

Department of Computer Applications, School of Computing Sciences

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES(VISTAS)

BCA BLOCK CHAIN TECHNOLOGY DEGREE COURSE

COURSES OF STUDY AND SCHEME OF ASSESSMENT TOTAL

NO OF CREDITS: 155

SEMESTER 1

CODE NO.	SUB CODE	COURSE	HOURS/WEEK			CREDITS	MAXIMUM MARKS		
			LECTURE	TUTORIAL	PRACTICAL		CA	SEE	TOTAL
LANG	21LTAM21	TAMIL I/	3	0	0	3	40	60	100
	21LHIN21 21LFRE21	HINDI / FRENCH							
ENG	21LEN001	ENGLISH I	3	0	0	3	40	60	100
CORE1	21CBTG11	RDBMS (IBM COLLABORATED)	4	0	0	4	40	60	100
CORE2	21CBTG12	PROGRAMMING IN C	4	1	0	5	40	60	100
CORE3	21BMA001	MATHEMATICS I	5	0	0	5	40	60	100
CORE	21PBTG12	PRACTICAL I - C	0	0	4	2	40	60	100
		RDBMS LAB(IBM COLLABORATED)	0	0	4	2	40	60	100
AECC	21AEC C---	COMMUNICATION SKILLS	1	0	2	2	40	60	100
SEC		ORIENTATION/INDUCTION PROGRAMME / LIFE SKILLS	-	-	-	-	-	-	-
			20	1	10	26			

SEMESTER 2

CODE NO.	SUB CODE	COURSE	HOURS/WEEK				MAXIMUM MARKS		
			LECTURE	TUTORIAL	PRACTICAL	CREDITS	CA	SEE	TOTAL
LANG	21LTA002 21LHN002 21LFR002	TAMIL II / HINDI / FRENCH	3	0	0	3	40	60	100
ENG	21LEN002	ENGLISH II	3	0	0	3	40	60	100
CORE 4	21CBTG21	IBM CLOUD FUNDAMENTALS (IBM COLLABORATED)	4	1	0	5	40	60	100
CORE 5	21CBTG22	JAVA PROGRAMMING	4	1	0	5	40	60	100
CORE 6	21BMA002	MATHEMATICS – II	4	0	0	4	40	60	100
CORE	21PBTG21	IBM CLOUD FUNDAMENTALS LAB	0	0	4	2	40	60	100
CORE	21PBTG22	PRACTICAL – III JAVALAB	0	0	4	2	40	60	100
SEC		SOFT SKILLS – I/ SECTORSKILL COUNCIL COURSE	2	0	0	2	40	60	100
SEC		NSS / NCC / SWACHH BHARAT/TRAINING	-	-	-	-	-	-	-
			20	2	8	26			

SEMESTER 3

CODE NO.	SUB CODE	COURSE	HOURS/WEEK				MAXIMUM MARKS		
			LECTURE	TUTORIAL	PRAC TICAL	CREDI TS.	CA	SEE	TOT AL
CORE 7	21CBTG31	DATA SCIENCE USING PYTHON	4	1	0	5	40	60	100
CORE 8	21CBTG32	MICRO SERVICES ARCHITECTURE AND IMPLEMENTATION (IBM COLLABORATED)	4	0	0	4	40	60	100
CORE 9	21CBTG33	ESSENTIALS OF BLOCKCHAIN TECHNOLOGY APPLICATIONS	4	0	0	4	40	60	100
CORE 10	21CBTG34	FINANCIAL ACCOUNTING	5	0	0	5	40	60	100
AECC	21EVSC31	ENVIRONMENTAL STUDIES	2	0	0	2	40	60	100
CORE PRAC	21PBTG31	PRACTICAL PYTHON	0	0	4	2	40	60	100
CORE PRAC	21PBTG32	MICRO SERVICES ARCHITECTURE AND IMPLEMENTATION LAB (COLLABORATED WITH IBM)	0	0	4	2	40	60	100
SEC		SOFT SKILLS - II / SECTORSKILL COUNCIL COURSE	2	0	0	2	40	60	100
SEC		SWAYAM / NPTEL / VALUEADDED COURSE	-	-	-	-	-	-	-
			21	1	8	26			

SEMESTER 4

CODE NO.	SUB CODE	COURSE	HOURS/WEEK				MAXIMUM MARKS		
			LECTURE	TUTORIAL	PRACTICAL	CRE DITS.	C A	SEE	TOT AL
CORE 11	21CBTG41	RAPID DEVELOPMENT FOR AI (IBM COLLABORATED)	4	0	0	5	40	60	100
CORE 12	21CBTG42	ADVANCED DATABASE SYSTEMS	5	0	0	5	40	60	100
CORE 13	21CBTG43	STATISTICAL & NUMERICAL METHODS	5	0	0	5	40	60	100
CORE PRAC	21PBTG41	RAPID DEVELOPMENT FOR AI LAB((IBM COLLABORATED)	0	0	4	2	40	60	100
CORE PRAC	21PBTG42	ADVANCED DATABASE SYSTEMS LAB	0	0	4	2	40	60	100
SEC		SOFT SKILLS III / SECTOR SKILL COUNCIL COURSE	2	0	0	2	40	60	100
SEC		CAPABILITY ENHANCEMENT PROGRAMME	0	0	2	1	-	-	-
			17	0	10	22			

SEMESTER 5

CODE NO.	SUB CODE	COURSE	HOURS/WEEK				MAXIMUM MARKS		
			LECTURE	TUTORIAL	PRACTICAL	CREDITS.	CA	SEE	TOTAL
CORE 14	21CBTG51	DESIGN THINKING AGILE AND DEVOPS (IBM COLLABORATED)	4	1	0	5	40	60	100
DSE 1	21 --- ---	DISCIPLINE SPECIFIC ELECTIVE – I	3	0	0	3	40	60	100
DSE 2	21 --- ---	DISCIPLINE SPECIFIC ELECTIVE - II	3	0	0	3	40	60	100
DSE 3	21 --- ---	DISCIPLINE SPECIFIC ELECTIVE – III	3	0	0	3	40	60	100
DSE 4	21 --- ---	DISCIPLINE SPECIFIC ELECTIVE – IV	3	0	0	3	40	60	100
DSE LAB		DESIGN THINKING AGILE AND DEVOPS LAB (IBM COLLABORATED)	0	0	4	2	40	60	100
DSE LAB		BLOCK CHAIN LAB	0	0	4	2	40	60	100
SEC		INTERNSHIP / MINI PROJECT / SECTOR SKILL COUNCIL COURSE	0	0	4	2	40	60	100
SEC		SKILL ENHANCEMENT TRAINING / STUDENT CLUB ACTIVITIES	-	-	-	2	-	-	-
			16	1	12	25			

SEMESTER 6

CODE NO.	SUB CODE	COURSE	HOURS/WEEK				MAXIMUM MARKS		
			COURSE	LECTURE	TUTORIAL	CREDITS	CA	SEE	TOTAL
DSE 5	21-- --	DISCIPLINE SPECIFIC ELECTIVE –V	3	0	0	3	40	60	100
DSE 6	21-- --	DISCIPLINE SPECIFIC ELECTIVE – VI	3	0	0	3	40	60	100
DSE 7	21-- --	DISCIPLINE SPECIFIC ELECTIVE - VII	3	0	0	3	40	60	100
GE	21-- ---	GENERIC ELECTIVE – I	3	0	0	3	40	60	100
SEC		ENTREPRENEURSHIP DEVELOPMENT	2	0	0	2	40	60	100
		CAPSTONE PROJECT WORK	0	0	0	5	40	60	100
SEC		TECHNICAL SEMINAR / INNOVATION COUNCIL / START UP INITIATIVE	0	0	2	1	40	60	100
			14	0	0	20			

SEMESTER 7

Capstone Project	0	0	0	5	40	60	100
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SEMESTER 8

Research and Publication Ethics (Scopus Indexed journal)	0	0	0	5	40	60	100
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Vels Institute of Science and Technology and Advanced studies (VISTAS)

BCA BLOCK CHAIN TECHNOLOGY DEGREE

Total No of Credits: 155

BCA Course Components

Component	I Sem	II Sem	III Sem	IV Sem	V Sem	VI Sem	VII Sem	VIII Sem	Total Credits
Core Courses & Languages	24	24	22	19	5				94
Ability Enhancement Courses (AEC)	2		2						4
Discipline Specific Elective (DSE) & Generic Elective(GEC)					16	12			28
Skill enhancement Course(SEC)		2	2	3	2	3			12
Internship					2	5	5	5	17
Total Credits	26	26	26	22	25	20	5	5	155

All UG Programmes – PART I TAMIL
(BA/B.Sc./B.Com./BBA/BCA)

பாடக் குறியீட்டு எண்: 21LTA001

பருவம்-1, தமிழ்மொழிப்பாடம்-1, பகுதி-1, தகுதிப்புள்ளி: 3, வாரப்

பாட நேரம்: 3.

