Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

5th Semester

Sl No	Types of Course	Code	Course Title	Title Hours per week			Credit
				L	T	P	
1	Professional Core Courses	PCC-CSBS 501	Computer Networks	3	1	0	4
2	Engineering Science Course	ESC(CSBS) 501	Software Engineering	3	1	0	3
3	Professional Core Courses	PCC-CSBS 502	Database Management Systems	3	1	0	3
4	Humanities &Social Sciences including Management courses	HSMC (CSBS)-501	Business Strategy	3	0	0	3
5	Engineering Science Course	ESC(CSBS) 502	Machine Learning	2	0	0	2
6	Professional Elective – I	PEC-CSBS- 501 A/B/C	Computer Graphics / Artificial Intelligence /E-Commerce and ERP	3	1	0	3
7	Mandatory Courses	MC- CSBS 501	Constitution of India/ Essence of Indian Knowledge Tradition	1	0	0	0
				16	3	0	18
Practical							
	Professional Core Courses	PCC-CSBS 591	Computer Networks	0	0	3	2
	Professional Core Courses	PCC-CSBS 592	Database Management Systems	0	0	3	2
	Engineering Science Course	ESC 591	Software Engineering	0	0	3	2
				0	0	2	6

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

Computer Networks
Code: PCC-CSBS 501
Contact: 4 hrs

Name of the Course:	**Computer Networks**	
Course Code: PCC-CSBS501	Semester: V	
Duration:6 months	Maximum Marks:100	
Teaching Scheme	**Examination Scheme**	
Theory:3 hrs./week	Mid Semester exam: 15	
Tutorial: 1 hr./week	Assignment and Quiz: 10 marks	
	Attendance: 5 marks	
Practical: hrs./week	End Semester Exam:70 Marks	
Credit Points:	4	
Objective:		
1	To develop an understanding of modern network architectures from a design and performance perspective.	
2	To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).	
3	To provide an opportunity to do network programming	
4	To provide a WLAN measurement ideas.	

Unit	Content	Hrs/Unit	Marks/Unit
1	Data communication Components: Representation of data and its flow Networks,Various Connection Topology, Protocols and Standards, OSI model, Transmission Media, LAN: Wired LAN, Wireless LANs, Connecting LAN and Virtual LAN, Techniques for Bandwidth utilization: Multiplexing - Frequency division, Time division and Wave division, Concepts on spread spectrum.	7	
2	Data Link Layer and Medium Access Sub Layer: Error Detection and Error Correction - Fundamentals, Block coding, Hamming Distance, CRC; Flow Control and Error control protocols - Stop and Wait, Go back – N ARQ, Selective Repeat ARQ, Sliding Window, Piggybacking,	7	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

	Random Access, Multiple access protocols -Pure ALOHA, Slotted ALOHA,CSMA/CD,CDMA/CA		
3	Network Layer: Switching, Logical addressing – IPV4, IPV6; Address mapping – ARP, RARP, BOOTP and DHCP–Delivery, Forwarding and Unicast Routing protocols.	12	
4.	Transport Layer: Process to Process Communication, User Datagram Protocol (UDP), Transmission Control Protocol (TCP), SCTP Congestion Control; Quality of Service, QoS improving techniques: Leaky Bucket and Token Bucket algorithm.	7	
5	Application Layer: Domain Name Space (DNS), DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls, Basic concepts of Cryptography.	7	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

Software Engineering
ESC(CSBS) 501
Contact : Contact: 4 hrs

Name of the Course:	**Software Engineering**	
Course Code: **ESC(CSBS) 501**	Semester: V	
Duration:6 months	Maximum Marks:100	
Teaching Scheme	**Examination Scheme**	
Theory:3 hrs./week	Mid Semester exam: 15	
Tutorial: 1 hr./week	Assignment and Quiz: 10 marks	
	Attendance: 5 marks	
Practical: hrs./week	End Semester Exam:70 Marks	

