

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

**SEMESTER – VII**

<b>Subject:</b> Blockchain and Crypto currency			
<b>Course Code:</b> PECICB70 1A		<b>Semester:</b> VII	
<b>Duration:</b> 36 Hrs.		<b>Maximum Marks:</b> 100	
<b>Teaching Scheme</b>		<b>Examination Scheme</b>	
<b>Theory:</b> 3		<b>End Semester Exam:</b> 70	
<b>Tutorial:</b> 0		<b>Attendance:</b> 5	
<b>Practical:</b>		<b>Continuous Assessment:</b> 25	
<b>Credit:</b> 3			
<b>Aim:</b>			
<b>Sl. No.</b>			
1.	Explain cryptographic building blocks and reason about their security		
2.	Define Bitcoin's consensus mechanism		
3.	Learn how the individual components of the Bitcoin protocol make the whole system works: transactions, script, blocks, and the peer-to-peer network		
4.	Define how mining can be re-designed in alternative cryptocurrencies		
<b>Objective:</b>			
<b>Sl. No.</b>			
1.	To learn Blockchain systems: Nuts and Bolts		
2.	Able to analyse Decentralized systems		
3.	To understand Tokenization and ICOs		
4.	To describe Cryptography of Blockchain		
<b>Pre-Requisite:</b>			
<b>Sl. No.</b>			
1.	Database System		
2.	Cryptography		
3.	Basic Financial Knowledge		
<b>Contents</b>			<b>4 Hrs./week</b>
<b>Chapter</b>	<b>Name of the Topic</b>	<b>Hours</b>	<b>Marks</b>
01	<b>INTRODUCTION</b> Need for Distributed Record Keeping, Modeling faults and adversaries, Byzantine Generals problem, Consensus algorithms and their scalability problems, Why Nakamoto Came up with Blockchain based cryptocurrency? Technologies Borrowed in Blockchain – hash pointers, consensus, byzantine fault-tolerant distributed computing, digital cash etc.	6	10
02	<b>Basic Distributed Computing</b> Atomic Broadcast, Consensus, Byzantine Models of fault tolerance	6	10
03	<b>Basic Crypto primitives</b> Hash functions, Puzzle friendly Hash, Collision resistant hash, digital signatures, public key crypto, verifiable random functions, Zero-knowledge systems	6	15

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

04	<b>Blockchain 1.0</b> Bitcoin blockchain, the challenges, and solutions, proof of work, Proof of stake, alternatives to Bitcoin consensus, Bitcoin scripting language and their use	6	10
05	<b>Blockchain 2.0</b> Ethereum and Smart Contracts, The Turing Completeness of Smart Contract Languages and verification challenges, Using smart contracts to enforce legal contracts, comparing Bitcoin scripting vs. Ethereum Smart Contracts	3	5
06	<b>Blockchain 3.0</b> Hyperledger fabric, the plug and play platform and mechanisms in permissioned blockchain	3	10
07	<b>Privacy, Security issues in Blockchain</b> Pseudo-anonymity vs. anonymity, Zcash and Zk-SNARKS for anonymity preservation, attacks on Blockchains – such as Sybil attacks, selfish mining, 51% attacks - -advent of algorand, and Sharding based consensus algorithms to prevent these	6	10
	<b>Sub Total:</b>	<b>36</b>	<b>70</b>
	<b>Internal Assessment Examination &amp; Preparation of Semester Examination</b>	<b>4</b>	<b>30</b>
	<b>Total:</b>	<b>40</b>	<b>100</b>

**List of Books**

**Text Books:**

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
Don Tapscott , Alex Tapscott	Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies Is Changing the World Paperback		

**Reference Books:**

William Mougayar	The Business Blockchain: Promise, Practice, and Application of the Next Internet Technology		Wiley
------------------	---	--	-------