தாள்-1

இக்காலக் கவிதைகள் – உரைநடை – பண்பாடு – மொழித்திறன்

பாடத்திட்ட நோக்கம்:

மாணவர்களின் இலக்கிய நாட்டத்தை மேம்படுத்துதல், தற்கால தமிழ் இலக்கிய வகைமைகளான மரபுக்கவிதை, புதுக்கவிதை, உரைநடை ஆகியவற்றை அறிமுகப்படுத்துதல், தமிழர்தம் வாழ்வியல் நெறிகளையும் பண்பாட்டுச் செழுமைகளையும் இன்றைய தலைமுறையினர் அறியச் செய்தல், மாணவர்களுக்குத் தமிழைத் தவறின்றி எழுதுவதற்குத் தேவையான பயிற்சி அளித்து அவர்களின் மொழித்திறனை மேம்படுத்துதல், செய்யுளின் நலத்தைப் பாராட்டும் முறைமையை அறியச் செய்து அதன்வழி சிந்தனை வளத்தைப் பெருகச் செய்தல் என்பனவும் மேற்கண்டவழி மாணவர்களை ஆளுமை மிக்கவர்களாக உருவாக்கி, போட்டித்தேர்வுகளுக்குத் தயார் செய்து அவர்களுக்கு வேலைவாய்ப்பை உருவாக்குவதும் இந்தப் பாடத்திட்டத்தின் முக்கிய நோக்கமாகும்.

அலகு 1: மரபுக்கவிதை

9 மணி

நேரம்

1. பாரதியார் - பாரத தேசம் என்னும் தலைப்பில் ஆறு பாடல்கள்.
(பாடல் எண்கள் 1, 6, 7, 9, 12, 13)
2. பாரதிதாசன் - தமிழுக்கும் அமுதென்று பேர் என்னும் தலைப்பிலான கவிதை.
3. தேசிக விநாயகம் பிள்ளை - உடல் நலம் பேணல் என்னும் தலைப்பிலான கவிதை
4. முடியரசன் - காவியப் பாவை - "புண்படுமா" என்னும் கவிதை.

அலகு 2: புதுக்கவிதை

9 மணி

நேரம்

1. நா. காமராசன் - **கறுப்பு மலர்கள்** தொகுப்பில் **காகிதப்பூக்கள்** என்னும் தலைப்பிலான கவிதை.
2. அப்துல் ரகுமான் - **ஆலாபனை** தொகுப்பில் **போட்டி** என்னும் தலைப்பிலான கவிதை
3. ஈரோடு தமிழன்பன் - **ஒரு வண்டி சென்ரியு** தொகுப்பில் தேர்ந்தெடுக்கப்பட்ட சென்ரியு கவிதைகள்
4. ஆண்டாள் பிரியதர்ஷினி - **முத்தங்கள் தீர்ந்துவிட்டன** தொகுப்பில் **'இங்கே வரும் போது'** என்னும் தலைப்பிலான கவிதை

அலகு 3: உரைநடை

9 மணி

நேரம்

1. மாணாக்கரும் தாய்மொழியும் - திரு.வி.க.,
2. மன வலிமை வேண்டும் - மு.வரதராசனார்
3. செம்மொழித் தமிழின் சிறப்புகள்
4. பண்டைத் தமிழரின் சாதனைச் சுவடுகள்

அலகு 4: தமிழர் வாழ்வும் பண்பாடும்

9

மணி நேரம்

பண்பாடு - வாழ்வியல் முறை - அகம், புறம் - உணவு முறை - விருந்தோம்பல் - நம்பிக்கைகள் - விழாவும் வழிபாடும் - கலைகள் - கட்டடம் - சிற்பம் - ஓவியம் - இசை - கூத்து - தொழிலும் வணிகமும் - அறிவியல் நோக்கு.

அலகு 5: மொழித்திறன், இலக்கிய வரலாறு, இலக்கணம்

9 மணி நேரம்

1. எழுத்துப் பிழை, தொடர்பு பிழைகள்
2. வேற்றுமை இலக்கணம்
3. செய்யுள் நலம் பாராட்டல்
4. பாடல் தழுவிய இலக்கிய வரலாறு (மரபுக் கவிதை, புதுக்கவிதை, உரைநடை)

மொத்தம்: 45 மணி நேரம்

பார்வை நூல்கள்

1. **தமிழர் நாகரிகமும் பண்பாடும்**, டாக்டர் அ. தட்சிணாமூர்த்தி, ஜந்திணைப் பதிப்பகம், 2001.
2. **தவறின்றித் தமிழ் எழுதுவோம்**, மா. நன்னன், ஏகம் பதிப்பகம், 1999.

3. **தவறின்றித் தமிழ் எழுத** - மருதூர் அரங்கராசன், ஐந்திணைப் பதிப்பகம், 2003.
4. **தமிழ் இலக்கிய வரலாறு**, வரதராசன், மு., புது தில்லி : சாகித்திய அக்காதெமி, 2002.
5. **புதிய தமிழ் இலக்கிய வரலாறு**, நீல. பத்மநாபன், சிற்பி பாலசுப்ரமணியம், சாகித்திய அகாடெமி, 2007.
6. **செம்மொழி தமிழின் சிறப்பியல்புகள்** - முனைவர் மறைமலை இலக்குவனார்; <https://www.youtube.com/watch?v=HHZnmJb4jSY>
7. **பாடநூல் தேடலுக்கான இணையம்** - <https://archive.org/>

COURSE OBJECTIVE:

To introduce French language.

To enable the students to understand and to acquire the basic knowledge of French language with elementary grammar.

UNIT:I INTRODUCTION 09

Introduction-Alphabet-comment prononcer, écrire et lire les mots-base: les prénoms personnel de 1er , 2eme et 3eme personnes-conjugaisons les verbes être et avoir en forme affirmative, négative Et interrogative.

UNIT II- LECON 1-309

Leçon 1 :Premiers mots en français- 2.Les hommes sont difficiles 3.Vive la liberté-Réponses aux questions tirées de la leçon-Grammaire: Les adjectives masculines ou féminines-Les articles définies et indéfinis-Singuliers et pluriels.

UNIT III-LECON 4-609

Leçons 4. L'heure c'est l'heure 5.Elle va revoir sa Normandie 6.Mettez-vous d'accord groupe de nom-Réponses aux questions tirées de la leçon-Grammaire :A placer et accorder l'adjectif en groupe de nom-Préposition de lieu-A écrire les nombres et l'heure en français

UNIT :IV-LECON 7-9 09

Leçon 7.Trois visages de l'aventure , 8. A moi Auvergne 9.Recit de voyage-Réponses aux questions tirées de la leçon- Grammaire : Adjectif possessif- Les phrases au présent de l'indicatif-Les phrases avec les verbes pronominaux au présent.

UNIT :V- COMPOSITION :09

A écrire une lettre à un ami l'invitant à une célébration différente ex :mariage-A faire le dialogue- A lire le passage et répondre aux questions.

Total No of Hours : 45

TEXTBOOK :

Jack GIRARDER & Jean Marie GRIDLIG, <<Méthode de Français PANORAMA>>, Clé Internationale, Goyal Publication ,New Delhi Edition 2014.

REFERENCE BOOKS:

DONDO Mathurin, "Modern French Course", Oxford University Press, New Delhi Edition 2014.

Nithya Vijayakumar get ready French grammar-Elementary Goyal publications ,New Delhi Edition 2014.

TEXT BOOKS

English for Communication Enrichment: by Jeya Santhi June 2015.

Dr. M. Narayana Rao and Dr. B. G. Barki – Anu's Current English for Communication (AnuChitra). June 2012.

Dr. Ananthan , R. Effective Communication. Ed. Chennai : Anu Chithra Pub.2010.

WEB SOURCES:

<https://www.gradesaver.com/>

<https://www.enotes.com/>

<https://www.jstor.org/>

<https://www.sparknotes.com/>

RDBMS (IBM)

Course Objectives

1. Understanding Database Concepts and Understanding Database Storage
2. Entities and Relationships and The Relational Data Model
3. To learn Normalization, Database Design and Performance Tuning and Creating Database Objects
4. Introduction Manipulating Data, JDBC As the Fundamental Java API, JPA as the JAVA ORM API and Database Security
5. Understanding Database Backup and Restore and Introduction of MySQL

Unit-1

15

Understanding Database Concepts and Understanding Database Storage

Introduction Database Concepts, Tables, Primary Keys, Foreign Keys, Installation of SQLite, Installation of Docker based MySQL and DB2 database, Introduction Database Storage, Database normalization, Indexes and how they are used in databases, Configure non- clustered indexes and Configure clustered indexes.

Unit-2

15

Entities and Relationships and The Relational Data Model

Introduction Entities and Relationships, Entities and Their Attributes, Domains, Basic Data Relationships, Documenting Relationships, Dealing with Many-to-Many Relationships, Relationships and Business Rules, Data Modelling Versus Data Flow, Schemas, Introduction Relational Data Model, Understanding Relations, Primary Keys, Representing Data Relationships, Views and The Data Dictionary.

Unit-3

15

Normalization, Database Design and Performance Tuning and Creating Database Objects

Introduction Normalization, Translating an ER Diagram into Relations, Normal Forms, First Normal Form, Second Normal Form, Third Normal Form, Boyce–Codd Normal Form, Fourth Normal Form, Fifth Normal Form, Sixth Normal Form, Introduction Database Design and Performance Tuning, Indexing, Clustering, Partitioning, Creating Database Objects, Understand data definition language (DDL) and Choose appropriate data types.