Unit	Content	Hrs/Unit	Marks/Unit
1	**Introduction:** Programming in the small vs. programming in the large; software project failures and importance of software quality and timely availability; of software engineering towards successful execution of large software projects; emergence of software engineering as a discipline, Software Engineering Historical Development from Jackson Structured Programming to Agile Development.	4	
2	**Software Project Management:** Basic concepts of life cycle models – different models and milestones; software project planning –identification of activities and resources; concepts of feasibility study; techniques for estimation of schedule and effort; software cost estimation models and concepts of software engineering economics; techniques of software project control and reporting; introduction to measurement of software size; introduction to the concepts of risk and its mitigation; configuration management.	6	
3	**Software Quality Management and Reliability:** Software quality; Garvin's quality dimensions, McCall's quality factor, ISO 9126 quality factor; Software Quality Dilemma; Introduction to Capability Maturity Models (CMM and CMMI); Introduction to software reliability, reliability models and estimation.	4	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

4	**Software Requirements Analysis, Design and Construction:** Introduction to Software Requirements Specifications (SRS) and requirement elicitation techniques; techniques for requirement modelling – decision tables, event tables, state transition tables, Petri nets; requirements documentation through use cases; introduction to UML, introduction to software metrics and metrics-based control methods; measures of code and design quality.	6	
5	**Object Oriented Analysis, Design and Construction:** Concepts -- the principles of abstraction, modularity, specification, encapsulation and information hiding; concepts of abstract data type; Class Responsibility Collaborator (CRC) model; quality of design; design measurements; concepts of design patterns; Refactoring; object-oriented construction principles; object oriented metrics.	6	
6	**Software Testing:** Introduction to faults and failures; basic testing concepts; concepts of verification and validation; black box and white box tests; white box test coverage – code coverage, condition coverage, branch coverage; basic concepts of black-box tests – equivalence classes, boundary value tests, usage of state tables; testing use cases; transaction based testing; testing for non-functional requirements – volume, performance and efficiency; concepts of inspection; Unit Testing, Integration Testing, System Testing and Acceptance Testing.	6	
7	**Agile Software Engineering:** Concepts of Agile Methods, Extreme Programming; Agile Process Model - Scrum, Feature; Scenarios and Stories	4	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

Database Management Systems
Code: PCC-CSBS 502

Contact: 4L

Name of the Course:	**Database Management Systems**	
Course Code: PCC-CSBS 502	Semester: V	
Duration:6 months	Maximum Marks:100	
Teaching Scheme		**Examination Scheme**
Theory:3 hrs./week		Mid Semester exam: 15
Tutorial: 1 hr./week		Assignment and Quiz: 10 marks
		Attendance: 5 marks
Practical: hrs./week		End Semester Exam:70 Marks
Credit Points:	3	
Objective:		
1	To understand the different issues involved in the design and implementation of a database system.	
2	To study the physical and logical database designs, database modeling, relational, hierarchical, and network models	
3	To understand and use data manipulation language to query, update, and manage a database	
4	To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency, distributed database, and intelligent database, Client/Server (Database Server), Data Warehousing.	
5	To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.	
6	To understand the different issues involved in the design and implementation of a database system.	

Unit	Content	Hrs/Unit	Marks/Unit
1	**Database system architecture:** Data Abstraction, Data Independence,Data Definition Language(DDL),Data Manipulation Language(DML). **Data models:** Entity-relationship model, network model, relational and object oriented data models, integrity constraints, data manipulation operations.	9	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

2	**Relational query languages:** Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQLserver. **Relational database design:** Domain and data dependency, Armstrong's axioms, Normal forms, Dependency preservation, Losslessdesign. **Query processing and optimization:** Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.	13	
3	**Storage strategies**: Indices, B-trees, hashing.	3	
4.	**Transaction processing:** Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp based schedulers, Multi-version and optimistic Concurrency Control schemes, Database recovery.	5	
5	**Database Security:** Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection.	3	
6	**Advanced topics:** Object oriented and object relational databases, Logical databases, Web databases, Distributed databases, Data warehousing and data mining.	3	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

