

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

FACULTY OF ENGINEERING AND TECHNOLOGY

Syllabus Structure- w.e.f. 2014-2015

Final Year B. Tech (Computer Science and Engineering)

Sub Code	SEMESTER-VII	Contact Hrs / Week				Examination Scheme						
		L	T	P	Total	CT	TH	T W	P	Total	Credits	Duration of Theory Exam
CSE401	Network Security	3	1	-	4	20	80	-	-	100	4	3 Hours
CSE402	Software Testing and Quality Assurance	3	1	-	4	20	80	-	-	100	4	3 Hours
CSE403	Mobile Application Development	4	-	-	4	20	80	-	-	100	4	3 Hours
CSE404	Cloud Computing	4	-	-	4	20	80	-	-	100	4	3 Hours
CSE441-444	Elective-II	4	-	-	4	20	80	-	-	100	4	3 Hours
CSE421	Laboratory-I Mobile Application Development	-	-	2	2	-	-	50	-	50	1	NA
CSE422	Laboratory-II Cloud Computing	-	-	2	2	-	-	50	-	50	1	NA
CSE423	Laboratory-III Network Security	-	-	2	2	-	-	50	50	100	1	NA
CSE424	Laboratory-IV Software Testing and Quality Assurance	-	-	2	2	-	-	50	50	100	1	NA
CSE425	Project-II	-	-	6	6	-	-	100	100	200	3	NA
	Total of semester-VII	18	02	14	34	100	400	300	200	1000	27	-

Sub Code	SEMESTER-VIII	Contact Hrs /Week				Examination Scheme						
		L	T	P	Total	CT	TH	T W	P	Total	Credits	Duration of Theory Exam
CSE471	Inplant Training (IPT) *	-	-	-	-	-	-	300	300	600	27	NA
	Total of semester-VIII	-	-	-	-	-	-	300	300	600	27	-
	Grand Total of VII & VIII	-	-	-	-	100	400	600	500	1600	54	-

L: Lecture hours per week T: Tutorial hours per week

P: Practical hours per week

CT: Class Test

TH: University Theory Examination TW: Term Work

P: Practical/Oral Examination

NA: Not Applicable

Elective-II

CSE441 Business Intelligence

CSE442 Introduction to Mainframe System

CSE443 Soft Computing

CSE444 Real Time Systems

***After every two weeks of In-Plant Training (IPT) student shall apprise the progress of training to the internal guide and get the required inputs.**

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No: CSE401
Teaching Scheme:
Theory: 03 Hrs/ week
Tutorial: 01 Hr/week
Credits:04

Course Title: Network Security
Class Test (Marks): 20
Theory Examination (Duration): 03Hrs
Theory Examination (Marks): 80

Course Objectives	:	<ul style="list-style-type: none"> At the end of this course students will able to correctly use the techniques, components and tools of Network Security to build secure communication system. At the end of this course students will able to understand traditional symmetric key ciphers. Students will also able to understand advanced cryptographic algorithms like DES & AES.
Unit-I	:	Introduction Computer Security Concepts – definition, key objectives, Confidentiality, Integrity and Availability, The Challenges of Computer Security, security goals, Security Attacks – Passive attacks and active attacks, Security Services, Security Mechanisms, A Model for Network Security. Tutorial: Tutorial based on Security attacks. (10 Hrs)
Unit-II	:	Introduction to Cryptography Cryptography – Introduction, categories of cryptography- Symmetric-Key Cryptography, Asymmetric-Key Cryptography, Types of Keys, Mathematics for Cryptography – Integer Arithmetics, Modular Arithmetics. Steganography – Historical Use, Modern Use, Text Cover , Image Cover, Other Covers. Tutorial: Tutorial based on Integer and Modular Arithmetic. (10 Hrs)
Unit-III	:	Traditional Symmetric Key Ciphers Introduction – Cryptanalysis, cryptanalytic attacks - Ciphertext Only, Known Plaintext, Chosen Plaintext, Chosen Ciphertext, Chosen Text, Brute force attacks, Traditional Ciphers : Substitution Cipher , Transposition Cipher, Stream and Block Ciphers. Tutorial: Tutorials based on Traditional Ciphers. (10 Hrs)
Unit-IV	:	Modern Symmetric Key Ciphers Introduction to Modern Symmetric Key Ciphers, modern block cipher, substitution or transposition, Components of Block Cipher – P-Boxes – Expansion and Compression P Boxes, invertibility, S – Boxes – Linear vs non linear S Boxes, invertibility, Product Ciphers. Tutorial: Tutorial Based on Moder Symmetric Ciphers. (10 Hrs)
Unit-V	:	Data Encryption Standard and Advanced Encryption standard Introduction, History, Overview, DES Structure – Initial and Final Permutation, Round, DES Function, Expansion P Box, S Boxes, Cipher and Reverse Cipher, Key Generation. AES: Introduction, Structure, Rounds. Tutorial: Tutorial Based on DES and AES. (10 Hrs)
Unit-VI	:	Asymmetric Key Ciphers Introduction to Asymmetric key cipher, Introduction to RSA, RSA Procedure, Attacks on RSA, Cryptographic Hash functions. Tutorial: Tutorial Based on Asymmetric Key Ciphers. (10 Hrs)

Text Books	:	<ul style="list-style-type: none"> • Cryptography and Network security Principles and Practice, William Stallings, Prentice Hall. • Cryptography and network Security, Behrouz Forouzan, TMH. • Data Communication and Networking , Behrouz Forouzan, TMH.
References e- books, e- Journals	:	<p>e- books</p> <ul style="list-style-type: none"> • Open Source Security Tools: Practical Guide to Security Applications by Tony Howlett - Prentice Hall PTR , 2004. • Intrusion Detection with SNORT by Rafeeq Ur Rehman - Prentice Hall PTR , 2003. • Firewalls Complete by Marcus Goncalves - Mcgraw-Hill, 1998. • Fundamentals of Network Security , John E. Canavan , Artech House. <p>e- Journals</p> <ul style="list-style-type: none"> • International Journal of Information Security. • JOC - Journal of Cryptology. • DCC - Designs, Codes and Cryptography. • IEEE Security & Privacy.