Unit-4

15

Manipulating Data, JDBC As the Fundamental Java API, JPA as the JAVA ORM API and Database Security

Introduction Manipulating Data, Understand data manipulation language (DML), Introduction JDBC As the Fundamental Java API, JDBC basics, Introduction JPA as the JAVA ORM API,

From JDBC to JPA, Introduction Database Security, Sources of External Security Threats, Sources of Internal Threats, External Remedies and Internal Solutions.

Unit-5

15

Understanding Database Backup and Restore and Introduction of MySQL

Introduction Database Backup and Restore, Understand different types of backups, Define a backup and recovery strategy, Introduction of MySQL, Create Tables, Drop Tables, Insert Query, Select Query, Where Query, Update Query, Delete Query, Like Clause and MySQL Joins.

Course Outcomes

CO1: Understanding Database and Understanding Database Storage Concepts

CO2: Understanding Entities and Relationships and The Relational Data Model

CO3: Normalization, Database Design and Performance Tuning and Creating Database Objects

CO4: Manipulating Data, JDBC As the Fundamental Java API, JPA as the JAVA ORM API and Database Security

CO5: Understanding Database Backup and Restore and Introduction of MySQL

Text Books

1. A.Silberchatz, H.Korth, Subarshan, “Database System Concepts”, McGraw – Hill Higher Education, 5th Edition, 2012.
2. Elmasri, Navathe, “Fundamentals of Database Systems, Addison Wesley”, 3rd Edition, 2000.

Reference Books

1. Bipin C. Desai, “An Introduction to Database Systems”, Galgotia Publications Pvt. Limited, 2001.
2. G. V. Post - Database Management Systems Designing and Building Business Application - McGraw Hill International edition - 1999.
3. ArunMajumdar & Pritimoy, “Database Management Systems” Bhattacharya, 2007, TMH.
4. Gerald V. Post, “Database Management Systems” 3rd edition, TMH.

Web Links

1. <https://www.oreilly.com/library/view/relational-theory-for/9781449365431/ch01.html>
2. <https://www.ibm.com/topics/data-storage>
3. https://www.ibm.com/docs/en/informix-servers/12.10?topic=SSGU8G_12.1.0/com.ibm.ddi.doc/ids_ddi_163.html
4. <https://www.ibm.com/docs/en/i/7.2?topic=design-normalization>
5. <https://www.ibm.com/docs/en/data-studio/4.1.1?topic=databases-creating-database-objects>
6. <https://www.ibm.com/docs/en/informix-servers/12.10?topic=started-what-is-jdbc>
7. <https://www.ibm.com/docs/en/was-liberty/nd?topic=overview-java-persistence-api-jpa>
8. <https://www.ibm.com/docs/en/db2/11.1?topic=commands-backup-database>
9. <https://www.ibm.com/docs/en/ztpf/1.1.0.15?topic=concepts-mysql-server-overview>

COURSE OUTCOMES

On completion of this course, Students can able to,

CO1: Design simple applications using File, Pointers & Structures.

CO2: Create simple programs using Functions & Control Structures

CO3: Analyze the basic structure of C Language.

CO4: Apply the Concept of Input, Output Statements, Operators & expressions in C programs

CO5: Understand the basic tokens in C language

TEXT BOOK

1.E. Balaguruswamy, Programming in ANSI C, TMH publishing Company LTD, 2008.

REFERENCE BOOKS

H. Schildt, The Complete Reference, 4th Edition, TMH,2004.

Gottfried, B.S, Programming with C, fourth edition, TMH Pub.Co.Ltd, 2004.

Kanetkar Y, Let us C, BPB publications with ANSI & Turbo C, First edition, Pearson Education, New Delhi, 2008.

WEBSITES

www.w3schools.com

www.tutorialspoint.com

www.javapoint.com

www.geeksforgeeks.org

WEB SOURCES

https://www.vssut.ac.in/lecture_notes/lecture1424354156.pdf

https://www.unf.edu/~wkloster/2220/ppts/cprogramming_tutorial.pdf

I SEM MATHEMATICS I 4 0 0 4

COURSE OBJECTIVE:

To develop the skills of the students in the areas of Algebra, Numerical methods Trigonometry and Calculus. The course will also serve as a prerequisite for post graduate and specialized studies and research.

UNIT – I ALGEBRA AND NUMERICAL METHODS 12

Algebra: Summation of series simple problems. Numerical Methods: Operators, difference tables -Newton’s forward and backward interpolation formulae for equal intervals, Lagrange’s interpolation formula.

UNIT- II MATRICES 12

Introduction-Basic operations-Symmetric-skew symmetric-Hermitian-Skew Hermitian – Unitary- orthogonal-Inverse of a matrix -Solution of linear system(Cramer’s rule)- Finding the Eigen roots and Eigen vectors of a matrix-Cayley Hamilton theorem(without proof)

UNIT- III THEORY OF EQUATIONS 12

Polynomial equations with real coefficients, irrational roots, complex roots, symmetric functions of roots, transformation of equation by increasing or decreasing roots by a constant, reciprocal equation. Newton’s method to find a root approximately - simple problems.

UNIT IV TRIGONOMETRY 12

Introduction- Expansions of $\sin n\theta$ and $\cos n\theta$ in a series of powers of $\sin\theta$ and $\cos\theta$ - Expansions of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ in a series of sines, cosines and tangents of multiples of θ - Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in a series of powers of θ – Hyperbolic and inverse hyperbolic functions - Logarithms of complex numbers.

UNIT V DIFFERENTIAL CALCULUS 12

Differentiation-Successive differentiation, n^{th} derivatives, Leibnitz theorem (without proof) and applications, Jacobians, Curvature and radius of curvature in Cartesian co-ordinates, maxima and minima of functions of two variables.

Total No of Hours : 60 Hrs

COURSE OUTCOME:

On completion of this course, the students will be able to:

CO1. Evaluate the underlying assumptions of analysis tools and relations of Set Theory

CO2. Understand and discuss the applications of matrices and utilizes.

CO3. Discuss the uses and limitations of Theory of equations

CO4. Understand the key terminology, concept tools and techniques used in trigonometry

CO5. Apply the maxima and minima in detailed ways and the applications of partial differential equations.

TEXT BOOKS

P. Kandaswamy and K.Thilagavathy, Allied Mathematics paper I, 1st Semester, S.Chand Publishing Pvt. Ltd. 1st Edition, 2003.

S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S.Viswanathan Printers, 1986, Chennai.

REFERENCE BOOKS

P.R. Vittal, Allied Mathematics, Margham Publications, 4th Edition 2009.

A. Singaravelu, Allied Mathematics, Meenakshi Agency, 2007.

P. Duraipandian and S.UdayaBaskaran, Allied Mathematics, Vol. I & II Muhil Publications, Chennai.

WEB SOURCES

https://books.google.co.in/books?id=4C4rDAAAQBAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

<https://ncert.nic.in/ncerts/l/keep203.pdf>

<http://www.universityofcalicut.info/SDE/VI%20Sem.%20B.Sc%20Maths%20-%20Additional%20Course%20in%20lie%20of%20Project%20-Theory%20of%20equations%20&%20fuzzy%20set.pdf>

<https://www.math.ust.hk/~machas/numerical-methods.pdf>

https://www.researchgate.net/publication/321825504_Differential_Calculus

COURSE OBJECTIVE

- ✓ To introduces to write programs using basic concepts of C programming.
- ✓ To practices the student to write simple programs using function.
- ✓ To improves the logical thinking in C programming.

LIST OF EXPERIMENTS

1. Write a program in C to find whether the given string is Palindrome or not.
2. Write a program in C to count vowels, consonants etc.
3. Write a program in C to find the factorial of a number.
4. Write a program in C to find the given number is prime or not.
5. Write a program in C to find the value of NPR
6. Write a program in C to find the GCD of two numbers.
7. Write a program in C to find the Fibonacci Series
8. Write a program in C to find Matrix Addition/Subtraction.
9. Write a program in C to find Matrix Transpose.
10. Write a program in C for swapping 2 numbers.
11. Write a program in C to open, read and close the file
12. Write a program in C to read name and marks of n number of students and store them in a file.

COURSE OUTCOMES:

On completion of this course, Students can able to,

CO1: Design simple applications using File, Pointers & Structures.

CO2: Create simple programs using Control Structures

CO3: Develop C Programs using Array.

CO4: Develop C Programs using Functions.

CO5: Develop simple programs using operators & Expression.

TEXT BOOK

1.E. Balaguruswamy, Programming in ANSI C, TMH publishing Company LTD, 2008.

REFERENCE BOOKS

H. Schildt, The Complete Reference, 4th Edition, TMH,2004.

Gottfried, B.S, Programming with C, fourth edition, TMH Pub.Co.Ltd, 2004.

Kanetkar Y, Let us C, BPB publications with ANSI & Turbo C, First edition, Pearson Education,New Delhi, 2008.

WEBSITES

www.w3schools.com

www.tutorialspoint.com

www.javapoint.com

WEB SOURCES

https://www.vssut.ac.in/lecture_notes/lecture1424354156.pdf

https://www.unf.edu/~wkloster/2220/ppts/cprogramming_tutorial.pdf

http://mars.tekkom.dk/w/images/4/42/6272_cnote.pdf

<https://www.slideshare.net/gauravjuneja11/c-language-ppt>

RDBMS (IBM) Lab

Course Objectives

- ✓ To introduces to write programs using basic concepts of RDBMS programming.
- ✓ To practices the student to write mysql query.
- ✓ To improves the logical thinking in RDBMS programming.