Business Strategy
Code: HSMC-501
Contact: 3L

Name of the Course:	Business Strategy	
Course Code: HSMC-501	Semester: V	
Duration:6 months	Maximum Marks:100	
Teaching Scheme		**Examination Scheme**
Theory:3 hrs./week		Mid Semester exam: 15
Tutorial: NIL		Assignment and Quiz: 10 marks
		Attendance: 5 marks
Practical: hrs./week		End Semester Exam:70 Marks
Credit Points:	3	
Objective:		
1	To introduce the concepts of strategic management and understand its nature in competitive and institutional landscape.	
2	To develop a holistic approach to see business issues comprehensively and using other core andfunctional subject knowledge for decision-making.	
3	To identify and interpret the critical challenges and opportunities before an organization.	
4	To introduce the concepts of strategic management and understand its nature in competitive and institutional landscape.	
Course Out Come:		
1. Learn the fundamental concepts of strategic management to analyze business situations and apply these concepts to solve business problems.		
2. Understand the fundamental principles of and interrelationships among business functions such as:R&D, production, marketing, finance, HR and information technology		
3. Understand the inter-relationships of business to individuals, other organizations, government andsociety.		
4. Describe the tools of strategic analysis thoroughly, how they are used, and where they fit in the managerial process to frame and implement strategies.		

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

Unit	Content	Hrs/Unit	Marks/Unit
1	Introduction: Importance of Strategic Management, Vision and Objectives, Schools of thought in Strategic Management, Strategy Content, Process, and Practice, Fit Concept and Configuration Perspective in StrategicManagement	6	
2	Internal Environment of Firm: Core Competence as the Root of Competitive Advantage, Sources of Sustained Competitive Advantage, Business Processes and Capabilities-based Approach to Strategy	6	
3	External Environment of Firm: Five Forces of Industry Attractiveness that Shape Strategy, The concept of Strategic Groups, and Industry Life Cycle	6	
4	Generic Strategies :Generic Strategies, Generic Strategies and the Value Chain	4	
5	**Corporate Strategy, and Growth Strategies** :The Motive for Diversification, Related and Unrelated Diversification, Business Portfolio Analysis	6	
6.	**Contesting with competitors in overseas markets** :Expansion, Integration and Diversification, Strategic Alliances, Joint Ventures, and Mergers & Acquisitions	6	
7.	**Strategy Implementation: Structure and Systems** :The 7S Framework, Strategic Control and Corporate Governance	4	

PG

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

Machine Learning
Code: ESC(CSBS) 502
Contact: 2L

Name of the Course:	**Machine Learning**	
Course Code: **ESC(CSBS) 502**	Semester: V	
Duration:6 months	Maximum Marks:100	
Teaching Scheme	Examination Scheme	
Theory:2 hrs./week	Mid Semester exam: 15	
Tutorial: NIL	Assignment and Quiz: 10 marks	
	Attendance: 5 marks	
Practical: hrs./week	End Semester Exam:70 Marks	
Credit Points:	2	
Objective:		
1	Ability to comprehend the concept of supervised and unsupervised learning techniques	
2	Differentiate regression, classification and clustering techniques and to implement their algorithms.	
3	To analyze the performance of various machine learning techniques and to select appropriate featuresfor training machine learning algorithms.	
Course Out Come:		
1. Understand the concepts of various machine learning strategies. 2. Handle computational data and learn ANN learning models. 3. Solve real world applications by selecting suitable learning model. 4. Boost the performance of the model by combining results from different approaches. 5. Recognize and classify sequencing patterns using HMM. 6. Infer the association and relationship between the data objects. Construct machine learning model for unseen data and can solve real world application.		