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper:

The six units in the course syllabus shall be divided in two equal parts of 3 units each. Question paper shall be set having two sections; Section A and Section B. The questions of Section A shall be set on first part and questions of Section B on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Set ten questions in all with five questions in each section.
2. Question no. 1 from section A and Question no. 6 from section B should be made compulsory and should cover the entire course syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
3. Two questions of 15 marks each from remaining questions from each section A and B should be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No.: CSE402

Course Title: Software Testing and Quality Assurance

Teaching Scheme:
Theory: 03 Hrs/ week
Tutorial: 01 Hr/week
Credits:04

Class Test (Marks): 20
Theory Examination (Duration): 03 Hrs
Theory Examination (Marks): 80

Course Objectives	:	<ul style="list-style-type: none"> To understand the importance of software Testing and software Bug. To develop a Skill necessary to find the Bug and solve it effectively. To develop ability for efficient testing using automated tools.
Unit-I	:	Software Testing Background Infamous software error case studies: Disney's Lion king, Intel bug, The Y2K Bug. What is a bug?, Software bug, Why do bugs occur?, The cost of bugs, What exactly does a software tester do?, What makes a good software tester? Tutorial: Solve Exercise on Usability Testing. (10 Hrs)
Unit-II	:	The Software Development Process Product components, software project staff, and software development life cycle models: Big bang model, Code and fix model, Waterfall model, spiral model. Tutorial: Solve Exercise on white box testing and black box testing. (10 Hrs)
Unit-III	:	The Realities Of Software Testing Testing Axioms: Risk based exercise, The Pesticide paradox, Product specifications are never fail, Software Testing Terms and definitions: Precision and accuracy, Verification and validation, Quality and reliability, Testing and quality assurance. Tutorial: Solve Exercise on performance testing. (10 Hrs)
Unit-IV	:	Testing Tactics Software testing fundamentals, Black box and white box testing, Basis path testing: Flow graph notation, Independent program paths, Deriving test cases, Graph matrices, Control structure testing: Condition, Data flow, Loop testing. Black box testing: Graph based testing methods, Equivalence Partitioning, Boundary value analysis. Tutorial: Solve Exercise on Graph based Testing. (10 Hrs)
Unit-V	:	Automated Testing And Test Tools The benefits of automation and tools, Test tools: Viewers and monitors, Drivers, Stubs, Stress and load tools, Analysis tools. Software test automation: Macro recording and playback, Programmed macros, Fully programmable automated testing tools. Random Testing: Dumb Monkeys, Semi-smart monkeys, smart monkeys, Realities of using test tools and automation. Tutorial: Solve Exercise on fault and failures. (10 Hrs)
Unit-VI	:	Software Quality Assurance and Quality management Quality is free, Quality concepts, Testing and quality assurance in the workplace, Software testing, Software reviews, Formal technical reviews, Software quality assurance, SQA activities, Test management and organizational structures, Capability Maturity model(CMM), ISO 9000 quality standards, The SQA plan . Tutorial: Solve Exercise on Structural Testing. (10 Hrs)

Text Books	:	<ul style="list-style-type: none"> • Ron Patton, “Software Testing”, SAMS Publication. • Roger Pressman, “Software Engineering”, Mc-Graw Hill publication.
References e- books, e- Journals	:	e- books <ul style="list-style-type: none"> • Kshirsagar, Naik, Priyadarshani Tripathi, “Software Testing and Quality Assurance”. • C. Kaner, “Testing Computer Software”. • Elfriede Dustin, “Implementing Automated Software Testing”. e- Journals <ul style="list-style-type: none"> • IIST, International Institute of Software Testing. • IJSE, International Journal of Software Engineering.

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper:

The six units in the course syllabus shall be divided in two equal parts of 3 units each. Question paper shall be set having two sections; Section A and Section B. The questions of Section A shall be set on first part and questions of Section B on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Set ten questions in all with five questions in each section.
2. Question no. 1 from section A and Question no. 6 from section B should be made compulsory and should cover the entire course syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
3. Two questions of 15 marks each from remaining questions from each section A and B should be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No.: CSE403

Course Title: Mobile Application Development

Teaching Scheme:

Class Test (Marks): 20

Theory: 04 Hrs/ week

Theory Examination (Duration): 03Hrs

Theory Examination (Marks): 80

Credits:04

Course Objective	:	<ul style="list-style-type: none"> Student able to understand the basic concept of Android operating system and Apps development skills for mobile and portable devices such as tablet , palmtop etc.
Unit-I	:	Getting started with Mobility Mobility landscape, Mobile platforms, Mobile appsdevelopment, Overview of Android platform, setting up the mobile app development environment along with an emulator, a case study on Mobile app development. (10 Hrs)
Unit-II	:	Building blocks of mobile apps App user interface designing – mobile UI resources (Layout,UI elements,Draw-able, Menu), Activity- states and life cycle, interaction amongst activities. App functionality beyond user interface - Threads,Async task,Services – states and lifecycle, Notifications, Broadcastreceivers,Telephony and SMS APIs. (10 Hrs)
Unit-III	:	Native data handling On-device file I/O, shared preferences, mobile databases such as SQLite, and enterprise data access (via Internet/Intranet). (10 Hrs)
Unit-IV	:	Sprucing up mobile apps Graphics and animation – custom views, canvas, animation APIs, multimedia – audio/video playback and record, location awareness, and native hardware access (sensors such as accelerometer and gyroscope). (10 Hrs)
Unit-V	:	Testing mobile apps Debugging mobile apps, White box testing, Black box testing, and test automation of mobile apps, JUnit for Android, Robotium, MonkeyTalk. (10 Hrs)
Unit-VI	:	Taking apps to Market Versioning, signing and packaging mobile apps, distributing apps on mobile market place. (10 Hrs)
Text Books		The courseware including PowerPoint is available for the Elective. In addition, following reference book can also be used: Anubhav Pradhan, Anil V Deshpande, “Composing Mobile Apps”, Edition: I, Publication: Wiley, Year: 2014.

References e- books, e- Journals	e- books <ul style="list-style-type: none"> Barry Burd, “ Android Application Development All in one for Dummies”, Edition: I. Name of the book: “Teach Yourself Android Application Development In 24 Hours”, Edition: I, Publication: SAMS.
---	--

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V, VI.

Pattern of Question Paper:

The six units in the course syllabus shall be divided in two equal parts of 3 units each. Question paper shall be set having two sections; Section A and Section B. The questions of Section A shall be set on first part and questions of Section B on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Set ten questions in all with five questions in each section.
2. Question no. 1 from section A and Question no. 6 from section B should be made compulsory and should cover the entire course syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
3. Two questions of 15 marks each from remaining questions from each section A and B should be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of B. Tech. Final Year (Computer Science and Engineering) Semester-VII

Course Code: CSE404

Teaching Scheme:

Theory: 04 Hrs/week

Credits:04

Title: Cloud Computing

Class Test: 20 Marks

Theory Examination (Duration): 03 Hrs

Theory Examination (Marks): 80

Objectives	: <ul style="list-style-type: none"> To understand cloud computing Basics. To study the basic service models of cloud computing. To understand the basics of virtualization. To study and configure Openstack & Storage server.
Unit-I	: Introduction What is the Cloud? The Emergence of Cloud Computing, The Global Nature of the Cloud, Cloud-Based Service Offerings, Grid Computing or Cloud Computing? Role of open standards, Benefits of Using a Cloud Model, What About Legal Issues when using Cloud Models? What Are the Key Characteristics of Cloud Computing? Challenges for the Cloud. (10 Hrs)
Unit-II	: Cloud service models Infrastructure as a Service (IaaS) Introduction to IaaS - IaaS definition, Examples: Amazon EC2 -Renting, EC2 Compute Unit, Platform and Storage, pricing, customers, Eucalyptus. Platform as a Service (PaaS) Introduction to PaaS -What is PaaS, Service Oriented Architecture (SOA). Cloud Platform and Management -Computation, Storage. Examples -Google App Engine , Microsoft Azure, Salesforce.com's Force.com platform. Software as a Service (SaaS) Introduction to SaaS, Web services, Web 2.0, Web OS. (10 Hrs)
Unit-III	: Using Cloud Services Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files. (10 Hrs)
Unit-IV	: Overview Of Virtualization Basics of Virtualization - Virtualization Types – Desktop Virtualization – Network Virtualization – Server and Machine Virtualization – Storage Virtualization – System-level or Operating Virtualization – Application Virtualization-Virtualization Advantages – Virtual Machine Basics – Taxonomy of Virtual machines - Process Virtual Machines - System Virtual Machines – Hypervisor - Key Concepts. (10 Hrs)
Unit-V	: Introduction to OpenStack OpenStack architecture, OpenStack terminology, Installation of RedHat Open stack, Object storage, block storage, networking service and metering service. (10 Hrs)

Unit-VI	: Introduction to Red Hat Storage Server Introduction - Features, Concept and terminology, Installation of redHat storage Server, Volume types , Clients -Native client, Cifs client, Volume options, Nfs client ACLs and Quotas , Extending volumes. (10 Hrs)
Text Books	: <ul style="list-style-type: none"> • John W. Rittinghouse, James F. Ransome, “Cloud Computing Implementation, Management and Security”, CRC Press. • Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que publishing. • William von Hagen, “Professional Xen Virtualization”, WROX publication. • Jim Smith, Ravi Nair, “Virtual Machines: Versatile Platforms for Systems and Processes (The Morgan Kaufmann Series in Computer Architecture and Design)”. • Dr Gautam Shroff, “Enterprise Cloud Computing: Technology, Architecture, Applications”. • Redhat Manual on Openstack administration and Storage server administration.
References e- books, e- Journals	e-books <ul style="list-style-type: none"> • George Reese ,“Cloud Application Architectures”, O'Reilly Media Publication. • Anthony T. Velte, Toby J. Velte, Ph.D. Robert Elsenpeter, “Cloud Computing: A Practical Approach”, McGraw Hill. • “Brian J.S. Chee and Curtis Franklin,“Cloud Computing Technologies and Strategies of the Ubiquitous Data Center., CRC Press. • Gautam Shroff, “ Enterprise Cloud Computing Technology, Architecture, Applications”, Cambridge University press. e- Journals <ul style="list-style-type: none"> • International Journal of Cloud Computing (IJCC). • International Journal of Cloud Computing and Services Science (IJ-CLOSER). • International Journal of Advanced Cloud Computing and Applied Research. • International Journal of Cloud Applications and Computing (IJCAC).

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper:

The six units in the course syllabus shall be divided in two equal parts of 3 units each. Question paper shall be set having two sections; Section A and Section B. The questions of Section A shall be set on first part and questions of Section B on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Set ten questions in all with five questions in each section.
2. Question no. 1 from section A and Question no. 6 from section B should be made compulsory and should cover the entire course syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
3. Two questions of 15 marks each from remaining questions from each section A and B should be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No.: CSE441
Teaching Scheme:
Theory: 04 Hrs/ week

Course Title: Elective-II Business Intelligence
Class Test (Marks): 20
Theory Examination (Duration): 03 Hrs
Theory Examination (Marks): 80

Credits:04

Course Objectives	:	<ul style="list-style-type: none"> To make aware of technology and processes associated with Business Intelligence framework. Identify the metrics, indicators and make recommendations to achieve the business goal. To Design an enterprise dashboard that depicts the key performance indicators this helps in decision making. To visualize application of concepts using open source/MS Office.
Unit-I	:	Introduction to Business Intelligence Introduction to digital data and its types – structured, semi-structured and unstructured, Difference between semi-structured & structured data, Introduction to OLTP and OLAP – OLTP, OLAP, Different OLAP Architectures (MOLAP, ROLAP, HOLAP), Data models for OLTP & OLAP, Role of OLAP tools in the BI architecture. (10 Hrs)
Unit-II	:	Getting Started with BI BI Definitions & Concepts, Evolution of BI & role of DSS, EIS, MIS & digital dashboard, Need for BI at virtually all levels, BI Component Framework, BI Users, Business Applications of BI, BI Roles & Responsibilities, BI best practices, Popular BI tools, BI Infrastructure Components – BI Process, BI Technology. (10Hrs)
Unit-III	:	Basics of Data Integration Concepts of data integration, needs and advantages of using data integration, Issues in data warehouse, Define data warehouse & data mart, Goals of data warehouse, introduction to ETL, introduction to common data integration approaches, Meta data - types and sources, Semantic Metadata Processes for Business Analytics, Introduction to data quality, data profiling concepts and applications. (10Hrs)
Unit-IV	:	Introduction to Multi-Dimensional Data Modeling Introduction, Datamodelling basics, Types of data model, Data modelling techniques, fact table, dimension table, Typical dimensional models, Dimensional modelling life cycle, Introduction to business metrics and KPIs, creating cubes using Microsoft Excel. (10Hrs)
Unit-V	:	Basics of Enterprise Reporting A typical enterprise, Malcolm Baldrige - quality performance framework, balanced scorecard, enterprise dashboards, balanced scorecard vs. enterprise dashboard, enterprise reporting using MS Access / MS Excel, best practices in the design of enterprise dashboards. (10 Hrs)

Unit-VI	:	Knowledge Delivery & Emerging Trends in BI Dimensional Analysis, Alerts/Notifications, Visualization - Charts, Graphs, Widgets. Emerging Trends: Search as a Business Intelligence Technique, Text Analysis, Entity Recognition & Extraction, Sentiment analysis, Mobile Business Intelligence, Event stream processing, Big Data Analytics. (10 Hrs)
Text Books	:	1. R. N. Prasad, Seema Acharya, “Fundamentals of Business Intelligence”. 2. Han, Kamber, “Data Mining Concepts and Techniques”, 2 nd Edition.
References e- books, e- Journals	:	e- books 3. Mike Biere, “Business intelligence for the enterprise”. 4. Larissa Terpeluk Moss, Shaku Atre , “Business intelligence roadmap”. 5. Business Intelligence by savvy manager's guide. 6. Information dashboard design by Stephen Few. 7. An introduction to Building the Data Warehouse – IBM. e- Journals 8. International Journal of Business Intelligence Research, 4(1), 43-51, January-March 2013 (IJOBIR). 9. International Journal of Data Warehousing and Mining (IJDWM). 10. IFRSA International Journal of Data Warehousing & Mining (IIJDWM).

