SYLLABUS

MASTER OF COMPUTER SCIENCE AND ENGINEERING

First and Second Semester Examination, 2015
Third and Fourth Semester Examination, 2016

JAI NARAIN VYAS UNIVERSITY
JODHPUR

NOTIFICATION

In compliance to decision of the Hon'ble High Court all students are required to fulfil the 75% attendance in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination

REGISTRAR (ACADEMIC)

Contents

MASTER OF ENGINEERING

General Information for Students

1. The Course of Study for M.E. degree in Civil, Electrical, Mechanical, Mining, Electronics & Communication, and Computer Science & Engineering shall extend over a period of not less than four semesters spread over twenty four months. On satisfactory completion of the course and after passing the final examination including the dissertation, a candidate shall be awarded M. E. Degree in the respective branch.

2. (a) No candidate shall be admitted to the course of study for the degree of M.E. in any of the above branches unless he produces satisfactory evidence to the effect that he has obtained at least a high second class B.E. degree with at least 55% aggregate marks from this University or from any other University or Institute recognized as equivalent thereto.

2 (b) Candidates who have obtained high second class BE in any of the branches CSE/IT/ECE with at least 55% marks in aggregate shall be eligible for admission to M.E. in Computer Science & Engineering

2. (c) Candidates who have obtained high second class in MCA degree with at least 60% aggregate marks from any recognized University or Institute recognized as equivalent and have cleared GATE may be admitted to M.E. degree course in Computer Science & Engineering.

2. (d) All the applications, received in the department for admission to M.E. degree in Computer Science & Engineering will be screened by the department. The applicants, found suitable after screening, will be required to appear in a test followed by an interview before the Selection Committee constituted by the Department for this purpose.

3. Teachers, Research Fellows/Scholars or Engineers or Technical Staff employed in this University, serving engineers in the departments/industries/self employed engineers/teachers in Polytechnic/engineers employed in research laboratories and other organizations in Jodhpur fulfilling the eligibility criteria specified in 2(a) / 2(b) / 2 (c) may be admitted to the M.E. course as part-time students.

4. The course of study for a part-time student will extend over a period of not less than six semesters spread over 3 years. He shall be required to attend regular lecture classes, complete the prescribed course work including the practicals and sessionals and submit a dissertation.

5. There shall be an examination at the end of each semester.

At the end of First Semester – First Semester Examination for M.E. Degree
At the end of Second Semester – Second Semester Examination for M.E. Degree
At the end of Third Semester – Seminar Examination for M.E. Degree
At the end of Fourth Semester – Dissertation Examination for M.E. Degree

6. The examination shall be conducted by means of written papers, practicals including sessionals, viva-voce and dissertation as per scheme of examination specified in the syllabus.

7. A candidate who has undergone regular course of study for the first semester shall be eligible to appear at the First Semester Examination for the M.E. Degree.

8. A candidate appearing at the First Semester Examination for the M.E. Degree shall be required to show competent knowledge of the subjects mentioned in the teaching and examination scheme for the respective branch of study.

9. A candidate who has passed the First Semester Examination and has undergone a regular course of study for the Second Semester shall be eligible for appearing at the Second Semester Examination for the M.E. Dgree.

10. A candidate appearing at the second semester examination for the M.E. Degree shall be required to show competent knowledge of the subjects mentioned in the teaching and examination scheme of respective branch of study.

11. (a) Each candidate shall submit for examination a seminar report embodying a critical review of the latest developments in a subject related to M.E. Degree course in Computer Science & Engineering. Three copies of the seminar report printed or type written shall be submitted to the Head of the Department along with a note of recommendation from his/her supervisor.

11. (b) Each candidate shall submit for examination a dissertation embodying the research work carried out by him/her during the course of study.

12. The attendance requirement for the candidate shall be as per University Ordinance.

13. (a) A candidate who fails in the course work in any course shall not be permitted to take examination in the theory paper of that course. He should join as a regular student in the course when it is offered next by the Department. In case, the course is discontinued in the Department, the student can take up, subject to approval of the Head of the Department, another course in lieu of the course discontinued.

13. (b) If a candidate passes in course work but fails in the corresponding theory paper, he shall reappear and pass in the subjects in which he has failed, at the next regular examination of the semester. The course work marks obtained by him in the previous semester shall be carried over to the semester in which he reappears.

13. (c) If a full time candidate fails in three or more units and a part-time student fails in two or more units in any semester, he shall not be permitted to continue his studies in the next semester. He shall be required to join as a regular student whenever these courses are offered next by the Department. In case, any of these courses is discontinued in the Department, the student can take up, subject to the approval of Head of the Department, another course in lieu of the course discontinued.