List of Experiments

1. Installation Process of IBM DB2
2. Installation Process of MYSQL WORKBENCH
3. Consider following database and draw ER diagram COLLEGE DATABASE:
 - (i) STUDENT (USN, SName, Address, Phone, Gender)
 - (ii) SEMSEC (SSID, Sem, Sec)
 - (iii) CLASS (USN, SSID)
 - (iv) SUBJECT (Subcode, Title, Sem, Credits)
 - (v) IAMARKS (USN, Subcode, SSID, Test1, Test2, Test3, FinallA)
4. Consider the database for an organisation. Write the queries for the following
 - (i) create the database by using SQL
 - (ii) select the current database by using SQL
 - (iii) Create the following tables by using SQL
 - a) employee (emp_no, emp_name, DOB, address, Date of Joining, mobile_no, dept_no, salary).
 - b) department (dept_no, dept_name, location).
5. Consider the database for an organisation. Write the queries for the following
 - (i) INSERT minimum 10 records in the employee table and 4 department records in department table using SQL
 - (ii) UPDATE any 3 fields in employee table by using SQL

(iii) ALTER the employee table by adding the email column by using SQL

6. Consider the database for an organisation. Write the queries for the following

(i) VIEW all the columns in the table by using SQL

(ii) Return a particular record using WHERE command in SQL

7. Consider the database for an organisation. Write the queries for the following

(i) Make use of JOIN command and join the above two tables by using SQL

(ii) Make of LEFT JOIN command and join the above two tables by using SQL

(iii) Make of RIGHT JOIN command and join the above two tables by using SQL

(iv) Make of FULL JOIN command and join the above two tables by using SQL

8. Consider the database for an organisation. Write the queries for the following

(i) Return the number of employees in each department by grouping them based on the department and sort them in the ascending order based on the count of employees in each department using SQL.

9. Consider the database for an organisation. Write the queries for the following

(i) DELETE any 3 records in the employee table using SQL

(ii) TRUNCATE employee table and department table by using SQL

(iii) DELETE all the tables along with database by using SQL

10. Consider the database for an organisation. Write the queries for the following

(i) Create a PRODUCT table with the following fields(product_id, product_name, price)

(ii) From the following table, write a SQL query to calculate total price of all products.

(iii) From the following table, write a SQL query to calculate the average price amount of all orders.

(iv) From the following table, write a SQL query to find the maximum price product.

(v) From the following table, write a SQL query to find the minimum price product

COURSE OUTCOMES:

On completion of this course, Students can able to,

CO1: Installation of mysql workbench.

CO2: Create Entity Relationship diagram

CO3: Develop mysql queries.

CO4: Way of create database.

CO5: Develop simple programs using mysql.

பாடக்குறியீட்டுஎண்: 21LTA002 3 0 0 3
பருவம்-2, தமிழ்மொழிப்பாடம்-2, பகுதி-1, தகுதிப்புள்ளி: 3,
வாரப்பாடநேரம்: 3.

தாள்-2

அறஇலக்கியம் - சிற்றிலக்கியம் - சிறுகதை - பயன்பாட்டுத்தமிழ்

அலகு 1: அறஇலக்கியங்கள்

10மணிநேரம்

1. திருக்குறள்- வான்சிறப்பு(அறம்), ஊக்கமுடைமை(பொருள்), குறிப்பறிதல்(இன்பம்) -மூன்றுஅதிகாரங்கள்முழுமையும்.
2. நாலடியார் - மூன்றுபாடல்கள். (2, 3, 5)
3. பழமொழிநானூறு - மூன்றுபாடல்கள் (74, 75, 78)
4. திரிகடுகம் - மூன்றுபாடல்கள் (10, 12, 22)
5. இனியவைநாற்பது - மூன்றுபாடல்கள் (1, 12, 16)

அலகு 2: சிற்றிலக்கியம்

10மணிநேரம்

1. முத்தொள்ளாயிரம்
சேரன் - வீரம் 14, 15 பாடல்கள்
சோழன் - காதல் 23, 24 பாடல்கள்
பாண்டியன் -நாடு87, 88 பாடல்கள்
2. தமிழ்விடுதூது - முதல் 20 கண்ணிகள்
3. திருக்குற்றாலக்குறவஞ்சி - மலைவளம்கூறுதல் - முதல்5 பாடல்கள்
4. முக்கூடற்பள்ளு - மூத்தபள்ளிநாட்டுவளம்கூறுதல் 3 பாடல்கள், இளையபள்ளிநாட்டுவளம்கூறுதல் 3 பாடல்கள்.
5. கலிங்கத்துப்பரணி - பாலைபாடியது - முதல் 5 பாடல்கள்

அலகு 3: சிறுகதை

9மணிநேரம்

1. அறிஞர்அண்ணா - செவ்வாழை
2. புதுமைப்பித்தன் - கடவுளும்கந்தசாமிப்பிள்ளையும்
3. ஜெயகாந்தன் - யுகசந்தி
4. கு.அழகிரிசாமி - காற்று
5. அம்பை - காட்டில்ஒருமான்

அலகு 4: பேச்சுத் தமிழ்

8

மணி நேரம்

பேச்சுத்திறன் - விளக்கம் - பேச்சுத்திறனின் அடிப்படைகள் -
வகைகள் - மேடைப்பேச்சு - உடையாடல் - பயிற்சிகள்

அலகு 5: எழுத்துத்தமிழ், இலக்கியவரலாறு, இலக்கணம்

8மணிநேரம்

1. கலைச்சொல்லாக்கம் - தேவைகள் -
கலைச்சொற்களின் பண்புகள் - அறிவியல்கலைச்சொற்கள் -
கடிதம் - வகைகள் - அலுவலகக்கடிதங்கள் -
உறவுமுறைக்கடிதங்கள்.
2. பாடம்தமிழியிலக்கியவரலாறு (அறஇலக்கியம்,
சிறீறிலக்கியம், சிறுகதை)
3. அணிஇலக்கணம்
4. விண்ணப்பக்கடிதம்எழுதுதல்

மொத்தம்:

45மணிநேரம்

பார்வைநூல்கள்

1. பேசும்கலை, முனைவர்கு. ஞானசம்பந்தன்விஜயாபதிப்பகம்
2. தமிழ்இலக்கியவரலாறு, வரதராசன், மு.,
சாகித்தியஅக்காதெமி, புதுதில்லி
3. தமிழ்நடைக்கையேடு, மொழிஅறக்கட்டளை
4. பயன்பாட்டுத்தமிழ்,
முனைவர்அரங்கஇராமலிங்கம், முனைவர்ஒப்பிலாமதிவாணன்,
சென்னைபல்கலைக்கழகம், 2007
5. மொழிபெயர்ப்பியல்அடிப்படைகள், கா.பட்டாபிராமன்,
யமுனைப்பதிப்பகம், திருவண்ணாமலை

6 பாடநூல்தேடலுக்கானஇணையம்

- <http://www.tamilvu.org/library>
- <https://archive.org/>

II SEM 21LFR002 FRENCH II 3 0 0 3

COURSE OBJECTIVE:

To fortify the grammar and vocabulary skills of the students.

To enable the students have an idea of the French culture and civilization

UNIT:I LECON 10-11 09

Leçons :10 Les affaires marchent,11 un repas midi a problèmes- Réponses aux questionstires de la leçon-grammaire ;présent progressif passe récent ou future proche-complément d'Object directe-complément d'objet

UNIT II- LECON 12-13 09

Leçons 12 :tout est bien qui fini bien,-13 aux armes citoyens-réponses aux questions tires dela leçon-grammaire :les pronoms<<en ou y>> rapporter des paroles-Les pronoms relatifs que, qui ou ou.

UNIT III-LECON 14-15 09

Leçons 14.Qui ne risque rien n'a rien-15.la fortune sourit aux audacieux-réponses aux questions tires de la leçon-grammaire : comparaison-les phrases au passe compose.

UNIT :IV-LECON 16-18 09

Leçons 16 la publicité et nos rêves 17 la France la monde 18 campagne publicitaire réponsesaux questions tires de la leçon-grammaire :les phrases a l'imparfait-les phrases au future UNIT :V-COMPOSITION : 09

A écrire une lettre de regret//refus a un ami concernant l'invitation d'une célébration reçue-a écrire un essaie sur un sujet générale-a lire le passage et répondre aux questions.

Total No of Hours : 45

TEXTBOOK :

Jack GIRARDER & Jean Marie GRIDLIG,<<Méthode de Français PANORAMA>>, Clé Internationale, Goyal Publication ,New Delhi Edition 2014.

REFERENCE BOOKS:

DONDO Mathurin, "Modern French Course", Oxford University Press, New Delhi Edition 2014.Nithya Vijayakumar get ready French grammar-Elementary Goyal publications ,New Delhi, Edition 2014.

I SEM ENGLISH II**POETRY****3 0 03****COURSE OBJECTIVE**

To enable students to develop their communication skills effectively.

To enrich their vocabulary in English

To develop communicative competency.

