TECHNO INDIA UNIVERSITY
WESTBENGAL

EM 4, Sector V, Salt Lake, Kolkata-700091, West Bengal, India
Phone: +91 9836544416/17/18/19, Fax: +91 33 2357 1097

3-Year Bachelor of Computer Application (BCA) Curriculum and Syllabus

Third Semester

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
Theory					
TIU-UEN-T201	Career Advancement and Skill Development	2	1	0	3
TIU-UMA-T211	Discrete Structures	3	1	0	4
TIU-UCA-T215	Cyber security and ethical hacking ***	3	1	0	4
TIU-UCA-T213	E-Commerce & Digital Marketing	3	0	0	3
TIU-UCA-T211	Introduction to R Programming	2	1	0	3
Practical					
TIU-UCA-L211	R Programming Lab	0	0	3	2
TIU-UCA-L215	Cyber security and ethical hacking Lab ***	0	0	3	2
Sessional					
TIU-UES-S299	Entrepreneurship Skill Development	0	0	4	2
Total Credits					23

NOTE: ***To be Started from July-19

Approved by:

External Expert-1 (Prof. Subhadip Basu, J.U.)
External Expert-2 (Prof. Amlan Chakraborty, C.U.)
HOD - (Prof. A.B. Chaudhuri)

TECHNO INDIA UNIVERSITY
WESTBENGAL

EM 4, Sector V, Salt Lake, Kolkata-700091, West Bengal, India
Phone: +91 9836544416/17/18/19, Fax: +91 33 2357 1097

Detailed Syllabus

Career advancement and Skill Development
TIU-PEN-T201

L-T-P: 2-1-0 **Credit: 3**

Course Code	Topics	Credit
Employability Skill Development	Body Language	1
	Presentation Skill	
	Time Management & Stress Management	
Global Skill	SPANISH/FRENCH	1
Applied Communicative English	Developing fluency in the language	
Total		**2**

Approved by:

External Expert-1 (Prof. Subhadip Basu, J.U.)
External Expert-2 (Prof. Amlan Chakraborty, C.U.)
HOD - (Prof. A.B. Chaudhuri)

TECHNO INDIA UNIVERSITY
WESTBENGAL

EM 4, Sector V, Salt Lake, Kolkata-700091, West Bengal, India
Phone: +91 9836544416/17/18/19, Fax: +91 33 2357 1097

Discrete Structures

TIU-UMA-T211

L-T-P: 3-1-0 **Credits: 4**

Module 1

Set theory; Paradoxes in set theory; inductive definition of sets and proof by induction; Piano's postulates; Relations; representation of relations by graphs; properties of relations; equivalence relations and partitions; Partial orderings; Possets; Linear and well-ordered sets.

Module2

Functions; mappings; injection and surjection; composition of functions; inverse functions; special functions; Piano postulates; pigeonhole principle; recursive function theory.

Module 3

Mathematical reasoning; propositions; negation disjunction and conjunction; implication and equivalence; truth tables; predicates; quantifiers; natural deduction; rules of Inference; methods of proofs; use in program proving; resolution principle.

Module 4

Elementary combinatorics; counting techniques; recurrence relation; generating functions.

Module 5

Graph Theory; elements of graph theory, Euler graph, Hamiltonian path, trees, tree traversals, spanning trees.

Module 6

Definition and elementary properties of groups, semi groups, monoids, rings, fields, vector spaces and lattices.

Recommended Books:

Main Reading:

1. Bernard Kolman, Robert Busby, Sharon C. Ross, Discrete Mathematical Structures (6th Edition), Pearson.

2. *C.L.Liu, Elements of Discrete Mathematics, second edition 1985, McGraw-Hill BookCompany. Reprinted 2000.*

Supplementary Reading:

1. . *K.H.Rosen, Discrete Mathematics and applications, fifth edition 2003, TataMcGraw Hill publishing Company.*

Approved by:

External Expert-1 (Prof. Subhadip Basu, J.U.)
External Expert-2 (Prof. Amlan Chakraborty, C.U.)
HOD - (Prof. A.B. Chaudhuri)

TECHNO INDIA UNIVERSITY
WESTBENGAL

EM 4, Sector V, Salt Lake, Kolkata-700091, West Bengal, India
Phone: +91 9836544416/17/18/19, Fax: +91 33 2357 1097

Cyber security and ethical hacking

TIU-UCA-T215

L-T-P: 3-1-0 **Credits: 4**

(1) Introduction to Cybercrime

Cybercrime definition and origins of the world, Cybercrime and information security, Classifications of cybercrime

(2) Cyber offenses & Cybercrime

How criminal plan the attacks, Social Engg, Cyber stalking, Cybercafe and cybercrimes, Botnets, Attack vector, Cloud computing, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Devices-Related Security Issues.

(3) Tools and Methods Used in Cyber line

Proxy Servers and Anonymizers, Phishing, Password Cracking, Keyloggers and Spywares, Virus and Worms, Steganography, DoS DDoS Attacks, SQL Injection, Buffer Over Flow, Attacks on Wireless Networks, Phishing, Identity Theft (ID Theft)

(4) Ethical Hacking Methodology

Introduction, Steps of Ethical Hacking: Planning, Reconnaissance, Scanning, Exploitation, post exploitation and result reporting. Ethical Hacking Tool: Metasploit

(5) Computer Forensics

Historical Background of Cyberforensics, Digital Forensics Science, The Need for Computer Forensics, Cyberforensics and Digital Evidance, Forensics Analysis of Email, Digital Forensics Lifecycle, Chain of Custody Concept, Network Forensics, Approaching a Computer Forensics

Approved by:

External Expert-1 (Prof. Subhadip Basu, J.U.)
External Expert-2 (Prof. Amlan Chakraborty, C.U.)
HOD - (Prof. A.B. Chaudhuri)

EM 4, Sector V, Salt Lake, Kolkata-700091, West Bengal, India
Phone: +91 9836544416/17/18/19, Fax: +91 33 2357 1097

Investigation, Setting of a Computer Forensics Laboratory: Understanding the Requirements, Computer Forensics and Steganography, Relevance of the OSI 7 Layer Model to the Computer Forensics and Social Networking Sites: The Security/Privacy Threats, Forensics Auditing, Anti Forensics.