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

**E-Commerce & ERP:**

**Code: PECICB70 1C**

**Contacts: 3L**

1. Overview, Definitions, Advantages & Disadvantages of E – Commerce, Threats of E – Commerce, Managerial Prospective, Rules & Regulations For Controlling E – Commerce, CyberLaws. [ 3 L ]
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, Wireless Web, Web Security, Infrastructure Requirement For E – Commerce . [ 5 L ]
3. Business Models of e – commerce : Model Based On Transaction Type, Model Based On Transaction Party - B2B, B2C, C2B, C2C, E – Governance. [2 L ]
4. E – strategy : Overview, Strategic Methods for developing E – commerce. [2 L ]
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 CAD, Simultaneous Collaboration, Security. Content Management : Definition of content, Authoring Tools & Content Management, Content – partnership, repositories, convergence, providers, Web Traffic & Traffic Management ; ContentMarketing. Call Center : Definition, Need, Tasks Handled, Mode of Operation, Equipment , Strength & Weaknesses of Call Center, Customer Premises Equipment (CPE). [ 6 L ]
6. 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 ]
7. E – Payment Mechanism : Payment through card system, E – Cheque, E – Cash, E – PaymentThreats & Protections. [ 1 L ]
8. E – Marketing :. Home –shopping, E-Marketing, Tele-marketing [ 1 L ]
9. Electronic Data Interchange (EDI) : Meaning, Benefits, Concepts, Application, EDI Model,Protocols (UN EDI FACT / GTDI, ANSI X – 12), Data Encryption (DES / RSA). [2 L ]
10. Risk of E – Commerce : Overview, Security for E – Commerce, Security Standards, Firewall, Cryptography, Key Management, Password Systems, Digital certificates, Digital signatures. [4 L ]
11. 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,

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

ERP Market: ERP Market Place, SAP AG, PeopleSoft, BAAN, JD Edwards, Oracle Corporation ERP-Present and Future: Enterprise Application Integration (EAI), ERP and E-Commerce, ERP and Internet, Future Directions in ERP [10]

**Reference :**

1. E-Commerce, M.M. Oka, EPH
2. Kalakotia, Whinston : Frontiers of Electronic Commerce , Pearson Education.
3. Bhaskar Bharat : Electronic Commerce - Technologies & Applications. TMH
4. Loshin Pete, Murphy P.A. : Electronic Commerce , Jaico Publishing Housing.
5. Murthy : E – Commerce , Himalaya Publishing.
6. E – Commerce : Strategy Technologies & Applications, Tata McGraw Hill.
7. Global E-Commerce, J. Christopher & T.H.K. Clerk, University Press
8. Beginning E-Commerce, Reynolds, SPD
9. Krishnamurthy, E-Commerce Mgmt, Vikas

Subject Code	Subject Name	L	T	P	C
PECICB702A	<b>Machine Learning</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	<b>NIL</b>				
<b>Course Objectives:</b>					
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 features for training machine learning algorithms.					
<b>Expected Course Outcome:</b>					
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. 7. Construct machine learning model for unseen data and can solve real world application.					
<b>Module:1</b>	<b>Introduction to Machine Learning</b>	<b>3 hours</b>			
Introduction to Machine Learning (ML); Feature engineering; Learning Paradigm, Generalization of hypothesis, VC Dimension, PAC learning, Applications of ML.					
<b>Module:2</b>	<b>Data Handling and ANN</b>	<b>4 hours</b>			