Credit Hours

UNIT I**09**

1. Growing Old - Winston Farewell

2. Ecology - A. K. Ramanujan

UNIT II**09**

3. Stopping by Woods on a Snowy Evening - Robert Frost

4. Our Casuarina Tree - Toru Dutt

UNIT III**09**

5. Goodbye Party for Miss Pushpa T.S. - Nissim Ezekiel

6. The Bull - Ralph Hodgson

UNIT IV**09**

7. If - Rudyard Kipling

8. The Drowned Children - Louise Glück

UNIT V**09**

Australia - A.D.Hope

A Far Cry from Africa - Derek Walcott

Total No of Hours :45 Hours

COURSE OUTCOME

At the end of this course students will be able to,

CO1: Learn to employ Poetic expressions in the course of daily speech.

CO2: Prove their better communicative ability.

CO3: Prove their skill in writing sentences with poetic impact.

CO4: Develop different sensibilities in approaching life.

CO5: Solve life's problems as highlighted in the selections.

TEXT BOOKS

Selections from Caribbean Literature. Mahaam Publishers, Chennai.

Our Casuarina Tree - Vasan Publication By Dr.A Shanmugakani

WEB SOURCES

<https://www.gradesaver.com/>

<https://www.enotes.com/>

<https://www.jstor.org/>

<https://www.sparknotes.com/>

<https://www.cliffsnotes.com/>

Course Objective: To understand the object oriented programming using Java, invoking methods using class libraries, the important topics and principles of software development & be able to use the Java SDK environment to create, debug and run simple Java programs.

UNIT I INTRODUCTION TO JAVA 15

Introduction to Java – Features of Java – Object Oriented Concepts – Lexical issues – Data Types – Variables – Arrays – Operators – Control Statements.

UNIT II CLASSES, OBJECTS AND METHODS 15

Classes – Objects – Constructors – Overloading methods – Access control – Static and fixed Methods – String Class – Inheritance – Overriding Methods – Using Super – Abstract Class.

UNIT III PACKAGES 15

Packages – Access Protection – Importing Packages – Interfaces – Exception Handling – Thread – Synchronization – Messaging – Runnable Interface – Inter Thread Communication.

UNIT IV I/O STREAMS 15

I/O Streams – File Streams – Applets – String Buffer – Char Array – Java Utilities – Random, Vector, Calendar and Properties.

UNIT V NETWORK BASICS 15

Network Basics – Socket Programming – Proxy Server – URL – Datagrams – Working With Windows Using AWT Classes. AWT Controls – Layout Management and Menus.

TOTAL: 75 HOURS

COURSE OUTCOME:

At the end of this course the students will be able to:

CO1: Create an integrated development environment to write, compile, run, and test simple object-Oriented Java programs.

CO2: Demonstrate and make elementary modifications to Java programs that solve real-world Problems.

CO3: Validate input in a Java program

CO4: Identify and fix defects and common security issues in code.

CO5: Design version control system to track source code in a project.

TEXT BOOK:

1. P. Naughton & H. Schildt, Java2-The Complete Reference , 5th Edition, Tata McGraw Hill, 2002.

REFERENCES:

Cay S. Horstmann, Gray Cornell, Core Java 2 Volume 1 Fundamentals , Addison Wesley, 2003.

K. Arnold and J. Gosling, The Java Programming Language , Second Edition.

WEB SOURCES:

https://www.w3schools.com/java/java_intro.asp

[https://en.wikipedia.org/wiki/Java_\(programming_language\)](https://en.wikipedia.org/wiki/Java_(programming_language))

COURSE OBJECTIVE :

To impart the knowledge of Integral calculus, Differential Equations, Fourier Series and Laplace transform. The course will also serve as a prerequisite for post graduate and specialized studies and research.

UNIT-I INTEGRAL CALCULUS**12**

Integral calculus: Integration – Definite integrals – Bernoulli's formula -Reduction formula for

$$\int \sin^n x dx, \int \cos^n x dx, \int \tan^n x dx, \int x^n e^{ax} dx.$$

UNIT-II DIFFERENTIAL EQUATIONS**12**

Ordinary Differential Equations: First order of higher degree equations – Second order and non-homogenous linear differential equations with constant coefficient. Partial Differential Equations: Formation of partial differential equations by eliminating arbitrary constants and arbitrary function- Solutions of four standard types of first order equation-Lagrange method of solving linear partial differential equation $Pp + Qq = R$

UNIT-III FOURIER SERIES**12**

Fourier series of periodic functions on the interval $[c, c+2\pi]$ – Even and Odd functions- Half range sine and cosine series.

UNIT-IV LAPLACE TRANSFORM**12**

Laplace transformation: Definition, Laplace transform of basic trigonometric, exponential and algebraic functions - Inverse Laplace transform- Solving differential equation of second order with constant coefficients using Laplace transform

UNIT – V VECTOR DIFFERENTIATION**12**

Introduction-Scalar point functions-Vector point functions-Vector differential operator, Gradient-Divergence-Curl-Solenoidal-irrotational-identities- Simple problems

Total No of Hours : 60 Hrs

COURSE OUTCOMES:

On completion of this course, the students will be able to:

CO1. Understand the key terminology, concept tools and techniques used in Integral calculus

CO2. Discuss the applications of differential equations.

CO3. Analyze the uses, limitations and applications of Fourier series

CO4. Evaluate Laplace transform and its applications

CO5. Understand the key terminology, concept tools and techniques used in Vector Differentiation.

TEXT BOOKS

P. Kandaswamy and K.Thilagavathy, Allied Mathematics paper II, 2nd Semester, S.Chand Publishing Pvt. Ltd. 1st Edition, 2004

S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.

REFERENCE BOOKS:

P.R. Vittal, Allied Mathematics, Margham Publications, 4th Edition 2009.

A. Singaravelu, Allied Mathematics, Meenakshi Agency, 2007.

P. Duraipandian and S.UdayaBaskaran, Allied Mathematics, Vol. I & II Muhil Publications, Chennai

WEB SOURCES

http://mdudde.net/pdf/study_material_DDE/M.Sc.Mathematics/DIFFERENTIAL%20EQUATIONS.pdf

<https://ncert.nic.in/ncerts/l/lemh201.pdf>

http://www.universityofcalicut.info/SDE/Vector_calculus_BSc_Maths.pdf

IBM CLOUD FUNDAMENTALS (IBM COLLABORATED)

Course Objective:

This course introduces the basic concepts of Cloud computing.
It provides the overview of technologies used in cloud computing.
To understand the concept of the cloud architecture and its services.
To provide the information on cloud platforms and its security.

Unit-1 Introduction to cloud Computing and DEEP DIVE INTO IBM Cloud 12

Introduction to cloud Computing - Traditional way of working in IT, Traditional IT challenges, Future trend in IT, What is Cloud Computing?, Cloud Characteristics, Service and Delivery models, Cloud computing helps overcome IT challenges, IBM Cloud - IAAS, PAAS and SAAS and Cloud delivery models. Deep Dive into IBM cloud - What is IBM Cloud?, Evolution of IBM Cloud, Why IBM Cloud?, IBM Cloud UI tour, Organizations, Spaces, Users and Domains, Organizations and Spaces.

Unit-2 IBM Cloud Architecture 12

Deep Dive into IBM cloud – Quota, User Management, Monitoring and Logs, Containers, Services, IBM Cloud Value to Developers, IBM Cloud Pricing Options. IBM Cloud Architecture - What is Cloud Foundry?, Cloud Foundry languages, frameworks, and services, Cloud Foundry provides more than 10x increase in speed and agility, Cloud Foundry Architecture - High Level, Cloud Foundry Architecture – CF Kernel Internal, Description of each of the components: Cloud Controller and Diego Brain.

Unit-3 IBM Cloud Services 12

IBM Cloud Architecture - nsync, BBS, and Cell Reps, App Storage and Execution, Messaging, Metrics and Logging, Cloud Foundry - Application Staging, Various IBM Cloud architecture, Cloud foundry command line interface, Cloud Foundry tools. IBM Cloud Services - IBM Cloud Services, Analytics Services, Watson Services, Storage, DevOps, Auto-Scaling, Why Register a Service?, Registering Services in IBM Cloud and Adding a Service to application.

Unit-4 IBM Cloud DevOps Services 12

IBM Cloud Services - Requesting a new service instance, Configuring your application to interact with a service, VCAP_SERVICES, Service Metadata, IBM Cloud User Provided Service Instance – Service Metadata, IBM Cloud User Provided Service Instance - User Interface service metadata. IBM Cloud DevOps Services - What is IBM Cloud DevOps Services?, Continuous delivery, Toolchains overview, Code, Code Repository, Delivery Pipeline and Get started with toolchains in IBM Cloud.

Unit-5 NODE RED - Getting Started and NODE CREATION 12

What is Node-RED?, Node-RED Software Download, Installing Node.js Windows Build Tools, Running Node-RED and Node-RED Architecture. NODE RED -NODE CREATION - Create a Node-RED Flow, Explain Types of Nodes and functions, INJECT Node, DEBUG Node, FUNCTION Node, CHANGE Node, RASPBERRY Pi Node, SWITCH Node and PALETTE Nodes.

Total Hours: 60

Course Outcomes:

- CO-1: To understand the concepts of Cloud computing.
- CO-2: To examine various technologies in cloud.
- CO-3: To identify and apply knowledge in architectures of infrastructure.
- CO-4: To analyze the fundamental and advance architectures in cloud services.
- CO-5: To apply the security models in the cloud environment.