Rule No. 13 (c) is clarified as follows:

“Whenever a full time student fails in 3 or more units/courses prescribed for that semester, he/she will have to repeat all the papers in that semester as a regular student and consequently re-appear in all the units/courses in that semester as a regular student”.

For part-time students, the rule is clarified as follows:

"Whenever a part-time student fails in 2 or more units/courses prescribed for that semester, he/she will have to repeat all the papers in that semester as a regular student and consequently re-appear in all the units/courses in that semester as a regular student".

(Approved by the Academic Council held on 8-9-1994)

14. A candidate who fails in any elective subject may be permitted by the Head of the Department to change the elective subject. He shall be required to undergo a regular course of study for the new elective subject.

15. A candidate may be permitted by the Head of the Department to change his specialization. He shall undergo the regular course prescribed for specialization.

16. (a) In no case will a candidate, who has not passed finally after six years from the date of enrolment, be allowed to continue the course.

16. (b) Provided the Vice-Chancellor in consultation with the Head of the Department may waive this limit of six years in the case of candidates who could not complete their M.E. Courses in one stretch. The reasons for granting exemption shall be recorded in writing. Such extension shall not exceed one year.

17. The subject for the dissertation shall be approved by the Head of the Department.

18. Three copies of dissertation printed or type-written shall be submitted to the Registrar through Head of Department, along with the certificate from the supervisor that the work has been undertaken and completed, the dissertation has been written under his guidance and meets the requirements of the course. A certificate should also be appended that the dissertation has not formed the basis of award of any previous degree or diploma etc. of this or any other University.

19. The dissertation shall be referred to two examiners, one External and one Internal. They shall examine the dissertation. The candidate shall also be required to appear for the Viva-voce examination conducted by a Board of Examiners consisting of the External Examiner, the Internal Examiner and the Head of the Department or his nominee who shall be the Chairman of the Board.

20. The dissertation examination shall be held only after the candidate has passed in all the theory papers, course work and Seminar.

21. (a) The number of part-time students to be admitted to a particular branch of study shall be decided by the Head of the Department concerned.

21. (b) The programme of instruction for a part-time student shall be drawn up by the Head of the Department so as to suit the requirements of the student concerned.

22. (a) For a pass, candidate should obtain 35 per cent marks in each theory paper, 50 per cent marks in each course work, 50 per cent marks in Seminar and the Dissertation should be "accepted".

22. (b) In case the dissertation is found "unacceptable", the candidate shall be required to repeat the dissertation work.

23. The division shall be awarded to the M.E. students as follows:

(a) Honours - 75 per cent marks or above
(b) First Division - 65 per cent marks or above
(c) Second Division - 50 per cent marks or above

24. A candidate may be permitted to offer additional units, subjects in excess of the minimum requirements for the M.E. Degree. The result of these additional units/subjects shall be separately mentioned in the mark-sheet and it will not be counted for the award of the division.

25. Candidates who have passed the Section 'A' and 'B' examinations of the Institution of Engineers (India) shall be eligible for the admission to the M.E. Course provided they pass a written and oral qualifying examination to be conducted by the Department concerned. On admission, a candidate may be required to offer and pass additional courses to make up the deficiency, if any, and when this is done, his normal instruction load of Master of Engineering will be correspondingly reduced. The admission of candidates under this category would be restricted to maximum two for each course out of which not more than one may be on a full time basis. The candidate's M.E. result will be announced only when he clears the deficiency papers.

26. Graduates in Agricultural Engineering shall be eligible for admission to M.E. Civil (Geotechnical Engg.). On admission a candidate may be required to appear in additional B.E. course in Civil Engg. To make-up the deficiency, if any. The candidate's M.E. result will be announced only when he clears the deficiency papers.

27. Only those candidates will be eligible for U.G.C. Scholarship who have qualified through the GATE (Graduate Aptitude Test for Engineers).