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper:

The six units in the course syllabus shall be divided in two equal parts of 3 units each. Question paper shall be set having two sections; Section A and Section B. The questions of Section A shall be set on first part and questions of Section B on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Set ten questions in all with five questions in each section.
2. Question no. 1 from section A and Question no. 6 from section B should be made compulsory and should cover the entire course syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
3. Two questions of 15 marks each from remaining questions from each section A and B should be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No.: CSE442

Course Title: Elective-II Introduction to Mainframe System

Teaching Scheme:
Theory: 04 Hrs/ week

Class Test (Marks): 20
Theory Examination (Duration): 03 Hrs
Theory Examination (Marks): 80

Credits:04

Course Objective	:	<ul style="list-style-type: none"> Student able to understand the basic concept of Z operating system, job controlling language, db-ii component and cobol programming.
Unit-I	:	<p>Evolution of Mainframe hardware Overview of Computer Architecture -Classification of Computers - micro, mini, mainframes and super computer - Mainframe computer - key features - benefits - Evolution of Mainframes - Different hardware systems. (10 Hrs)</p>
Unit-II	:	<p>Mainframes OS and Terminology Operating systems on mainframes, Batch processing vs. online processing - mainframe operating system. - evolution - concepts of Address space, Buffer management - Virtual storage - paging - swapping - Dataset management in mainframes. (10 Hrs)</p>
Unit-III	:	<p>z/OS and its features Z-operating system (Z/OS) - Virtual storage - Paging process - storage Managers - Program execution modes - Address space - Multiple virtual system (MVS), MVS address space, Z/OS address space - Dataset - sequential and partial dataset - Direct access storage device (DASD) - Access methods - Record formats - Introduction to virtual storage access methods (VSAM) - Catalog – VTOC. (10 Hrs)</p>
Unit-IV	:	<p>Overview of JCL Introduction to Job Control language - structure of JCL statements - Various statements in JCL - JOB statement - EXEC statement - DD statement - JCL procedures and IBM utility programs. (10 Hrs)</p>
Unit-V	:	<p>Overview of DB2 Introduction to DB2 – System Service component, Database Service component, Locking Service component, Distributed Data Facility Services component, Stored Procedure component, catalogs and optimizer DB2 Objects and Data Types - DB2 Objects Hierarchy, Storage groups, Database, Table space, Table, Index, Clustered index, Synonyms and aliases, Views, Data Types. DB2 SQL programming – Types of SQL statements, DCL, DDL, DML, SPUFI utility. Embedded SQL programming – Host variable, DECLGEN utility, SQLCA, single/multiple row manipulation, cursors, scrollable cursors. (10 Hrs)</p>

Unit-VI	:	COBOL Programming 1 Introduction – History, evolution and Features, COBOL program Structure, steps in executing COBOL Language Fundamentals – Divisions, sections, paragraphs, sections, sentences and statements, character set, literals, words, figurative constants, rules for forming user defined words, COBOL coding sheet. Data division – Data names, level numbers, PIC and VALUE clause, REDEFINES, RENAME and USAGE clause Procedure Division – Input / Output verbs, INITIALIZE verb, data movement verbs, arithmetic verbs, sequence control verbs. (10 Hrs)
Text Books		<ul style="list-style-type: none"> • Doug Lowe, “MVS JCL”, Mike Murach and Associates. • Gary DeWard Brown, “JCL Programming Bible (with z/OS)”, fifth edition, Wiley India Dream Tech, 2002. • COBOL - Language Reference, Ver 3, Release 2, IBM Redbook. • COBOL - Programming Guide, Ver 3, Release 2, IBM Redbook. • Nancy Stern & Robert A Stern, “Structured Cobol Programming”, John Wiley & Sons, New York, 1973. • M.K. Roy and D. Ghosh Dastidar, “Cobol Programming”, Tata McGraw Hill, New York, 1973. • Newcomer and Lawrence, “Programming with Structured COBOL”, McGraw Hill Books, New York, 1973.
References e- books, e- Journals		<ul style="list-style-type: none"> • IBM Manual: DB2 Application Programming and SQL guide. • IBM Manual: DB2 SQL Reference. • DB2 Version 7 Information Center found online at http://publib.boulder.ibm.com/infocenter/db2v7luw/index.jsp.

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V, VI.

Pattern of Question Paper:

The six units in the course syllabus shall be divided in two equal parts of 3 units each. Question paper shall be set having two sections; Section A and Section B. The questions of Section A shall be set on first part and questions of Section B on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Set ten questions in all with five questions in each section.
2. Question no. 1 from section A and Question no. 6 from section B should be made compulsory and should cover the entire course syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
3. Two questions of 15 marks each from remaining questions from each section A and B should be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No.: CSE443
Teaching Scheme:
Theory: 04 Hrs/ week

Course Title: Elective-II Soft Computing
Class Test (Marks): 20
Theory Examination (Duration): 03 Hrs
Theory Examination (Marks): 80

Credits:04

Course Objectives	:	<ul style="list-style-type: none"> To study models of ANN and Fuzzy Logic. To be able to apply these models in practice for solving problems in diverse areas such as pattern recognition, pattern matching. To study and understand techniques of Feed forward and feedback neural networks.
Unit-I	:	Basics of Artificial Neural Network Characteristics of Neural Networks, Structure and working of a biological neural network, artificial neural network: terminology, models of neurons: Mc Culloch Pitts model, Perceptron model, Adaline model, topology, Basic learning laws. Functional Units for ANN for Pattern Recognition Task: Pattern Recognition Problem, Basic Functional units, PR by functional units. (10 Hrs)
Unit-II	:	Feedforward Neural Networks Supervised Learning I: Perceptrons – Learning and Memory, Learning Algorithms, Error Correction and Gradient Decent Rules, Perceptron Learning Algorithms, Supervised Learning II: Backpropagation Multilayered Network Architectures, Back propagation Learning Algorithm, example Applications of feed forward neural networks. (10 Hrs)
Unit-III	:	Feedback Neural Networks Introduction, Associative Learning, Hopfield network, Error Performance in Hopfield networks, simulated annealing, Boltzmann machine and Boltzmann learning, State transition diagram and false minima problem, stochastic update, simulated annealing, Boltzmann machine, Bidirectional Associative Memory, BAM Stability Analysis. (10 Hrs)
Unit-IV	:	Self Organizing Feature Map & Fuzzy Logic Self Organization, Generalized Learning Laws, Competitive Learning, Vector Quantization, self organizing feature map, Applications of self organizing feature map. Fuzzy set theory, crisp sets, operations on crisp set, fuzzy sets, fuzzy versus crisp, operations, fuzzy relations, crisp relations, properties Fuzzy logic Application: Fuzzy Control of Blood Pressure. (10 Hrs)
Unit-V	:	Fuzzy Logic in database and Information systems Fuzzy Information, Fuzzy Logic in database Systems, Fuzzy Relational data Models, operations in Fuzzy Relational data Models, Design theory for Fuzzy Relational databases, Fuzzy information Retrieval and Web search, Fuzzy Object Oriented databases. Introduction to Genetic Algorithms, Evolutionary Algorithms. (10 Hrs)
Unit-VI	:	Gentic Algorithm Survival of the fittest, Fitness computations, crossover, mutation, reproduction, rank method, rank space method, Applications. (10 Hrs)