Text Books:

1. Thomas Erl, Zaigham Mahmood, and Ricardo Puttini, "Cloud Computing: Concepts, Technology and Architecture", Prentice Hall, U.S.A., 2013.
2. Rajkumar Buyya, James Broberg, Andrzej Goscinsky, "Cloud Computing Principles and Paradigms", Wiley India Pvt. Ltd., 2011.

Reference Books:

1. George Reese, "Cloud Application Architectures", Shroff O'Reilly, ISBN: 8184047142, 2009.
2. Michael Miller, "Cloud Computing Web Based Applications That Change The Way You Work and Collaborate Online", Pearson Education, 2009.
3. PrasantaPattnaik, ManasKabat, "Fundamentals of Cloud Computing", S.Chand (G/L) & Company Ltd; First edition (2014).

Web Link:

1. <https://www.digitalocean.com/community/tutorials/a-general-introduction-to-cloud-computing>
2. <https://www.ibm.com/cloud/architecture/>
3. <https://www.ibm.com/cloud>
4. <https://www.ibm.com/docs/en/cloud-private/3.1.2?topic=ubicpcf-working-user-provided-services-in-cloud-private-cloud-foundry>

Course Objective: To understand and apply the fundamentals of core Java and to implement inheritance, polymorphism, interfaces, multithreading, networking. Developing applications using client side and server side programming.

EXPERIMENTS

1. Program to define a structure of a basic JAVA program.
2. Program to define operators, arrays and control structures.
3. Program to define class and constructors. Demonstrate constructors.
4. Program to define class, methods and objects.
5. Program to demonstrate method overloading.
6. Program to define inheritance and show method overriding.
7. Program to demonstrate Packages.
8. Program to demonstrate Exception Handling.
9. Program to demonstrate Multithreading.
10. Program to demonstrate Applet structure
11. Program to demonstrate Graphics programming

TOTAL: 90 HOURS

COURSE OUTCOME:

At the end of this course the students will be able to:

CO1: Identify classes, objects, members of a class and relationships among them needed for a specific problem

CO2: Write Java application programs using OOP principles and proper program structuring Demonstrate the concepts of polymorphism and inheritance

CO3: Create Java programs to implement error handling techniques using exception handling

CO4: Design and develop GUI based applications

CO5: Develop graphics applications

III SEMESTER

COURSE OBJECTIVES:

To provide computational environments for data scientists using python.

To includes the array for efficient storage and manipulation of dense data arrays in python

To features the data frame for efficient storage and manipulation of labeled/columnar data in python

To make decisions using applied and practical machine learning techniques.

To learn the efficient and clean Python implementations of the most important and established machine learning algorithms

UNIT I | PYTHON: BEYOND NORMAL PYTHON**12**

Shell Or Notebook – I python Shell – I python Magic Commands - Input And Output History - Ipython And Shell Commands– Shell Related Magic Commands - Errors And Debugging - Profiling And Timing Code.

UNIT II INTRODUCTION TO NUMPY**12**

Understanding Data Types - The Basics Of Numpy Arrays - Computation On Numpy Arrays -Universal Functions –Aggregations - Min, Max,computation On Arrays: Broadcasting - Comparisons, Masks, And Boolean Logic – Fancy Indexing - Sorting Arrays - Structured Data: Numpy’s Structured Arrays.

UNIT III DATA MANIPULATION WITH PANDA**12**

Installing And Using Pandas - Introducing Pandas Objects - Data Indexing And Selection - Operating On Data In Pandas-Handling Missing Data -Hierarchical Indexing - Combining Datasets: Concat And Append - Combining Datasets: MergeAnd Join - Aggregation And Grouping - Pivot Tables - Vectorized String Operations - Working With Time Series - HighPerformance Pandas: Eval() And Query()

UNIT IV VISUALIZATION WITH MATPLOTLIB**12**

General Matplotlib Tips - Two Interfaces For The Price Of One - Simple Line Plots - Simple Scatter Plots – Visualizing Errors - Density And Contour Plots -Histograms, Binnings, And Density - Customizing Plot Legends – Customizing Colorbars - Multiple Subplots - Text And Annotation - Customizing Ticks - Customizing Matplotlib: Configurations And Stylesheets - Three-Dimensional Plotting In Matplotlib - Geographic Data With Basemap - Visualization With Seaborn.

UNIT - V MACHINE LEARNING**12**

Machine Learning - Introducing Scikit-Learn - Hyperparameters And Model Validation - Feature Engineering – Naïve Bayes Classification - Linear Regression - Support Vector Machines -Manifold Learning - K-Means Clustering – Gaussian Mixture Models.

TOTAL: 60 Hours

COURSE OUTCOMES:

CO1: Perform powerful libraries for Machine learning applications and other scientific computations

CO2: Describe about numpy and deal with feature like linear algebra, fourier transforms and advanced random number capabilities.

CO3: Implement the pandas help us with mugging and preparing data and also it is great for operating on and maintaining structured data, manipulating, transforming, and cleaning data

CO4: Apply the matplotlib will let you plot different kinds of graphs and visualizing different types of data

CO5: Describe the concepts and model of machine learning

III SEM

CRYPTOGRAPHY AND NETWORK SECURITY 4 0 0 4

COURSE OBJECTIVES:

Students to have a theoretical understanding of the principles underlying cryptography and cryptanalysis.

Students to have a fundamental understanding of symmetric and asymmetric encryption, hashing, and digital signatures.

Students to learn the basic concepts in networking and wireless security, applied cryptography, as well as ethical, legal, social and economic facets of security.

Students to be able to evaluate the security of communication systems, networks and protocols based on a multitude of security metrics.

UNIT I CRYPTOGRAPHY AND ENCRYPTION TECHNIQUES 12

Overview – Principles-Concepts –Symmetric and Asymmetric Encryption–AES – Block Cipher Operations– RSA Algorithm – Diffie Hellman Key Exchange.

UNIT II DATA INTEGRITY ALGORITHMS AND MUTUAL TRUST 12

Hash Functions – SHA – Message Authentication Codes – Digital Signatures- Key Management and Distribution – X.509 Certificates – Kerberos.

UNIT III NETWORK SECURITY 12

Vulnerabilities - Security Assessment, Analysis, and Assurance-Disaster Management – Access Control and Authentication – Authorization.

UNIT IV WIRELESS NETWORK SECURITY 12

Wireless Security – Wireless LAN - Smart Phones – PDA – Bluetooth- Broadband Security

UNIT V SECURITY IN EMERGING TECHNOLOGIES 12

Next Generation Mobile Networks – Wireless Sensor Networks – Adhoc Networks – IP based Mobile Networks

Total Hours – 60

COURSE OUTCOMES:

Students who complete this course should

CO1: Analyse the vulnerabilities in any computing system and hence be able to design a security solution

CO2: Identify the security issues in the network and resolve it

CO3: Evaluate security mechanisms using rigorous approaches by key ciphers and Hash functions.

CO4: Demonstrate various network security applications, IPSec, Firewall, IDS, Web Security, Email Security and Malicious software

CO5: Ability to take up doctoral level research work in security

TEXT BOOKS

1. William Stallings, "Cryptography and Network Security – Principles and Practice" 7th Edition, Pearson Education, ISBN No. 978- 0134444284, 2016.

2. Joseph MiggaKizza, " Guide to Computer Network Security" 3rd Edition, Springer Publishers, ISBN No 978-1447166535, 2015.

REFERENCES:

1. Wolfgang Osterhage, " Wireless Security", CRC Press, ISBN No. 978-1578087686, 2011.

2. William Stallings, "Network Security Essentials, Applications and Standards", 5th Edition, Pearson Education, ISBN No. 978-0133370430, 2013.

3. John R. Vacca , "Network and System Security", 2nd Edition, Elsevier Publishers, ISBN No. 978-0124166899, 2014.

III SEM

Essentials of Block chain Technology Applications 4 0 0 4

Course Objectives:

Understand the structure of a block chain and why/when it is better than a simple distributed Database

Evaluate the setting where a block chain-based structure may be applied, its potential and its limitations

Understand how block chain systems (mainly Bitcoin and Ethereum) work

Design, build, and deploy smart contracts and distributed applications,

UNIT I INTRODUCTION

12

Introduction of block chain- the basic terms about block chain-advent of block chain technology- evolution of block chain technology –block chain mechanism -the advantages introduced by the block chain technology -challenges of block chain adoption -Distinguish different types of block chains.

UNIT II BITCOIN

12

Transactions, blocks, mining, scripting, attacks on mining-Building blocks: Hash functions, signature schemes, zero-knowledge proofs, consensus algorithms- Proof of work, proof of stake, proof of burn, proof of storage-Distinguish Proof-of-Work and Proof-of-Stake concepts -- Byzantine Fault Tolerance- Sharding - Layer 2 approaches

UNIT III SMART CONTRACTS

12

Basic terms about smart contract -the advent of smart contract - the smart contract mechanism- Restate the advantages introduced by the smart contract -challenges of smart contract - different applications of smart contract -Implement hands-on the smart contract using solidity and Ethereum

UNIT IV PRIVACY ISSUES

12

Anonymity, mixing techniques, privacy with ZK-Snarks.-Permissioned block chains: Distributed consensus, sharing algorithms, privacy issues.