LIST OF TEACHING STAFF

ASSOCIATE PROFESSOR

1. Dr. N.C. Barwar	B.E., ME, Ph.D.,MISTE, MIE
2. Dr. Rajesh Purohit (HEAD)	B.E., ME, Ph.D., MISTE, MIE
3. Dr. Anil Gupta	BE (Hons), M.Tech., Ph.D., MCSI, MISTE

ASSISTANT PROFESSOR

1. Shri Shrwan Ram	B.E., M.E.
2. Dr. Alok Singh Gahlot	B.E., MS, Ph.D.
3. Dr. (Mrs.) Rachna	MCA, Ph.D.

M.E. COMPUTER SCIENCE & ENGINEERING

TEACHING AND EXAMINATION SCHEME

FIRST SEMESTER – 2015

A. Written Papers	Periods per week			Marks		Exam Hours
	Units	L	T/P	Course work	Exam	
CSME 101A -Theory of Formal Languages	1	3	2	25	100	3
CSME 102A - Advanced Operating Systems	1	3	2	25	100	3
CSME 103A - Algorithms and Complexity	1	3	2	25	100	3
CSME 104A – Distributed and Parallel Databases	1	3	2	25	100	3
CSME 105A – Advanced Computer Networks	1	3	2	25	100	3
Total (A)	**5**	**15**	**10**	**125**	**500**	**-**
B. Practicals and Sessionals:						
CSME 151B - Distributed and Parallel Databases Lab	1	-	3	50	100	-
CSME 152B – Advanced Networking Lab	1	-	3	50	100	-
Total (B)	**2**	**-**	**6**	**100**	**200**	**-**
Total (A+B)	**7**	**15**	**16**	**225**	**700**	**-**

Total Marks for I Semester: 925

FIRST SEMESTER

CSME 101A - THEORY OF FORMAL LANGUAGES

3L, 2T 3 Hours, 100 Marks

Formal languages and their related automata, Turing machines, type-0 languages, linear bounded automata and CFLs. Time and tape bounded Turing machines, time and space bounds for recognizing CFLs. Turing

Computability: number theoretic computations by Turing machines and indexing. Axiomatic systems, their soundness and completeness.

Recursive function theory: primitive recursive functions and primitive recursive predicates. Ackermann's function, recursive and general recursive functions.

Computability and decidability: computable functions, computable sets, decision problems. Fixpoint theory of programs, functions and functionals, verification methods, Lambda calculus and applications.

CSME 102A - ADVANCED OPERATING SYSTEMS

3L, 2T 3 Hours, 100 Marks

Distributed Operating System: Issues, limitation, casual and total ordering.

Logical clocks, mutual exclusion classification and algorithms, deadlock model, detection, prevention, avoidance, resolution, centralized and distributed detection algorithms.

Distributed file system architecture, design issues, name resolution, cache consistency.

Distributed shared memory architecture, design issues, memory coherence, granularity, page replacement.

Distributed scheduling, load distribution, stability, load sharing, task migration.

CSME 103A - ALGORITHMS AND COMPLEXITY

3L, 2T 3 Hours, 100 Marks

Introduction, models of computation, computational problems and languages, Turing machines and non-determinism, models of computation like RAM and pointer machines.

Relations between complexity classes, time-space tradeoffs for some fundamental problems. Reductions and completeness, Complete languages, proving completeness. Relationship between P and NP problem, NP hierarchy. Relationship between complexity classes.

Randomized complexity classes, Boolean circuit complexity.

Cryptography and one-way functions. Polynomial hierarchy, P-space completeness.

Interactive proofs and Hardness of approximation, Parallel complexity classes.

Probabilistic complexity classes, Interactive models and complexity classes, Kolmogorov complexity.

CSME 104A - DISTRIBUTED AND PARALLEL DATABASES

3L, 2T 3 Hours, 100 Marks

Introductory concepts and design of Distributed Database Systems, Data Fragmentation, Replication, and allocation techniques for DDBMS, Methods for designing and implementing DDBMS designing a distributed relational database, Architectures for DDBMS cluster, federated, parallel databases and client server architecture.

Advanced concepts in DDBMS: Overview of distributed management, atomicity, two phase locks, time stamp ordering, optimistic concurrency control, concurrency and recovery in DDBMS, Distributed Deadlock Management, transaction recovery and replication servers, Distributed Query Processing and Optimisation.

Current trends and developments related to Distributed database applications technologies.

Introduction to related database technologies: Parallel Databases, Mobile and Cloud Database and Web Databases.

CSME 105A - ADVANCED COMPUTER NETWORKS

3L, 2T 3 Hours, 100 Marks

Flow and Congestion Control: Window and Rate Based Schemes, Decbit, TCP, ATM ABR, hop-by-hop schemes. Quality of Service: in ATM, IETF integrated services model, Differentiated Services Model.

Flow Identification, Packet Classifiers and Filters. Scheduling.

