prevention and Prohibition of Ragging in Technical Institutions. In case Institution fails to take adequate steps to Prevent Ragging or fails to act in accordance with AICTE Regulation or fails to punish perpetrators or incidents of Ragging, it will be liable to take any action as defined under clause 9(4) of the said Regulation.

Prof. A.P Mittal Member Secretary, AICTE

Copy to:

- The Regional Officer, All India Council for Technical Education Shastri Bhawan 26, Haddows Road Chennai - 600 006, Tamil Nadu
- 2. The Director Of Technical Education**, Tamil Nadu
- The Registrar**, Manonmaniam Sundaranar University, Tirunelveli
- 4. The Principal / Director, N M CHRISTIAN COLLEGE MARTHANDAM KANYAKUMARI DISTRICT, NALLOOR,KANYAKUMARI, Tamil Nadu.629165

- 5. The Secretary / Chairman, C.S.I. TRUST ASSOCIATION DENNIS STREET NAGERCOIL, NAGERCOIL,KANYAKUMARI, Tamil Nadu,629001
- 6. Guard File(AICTE)

Note: Validity of the Course details may be verified at <u>http://www.aicte-india.org/</u>

^{**} Individual Approval letter copy will not be communicated through Post/Email. However, consolidated list of Approved Institutions(bulk) will be shared through official Email Address to the concerned Authorities mentioned above.

(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela Marg, Vasant Kunj, New Delhi-110070 Website: www.aicte-india.org

APPROVAL PROCESS 2019-20

Extension of Approval (EoA)

F.No. Southern/1-4260996077/2019/EOA

To,

The Principal Secretary (Higher Education) Govt. of Tamil Nadu, N. K. M. Bld. 6th Floor Secretariat, Chennai-600009

Sub: Extension of Approval for the Academic Year 2019-20

Ref: Application of the Institution for Extension of approval for the Academic Year 2019-20

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations 2018 notified by the Council vide notification number F.No.AB/AICTE/REG/2018 dated 31/12/2018 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to

Permanent Id	1-415293922	Application Id	1-4260996077
Name of the Institute	N M Christian College	Name of the Society/Trust	C.S.I. TRUST ASSOCIATION
Institute Address	MARTHANDAM KANYAKUMARI DISTRICT, NALLOOR, KANYAKUMARI, Tamil Nadu, 629165	Society/Trust Address	DENNIS STREET NAGERCOIL,NAGERCOIL,KANYAK UMARI,Tamil Nadu,629001
Institute Type	Unaided - Private	Region	Southern

Opted for Change from	No	Change from Women to Co-Ed	NA
Women to Co-Ed and vice		and vice versa Approved or	
versa		Not	
Opted for Change of Name	No	Change of Name Approved or	NA
		Not	
Opted for Change of	No	Change of Site/Location	NA
Site/Location		Approved or Not	
Opted for Conversion from	No	Conversion for Degree to	NA
Degree to Diploma or vice		Diploma or vice versa	
versa		Approved or Not	
Opted for Organization Name	No	Change of Organization Name	NA
Change		Approved or Not	
Opted for Merger of	No	Merger of Institution Approved	NA
Institution		or Not	
Opted for Introduction of	No	Introduction of Program/Level	NA
New Program/Level		Approved or Not	

To conduct following Courses with the Intake indicated below for the Academic Year 2019-20

Program	Shift	Level	Course	FT/PT+	Affiliating Body (Univ/Body)	Intake Approved for 2019-20	NRI Approval Status	PIO / FN / Gulf quota/ OCI/ Approval Status
MCA	1st	POST GRADUA TE	MASTER OF COMPUTER APPLICATIONS	FT	Manonmaniam Sundaranar University, Tirunelveli	35#	NA	NA

+FT -Full Time,PT-Part Time



Date: 25-Apr-2019

Particulars	Deficiency
Other Excilities Deficiency	
Atlasst 5 Mol Is with industries	Ves
Computational Facilities	103
Legal Application S/W	Yes
Legal System S/W	Yes
Library Facilities	
e-Books Volumes	Yes
Titles	Yes
e-Books Titles	Yes

N M CHRISTIAN COLLEGE is hereby informed to submit the compliance of the deficiencies mentioned above to the Regional Office within a period of **6 months** from the date of issuance of this letter failing which the council shall initiate strict action as defined in Approval Process Handbook 2019-20 during the subsequent Academic Year.