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

Feature selection Mechanisms, Imbalanced data, Outlier detection- Artificial neural networks including backpropagation- Applications		
<b>Module:3</b>	<b>ML Models and Evaluation</b>	<b>6 hours</b>
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-measure, accuracy, area under curve); Statistical decision theory including discriminant functions and decision surfaces		
<b>Module:4</b>	<b>Model Assessment and Inference</b>	<b>4 hours</b>
Model assessment and Selection – Ensemble Learning – Boosting, Bagging, Model Inference and Averaging, Bayesian Theory, EM Algorithm		
<b>Module:5</b>	<b>Hidden Markov Models</b>	<b>3 hours</b>
Hidden Markov Models (HMM) with forward-backward and Viterbi algorithms; Sequence classification using HMM; Conditional random fields; Applications of sequence classification such as part-of-speech tagging		
<b>Module:6</b>	<b>Association Rules</b>	<b>3 hours</b>
Mining Association Rules in Large Databases. Mining Frequent Patterns-- basic concepts - Efficient and scalable frequent item set mining -methods, Apriori algorithm, FP-Growth algorithm		
<b>Module:7</b>	<b>Clustering</b>	<b>5 hours</b>
K Means, Hierarchical Clustering – Single, complete, Average linkage; Ward’s algorithm; Minimum spanning tree clustering; BIRCH clustering		
<b>Module:8</b>	<b>Recent Trends</b>	<b>2 hours</b>
Recent Trends and case study		
<b>Total Lecture hours:</b>		<b>30 hours</b>
<b>Text Book(s)</b>		
1.	Ethem Alpaydin, Introduction to Machine Learning, MIT Press, Pearson, Third Edition, 2014.	
2.	Friedman Jerome, Trevor Hastie, and Robert Tibshirani. The Elements of Statistical Learning. Springer-Verlag, 2nd Edition, 2013.	
<b>Reference Books</b>		
1.	Kevin P. Murphy, “Machine Learning: A Probabilistic Perspective”, MIT Press, 2012.	
2.	Peter Flach, “Machine Learning: The Art and Science of Algorithms that Make Sense of Data”, Cambridge University Press, 2012.	

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
***(Formerly West Bengal University of Technology)***  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
*(Formerly West Bengal University of Technology)*  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

**Information Theory and Coding**

**Code: PECICB702B**

**Contact: 3L**

Name of the Course:		<b>Information Theory and Coding</b>	
<b>Course Code: PECICB702B</b>		Semester: VII	
Duration: 6 months		Maximum Marks: 100	
<b>Teaching Scheme</b>		<b>Examination Scheme</b>	
Theory: 3 hrs./week		Mid Semester exam: 15	
Tutorial: NIL		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	<b>Source Coding [7L]</b> Uncertainty and information, average mutual information and entropy, information measures for continuous random variables, source coding theorem, Huffman codes	7	
2	<b>Channel Capacity And Coding [7L]</b> Channel models, channel capacity, channel coding, information capacity theorem, The Shannon limit	7	
3	<b>Linear And Block Codes For Error Correction [8L]</b> Matrix description of linear block codes, equivalent codes, parity check matrix, decoding of a linear block code, perfect codes, Hamming codes	8	
4.	<b>Cyclic Codes [7L]</b> Polynomials, division algorithm for polynomials, a method for generating cyclic codes, matrix description of cyclic codes, Golay codes..	7	
5	<b>BCH Codes [8L]</b> Primitive elements, minimal polynomials, generator polynomials in terms of minimal polynomials, examples of BCH codes.	8	

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

6	<b>Convolutional Codes [8L]</b> Tree codes, trellis codes, polynomial description of convolutional codes, distance notions for convolutional codes, the generating function, matrix representation of convolutional codes, decoding of convolutional codes, distance and performance bounds for convolutional codes, examples of convolutional codes, Turbo codes, Turbo decoding	8	
---	--	---	--

**Text book and Reference books:**

1. Information theory, coding and cryptography - Ranjan Bose; TMH.
2. Information and Coding - N Abramson; McGraw Hill.
3. Introduction to Information Theory - M Mansurpur; McGraw Hill.
4. Information Theory - R B Ash; Prentice Hall.
5. Error Control Coding - Shu Lin and D J Costello Jr; Prentice Hall

<b>Subject: Bioinformatics</b>	
<b>Course Code: OECICB701B</b>	<b>Semester: VII</b>
<b>Duration: 36 Hrs.</b>	<b>Maximum Marks: 100</b>
<b>Teaching Scheme</b>	<b>Examination Scheme</b>
<b>Theory: 3hrs./week</b>	<b>End Semester Exam: 70</b>
<b>Tutorial:</b>	<b>Attendance : 5</b>
<b>Practical: 0</b>	<b>Continuous Assessment: 25</b>
<b>Credit:3</b>	<b>Practical Sessional internal continuous evaluation: NA</b>
	<b>Practical Sessional external examination: NA</b>
<b>Aim:</b>	
<b>Sl. No.</b>	
1.	To give students an introduction to the basic practical techniques of bioinformatics. Emphasis will be given to the application of bioinformatics and biological databases to problem solving in real research problems.
2.	The students will become familiar with the use of a wide variety of internet applications, biological database and will be able to apply these methods to research problems.
<b>Objective:</b>	
<b>Sl. No.</b>	After completion of the course, students will be able to:



**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

1.	Describe the contents and properties of the most important bioinformatics databases, perform text- and sequence-based searches, and analyze and discuss the results in light of molecular biological knowledge		
2.	Explain the major steps in pairwise and multiple sequence alignment, explain the principle for, and execute pairwise sequence alignment by dynamic programming		
3.	Predict the secondary and tertiary structures of protein sequences.		
<b>Contents</b>		<b>3 Hrs./week</b>	
<b>Chapter</b>	<b>Name of the Topic</b>	<b>Hours</b>	<b>Marks</b>
01	Concepts of Cell, tissue, types of cell, components of cell, organelle. Functions of different organelles. Concepts of DNA: Basic Structure of DNA; Double Helix structure; Watson and crick model. Exons and Introns and Gene Concept. Concepts of RNA : Basic structure, Difference between RNA and DNA. Types of RNA. Concept of Protein: Basic components and structure. Introduction to Central Dogma: Transcription and Translation Introduction to Metabolic Pathways	7	12
02	Sequence Databases 2 Introduction to Bioinformatics. Recent challenges in Bioinformatics. Protein Sequence Databases, DNA sequence databases. sequence database search programs like BLAST and FASTA. NCBI different modules: GenBank; OMIM, Taxonomy browser, PubMed;	7	14
03	DNA SEQUENCE ANALYSIS 14 Syllabus for B.Tech(Information Technology) Up to Fourth Year Revised Syllabus of B.Tech IT DNA Mapping and Assembly : Size of Human DNA ,Copying DNA: Polymerase Chain Reaction (PCR), Hybridization and Microarrays,	8	18
	Cutting DNA into Fragments, Sequencing Short DNA Molecules, Mapping Long DNA Molecules. DeBruijn Graph. Sequence Alignment: Introduction, local and global alignment, pair wise and multiple alignment, Dynamic Programming Concept. Alignment algorithms: Needleman and Wunsch algorithm, Smith-Waterman.		
04	Introduction Probabilistic models used in Computational Biology 8 Probabilistic Models; Hidden Markov Model : Concepts, Architecture, Transition matrix, estimation matrix. Application of HMM in Bioinformatics : Genefinding, profile searches, multiple sequence alignment and regulatory site identification. Bayesian networks Model :Architecture, Principle ,Application in Bioinformatics.	7	12
05	Biological Data Classification and Clustering 6 Assigning protein function and predicting splice sites: Decision Tree	7	14
	<b>Sub Total:</b>	<b>36</b>	<b>70</b>
	<b>Internal Assessment Examination &amp; Preparation of Semester Examination</b>	<b>4</b>	<b>30</b>
	<b>Total:</b>	<b>40</b>	<b>100</b>

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

<b>List of Books</b>			
<b>Text Books:</b>			
<b>Name of Author</b>	<b>Title of the Book</b>	<b>Edition/ISSN/ISBN</b>	<b>Name of the Publisher</b>
Des Higgins (Editor), Willie Taylor.	Bioinformatics: Sequence, Structure and Databanks: A Practical Approach	ISBN: 978- 0199637904. 1st edition,	Oxford University Press.
David W. Mount.	Bioinformatics: Sequence and Genome Analysis	ISBN: 978-0879697129 2nd edition,	Cold spring harbor laboratory press.
<b>Reference Books:</b>			
	Introduction to Bioinformatics	ISBN: 978-8178085074 1st edition	Pearson Education.
	Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins	ISBN: 978- 0471478782. Second Edition,	John Wiley & Sons, Inc., Publication.