Network Management: ASN, SNMP, CMIP. Issues in the management of large networks. Multicast: IGMP, PIM, DVMRP. Mobility: IP.

M.E. COMPUTER SCIENCE & ENGINEERING

TEACHING AND EXAMINATION SCHEME

SECOND SEMESTER – 2015

Subjects	Periods per week			Marks		Exam Hours
	Units	L	T/P	Course work	Exam	
CSME 201A - Wireless and Mobile Computing	1	3	2	25	100	3
CSME 202A - Information Protection & Computer Security	1	3	2	25	100	3
CSME Elective-I	1	3	2	25	100	3
CSME Elective-II	1	3	2	25	100	3
CSME Elective-III	1	3	2	25	100	3
Total (A)	**5**	**15**	**10**	**125**	**500**	**-**
B. Practicals and Sessionals:						
CSME 251B – Information Protection & Computer Security Lab	1	-	3	50	100	-
CSME 252B – Wireless and Mobile Computing Lab	1	-	3	50	100	-
Total (B)	**2**	**-**	**6**	**100**	**200**	-
Total (A+B)	**7**	**15**	**16**	**225**	**700**	**-**

Total marks for II Semester: 925

List of Electives

(i) CSME 203A - Information Retrieval
(ii) CSME 204A - Fault Tolerant Computing
(iii) CSME 205A - Performance Evaluation of Computer System & Networks
(iv) CSME 206A – Natural Language & Speech Processing
(v) CSME 207A – Advanced Compilers
(vi) CSME 208A - Algorithmic Graph Theory
(vii) CSME 209A – Parallel Computing
(viii) CSME 210A – Digital Image Processing and Computer Vision
(ix) CSME 211A – Machine Learning
(x) CSME 212A – Formal specifications and verification of programs
(xi) CSME 213A – Information and Coding Theory
(xii) CSME 214A – Advanced Algorithms

SECOND SEMESTER

CSME 201A - WIRELESS AND MOBILE COMPUTING

3L, 2T 3 Hours, 100 Marks

The Cellular concepts and its implementations, Analog and Digital cellular mobile system, cellular mobile systems, wireless systems including wireless LAN and Wireless ATM, Channel allocation, Multiple access, Location management, Handoffs. Mobile network and Transport layers and protocols, General study of 4-G mobile communication systems.

Wireless Networking: MAC protocols, Routing, Transport, Ad-hoc networking.

Applications: Mobility adaptations, Disconnected operations, Data broadcasting, Mobile agents.

Security, Energy efficient computing, Impact of mobility on algorithms.

CSME 202A - INFORMATION PROTECTION AND COMPUTER SECURITY

3L, 2T 3 Hours, 100 Marks

Introduction: Basic objectives of cryptography, secret-key and public-key cryptography, one-way and trapdoor one-way functions, cryptanalysis, attack models, classical cryptography.

Block ciphers: Modes of operation, DES and its variants, RCS, IDEA, SAFER, FEAL, BlowFish, AES, linear and differential cryptanalysis.

Stream ciphers: Stream ciphers based on linear feedback shift registers, SEAL, unconditional security.

Message digest: Properties of hash functions, MD2, MD5 and SHA-1, keyed hash functions, attacks on hash functions.

Public-key parameters: Modular arithmetic, gcd, primality testing, Chinese remainder theorem, modular square roots, finite fields.

Intractable problems: Integer factorization problem, RSA problem, modular square root problem, discrete logarithm problem, Diffie-Hellman problem, known algorithms for solving the intractable problems.

Public-key encryption: RSA, Rabin and EIGamal schemes, side channel attacks.

Key exchange: Diffie-Hellman and MQV algorithms.

Digital signatures: RSA, DAS and NR signature schemes, blind and undeniable signatures.

Entity authentication: Passwords, challenge-response algorithms, zero-knowledge protocols.

ELECTIVE PAPERS

CSME 203A - INFORMATION RETRIEVAL

3L, 2T 3 Hours, 100 Marks

Introduction, Information retrieval V/S Data Retrieval, logical view of documents, retrieval process.

Basic models for IR and their formal characterization. Probabilistic, Bayesian, and Dempster Shafer approaches.

Retrieval Evaluation, query languages.

Text operations – document clustering, compressions and various compression models.

Indexing and searching – brute-force, Knuth-Morris-Pratt, Boyer-Moore, pattern matching, basic idea of parallel and distributed IR.

User interfaces and visualizations, Information access process, query specifications, relevance judgments.

Introduction to multimedia IR, models, and languages.

Searching web, search engines, browsings and metasearches, searching through hyperlinks.