Unit	Content	Hrs/Unit	Marks/Unit
1	**Introduction to Machine Learning:** Introduction to Machine Learning (ML); Feature engineering; Learning Paradigm, Generalization of hypothesis, VC Dimension, PAC learning, Applications of ML.	3	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

2	**Data Handling and ANN:** Feature selection Mechanisms, Imbalanced data, Outlier detection- Artificial neural networks including backpropagation- Applications	3	
3	**ML Models and Evaluation:** Regression: Multi-variable regression; Model evaluation; Least squares regression; Regularization; LASSO; Applications of regression, Classification – KNN, Naïve Bayes, SVM, Decision Tree; Training and testing classifier models; Cross-validation; Model evaluation (precision, recall, F1-mesure, accuracy, area under curve); Statistical decision theory including discriminant functions and decision surfaces	4	
4	**Model Assessment and Inference:** Model assessment and Selection – Ensemble Learning – Boosting, Bagging, Model Inference and Averaging, Bayesian Theory, EM Algorithm	4	
5	**Hidden Markov Models:** Hidden Markov Models (HMM) with forward-backward and Vierbi algorithms; Sequence classification using HMM; Conditional random fields; Applications of sequence classification such as part-of-speech tagging	3	
6.	**Association Rules:** Mining Association Rules in Large Databases. Mining Frequent Patterns-- basic concepts - Efficient and scalable frequent item set mining - methods, Apriori algorithm, FP-Growth algorithm	3	
7.	**Clustering:** K Means, Hierarchical Clustering – Single, complete, Average linkage; Ward's algorithm; Minimum spanning tree clustering; BIRCH clustering	4	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

Computer Graphics
Code: PEC-CSBS- 501 A
Contact: 4L

Name of the Course:	**Computer Graphics**	
Course Code: PEC-CSBS- 501 A	Semester: V	
Duration: 6 months	Maximum Marks:100	
Teaching Scheme	**Examination Scheme**	
Theory:3 hrs./week	Mid Semester exam: 15	
Tutorial: 1 hr./week	Assignment and Quiz: 10 marks	
	Attendance : 5 marks	
Practical: NIL	End Semester Exam :70 Marks	
Credit Points:	3	

Unit	Content	Hrs/Unit	Marks/Unit
1	**Introduction to computer graphics & graphics systems [6L]**: Overview of computer graphics, representing pictures, preparing, presenting & interacting with pictures for presentations; Visualization & image processing; RGB color model, direct coding, lookup table; storage tube graphics display, Raster scan display, 3D viewing devices, Plotters, printers, digitizers, Light pens etc.; Active & Passive graphics devices; Computer graphics software. **Scan conversion [8L]:** Points & lines, Line drawing algorithms; DDA algorithm, Bresenham's line algorithm, Circle generation algorithm; Ellipse generating algorithm; scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm.	14	
2	**2D transformation & viewing [15L]:** Basic transformations: translation, rotation, scaling; Matrix representations & homogeneous coordinates, transformations between coordinate systems; reflection shear; Transformation of points, lines, parallel lines, intersecting lines. Viewing pipeline, Window to view port co-ordinate transformation, clipping operations, point clipping, line clipping, clipping circles, polygons & ellipse. Cohenand Sutherland line clipping, Sutherland-Hodgeman Polygon clipping, Cyrus-beck clippingmethod 3D transformation & viewing [5L]: 3D transformations: translation, rotation, scaling & other transformations. Rotation about an arbitrary axis in space, reflection through an arbitrary plane; general parallel projection transformation; clipping, view port clipping, 3D viewing.	20	

12

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

3	**Curves [3L]:** Curve representation, surfaces, designs, Bezier curves, B-spline curves, end conditions for periodic B-spline curves, rational B-spline curves. **Hidden surfaces [3L]:** Depth comparison, Z-buffer algorithm, Back face detection, BSP tree method, the Painter's algorithm, scan-line algorithm; Hidden line elimination, wire frame methods , fractal - geometry. **Color & shading models [2L]:** Light & color model; interpolative shading model; Texture. **Introduction to Ray-tracing: [3L]** Human vision and color, Lighting, Reflection and transmission models.	6