**Project Management and Entrepreneurship**

**Code: HSMC 701**

**Contact: 2L**

Name of the Course:	Project Management and Entrepreneurship		
Course Code: HSMC 701	Semester: VII		
Duration: 6 months	Maximum Marks: 100		
<b>Teaching Scheme</b>		<b>Examination Scheme</b>	
Theory: 2 hrs./week		Mid Semester exam: 15	
Tutorial: 1hr		Assignment and Quiz: 10 marks	
		Attendance: 5 marks	
Practical: NIL		End Semester Exam: 70 Marks	
Credit Points:	2		

**ENTREPRENEURSHIP**

1. Introduction: Meaning and Concept of Entrepreneurship, Innovation and entrepreneurship, Contributions of entrepreneurs to the society, risk-opportunities perspective and mitigation of risks [2L]
2. Entrepreneurship – An Innovation: Challenges of Innovation, Steps of Innovation Management, Idea Management System, Divergent v/s Convergent Thinking, Qualities

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

- of a prospective Entrepreneur [2L]
3. Idea Incubation: Factors determining competitive advantage, Market segment, blue ocean strategy, Industry and Competitor Analysis (market structure, market size, growth potential), Demand-supply analysis [4L]
  4. Entrepreneurial Motivation: Design Thinking - Driven Innovation, TRIZ (Theory of Inventive Problem Solving), Achievement motivation theory of entrepreneurship – Theory of McClelland, Harvesting Strategies [2L]
  5. Information: Government incentives for entrepreneurship, Incubation, acceleration. Funding new ventures – bootstrapping, crowd sourcing, angel investors, Government of India's efforts at promoting entrepreneurship and innovation – SISI, KVIC, DGFT, SIDBI, Defense and Railways [4L]
  6. Closing the Window: Sustaining Competitiveness, Maintaining Competitive Advantage, the Changing Role of the Entrepreneur. [2L]
  
  7. Applications and Project Reports Preparation [4L]
  
  8. PROJECT MANAGEMENT : Definitions of Project and Project Management, Issues and Problems in Project Management, Project Life Cycle - Initiation / Conceptualization Phase, Planning Phase, Implementation / Execution Phase, Closure / Termination Phase [4L]
  
  9. Project Feasibility Studies – Pre-Feasibility and Feasibility Studies, Preparation of Detailed Project Report, Technical Appraisal, Economic/Commercial/Financial Appraisal including Capital Budgeting Process, Social Cost Benefit Analysis [2L]
  
  10. Project Planning – Importance of Project Planning, Steps of Project Planning, Project Scope, Work Breakdown Structure (WBS) and Organization Breakdown Structure (OBS), Phased Project Planning [2L]
  11. Project Scheduling and Costing – Gantt chart, CPM and PERT Analysis, Identification of the Critical Path and its Significance, Calculation of Floats and Slacks, Crashing, Time Cost Trade-off Analysis, Project Cost Reduction Methods. [6L]
  
  12. Project Monitoring and Control – Role of Project Manager, MIS in Project Monitoring, Project Audit [2L]
  13. Case Studies with Hands-on Training on MS-Project [4L]

**Text Books and References**

1. Innovation and Entrepreneurship by Drucker, P.F.; Harper and Row
2. Business, Entrepreneurship and Management: Rao, V.S.P. ; Vikas
3. Entrepreneurship: Roy Rajeev; OUP.
4. Text Book of Project Management: Gopalkrishnan, P. and Ramamoorthy, V.E.; McMillan
5. Project Management for Engineering, Business and Technology: Nicholas, J.M., and Steyn, H.; PHI
6. Project Management: The Managerial Process: Gray, C.F., Larson, E.W. and Desai, G.V.; MGH

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

**Project-II**

**Code:** PROJ-AIML 781

**Contact:** 12P

**Credit-6**

**Project work II**

The object of Project Work II is to enable the student to take up investigative study in the broad field of Electronics & Communication Engineering, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department on an individual basis or two/three students in a group, under the guidance of a Supervisor. This is expected to provide a good initiation for the student(s) in R&D work.