In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.

Strict compliance of Anti-Ragging Regulation: - Approval is subject to strict compliance of provisions made in AICTE Regulation notified vide F. No. 37-3/Legal/AICTE/2009 dated July 1, 2009 for Prevention and Prohibition of Ragging in Technical Institutions. In case Institution fails to take adequate steps to Prevent Ragging or fails to act in accordance with AICTE Regulation or fails to punish perpetrators or incidents of Ragging, it will be liable to take any action as defined under clause 9(4) of the said Regulation.

It is mandatory to comply all the essential requirements as given in APH 2019-20(appendix 6)

NOTE: If the State Government / UT / DTE / DME has a reservation policy for admission in Technical Education Institutes and the same is applicable to Private & Self-financing Technical Institutions, then the State Government / UT/ DTE / DME shall ensure that 10 % of Reservation for EWS would be operational from the Academic year 2019-20 without affecting the percentage reservations of SC/ST/OBC/General. However, this would not be applicable in the case of Minority Institutions referred to the clause (1) of Article 30 of Constitution of India.

Prof. A.P Mittal Member Secretary, AICTE

Copy to:

- 1. The Director Of Technical Education**, Tamil Nadu
- 2. The Registrar**, Manonmaniam Sundaranar University, Tirunelveli
- The Principal / Director, N M Christian College Marthandam Kanyakumari District, Nalloor,Kanyakumari, Tamil Nadu,629165
- 4. The Secretary / Chairman, C.S.I. Trust Association
- Application No:1-4260996077 Note: This is a Computer generated Report. No signature is required. Printed By : ae26032031

Dennis Street Nagercoil. Nagercoil,Kanyakumari, Tamil Nadu,629001

5. The Regional Officer, All India Council for Technical Education Shastri Bhawan 26, Haddows Road Chennai - 600 006, Tamil Nadu

6. Guard File(AICTE)

Note: Validity of the Course details may be verified at <u>http://www.aicte-india.org/</u>

** Individual Approval letter copy will not be communicated through Post/Email. However, consolidated list of Approved Institutions(bulk) will be shared through official Email Address to the concerned Authorities mentioned above.
All India Council for Technical Education

(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela Marg, Vasant Kunj, New Delhi-110070 Website: www.aicte-india.org

APPROVAL PROCESS 2020-21

Extension of Approval (EoA)

F.No. Southern/1-7013110167/2020/EOA

To,

The Principal Secretary (Higher Education) Govt. of Tamil Nadu, N. K. M. Bld. 6th Floor Secretariat, Chennai-600009

Sub: Extension of Approval for the Academic Year 2020-21

Ref: Application of the Institution for Extension of Approval for the Academic Year 2020-21

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations 2020 notified by the Council vide notification number F.No. AB/AICTE/REG/2020 dated 4th February 2020 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to

Permanent Id	1-415293922	Application Id	1-7013110167	
Name of the Institute	N M CHRISTIAN COLLEGE	Name of the Society/Trust	C.S.I. TRUST ASSOCIATION	
Institute Address	MARTHANDAM KANYAKUMARI DISTRICT, NALLOOR, KANYAKUMARI, Tamil Nadu, 629165	Society/Trust Address	DENNIS STREET NAGERCOIL,NAGERCOIL,KANYA KUMARI,,629001	
Institute Type	Private-Self Financing	Region	Southern	

To conduct following Courses with the Intake indicated below for the Academic Year 2020-21

Program	Level	Course	Affiliating Body (University /Body)	Intake Approved for 2019-20	Intake Approved for 2020-21	NRI Approval Status	PIO / FN / Gulf quota/ OCI/ Approval Status
MCA	POST GRADUATE	MASTER OF COMPUTER APPLICATIONS	Manonmaniam Sundaranar University, Tirunelveli	35	35	NA	No