Text Books	: <ul style="list-style-type: none"> • B. Yegnanarayana , “Artificial Neural Networks”, PHI publications. • Jang J.S.R.,Sun C.T and Mizutami E - Neuro Fuzzy and Soft computing Prentice hall New Jersey,1998. • Satish Kumar, “Neural Networks A classroom Approach”, TMH Publication. • John Yen, Reza Langari, “Fuzzy Logic”, Pearson Education . • S. Rajasekaran, Vijaylakshmi Pari, “Neural networks, Fuzzy Logic and Genetic Algorithms Synthesis and Applications”, PHI publication. • Lotfi A. Zadeh, “Soft computing and Fuzzy Logic”, World Scientific Publishing Co., Inc. River Edge, NJ, USA.
References e- books, e- Journals	: <p>e- books,:</p> <ul style="list-style-type: none"> • R. Rojas, “Neural Networks”, Springer-Verlag, Berlin, 1996. Raúl Rojas, Chennakeseva R.Alava. • “Fuzzy Logic and Neural Networks Basic Concepts Application”. • S. N. Sivanandam, S. N. Deepa, “Introduction to Genetic Algorithms”. <p>e- Journals:</p> <ul style="list-style-type: none"> • International Neural Network Society. • European Neural Network Society, & Japanese Neural Network Society.

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper:

The six units in the course syllabus shall be divided in two equal parts of 3 units each. Question paper shall be set having two sections; Section A and Section B. The questions of Section A shall be set on first part and questions of Section B on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Set ten questions in all with five questions in each section.
2. Question no. 1 from section A and Question no. 6 from section B should be made compulsory and should cover the entire course syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
3. Two questions of 15 marks each from remaining questions from each section A and B should be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No.: CSE444

Teaching Scheme:

Theory: 04 Hrs/ week

Credits:04

Course Title: Elective-II Real Time Systems

Class Test (Marks): 20

Theory Examination (Duration): 03 Hrs

Theory Examination (Marks): 80

Course Objectives	: <ul style="list-style-type: none"> • Give general introduction to real time computer control systems. • To introduce the students the fundamental problems, concepts, and approaches in the design and analysis of real-time systems. • Real-time scheduling and schedulability analysis. • Study of computer controlled strategies and their implementations. • Introduction of real time operating system.
Unit-I	: Introduction Definition, Typical Real Time Applications: Digital Control, High Level Controls, Signal Processing etc., Release Times, Deadlines, and Timing Constraints, Hard Real Time Systems and Soft Real Time Systems, Reference Models for Real Time Systems: Processors and Resources, Temporal Parameters of Real Time Workload, Periodic Task Model, Precedence Constraints and Data Dependency. (10 Hrs)
Unit-II	: Real Time Scheduling Common Approaches to Real Time Scheduling: Clock Driven Approach, Weighted Round Robin Approach, Priority Driven Approach, Dynamic Versus Static Systems, Optimality of Effective-Deadline -First (EDF) and Least-Slack-Time-First (LST) Algorithms, Offline Versus Online Scheduling, Scheduling Aperiodic and Sporadic jobs in Priority Driven and Clock Driven Systems. (10 Hrs)
Unit-III	: Resources Access Control Effect of Resource Contention and Resource Access Control (RAC), Non-preemptive Critical Sections, Basic Priority-Inheritance and Priority-Ceiling Protocols, Stack Based Priority-Ceiling Protocol, Use of Priority-Ceiling Protocol in Dynamic Priority Systems, Preemption Ceiling Protocol, Access Control in Multiple-Unit Resources, Controlling Concurrent Accesses to Data Objects. (10 Hrs)
Unit-IV	: Multiprocessor System Environment Multiprocessor and Distributed System Model, Multiprocessor Priority-Ceiling Protocol, Schedulability of Fixed-Priority End-to-End Periodic Tasks, Scheduling Algorithms for End-to-End Periodic Tasks, End-to-End Tasks in Heterogeneous Systems, Predictability and Validation of Dynamic Multiprocessor Systems, Scheduling of Tasks with Temporal Distance Constraints. (10 Hrs)
Unit-V	: Real Time Communication Model of Real Time Communication, Priority-Based Service and Weighted Round-Robin Service Disciplines for Switched Networks, Medium Access Control Protocols for Broadcast Networks, Internet and Resource Reservation Protocols, Real Time Protocols, Communication in Multicomputer System. (10 Hrs)

Unit-VI	: An Overview of Real Time Operating Systems. Difference between operating system of general purpose systems(GPOS) and real time operating systems. Monolythic OS and Modular OS, Kernel, microkernel and nanokernel. (10 Hrs)
Text Books	: <ul style="list-style-type: none"> • Jane W. S. Liu, ‘Real Time Systems’, Pearson Education Publication. • Prof. Albert M. K. Cheng, “Real-Time Systems: Scheduling, Analysis, and Verification”, John Wiley and Sons Publications.
References e- books, e- Journals	: <ul style="list-style-type: none"> • A. Laplante, Seppo J. Ovaska, “Real-Time Systems Design and Analysis”, 4th Edition By Phillip • Seyed Morteza Babamir, “Real-Time Systems, Architecture, Scheduling, and Application”. • A. Laplante, “Real-Time Systems Design and Analysis”, 3rd Edition. By Phillip. • Editor-in-Chief: T.F. Abdelzaher; G.C. Buttazzo; K. Ramamritham, “Real-Time Systems”.

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper:

The six units in the course syllabus shall be divided in two equal parts of 3 units each. Question paper shall be set having two sections; Section A and Section B. The questions of Section A shall be set on first part and questions of Section B on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Set ten questions in all with five questions in each section.
2. Question no. 1 from section A and Question no. 6 from section B should be made compulsory and should cover the entire course syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
3. Two questions of 15 marks each from remaining questions from each section A and B should be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No: CSE421

Teaching Scheme:

Practicals : 02 Hrs/week

Credits: 01

Course Title: Laboratory- I Mobile

Application Development

Term Work (Marks): 50

Course Objectives	:	<ul style="list-style-type: none"> • Student will learn basic building blocks of Android. • Student will able to build their own apps.
List of Practical's (Not Less than 10)	:	Experiments: <ol style="list-style-type: none"> 1. Understand the app idea and design user interface/wireframes of mobile app 2. Set up the mobile app development environment 3. Develop and debug mobile app components – User interface, services, notifications, broadcast receivers, data components 4. Using emulator to deploy and run mobile apps 5. Testing mobile app - unit testing, black box testing and test automation 6. Testing of Telephony and SMS Application program interface. 7. To Study mobile databases such as SQLite 8. Develop media player application. 9. Build web apps in web view. 10. Develop simple Application on Activity LifeCycle.