UNIT V SCALING ISSUES

12

Sharding - Layer 2 approaches Lightning networks, Payment networks. Platforms and ledgers: Ethereum, Ripple, Hyper ledger, Algorand, etc –Block chain applications
Government- Identity management-Auto executing contracts-Three signature escrow- Triple entry account- Elections and voting.

TOTAL : 60 HRS.

COURSE OUTCOME:

- CO1: Blockchain technology landscape
- CO2: Understand the block chain technology, its benefits and challenges
- CO3: Applications and implementation strategies
- CO4: Explain Bit coin security practices
- CO5: State-of-the-art, open research challenges, and future directions

TEXTBOOKS

1. A. Narayanan, J. Bonneau, E. Felten, A. Miller, S Goldfeder, J. Clark: Bitcoin and Cryptocurrency Technologies, Princeton University Press. 2017.
2. A. M. Antonopoulos: Mastering Bitcoin: Programming the Open Blockchain, O’Reilly, 2017.

REFERENCES

- 1.Draft version of “S. Shukla, M. Dhawan, S. Sharma, S. Venkatesan, ‘Blockchain Technology: Cryptocurrency and Applications’, Oxford University Press, 2019.
- 2.J.A.Garay et al, the Bitcoin backbone protocol - analysis and applications eurocrypt 2015 Incs vol 9057, (volii), pp 281-310
- 3.R.Pass et al, Analysis of blockchain protocol in asynchronous networks , eurocrypt 2017,

III SEM FINANCIAL ACCOUNTING-I 4 0 0 4

COURSE OBJECTIVE

To give an insight into the basics of Accounting Concepts and Principles to Prepare to Studentsto have the foot hold in Accounts.

UNIT I INTRODUCTION TO ACCOUNTING 12

Meaning and definition of accounting- functions of accounting – limitations of accounting –accounting concepts and conventions, systems of accounting – single entry system – double entry system – subsidiary books including cashbook – trial balance – rectification of errors.

UNIT II PREPARATION OF FINAL ACCOUNTS 12

Final accounts with adjustments – closing stock, outstanding expenses, unexpired or prepaid expense, accrued income, income received in advance, depreciation, additional bad debts, provision for doubtful debts, provision for discount on debtors, interest on capital, interest on drawing, discount on creditors and creation of various reserves.

UNIT III BANK RECONCILIATION STATEMENT AND ACCOUNTS 12

Bank reconciliation statement – Importance of Bank Reconciliation Statement – Scope of Bank Reconciliation Statement - Insurance Claim Account – loss of property and stock – average clause.

UNIT IV CALCULATION OF DEPRECIATION UNDER DIFFERENT 12

Depreciation accounts – definition and causes of depreciation – need for depreciation – methods of calculating the amount of depreciation – straight line method – diminishing balance method.

UNIT V SINGLE ENTRY SYSTEM OF ACCOUNTING 12

Single entry system – salient features – limitations of single entry system – distinction between single entry system and double entry system – ascertainment of profit – net worth method – conversion method (simple problems only)

Total No of Hours: 60 Hrs

COURSE OUTCOME

At the end of this course the students can able to,

CO1: Develop accounts using adjustment. Combinational circuits

CO2:BuildJournal,ledgerandBalanceSheet.

CO3:Analyze the depreciation under different methodsCO4:Understand the basic concepts of accountingCO5:Explainsingleentry anddouble entrysystem.

TEXTBOOKS:

- 1.T.S.Reddy&A.Murthy,“FinancialAccounting”,MarghamPublications,SixthRevisionEdition, 2011.
- 2.P.C.Tulsian,“FinancialAccounting”,TataMCGrawHillLtd,2003.

REFERENCES:

- 1.AssishK.Bhattacharyya,“FinancialAccounting”,Prenticeofhalof India,2002.
- 2.N.Vinayagam andB.Charumaki,“FinancialAccounting”,S.Chand&CompanyLtd.,2002, Reprint– 2008.

WEBSITES

www.accountigcoach.com

www.topaccountingdegrees.org

WEBSOURCES

<https://www.csus.edu/indiv/c/clarket/course1/chap001.pdf>

<https://www.slideshare.net/ashu1983/financial-accounting>

III SEM

PRACTICAL- PYTHON LAB 0 0 4 2

COURSE OBJECTIVES:

To implement Python programs with conditionals and loops. Also represent compound data using Python lists, tuples, dictionaries and Read and write data from/to files in Python.

LIST OF PROGRAMS:

1. Compute the GCD of two numbers.
2. Find the square root of a number (Newton's method)
3. Exponentiation (power of a number)
4. Find the maximum of a list of numbers
5. Linear search and Binary search
6. Selection sort, Insertion sort
7. First n prime numbers
8. Multiply matrices
9. Programs that take command line arguments (word count)
10. Find the most frequent words in a text read from a file
11. Simulate elliptical orbits in Pygame
12. Simulate bouncing ball using Pygame

TOTAL HOURS: 60Hrs

TEXTBOOKS:

1.CharlesDierbach,“IntroductiontoComputerScienceusingPython-AcomputationalProblem solvingFocus”,Wiley IndiaEdition,2015.

REFERENCEBOOKS:

1. Timothy A. Budd, "Exploring Python", Tata McGraw Hill Education Private Limited 2011, 1st Edition.
. Ch Satyanarayana M Radhika Mani, BN Jagadesh, "Python programming", Universities Press 2018.

WEBSITE

www.w3schools.com

www.tutorialspoint.com

www.javapoint.com

www.geeksforgeeks.org

WEBSOURCE

<http://interactivepython.org/courselib/static/pythonds>

<http://docs.python.org/3/tutorial/index.html>

<https://www.w3schools.com/python/default.asp>

https://www.tutorialspoint.com/python3/python_tutorial.pdf

III SEM

NETWORK SECURITY LAB 0 0 4 2

COURSE OBJECTIVES:

The student learns to work with various Redundancy Check Algorithms, Sliding Window Protocol, Routing Algorithm, Sub netting Procedures.

LIST OF PROGRAMS:

1. To detect Errors using Vertical Redundancy Check (VRC).
2. To detect Errors using Longitudinal Redundancy Check (LRC).
3. To detect Errors using Cyclic Redundancy Check (CRC).
4. Socket programming to implement Asynchronous Communication.
5. Socket programming to implement Isochronous Communication.
6. To implement Stop & Wait Protocol.
7. To implement Sliding Window Protocol.
8. To implement the Shortest Path Routing using Dijkstra algorithm.
9. Socket Programming to Perform file transfer from Server to the Client.
10. To implement Remote Procedure call under Client / Server Environment.
11. Code simulating PING and TRACEROUTE commands
12. Implementing of Sub netting

TOTAL HOURS: 60Hrs

IVSEMESTER

COURSE OBJECTIVES:

- ✓ To provide hardware and software issues in modern distributed systems.
- ✓ To get knowledge in distributed architecture, naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.
- ✓ To analyze the current popular distributed systems such as peer-to-peer (P2P) systems will also be analyzed.

UNIT-I Characterization of Distributed Systems 15

Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges. System Models: Introduction, Architectural Models, Fundamental Models.

UNIT-II Time and Global States 15

Introduction, Clocks Events and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging. Coordination and Agreement: Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication, Consensus and Related Problems.

UNIT-III Inter Process Communication 15

Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in UNIX. Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

UNIT-IV Distributed File Systems 15

Introduction, File Service Architecture, Case Study 1: Sun Network File System, Case Study 2: The Andrew File System. Name Services: Introduction, Name Services and the Domain Name System, Directory Services, Case Study of the Global Name Services. Distributed Shared Memory: Introduction, Design and Implementation Issues, Sequential Consistency and IVY case study, Release Consistency, Munin Case Study, Other Consistency Models.

UNIT- V Transactions and Concurrency Control 15

Introduction, Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for Concurrency Control. Distributed Transactions: Introduction, Flat and Nested Distributed Transactions, Atomic Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks, Transaction Recovery.

TOTAL : 75 HRS.

TEXT BOOK

1. Distributed Systems, Concepts and Design, George Coulouris, J Dollimore and Tim Kindberg, Pearson Education, Edition. 2009.

REFERENCE BOOKS

1. Distributed Systems, Principles and Paradigms, Andrew S. Tanenbaum, Maarten Van Steen, 2nd Edition, PHI.
2. Distributed Systems, An Algorithm Approach, Sukumar Ghosh, Chapman&Hall/CRC, Taylor & Fransis Group, 2007

IV SEM

ADVANCED DATABASE SYSTEM

4 0 0 4

COURSE OBJECTIVES:

- To learn the modeling and design of databases.
- To acquire knowledge on parallel and distributed databases and its applications.
- To study the applications of Object-Oriented database
- To understand the principles of intelligent databases and usage of advanced data models.
- To learn emerging databases such as XML, Cloud and Big Data.

UNIT I PARALLEL AND DISTRIBUTED DATABASES

12

Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems- Distributed Systems – Parallel Databases: I/O Parallelism – Inter and Intra Query Parallelism – Inter and Intra operation Parallelism – Distributed Database Concepts - Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Three Tier Client Server Architecture- Case Studies.

UNIT II OBJECT AND OBJECT RELATIONAL DATABASES

12

Concepts for Object Databases: Object Identity – Object structure – Type Constructors – Encapsulation of Operations – Methods – Persistence – Type and Class Hierarchies – Inheritance – Complex Objects – Object Database Standards, Languages and Design: ODMG Model – ODL – OQL – Object Relational and Extended – Relational Systems: Object Relational features in SQL/Oracle – Case Studies.