CSME 204A - FAULT TOLERANT COMPUTING

3L, 2T 3 Hours, 100 Marks

System model: Error, failure, faults, software fault tolerance.

Byzantine agreement, fail-stop processors, stable storage, reliable and atomic broadcasting.

Process resiliency, data resiliency and recovery.

Commit protocols, reliability modeling and performance evaluation.

Crash recovery in databases, and voting methods.

CSME 205A - PERFORMANCE EVALUATION OF COMPUTER SYSTEMS AND NETWORKS

3L, 2T 3 Hours, 100 Marks

Review of probability and statistics, stochastic processes, Markov Models, Parameter estimation and hypothesis testing.

Models of information systems, introduction to reliability measures.

Estimation of MTF and other reliability parameters.

Software metrics and software reliability models. Queuing network models, Workload design.

Benchmarks, Estimations of performance metrics, case studies.

CSME 206A - NATURAL LANGUAGE & SPEECH PROCESSING

3L, 2T 3 Hours, 100 Marks

Speech and Natural Language Processing: Introduction; Brief Review of Regular Expressions and Automata; Finite State Transducers; Word level Morphology and Computational Phonology.

Basic Text to Speech; Introduction to HMMs and Speech Recognition.

Indian language case studies; Part of Speech Tagging; Parsing with CFGs; Probabilistic Parsing. Representation of Meaning; Semantic Analysis; Lexical Semantics.

Word Sense; Disambiguation; Discourse understanding; Natural Language Generation; Techniques of Machine Translation; Indian Language case studies.

CSME 207A - ADVANCED COMPILERS

3L, 2T 3 Hours, 100 Marks

Review of compiler fundamentals - lexical analysis, parsing, semantic analysis, error recovery and intermediate code generation; Runtime storage management; Code generation.

Code improvement – peephole optimization, dependence analysis and redundancy elimination, loop optimization, procedural and inter-procedural optimization, instruction scheduling, optimization for memory hierarchy.

Compilation for high performance architecture; Portability and retargetability.

Selected topics from compilers for imperative, object-oriented and mark-up languages, parallel and distributed programming and concurrency.

CSME 208A - ALGORITHMIC GRAPH THEORY

3L, 2T 3 Hours, 100 Marks

Review of graphs, connectivity, number of components, edge and vertex connectivity, Menjer's theorem, algorithm for isomorphism, 1-isomorphism, 2-isomorphism.

Fundamental cutest, max flow, min-cut theorem, s-t flow in graph, minimum cut in a graph.

Shortest path, Matching, maximal-matching, Hall's theorem, algorithm for max matching in weighted and un-weighted graph.

Algorithm for checking planarity, computation of chromatic number, independent sets, perfect graphs.

Algorithm for Eular line, Hamiltonion. Adaptive algorithm, traveling salesmen problem, Network flow, Activity Network in project planning, detection and avoidance of deadlock, Game theory, Cyclomatic complexity in testing a program.

CSME 209A - PARALLEL COMPUTING

3L, 2T 3 Hours, 100 Marks

Parallel processing terminology, parallel control and data approaches. PRAM algorithms, reduction of number of processors. Processor arrays, multiprocessors, and multicomputers; processor organization-mesh, binary tree, hyper-tree, and hyper-cube.

Parallel programming languages, programming parallel processes, parallel programming features of Fortran 90, C*, nCUBE C, and C-LINDA. Mapping and scheduling, dynamic load balancing and static scheduling.

Basic parallel algorithms, matrix multiplication and fast Fourier transforms.

Typical examples of parallel sorting algorithms, and dictionary operations.

CSME 210A - DIGITAL IMAGE PROCESSING AND COMPUTER VISION

3L, 2T 3 Hours, 100 Marks

Sensor and Imaging: Imaging Optics, Radiometry of Imaging, Illumination sources and techniques, Camera Principles, Color Imaging, Single Sensor Color Imaging and Color Demosaicing, Range Images, 3D Imaging.

Signal Representation: Vector Space and Unitary Trasnsforms, Multi-Resolutional Signal representation, Wavelet Decomposition, Scale space and diffusion, Representation of color, Retinex Processing, Markov Random Field Modellings of Images.

Non-linear Image Processing: Median and Order Statistics Filters, Rank-Ordered-Mean Filters and Signal Dependent Rank-Ordered-Mean Filters, Two Dimensional Teager.