Term Work assesment shall be done on the basis of

Performing the experiments in the laboratory and
Continuous assessment

Practical Examination, if applicable, shall be conducted on the syllabus and term work mentioned above.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No: CSE422
Teaching Scheme:
Practicals: 02 Hrs/week
Credits: 01

Course Title: Laboratory- II Cloud Computing

Term Work (Marks): 50

Course Objectives	:	<ul style="list-style-type: none"> • To understand the various commercial and open source clouds. • To learn the installation of Red Hat Openstack and storage server.
List of Practical's (Not Less than 10)	:	Experiments: <ol style="list-style-type: none"> 1. To study IaaS using open Source & Commercial Clouds <ol style="list-style-type: none"> a. Eucalyptus b. Amazon EC2 2. To study PaaS using a Commercial Cloud (Microsoft Azure) 3. Collaboration on calendars, schedules and task management 4. Collaboration on word processing , spreadsheets and presentation. 5. Installation of Red Hat Openstack. 6. Configuration of Object Storage . 7. Installation of Red Hat Storage server 8. Configuring Different Volume types 9. Client Configuration 10. Extending Volumes

Term Work assesment shall be done on the basis of

Performing the experiments in the laboratory and
Continuous assessment

Practical Examination, if applicable, shall be conducted on the syllabus and term work mentioned above.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No: CSE423

Course Title: Laboratory-III Network Security

Teaching Scheme:

Term Work (Marks): 50

Practicals: 02 Hrs/week

Credits: 01

Practical Examination (Marks): 50

Course Objectives	:	At the end of the course, the students will be able to: <ul style="list-style-type: none"> • Understand Network Devices functions and configurations hub, switch, tap and routers) • Understand Network Security Devices (IDS, Firewall..etc) • Understand and analyze network services. • Understand and analyze application performance • Understand and analyze network traffic and protocols • Understand network-troubleshooting concepts.
List of Practical's (Not Less than 10)	:	Experiments: <ol style="list-style-type: none"> 1. Write a C program that contains a string(char pointer) with a value 'Hello world'. The program should XOR each character in this string with 0 and displays the result. 2. Write a C program that contains a string(char pointer) with a value 'Hello world'. The program should AND or and XOR each character in this string with 127 and display the result. 3. Program to perform encryption and decryption using Ceaser cipher 4. Program to perform encryption and decryption using substitution cipher 5. A Case study on cyber crime and cyber laws 6. A Case study on firewalls 7. To study networking tools 8. To study DES algorithm 9. To study AES algorithm 10. A Case Study of Network Security

Term Work assesment shall be done on the basis of

Performing the experiments in the laboratory and
Continuous assessment

Practical Examination, if applicable, shall be conducted on the syllabus and term work mentioned above.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No: CSE424

**Course Title: Laboratory- IV : Software
Testing and Quality Assurance**

Teaching Scheme:

Practicals: 02 Hrs/week

Credits: 01

Term Work (Marks): 50

Practical Examination (Marks): 50

Course Objectives	:	At the end of the course, the students will be able to: <ul style="list-style-type: none">• Create test cases for testing of different applications• Test the application by using Winrunner.
List of Practical's (Not Less than 10)	:	Experiments: <ol style="list-style-type: none">1. To study any Software Testing Tool.2. To study winrunner3. To Write minimum 20 Test Cases for calculator4. Create application to spy the object5. To Create Equivalence partitioning on assignment problem.6. Create application to study recording (context sensitive, analog)7. To create Database Checkpoint.8. To create Bitmap Checkpoint9. To study Programming in TSL10 . To create Data Driven Test

Term Work assessment shall be done on the basis of

Performing the experiments in the laboratory and
Continuous assessment

Practical Examination, if applicable, shall be conducted on the syllabus and term work mentioned above.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering and Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VII

Code No: CSE425
Teaching Scheme:
Practical: 06 Hrs/week
Credits: 03

Title: Project-II
Term Work (Marks): 100
Practical Examination (Marks): 100

Course Objectives	:	<ul style="list-style-type: none"> • The practical implementation of theoretical knowledge gained during the study to till date is important for engineering education. The student should be able implement their ideas/real time industrial problem/ current application of their engineering branch which they have studied in curriculum. • To motivate students for creativity. • To create awareness regarding latest technology • To have common platform for interaction about emerging technology. • To inculcate qualities of team work. • To explore related information using books, research papers, journals & websites. • To improve presentation and communication skills.
		<p>Guidelines For Students And Faculty:</p> <ol style="list-style-type: none"> 1. Students shall complete the Project-II in continuation of the work planned in third year under the course Project-I 2. Each student/group is required to- <ol style="list-style-type: none"> a. Submit a report with latest status of the project work. b. Give a 10 minutes presentation through OHP, PC, and Slide projector followed by a 10 minute discussion in the second week of their academic semester. c. Submit a report on the project topic with a list of required hardware, software or other equipment for executing the project in the third week of their academic semester. d. Start working on the project and submit initial development and CPM/PERT planning drawing in the fourth week of their academic semester. e. Preparation of PCB layout, wiring diagram, purchase of components, software demo, flowchart, algorithm, program/code, assembling, testing, etc. should be submitted by student/s within next five/Six weeks and minimum one page report should be there for each major activity. f. Overall assembling, wiring, code writing, testing, commissioning along with performance analysis, should be completed within next two weeks. g. In the last week, student/group will submit final project report to the guide. 3. Every assigned faculty/s should maintain record of progress of each student or group. The format and other guidelines for the purpose of the Project Submission in hard bound copies should be as follows, <p>REPORT STRUCTURE</p> <p style="padding-left: 40px;">Index/Contents/Intent List of Figures List of Tables List of Symbols / Abbreviations 1. Introduction 2. Literature survey</p>

		3. System development 4. Performance analysis 5. Conclusions References Appendices Acknowledgement
		<p>1. INTRODUCTION</p> <p>1.1 Introduction 1.2 Necessity 1.3 Objectives 1.4 Theme 1.5 Organization</p> <p>2. LITERATURE SURVEY</p> <p>Literature Survey Related information available in standard Books, Journals, Transactions, Internet Websites <i>etc.</i> till date (More emphasis on last three to five years)</p> <p>3. SYSTEM DEVELOPMENT</p> <p>Model Development</p> <ul style="list-style-type: none"> • Mechanical / Fabricated • Analytical • Computational • Experimental • Mathematical • Software <p>(out of above methods at least one method is to be used for the model development) Some mathematical treatment or related information is required to be embodied</p> <p>4. PERFORMANCE ANALYSIS</p> <ul style="list-style-type: none"> • Analysis of system developed either by at least two methods depending upon depth of standard • These methods normally used are Analytical /Computational/Statistical/Experimental/ or Mathematical • Results at various stages may be compared with various inputs • Output at various stages with same waveforms or signals or related information/parameters • Comparison of above results by at least two methods and justification for the differences or error in with theory or earlier published results <p>5. CONCLUSIONS</p> <p>5.1 Conclusions 5.2 Future Scope 5.3 Applications Contributions (if any,) The innovative work/invention/new ideas generated from the analysis of the work which can be taken from the conclusions</p> <p>REFERENCES</p> <ul style="list-style-type: none"> • Author, “Title”, Name of Journal/Transactions/ Book, Edition/Volume, Publisher, Year of Publication, page to page (pp.____).