**Soft Skill & Interpersonal Communication**

**Code:** OECICB701A

**Contact:** 3L

Name of the Course:	<b>Soft Skill &amp; Interpersonal Communication</b>	
Course Code: OECICB701A	Semester: VII	
Duration: 6 months	Maximum Marks: 100	
<b>Teaching Scheme</b>		<b>Examination Scheme</b>
Theory: 3 hrs./week		Mid Semester exam: 15
Tutorial: NIL		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: A New Approach To Learning, Planning And Goal-Setting, Human Perceptions: Understanding People, Types Of Soft Skills: Self-Management Skills, Aiming For Excellence: Developing Potential And Self- Actualization, Need Achievement And Spiritual Intelligence	5	
2	Conflict Resolution Skills: Seeking Win-Win Solution, Inter-Personal Conflicts: Two Examples, Inter-Personal Conflicts: Two Solutions, Types Of Conflicts: Becoming A Conflict Resolution Expert Types Of Stress: Self-Awareness About Stress, Regulating Stress: Making The Best Out Of Stress	5	
3	Habits: Guiding Principles, Habits: Identifying Good And Bad Habits, Habits: Habit Cycle, Breaking Bad Habits, Using The Zeigarnik Effect For Productivity And Personal Growth,	5	

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

	Forming Habits Of Success		
4.	Communication: Significance Of Listening, Communication: Active Listening, Communication: Barriers To Active Listening, Telephone Communication: Basic Telephone Skills , Telephone Communication: Advanced Telephone Skills, Telephone Communication: Essential Telephone Skills	5	
5.	Technology And Communication: Technological Personality, Technology And Communication: Mobile Personality?, Topic: Technology And Communication: E-Mail Principles, Technology And Communication: How Not To Send E-Mails!, Technology And Communication: Netiquette, Technology And Communication: E-Mail Etiquette	5	
6	Communication Skills: Effective Communication, Barriers To Communication: Arising Out Of Sender/Receiver's Personality, Barriers To Communication: Interpersonal Transactions, Barriers To Communication: Miscommunication, Non-Verbal Communication: Pre-Thinking Assessment-1, Non-Verbal Communication: Pre-Thinking Assessment-2	5	
7	Nonverbal Communication: Introduction And Importance, Non-Verbal Communication: Issues And Types, Non- Verbal Communication: Basics And Universals, Non- Verbal Communication: Interpreting Non- Verbal Cues, Body Language: For Interviews, Body Language: For Group Discussions	5	
	Presentation Skills: Overcoming Fear,	5	
8	Presentation Skills: Becoming A Professional, Presentation Skills: The Role Of Body Language, Presentation Skills: Using Visuals, :Reading Skills: Effective Reading, Human Relations: Developing Trust And Integrity		

**TEXT BOOKS AND REFERENCES**

1. Dorch, Patricia. *What Are Soft Skills?* New York: Execu Dress Publisher, 2013.
2. Kamin, Maxine. *Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders.* Washington, DC: Pfeiffer & Company, 2013.
3. Klaus, Peggy, Jane Rohman & Molly Hamaker. *The Hard Truth about Soft Skills.* London: HarperCollins E-books, 2007.

**Maulana Abul Kalam Azad University of Technology, West Bengal  
(Formerly West Bengal University of Technology)  
Syllabus for B. Tech in Computer Science and Engineering  
(Internet of Things, Cyber Security including Block Chain Technology)  
(Applicable from the academic session 2020-2021)**

4. Petes S. J., Francis. *Soft Skills and Professional Communication*. New Delhi: Tata McGraw-Hill Education, 2011.
5. Stein, Steven J. & Howard E. Book. *The EQ Edge: Emotional Intelligence and Your Success*. Canada: Wiley & Sons, 2006.

**Cyber Security in Block Chain Technology [3 0 0 3]- PECICB702C**

<b>Privacy, Security issues in Blockchain</b>
Pseudo-anonymity vs. anonymity, Zcash and Zk-SNARKS for anonymity preservation
attacks on Blockchains – such as Sybil attacks, selfish mining, 51% attacks - -advent of algorand
Sharding based consensus algorithms to prevent these attacks
<b>Cryptography</b>
Public Key Infrastructure (PKI) and Cryptography
Conventional PKI , Blockchain as a Form of Distributed PKI , Blockchain vs PKI
Blockchain - Public Key Cryptography, Decentralized Public Key Infrastructure (DPKI)
<b>Digital Signature</b>
Digital Signature from Blockchain context
Undeniable signature
Diffie–Hellman, Digital signature scheme for information non-repudiation in blockchain
<b>Blockchain-based time stamping</b>
Time stamping Metadata Using Blockchain
Decentralized Trusted Time stamping Based on Blockchains
Content Time stamping
<b>Use Cases of Blockchain In Cyber security</b>
Decentralized Storage Solutions, How Guardtime uses blockchain technology to safeguard data
IoT Security, Safer DNS, Using blockchains to prevent DDoS attacks
Implementing Security in Private Messaging