Artificial Intelligence
Code: PEC-CSBS- 501 B
Contact: 4L

Name of the Course:	**Artificial Intelligence**	
Course Code**:** PEC-CSBS- 501 B	Semester: V	
Duration: 6 months	Maximum Marks:100	
Teaching Scheme	**Examination Scheme**	
Theory:3 hrs./week	Mid Semester exam: 15	
Tutorial: 1 hr./week	Assignment and Quiz: 10 marks	
	Attendance : 5 marks	
Practical: NIL	End Semester Exam :70 Marks	
Credit Points:	3	

Unit	Content	Hrs/Unit	Marks/Unit
1	**Introduction [2]** Overview of Artificial intelligence- Problems of AI, AI technique, Tic - Tac - Toe problem. **Intelligent Agents [2]** Agents & environment, nature of environment, structure of agents, goal based agents, utility based agents, learning agents. **Problem Solving [2]** Problems, Problem Space & search: Defining the problem as state space search, production system, problem characteristics, issues in the design of search programs.	6	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

2.	**Search techniques [5]** Solving problems by searching :problem solving agents, searching for solutions; uniform search strategies: breadth first search, depth first search, depth limited search, bidirectional search, comparing uniform search strategies. **Heuristic search strategies [5]** Greedy best-first search, A* search, memory bounded heuristic search: local search algorithms & optimization problems: Hill climbing search, simulated annealing search, local beam search, **genetic algorithms; constraint satisfaction problems, local search for constraint satisfaction problems.** **Adversarial search [3]** **Games, optimal decisions & strategies in games, the minimax search procedure, alpha-beta pruning, additional refinements, iterative deepening.**	13	
3	**Knowledge & reasoning [3]** **Knowledge representation issues, representation & mapping, approaches to knowledge representation, issues in knowledge representation.**	3	
4	**Using predicate logic [2]** **Representing simple fact in logic, representing instant & ISA relationship, computable functions & predicates, resolution, natural deduction.** **Probabilistic reasoning [4]** **Representing knowledge in an uncertain domain, the semantics of Bayesian networks, Dempster-Shafer theory, Fuzzy sets & fuzzy logics.**	6	
5	**Natural Language processing [2]** **Introduction, Syntactic processing, semantic analysis, discourse & pragmatic processing.** **Learning [2]** **Forms of learning, inductive learning, learning decision trees, explanation based learning, learning using relevance information, neural net learning & genetic learning.** **Expert Systems [2]** **Representing and using domain knowledge, expert system shells, knowledge acquisition.**	6	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

E-Commerce & ERP
Code: PEC-CSBS- 501 C

Contacts: 4L

Name of the Course:	E-Commerce & ERP	
Course Code**:** PEC-CSBS- 501 C	Semester: V	
Duration: 6 months	Maximum Marks:100	
Teaching Scheme	**Examination Scheme**	
Theory:3 hrs./week	Mid Semester exam: 15	
Tutorial: 1 hr./week	Assignment and Quiz: 10 marks	
	Attendance : 5 marks	
Practical: NIL	End Semester Exam :70 Marks	
Credit Points:	3	

Unit	Content	Hrs/Unit	Marks/Unit
1	Overview, Definitions, Advantages & Disadvantages of E – Commerce, Threats of E – Commerce, Managerial Prospective, Rules & Regulations For Controlling E – Commerce, CyberLaws. [3 L]	3	
2.	Technologies : Relationship Between E – Commerce & Networking, Different Types of Networking Commerce, Internet, Intranet & Extranet, EDI Systems Wireless Application Protocol : Definition, Hand Held Devices, Mobility & Commerce, Mobile Computing, WirelessWeb, Web Security, Infrastructure Requirement For E – Commerce . [5 L]	5	
3	Business Models of e – commerce : Model Based On Transaction Type, Model Based OnTransaction Party - B2B, B2C, C2B, C2C, E – Governance. [2 L]	2	
4	E – strategy : Overview, Strategic Methods for developing E – commerce. [2 L]	2	
5	Four C's : (Convergence, Collaborative Computing, Content Management & Call Center). Convergence : Technological Advances in Convergence – Types, Convergence and its implications, Convergence & Electronic Commerce. Collaborative Computing : Collaborative product development, contract as per	6	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