(6) Mobile Device Forensics

Crime and mobile phones, evidences, forensic procedures, files present in SIM cards, device data, external memory dump, and evidences in memory card, operator's networks.

Text Book: (1) Nina Godbole, Sunit Belapure, Cyber Security, Wiley India, New Delhi

(2) Kevin Mandia, Chris Prosise, "Incident Response and computer forensics", Tata McGraw Hill, 2006.

(3) Patrick Engebretson, "The Basics of Hacking and Penetration Testing, Second Edition: Ethical Hacking and Penetration Testing Made Easy", 2nd Edition, Syngress.

References:

3. Nina Godbole, Information Systems Security, Wiley India, New Delhi

4. Kennetch J. Knapp, Cyber Security & Global Information Assurance Information Science Publishing.

5. William Stallings, Cryptography and Network Security, Pearson Publication

E-Commerce & Digital Marketing

TIU-UCA-T213

L-T-P: 3-0-0 **Credits: 3**

Unit-I

Basic elements in networking, Network topology, and Common network services- file services, print services, message services, application services, database services, Different types of network- LAN, WAN, MAN, VAN, SAN. Network connecting devices.

Unit-II

Identifying Web Presence Goals, The Browsing Behaviour Model, Online Marketing, E-advertising, Internet Marketing Trends, Target Markets, E Branding, and Marketing Strategies.

Unit-III

Operating System Services, Developer Services, Data Services, Application Services, Store Services, Client Services. Types of E Commerce Solutions- Direct Marketing and Selling, Supply Chain Integration, Corporate Procurement, EDI.

Approved by:

External Expert-1 (Prof. Subhadip Basu, J.U.)
External Expert-2 (Prof. Amlan Chakraborty, C.U.)
HOD - (Prof. A.B. Chaudhuri)

EM 4, Sector V, Salt Lake, Kolkata-700091, West Bengal, India
Phone: +91 9836544416/17/18/19, Fax: +91 33 2357 1097

Unit –IV:

Application of E Commerce in Direct Marketing and Selling, Value Chain Integration, Supply Chain Management, Corporate Purchasing, Financial and Information Services, Obstacles in adopting E-Commerce Applications, Future of E Commerce.

Unit-V:

E-Strategy: Information and Strategy, The virtual value chain, seven dimensions of ecommerce strategy, planning E-commerce project, E-commerce strategy and knowledge management, E-Business Strategy and Data Warehousing and Data Mining.

Unit-VI:

Overview of Electronic Payment Systems, Cyber cash (Customer to Merchant Payments, Peer to Peer Payments, and Security). Smart Card (Card Types, Closed or Open Security, Privacy, Card Costs, Non Card Costs), Electronic Banking, Electronic Fund Transfers.

Recommended Books:

Main Reading:

P.T.Joseph, S.J., "E-Commerce An Indian Perspective", PHI.

Supplementary Reading:

S. Jaiswal, Doing Business on the Internet E-COMMERCE (Electronic Commerce for Business): Galgotia Publications.

Introduction to R Programming

TIU-UCA-T211

L-T-P: 2-1-0 **Credit: 3**

Unit-1.

Introduction to R, R character set, R words, constants, operators, precedence and associativity of the operators, R working environment as a displayer, R as a calculator, R as a data manipulator, R objects and their data types.

Unit 2.

R as a programming environment, programming in R using, Sequence, Selection iteration and Case logic structures.

Unit 3.

Approved by:

External Expert-1 (Prof. Subhadip Basu, J.U.)
External Expert-2 (Prof. Amlan Chakraborty, C.U.)
HOD - (Prof. A.B. Chaudhuri)

EM 4, Sector V, Salt Lake, Kolkata-700091, West Bengal, India
Phone: +91 9836544416/17/18/19, Fax: +91 33 2357 1097

User-defined functions in R, Recursion, Basic data structures in R(vector, factor, list, data frame, matrix, array).

Unit 4.

Data file handling in R.

Unit 5.

Charts and Graphs in R

Unit 6.

Statistical Applications of R.

Recommended Books:

1. The art of Programming through R by Anil Bikash Chowdhury

2. The art of R programming by Norman Matloff, , No Starch Press, Sanfrancisco.

3. Statistical Programming in R by Srinivasa,Siddesh,Shetty and Sowmya, Oxford Higher Education.

Cyber security and ethical hacking Lab
TIU-UCA-L215

L-T-P: 0-0-3 **Credits: 3**

1. Install and study chkrootkit security audit tool
2. Install and study Nessus network vulnerability audit tool
3. Simulate DOS attack using your favorite programming language.
4. Simulate Buffer overflow problem.
5. Write a program to hide text data in image file (Steganography).
6. Write a program to implement RSA algorithm.

R Programming Lab
TIU-UCA-L211

L-T-P: 0-0-3 **Credits: 2**

Class assignments are to be practiced.

Approved by:

External Expert-1 (Prof. Subhadip Basu, J.U.)
External Expert-2 (Prof. Amlan Chakraborty, C.U.)
HOD - (Prof. A.B. Chaudhuri)