It is mandatory to comply with all the essential requirements as given in APH 2020-21 (Appendix 6)



Date: 30-Apr-2020

Important Instructions

- The State Government/ UT/ Directorate of Technical Education/ Directorate of Medical Education shall ensure that 10% of reservation for Economically Weaker Section (EWS) as per the reservation policy for admission, operational from the Academic year 2020-21 is implemented without affecting the reservation percentages of SC/ ST/ OBC/ General. However, this would not be applicable in the case of Minority Institutions referred to the Clause (1) of Article 30 of Constitution of India. Such Institution shall be permitted to increase in annual permitted strength over a maximum period of two years beginning with the Academic Year 2020-21
- 2. The Institution offering courses earlier in the Regular Shift, First Shift, Second Shift/Part Time now amalgamated as total intake shall have to fulfil all facilities such as Infrastructure, Faculty and other requirements as per the norms specified in the Approval Process Handbook 2020-21 for the Total Approved Intake. Further, the Institutions Deemed to be Universities/ Institutions having Accreditation/ Autonomy status shall have to maintain the Faculty: Student ratio as specified in the Approval Process Handbook. All such Institutions/ Universities shall have to create the necessary Faculty, Infrastructure and other facilities WITHIN 2 YEARS to fulfil the norms based on the Affidavit submitted to AICTE.
- 3. In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.
- 4. Strict compliance of Anti-Ragging Regulation: Approval is subject to strict compliance of provisions made in AICTE Regulation notified vide F. No. 373/Legal/AICTE/2009 dated July 1, 2009 for Prevention and Prohibition of Ragging in Technical Institutions. In case Institution fails to take adequate steps to Prevent Ragging or fails to act in accordance with AICTE Regulation or fails to punish perpetrators or incidents of Ragging, it will be liable to take any action as defined under clause 9(4) of the said Regulation.

Prof.Rajive Kumar Member Secretary, AICTE

Copy to:

- 1. The Director Of Technical Education**, Tamil Nadu
- 2. The Registrar**, Manonmaniam Sundaranar University, Tirunelveli
- 3. The Principal / Director, N M CHRISTIAN COLLEGE Marthandam Kanyakumari District, Nalloor,Kanyakumari, Tamil Nadu,629165
- 4. The Secretary / Chairman, DENNIS STREET NAGERCOIL NAGERCOIL,KANYAKUMARI ,629001
- The Regional Officer, All India Council for Technical Education Shastri Bhawan 26, Haddows Road Chennai - 600 006, Tamil Nadu

6. Guard File(AICTE)

Note: Validity of the Course details may be verified at http://www.aicte-india.org/

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All India Council for Technical Education

(A Statutory body under Ministry of Education, Govt. of India)

Nelson Mandela Marg, Vasant Kunj, New Delhi-110070 Website: www.aicte-india.org

APPROVAL PROCESS 2021-22

Extension of Approval (EoA)

F.No. Southern/1-9318661149/2021/EOA

To,

The Principal Secretary (Higher Education) Govt. of Tamil Nadu, N. K. M. Bld. 6th Floor Secretariat, Chennai-600009

Sub: Extension of Approval for the Academic Year 2021-22

Ref: Application of the Institution for Extension of Approval for the Academic Year 2021-22

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Education) (1st Amendment) Regulations, 2021 notified on 24th February 2021 and other notifications as applicable and published from time to time, I am directed to convey the approval to

Permanent Id	1-415293922	Application Id	1-9318661149	
Name of the Institution /University	N M CHRISTIAN COLLEGE	Name of the Society/Trust	C.S.I. TRUST ASSOCIATION	
Institution /University Address	MARTHANDAM KANYAKUMARI DISTRICT, NALLOOR, KANYAKUMARI, Tamil Nadu, 629165	Society/Trust Address	DENNIS STREET NAGERCOIL,NAGERCOIL,KANYA KUMARI,Tamil Nadu,629001	
Institution /University Type	Private-Self Financing	Region	Southern	