	CAD, Simultaneous Collaboration, Security. Content Management : Definition of content, Authoring Tools & Content Management, Content – partnership, repositories, convergence, providers, Web Traffic & Traffic Management ; Content Marketing. Call Center : Definition, Need, Tasks Handled, Mode of Operation, Equipment , Strength & Weaknesses of Call Center, Customer Premises Equipment (CPE). [6 L]		
	Supply Chain Management : E – logistics, Supply Chain Portal, Supply Chain Planning Tools(SCP Tools), Supply Chain Execution (SCE), SCE - Framework, Internet's effect on Supply Chain Power. [3 L]	3	
	E – Payment Mechanism : Payment through card system, E – Cheque, E – Cash, E – PaymentThreats & Protections. [1 L] E – Marketing :. Home –shopping, E-Marketing, Tele-marketing [1 L]	2	
	Electronic Data Interchange (EDI) : Meaning, Benefits, Concepts, Application, EDI Model,Protocols (UN EDI FACT / GTDI, ANSI X – 12), Data Encryption (DES / RSA). [2 L]	2	
	Risk of E – Commerce : Overview, Security for E – Commerce, Security Standards, Firewall, Cryptography, Key Management, Password Systems, Digital certificates, Digital signatures. [4 L]	4	
	Enterprise Resource Planning (ERP) : Features, capabilities and Overview of Commercial Software, re-engineering work processes for IT applications, Business Process Redesign, Knowledge engineering and data warehouse . Business Modules: Finance, Manufacturing (Production), Human Resources, Plant Maintenance, Materials Management, QualityManagement, Sales&Distribution ERPPackage, ERP Market: ERP Market Place, SAP AG, PeopleSoft, BAAN, JD Edwards, Oracle Corporation ERP-Present and Future: EnterpriseApplication Integration (EAI), ERP and E-Commerce, ERP and Internet, Future Directions in ERP [10]	10	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

Constitution of India
Code: MC-CSBS 501
Contact

Name of the Course:	**Constitution of India**	
Course Code: MC-CSBS 501	Semester: V	
Duration: 6 months	Maximum Marks:100	
Teaching Scheme	**Examination Scheme**	
Theory:	Mid Semester exam: 15	
Tutorial: NIL	Assignment and Quiz: 10 marks	
	Attendance : 5 marks	
Practical: NIL		
Credit Points:	0	

Unit	Content	Hrs/Unit	Marks/Unit
1.	**Introduction:** Constitution' meaning of the term,, Indian Constitution: Sources and constitutional history, Features: Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy	3	
2.	**Union Government and its Administration :** Structure of the Indian Union: Federalism, Centre- State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, Lok Sabha, Rajya Sabha	6	
3.	**State Government and its Administration Governor:** Role and Position, CM and Council of ministers, State Secretariat: Organisation, Structure and Functions	6	
4.	**Local Administration District's Administration head:** Role and Importance, Municipalities: Introduction, Mayor and roleof Elected Representative, CEO of Municipal Corporation, Pachayati raj: Introduction, PRI: Zila Pachayat, Elected officials and their roles, CEO Zila Pachayat: Position and role, Block level: Organizational Hierarchy **(Different 4.departments), Village level:** Role of Elected and Appointed officials, Importance of grass root democracy	8	
5.	**Election Commission Election Commission:** Role and Functioning, Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning, Institute and Bodies for the welfare of SC/ST/OBC and women	2	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