		<p>These references must be reflected in text at appropriate places in square bracket In case of web pages complete web page address with assessing date has to be enlisted List of references should be as per use in the text of the report</p> <p>APPENDICES Related data or specifications or referred charts, details computer code/program, <i>etc.</i></p> <p>ACKNOWLEDGEMENTS Expression of gratitude and thankfulness for helping in completion of the said task with name& signed by the candidate</p>
		<ul style="list-style-type: none"> • General Guidelines Text should be printed on front and correct side of the watermark on quality bond paper Paper size- A4, 75 to 85 gsm paper Left Margin-1.5” Right Margin-3/4” Top Margin-1” Bottom Margin-1” • Pagination First page of every chapter need not be printed but counted,second page onwards page number to printed at bottom center place. All Greek words must be italic Report Heading -ALL CAPITAL—16 Font Chapter heading -ALL CAPITAL—14 Font Subchapter –Title Case-12 Font Sub-Subchapter –First Alphabet Capital case-12 Font Page numbers for Index/Contents/Intent should be in roman All text should be in times new roman Cover page should have complete symbol of institute Suitable flap (bookmark) with name of the candidate, Department and Institute name and symbol can be used with nylon strip.
		<p><i>For more information and sample of hard copy please contact the respective Head of the Department.</i></p>

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of Final Year B. Tech. (Computer Science and Engineering) Semester VIII

Code No: CSE471

Title: Inplant Training (IPT)

Examination Scheme:

Term work (Marks): 300

Credits: 27

Practical Examination (Marks): 300

(a)	<p>Rationale:</p> <p>The techniques and processes of production of goods and services do not demand only technical skills, but also a cluster or conglomerate of skills. A significant part of which is related to the total humanistic growth of the man. Such conglomerate skills technical and humanistic cannot obviously be acquired through pure academic learning of concepts in formalized and institutional courses and in isolation of the actual work situation. It, therefore, naturally follows that no technical education will be complete till it has two components, one learning of concepts vis-a vis acquiring conceptual skill and other application of the concepts in real work situation vis-a vis acquiring manipulative or practicing skills. Technical education needs to have a complement of learning of the techniques of applying the concepts within the industry and business.</p>
(b)	<p>Objectives:</p> <ol style="list-style-type: none"> 1) The students of B.Tech course shall get an opportunity to work on live problems of the industry. 2) He/She shall apply learning concepts in the real work situation. 3) He/She shall get an exposure to the industrial environment and thereby enable himself/herself to appreciate the other related aspects of industry viz. human, economic, commercial and regulatory. 4) He/She shall identify career paths taking into account their individual strengths and aptitude. 5) He/She shall contribute for the achievement of economic goals and aspirations of the industry and our country as a whole.
(c)	<p>The curriculum for B.Tech students of Final Year Course of Part-II shall consist of;</p> <ol style="list-style-type: none"> 1) Inplant training for a period of one full term, and the period of the term shall be as prescribed by the university from time to time. 2) A project on live problems of the industry shall be undertaken by the student/group of students undergoing training in the same establishment. 3) The term work shall consist of the inplant training record-daily diary, work diary, progress report, a record containing the literature survey in the field of appropriate branch of Engineering, a preliminary report related to project work etc. 4) Seminars will be arranged after successful completion of period specified in the scheme of semester VIII of B.Tech. The date and times will be decided according to the convenience of guide and student.
(d)	<p>General Provisions, Rules and Regulation of Inplant Training</p> <ol style="list-style-type: none"> 1. Definition <ul style="list-style-type: none"> • In-plant training (IPT) means a course of training in any industry or establishment undergone in pursuance of memorandum of understanding between industry and institute and under the prescribed terms and conditions of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

	<ul style="list-style-type: none"> • Institute means an academic Institution of higher learning associated and admitted under the privileges of university, i.e. Maharashtra Institute of Technology, Aurangabad affiliated to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. • Industry means any industry or business in which any trade, occupation or subject field in engineering or technology may be specified as a designated trade. • Establishment includes research organizations (like IITs, NITs, National Laboratories or research organization as recognized by Central Govt. / State Govt. / University) • University means any of the universities mentioned in the schedule of Maharashtra University Act, 1994 i.e. Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. • Collaboration means collaborative academic activity of the Institute with industry. • Student means a B Tech Course student.
	<p>2. Memorandum of understanding: Maharashtra Institute of Technology, Aurangabad will enter into an agreement with the industry through ‘Memorandum of Understanding’ for creating facilities of inplant training in the appropriate branch of Engineering according to the Course Curriculum and keep this agreement for a period of 10 years to foster a healthy industry- institute interaction for mutual benefits of both.</p>
	<p>3. Admission to inplant training: No student will be deputed for inplant training unless he/she produces testimonial of having kept one term for the subject under B.Tech. of final year course satisfactorily in Maharashtra Institute of Technology, Aurangabad.</p>
	<p>4. Period of inplant training: The period of Inplant training will be the period of one term for the subject under B.Tech. course semester-VIII, which will be notified by Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.</p>
	<p>5. Contract of Inplant Training :</p> <ul style="list-style-type: none"> • The student of Maharashtra Institute of Technology shall enter into a contract of inplant training with the employing industry. • The inplant training shall be deemed to have commenced on the date, on which the contract of inplant training has been entered into. • Every contract of inplant training will contain the Terms and Conditions to be agreed by both the parties. • Every contract of inplant training shall be registered with the Maharashtra Institute of Technology within 15 days from entering into the contract.
	<p>6. Violation of contract: Where an employer, with whom a contract for inplant training has been entered into, is for any reason, unable to fulfill his obligation under the contract, the contract end with the consent of Maharashtra Institute of Technology. It is agreed between the employer, the student and any other employer that the student shall be engaged as an “inplant trainee” under the other employer till the expiry period of the inplant training. The agreement on registration with Maharashtra Institute of Technology shall be deemed to be the contract of inplant training between the student and other employer, and from the date of such registration, the contract of inplant training with the first employer shall terminate and no obligation under that contract shall be enforceable at the instance of any party to contract against the other party thereto.</p>