Filters, Applications of nonlinear filters in image enhancement, edge detections, noise removal etc. Feature Estimation: Morphological Operations, Edge Detection, Edges in multichannel images, Texture Analysis, Optical flow based motion estimation, Reflectance based shape recovery, Depth from focus, Stereo atching and depth estimation.

Image and Video Compression Standards: Lossy and lossless compressions.

CSME 211A - MACHINE LEARNING

3L, 2T 3 Hours, 100 Marks

The concept learning task. General-to-specific ordering of hypotheses. Version spaces. Inductive bias. Decision Tree Learning. Rule Learning: Propositional and First-Order, Over-fitting, Cross-Validation.

Experimental Evaluation of Learning Algorithms Instance-Based Learning: k-Nearest neighbor algorithm, Radial basis functions. Case-based learning.

Computational Learning Theory: probably approximately correct (PAC) learning. Sample complexity. Computational complexity of training. Vapnik-Chervonenkis dimension.

Artificial Neural Networks : Linear threshold units, Perceptrons, Multilayer networks and backpropagation, recurrent networks.

Probabilistic Machine Learning Maximum Likelihood Estimation, MAP, Bayes Classifiers Naive Bayes. Bayes optimal classifers.

Minimum description length principle. Bayesian Networks, Inference in Bayesian Networks.

Bayes Net Structure Learning Unlabelled data: EM, preventing overfitting, cotraining Gaussian Mixture Models, K-means and Hierarchical Clustering, Clustering and Unsupervised Learning, Hidden Markov Models, Reinforcement Learning. Support Vector Machines Ensemble learning: boosting, bagging.

CSME 212A - FORMAL SPECIFICATION AND VERIFICATION OF PROGRAMS

3L, 2T 3 Hours, 100 Marks

Review of first-order logic, syntax and semantics. Resolution theorem proving. Binary Decision Diagrams (BDDs) and their use in representing systems. (Programming exercises coding and using logic programming frameworks).

Transition systems, automata and transducers. Buechi and other automata on infinite words; Linear Time Temporal Logic (LTL), and specifying properties of systems in LTL; the relationship between temporal logic and automata on infinite words, LTL Model checking (exercises using Spin or similar tools); Computational Tree Logic (CTL and CTL*); CTL model checking (exercises); Process calculi such as CSP and CCS.

Notions of program equivalence — traces, bi-simulation and other notions. Hennessy-Milner Logic (HML) and Mu calculus (exercises using tools such as CWB — Concurrency Work Bench).

Symbolic model checking, exercises using tools such as SMV. Set-based model checking and Davis-Putnam procedure.

Equational logic frameworks, real-time frameworks, reactive frameworks, pi-calculus, Tree automata and Weak Second-order Logic with k successors.

CSME 214A - ADVANCED ALGORITHMS

3L, 2T 3 Hours, 100 Marks

Advanced data structures: self-adjustment, persistence and multidimensional trees. Randomized algorithms: Use of probabilistic inequalities in analysis, applications using examples.

Geometric algorithms: Point location, Convex hulls and Voronoi diagrams, Arrangements.

Graph algorithms: Matching and Flows. Approximation algorithms: Use of Linear programming and primal dual, Local search heuristics.

Parallel algorithms: Basic techniques for sorting, searching, merging, list ranking in PRAMs and Interconnection networks.

M.E. COMPUTER SCIENCE & ENGINEERING

TEACHING AND EXAMINATION SCHEME

THIRD SEMESTER - 2016

Subjects	Periods per week			Marks		Exam Hours
	Units	L	T/P	Course work	Exam	
CSME 351B – Documentation and Research Tools Laboratory	1	-	2	50	-	-
CSME 352B - Seminar	1	-	-	100	-	-
CSME 353B - Dissertation	2	-	-	-	-	-
Total	4	-	2	150	-	-

CSME 351B – DOCUMENTATION AND RESEARCH TOOLS LABORATORY

2P 50 Marks

Compulsory tools for Documentation: Latex, Lex, tex editor and reports.

Optional tools based on requirements of dissertations: Octave, Sci-lab, Matlab, SPSS, NS2, Opnet, Freemat, Weka, Pset SIM, P SIM.

M.E. COMPUTER SCIENCE & ENGINEERING

TEACHING AND EXAMINATION SCHEME

FOURTH SEMESTER - 2016

Subjects	Periods per week			Marks		Exam Hours
	Units	L	T/P	Course work	Exam	
CSME 352B - Dissertation	4	-	-	-	-	-

Total marks for III & IV Semester: 150
Grand total marks for M.E. (Computer Science & Engg): 2000