To conduct following Programs / Courses with the Intake indicated below for the Academic Year 2021-22

Program	Level	Course	Affiliating Body (University /Body)	Intake Approved for 2020-21	Intake Approved for 2021-22	NRI Approval Status	FN / Gulf quota/ OCI/ Approval Status
MCA	POST GRADUATE	MASTER OF COMPUTER APPLICATIONS	Manonmaniam Sundaranar University, Tirunelveli	35	35	NA	NA

It is mandatory to comply with all the essential requirements as given in APH 2021-22 (Appendix 6)

The Institution/ University is having the following deficiencies as per the online application submitted to AICTE (self-disclosure based) and the same shall be complied within Six Months from the date of issue of this EoA



Date: 25-Jun-2021

Deficiencies* Noted (based on Self Disclosure)

Implementation of student Induction Programme.

Waste Management and a sustainable Green Campus.

*Please refer Deficiency Report for details

Important Instructions

- The State Government/ UT/ Directorate of Technical Education/ Directorate of Medical Education shall ensure that 10% of reservation for Economically Weaker Section (EWS) as per the reservation policy for admission, operational from the Academic year 2019-20 is implemented without affecting the reservation percentages of SC/ ST/ OBC/ General. However, this would not be applicable in the case of Minority Institutions referred to the Clause (1) of Article 30 of Constitution of India. Such Institution shall be permitted to increase in annual permitted strength over a maximum period of two years.
- 2. The Institution offering courses earlier in the Regular Shift, First Shift, Second Shift/Part Time now amalgamated as total intake shall have to fulfil all facilities such as Infrastructure, Faculty and other requirements as per the norms specified in the Approval Process Handbook 2021-22 for the Total Approved Intake. Further, the Institutions Deemed to be Universities/ Institutions having Accreditation/ Autonomy status shall have to maintain the Faculty: Student ratio as specified in the Approval Process Handbook.
- Strict compliance of Anti-Ragging Regulation, Establishment of Committee for SC/ ST, Establishment of Internal Complaint Committee (ICC), Establishment of Online Grievance Redressal Mechanism, Barrier Free Built Environment for disabled and elderly persons, Fire and Safety Certificate should be maintained as per the provisions made in Approval Process Handbook and AICTE Regulation notified from time to time.
- 4. In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.

Prof.Rajive Kumar Member Secretary, AICTE

Copy ** to:

- 1. The Director of Technical Education**, Tamil Nadu
- 2. The Registrar**, Manonmaniam Sundaranar University, Tirunelveli
- The Principal / Director, N M CHRISTIAN COLLEGE Marthandam Kanyakumari District, Nalloor,Kanyakumari, Tamil Nadu,629165
- 4. The Secretary / Chairman, DENNIS STREET NAGERCOIL NAGERCOIL,KANYAKUMARI Tamil Nadu,629001
- The Regional Officer, All India Council for Technical Education Shastri Bhawan 26, Haddows Road Chennai - 600 006, Tamil Nadu

6. Guard File(AICTE)

Note: Validity of the Course details may be verified at http://www.aicte-india.org/ .

** Individual Approval letter copy will not be communicated through Post/Email. However, consolidated list of Approved Institutions(bulk) will be shared through official Email Address to the concerned Authorities mentioned above.

This is a computer generated Statement. No signature Required

19. Accounted audited statement for the last three years

20. Best Practices adopted, if any

Note: Suppression and/or misrepresentation of information shall invite appropriate penal action. The Website shall be dynamically updated with regard to Mandatory Disclosures

Important Instructions:

• Avoid putting personal information in public domain.

• The mandatory disclosure should be available freely to view/download to the public without any

restrictions.

• LoA/EoA letters (since inception) should form part of the mandatory disclosure and complete mandatory disclosure document should be converted into a single PDF file and the URL (web-link) to be entered in the AICTE portal (under attachments tab).