PRACTICAL
SYLLABUS

Computer Networks Lab
Course Code: PCC- CSBS 591
Contact: 3P

Name of the Course:	Computer Networks Lab
Course Code: PCC-CSBS 591	Semester: V
Duration:6 months	Maximum Marks:100
Teaching Scheme:	
Theory: hrs./week	Continuous Internal Assessment
Tutorial: NIL	External Assesement:60
Practical: 3 hrs./week	Distribution of marks:40
Credit Points:	2

Laboratory Experiments:

1) NIC Installation & Configuration (Windows/Linux)
2) Understanding IP address, subnet etc
Familiarization with
- Networking cables (CAT5, UTP)
- Connectors (RJ45, T-connector)
- Hubs, Switches

3) TCP/UDP Socket Programming
- Simple, TCP based, UDP based
- Multicast & Broadcast Sockets
- Implementation of a Prototype Multithreaded Server

Implementation of
4) Data Link Layer Flow Control Mechanism (Stop & Wait, Sliding Window) Data Link Layer Error
☐☐Detection Mechanism (Cyclic Redundancy Check) Data Link Layer Error Control Mechanism
☐☐(Selective Repeat, Go Back N)
☐☐ Server Setup/Configuration : FTP, TelNet,

5) NFS, DNS, Firewall

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

**Database Management
System Lab**

Code: PCC- CSBS 592

Name of the Course:	**Database Management System Lab**
Course Code: PCC-CSBS 592	Semester:V
Duration:6 months	Maximum Marks:100
Teaching Scheme:	
Theory: hrs./week	Continuous Internal Assessment
Tutorial: NIL	External Assesement:60
Practical: 3 hrs./week	Distribution of marks:40
Credit Points:	2

Laboratory Experiments:

Structured Query Language

1. **Creating Database**
   - Creating a Database
   - Creating a Table
   - Specifying Relational Data Types
   - Specifying Constraints
   - Creating Indexes

2. **Table and Record Handling**
   - INSERT statement
   - Using SELECT and INSERT together
   - DELETE, UPDATE, TRUNCATE statements
   - DROP, ALTER statements

3. **Retrieving Data from a Database**
   - The SELECT statement
   - Using the WHERE clause
   - Using Logical Operators in the WHERE clause
   - Using IN, BETWEEN, LIKE , ORDER BY, GROUP BY and HAVING
   Clause
   - Using Aggregate Functions
   - Combining Tables Using JOINS
   - Subqueries

4. **Database Management**
   - Creating Views
   - Creating Column Aliases
- Creating Database Users
- Using GRANT and REVOKE

PG

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus of B. Tech. in Computer Science and Business Systems
(Applicable from the Academic Session 2020-2021)

Software Engineering
Lab Code: ESC591

Contact: 3P

Name of the Course:	**Software Engineering Lab**
Course Code: **ESC591**	Semester:V
Duration:6 months	Maximum Marks:100
Teaching Scheme:	
Theory: hrs./week	Continuous Internal Assessment
Tutorial: NIL	External Assesement:60
Practical: 3 hrs./week	Distribution of marks:40
Credit Points:	2
Course Outcomes:	
1	To understand the software engineering methodologies involved in the phases for project development.
2	To gain knowledge about open source tools used for implementing software engineering methods.
3	To exercise developing product-startups implementing software engineering methods.
4	Learn simple optimization techniques
Pre-Requisite:	
Laboratory Experiments:	
- Problem Analysis and Project Planning -Thorough study of the problem – Identify Project scope, Objectives and Infrastructure. - Software Requirement Analysis – Describe the individual Phases/modules of the project and Identify deliverables. Identify functional and non-functionalrequirements. - Data Modeling – Use work products – data dictionary. - Software Designing - Develop use case diagrams and activity diagrams, build and testclass diagrams, sequence diagrams and add interface to class diagrams. - Prototype model – Develop the prototype of theproduct. The SRS and prototype model should be submitted for end semester examination.	

Any experiment specially designed by the college
(Detailed instructions for Laboratory Manual to be followed for further guidance)