**Reference Books:**

1. Blockchain Technology Basics: Blockchain cryptography and cybersecurity  
Kindle Edition by Raghava Shankar (Author), Srikanth RC Cherukupalli  
M.Tech (Author)
2. Mastering Blockchain: Deeper insights into decentralization, cryptography,  
Bitcoin, and popular Blockchain frameworks Kindle Edition by Imran Bashir  
(Author) Format: Kindle Edition

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**



**SOCIAL NETWORK ANALYSIS [3 0 0 3]-PECICB701B**

Introduction to Social Web, Nodes, Edges and Network Measures, Describing Nodes and Edges, Describing Networks, Layouts, Visualizing network features, The role of Tie strength, Measuring Tie strength and its network structures, network propagation, Link prediction, entity resolution, Case study, Introduction to community discovery, communities in context, quality functions, The Kernighan-Lin algorithm, Agglomerative algorithms, spectral algorithms, multi-level graph partitioning, Markov clustering, Other approaches, Introduction to social influence, Influence related statistics, social similarity and influence, Homophily, Existential Test for social influence, Influence and actions, Influence and interactions, influence maximization in viral marketing.

**References:**

1. Jennifer Golbeck., *Analysing the Social Web*, Morgan Kaufmann publications, 2013
2. Charu C. Aggarwal, *Social Network Data Analytics*, Springer publications, 2011
3. John Scott, *Social Network Analysis*, (3e), Sage publications limited, 2013
4. Jay Goldman, *Facebook Cookbook*, O'Reilly, 2009
5. Shamanth Kumar, Fred Morstatter, Huan Liu, *Twitter Data Analytics*, Springer publications, 2013

**FUNDAMENTALS OF BUSINESS ANALYTICS [3 0 0 3]- OECICB701C**

Data-Analytic Thinking for Business: The Ubiquity of Data Opportunities, Data Science as a strategic asset, data analytic thinking, Business Enterprise and its functions, Enterprise Applications – ERP, CRM, MIS.

Difference between Business Intelligence and Business Analytics. Database systems for Business: OLTP and OLAP systems for business overview and architecture overview. Business Problems and Data Science Solutions using CRISP-DM Approach: Business Understanding, preparation, modeling, evaluation, deployment. Performance Metrics in Analytics - Key performance Indicators (KPIs), KPI based balanced score card, KPIs on Dashboards. Project Management - Project Management, phases, tools, techniques and methodologies in project management, Agile Framework and Scrum Approach. Quality Management - quality management philosophy, concepts and tools, Statistical Quality Control methods, Lean and Six Sigma, SERVQUAL model of service quality. Case studies – Human Capital Analytics, IT Analytics, Sales and Marketing Analytics, Analytics in telecom, Retail, healthcare, financial markets, social media, sports and other related business fields.

**References:**

1. Prasad, R, N. and Acharya, Seema *Fundamentals of Business Analytics*. Wiley India Pvt, Ltd, New Delhi, 2016.
2. Provost and Fawcett, *Data Science for Business*, O'Reilly, 2013.

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
**(Formerly West Bengal University of Technology)**  
**Syllabus for B. Tech in Computer Science and Engineering**  
**(Internet of Things, Cyber Security including Block Chain Technology)**  
**(Applicable from the academic session 2020-2021)**

3. Shmueli, Patel, and Bruce, *Data Mining for Business Intelligence, Concepts, Techniques and Applications*. Wiley, 2009.
4. Clifford F. Gray, Erik W. Larson, Gautam V. Desai - *Project Management* - Tata McGraw Hill, 2014.
5. Schwaber Ken *Agile project management with scrum*, WP Publishers and Distributors, Bangalore, 2004.
6. Sridhar Bhatta, *Total Quality Management, concepts and cases*-Himalaya Publishing House, 2015.