	<p>7. Termination of Contract: The contract of inplant training shall terminate on the expiry of the period of inplant training. Either party to the contract of inplant training make an application to Maharashtra Institute of Technology, Aurangabad for the termination of the contract. After considering the content of the application, and objection, Maharashtra Institute of Technology by order in writing, will terminate the contract, if it is satisfied that the parties to the contract have/has failed to carry out the Terms and Conditions of the contract. Provided that where a contract is terminated-</p> <ul style="list-style-type: none"> • For the failure on the part of the Employer, Maharashtra Institute of Technology will depute students to another Employer for providing facilities of inplant training to the remaining period of training. • For the failure on the part of the student, the student will not be allowed to continue his/her inplant training in that term. The student shall be deputed for inplant training in the next coming term.
	<p>8. Expectation from the Employer / Industry / Establishment: The following expectations are derived for effective inplant training.</p> <ul style="list-style-type: none"> • To provide legitimate facilities for the training and learning of all the processes. • To guide the student for understanding a project of immense importance to industry and to help him/her for his/her career advancement.
	<p>9. Obligation of Students:</p> <ul style="list-style-type: none"> • Student must maintain a minimum attendance of 90% of total working days for the period of Inplant Training. • To learn his/her subject field in Engineering or Technology consciously and diligently at his place of training. • To carry out all orders of his/her Employer and the Superior in the establishment. • To abide by the Rules and Regulations of the Industry/Establishment in all matters of conduct and discipline. • To carry out the obligation under the contract of inplant training. • The student shall maintain a report of his work during the period of his inplant training in a proforma (form no: 2) made available in Annexure. • Except in case of extreme urgency, the B.Tech. student shall submit an application for all other leaves except the medical leave to the Manager/Gen. Manager (Personnel) of the concerned industry, where he is undergoing an inplant training and obtain sanction before the leave is taken. In case of Medical Leave, he shall submit an application to Maharashtra Institute of Technology, Aurangabad. The shortage in attendance will be subjected to extending the period of inplant training in which case, the student may not be allowed to appear for the test, project seminar and assessment of term work etc. which will be held immediately after successful completion of the inplant training.
	<p>10. Maintenance of Record: Every student of B.Tech. course shall maintain a daily record of the work done by him/her relating to the inplant training in the proforma (Annexure).</p>
	<p>11. Industry Sponsored Student Projects: The scheme envisages working out suitable programme for B.Tech. students. They are required to complete their inplant training in a given period. During this period, they shall be familiar with the understanding of the shop process and activities. The students can be asked to solve the mini-shop problem, which will make them think and try out short experiments as an improvement in the process, tools and equipment.</p>

	<p>The students in a group alone can undertake a project of immense importance for the benefit of the industry and also useful for the students for their advancement of career. Industry staff and Maharashtra Institute of Technology faculty can plan in advance to effectively complete the practical training with the project for preliminary studies on the floor.</p> <p>The projects should aim mainly-</p> <ul style="list-style-type: none"> • Cost reduction • Enhancing productivity • Development/Improvement/ Effective use of Softwares/ Systems • Energy conservation measures • Process Improvement technique • Application Development • Plastic and Polymer working • Hardware/ Software • Agroengineering and so on.
12.	<p>What will form a good project?</p> <p>Through the project, it is hoped to provide the students an exciting experience in solving line problems under practical constraints. Hence it is desired that the project should be a well-defined problem, which can be completed and implemented within the project period. It may be a problem, evolving analysis, design, fabrication and / or testing.</p>
13.	<p>Time Schedule for the Project:</p> <p>The following time schedule should be planned by each student or groups of students, who undertake the project.</p> <ul style="list-style-type: none"> • Proposal to be received before specified date. • Project acceptance before. • Commencement of the project. • Completion of the project.
14.	<p>Commitment on the part of the Institute:</p> <ul style="list-style-type: none"> • Providing a faculty member to supervise the project. • Providing the Institute facilities to complete the project. • Coordinator from industry will be invited to participate in the stage wise assessment of the students performance.
15.	<p>Assistance for completion of the Project:</p> <p>All the projects undertaken by the students are time bound. Although, every attempt results may not be achieved within the period available for the student. In such cases, the services of the associated faculty members can be sought for the completion of the same on mutually agreed terms.</p>

	<p>16. Monitoring of Inplant Training:</p> <p>The B.Tech. students are expected to follow all the rules and discipline of the industry. However, because of other academic requirements and the nature of the project, the student may have to work in other places outside the industry. The faculty and Industry supervisor will work out a suitable arrangement to review the progress of the work from time to time. Maharashtra Institute of Technology, Aurangabad will monitor the progress of inplant training in association with industry authority.</p>
	<p>17. Conduct and Discipline:</p> <p>In all matters of the conduct and discipline, B.Tech. student shall be governed by the rules and regulations (applicable to employees of the corresponding category) in the Establishment, where he/she is undergoing a training.</p>
	<p>18. B.Tech. Students are Trainees and not Workers:</p> <ul style="list-style-type: none"> • Every B.Tech. student undergoing an inplant training in the respective branch of Engineering & Technology in any Establishment shall be treated as a trainee and not a worker and- • The provision of any law with respect to labour will not apply to such a trainee.
	<p>19. Settlement of Disputes:</p> <p>Any disagreement or dispute between an industry and a B.Tech. student trainee arising out of the contract of inplant training shall be resolved both by Maharashtra Institute of Technology and the industry with mutual cooperation. The decision of both Maharashtra Institute of Technology and the industry shall be final.</p>
	<p>20. Holding of Test and Grant of Certificate:</p> <p>The progress in inplant training of every student shall be assessed by the industry and Maharashtra Institute of Technology faculty from time to time.</p> <p>Every B.Tech. student undergoing an inplant training shall be issued a certificate of Proficiency on completion of his/her training to the satisfaction of the industry.</p>
	<p>21. Offer of Stipend / Other Welfare Activities and Employment:</p> <p>It shall not be obligatory on the part of the Employer / Industry to offer any stipend and other welfare amenities available, if any, to the students of B.Tech. courses undergoing an inplant training. However, if the industry desirous to do so will be a privilege for the students and also for Maharashtra Institute of Technology in view of the bonding of better understanding and cooperation forever.</p>

(e)	<p>PRACTICAL EXAMINATION</p> <p>The Practical examination will be conducted after successful completion of the inplant training for which guide will be internal examiner and external examiner will be appointed by the university. The date of practical examination will be same for the students of a branch and will be notified by the university. The assessment of the practical examination shall consist of</p> <ol style="list-style-type: none"> 1. Seminar Performance 2. An oral on the project work done. 3. Assessment of the term work / report.
-------	---