UNIT III XML DATABASES

12

XML Databases: XML Data Model – DTD - XML Schema - XML Querying – Web Databases – JDBC – Information Retrieval – Data Warehousing – Data Mining

UNIT IV MOBILE DATABASES

12

Mobile Databases: Location and Handoff Management - Effect of Mobility on Data Management - Location Dependent Data Distribution - Mobile Transaction Models - Concurrency Control - Transaction Commit Protocols- Mobile Database Recovery Schemes

UNIT V MULTIMEDIA DATABASES

12

Multidimensional Data Structures – Image Databases – Text/Document Databases- Video Databases – Audio Databases– Multimedia Database Design.

TOTAL:60 hours

COURSE OUTCOMES:

Upon the successful completion of the course, students will be able to:

CO1: Develop skills on databases to optimize their performance in practice.

CO2: Analyze each type of databases and its necessity

CO3: Design faster algorithms in solving practical database problems

CO4: Analyze mobile databases and various transaction models.

CO5: Gain knowledge about multimedia databases and its applications.

TEXT BOOKS

1. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Fifth Edition, Pearson Education/Addison

Wesley, 2007.

2. Thomas Cannolly and Carolyn Begg, " Database Systems, A Practical Approach to Design, Implementation and

Management", Third Edition, Pearson Education, 2007.

3. Henry F Korth, Abraham Silberschatz, S. Sudharshan, "Database System Concepts", Fifth Edition, McGraw Hill,

2006.

4. V.S.Subramanian, "Principles of Multimedia Database Systems", Harcourt India Pvt Ltd., 2001.

REFERENCES

1. C.J.Date, A.Kannan and S.Swamynathan,"An Introduction to Database Systems", Eighth Edition, Pearson

Education, 2006.

2. Vijay Kumar, " Mobile Database Systems", John Wiley & Sons, 2006.

IV SEM

STATISTICAL AND NUMERICAL METHODS

5005

COURSE OBJECTIVE:

To develop the skills of the students in the concepts of Statistics and Numerical Methods. The course will also serve as a prerequisite for postgraduate and specialized studies and research.

UNIT-I INTRODUCTION TO STATISTICS

15

Introduction to statistics - Measures of Central Tendency: Mean, Median, Mode - Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation and Coefficient of Variation.

UNIT-II CORRELATION AND REGRESSION ANALYSIS

15

Correlation: Types of Correlation - Methods of studying correlation - Scatter diagram method, Karl Pearson's Coefficient of correlation, Spearman's Rank Correlation Coefficient. Regression: Regression Lines and Regression equations - simple problems.

UNIT-III TESTING OF HYPOTHESIS

15

Introduction - Concept of Sampling and Sampling Distribution - Parameter and Statistics - Standard error - Tests of Significance for small samples: t-test for single mean - difference of means, F-test (variance - Ratio test), Chi-Square tests for Goodness of Fit and test for independence of attributes in contingency table.

UNIT-IV ALGEBRAIC AND TRANSCENDENTAL EQUATIONS

15

Roots of equations: Graphical Method - Bisection Method - False position Method - Newton

- Raphson's Method - Secant Method - Algebraic Equations: Gauss Elimination Method - Gauss-Jordan Method - Matrix Inverse Method - Gauss-Seidel Method.

UNIT-V NUMERICAL DIFFERENTIATION AND INTEGRATION

15

Numerical Differentiation - Errors in Numerical Differentiation - Cubic Spline Method - Numerical Integration - Trapezoidal Rule - Simpson's 1/3 and 3/8 Rules - Romberg Integration -

Ordinary Differential Equations - Taylor's Series Method - Euler's Method - Runge-Kutta 2nd and 4th Order Methods.

Total No of Hours: 75

COURSE OUTCOMES:

On completion of this course, the students will be able to:

CO1. Understand the key terminology, concepts tools and techniques used in statistical analysis

CO2. Evaluate the underlying assumptions of analysis tools of correlation and

regression
CO3. Understand the issues surrounding techniques and significance of testing of hypothesis
CO4. Analyze the uses and limitations and applications of algebraic and transcendental equations

CO5. Analyze the utilization of differentiation and integration

TEXTBOOKS

1. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, 35th Revised Edition, 2007. (Unit I, II, III)

2. S. Arumugam, A. Thangapandilsaac and A. Somsundaram, Numerical Methods, Scitech Publications India Pvt. Ltd. 2001. (Unit IV, V)

REFERENCE BOOKS:

P.R. Vital and V. Malini, Statistical and Numerical Methods, Margham Publications, 1st Edition, 2007.

A. Singaravelu, Numerical Methods, Meenakshi Agency, 2008

WEBSOURCES

<https://d3bxy9euw4e147.cloudfront.net/oscms-prodcms/media/documents/IntroductoryBusinessStatistics-OP.pdf>

<http://www.ddegjust.ac.in/studymaterial/mcom/mc-106.pdf>

IV SEM ADVANCED DATABASE MANAGEMENT SYSTEM LAB 0 0 4 2

COURSE OBJECTIVES:

Explore the features of a Database Management Systems

To interface a database with front end tools

To understand the internals of a database system

LIST OF LAB EXERCISE

1. Distributed Database for Bookstore
2. Deadlock Detection Algorithm for distributed database using wait- for graph
3. Object Oriented Database – Extended Entity Relationship(EER)
- 4 Parallel Database – University Counselling for Engineering
5. Parallel Database – Implementation of Parallel Join & ParallelSort
6. Active Database – Implementation of Triggers & Assertions for Bank Database
7. Deductive Database – Constructing Knowledge Database for Kinship Domain (Family Relations)
8. Study and Working of WEKA Tool
- 9 Query Processing – Implementation of an Efficient QueryOptimizer
- 10 Designing XML Schema for Company Database
11. Building Web Applications using PHP & MySQL
12. Big Data Analytics using Hadoop

TOTAL: 45 Hours

COURSE OUTCOMES:

At the end of the course, a student will be able to

CO1: Create databases for database-driven applications.

CO2: Apply transaction management for suitable case study.

CO3: Implement query processing and optimization.

CO4: Analyze the applicability of advanced databases like DDBMS, OODBMS,etc. in real life scenarios.

CO5: Work in teams to create and implement distributed databases for real-life case study

COURSE OBJECTIVES:

- ✓ Explore the features of a Distributed System Lab
- ✓ To provide hardware and software issues in modern distributed systems.
- ✓ To get knowledge in distributed architecture, naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.
- ✓ To analyze the current popular distributed systems such as peer-to-peer (P2P) systems will also be analyzed

LIST OF LAB EXERCISE

1. To Simulate the functioning of Lamport's Logical Clock in C.
2. To Simulate the functioning of Lamport's Vector clock in C
3. Simulate the Distributed Mutual Exclusion in C.
4. Implement a Distributed Chat Server using TCP Sockets in C.
5. Implement Java RMI™ mechanism for accessing methods of remote systems.
6. Simulate Balanced Sliding Window Protocol in C.
7. Implement CORBA mechanism by using C++ program at one end and Java program on the
8. To Simulate the Non Token/ Token based algorithm in Distributed system.
9. To Simulate the Distributed Deadlock Detection algorithm-Edge chasing.
10. To Implement 'RPC' mechanism for accessing methods of remote systems.

VSEMESTER

V SEM

PRINCIPLES CLOUD COMPUTING 4 1 0 5

COURSE OBJECTIVES:

This course introduces the fundamental concepts of cloud computing model for enabling ubiquitous, convenient access to shared pool of configurable computing resources and storage solutions over a network.

COURSE OUTCOMES:

CO-1: Ability to understand architecture and concepts of different cloud models.

CO-2: Capable of creating applications by utilizing cloud platforms.

CO-3: Ability to assess own organization's needs for capacity building and training in cloud related IT areas.

CO-4: Attempt to generate new ideas and innovations in cloud computing.

CO-5: Ability to choose the appropriate technologies and approaches for the related issues to cloud computing.

Unit I PRINCIPLES CLOUD COMPUTING

15

History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services

Unit II WEB-BASED APPLICATION

15

Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds

Unit III CENTRALIZING EMAIL COMMUNICATIONS

15

Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events for the Corporation

Unit IV COLLABORATING ON CALENDARS SCHEDULES AND

TASKMANAGEMENT

15

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

Unit V COLLABORATING VIA WEB-BASED COMMUNICATION TOOLS

15

Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis

TOTAL: 75 Hours

TEXT BOOKS:

- 1.Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Michael Miller , Queue Publishing, August 2008.
2. Cloud Computing Best Practices for Managing and Measuring Processes for On demand Computing, Applications and Data Centers in the Cloud with SLAs, Haley Beard, Emereo Pty Limited, July 2008.

REFERENCE BOOKS:

1. Cloud computing a practical approach 2010, velete, Antony. T,TMH, 4th Edition,2007.
2. Cloud computing with Windows Azure platfo, Jennings,Roger, PHI,2009

COURSE OBJECTIVES

- ✓ Introducing cloud computing and Amazon web services.
- ✓ Understanding and using EC2 instances.
- ✓ Deploying and managing applications on AWS cloud.
- ✓ Using AWS security services.
- ✓ Implementing the networking concepts on AWS cloud.

LIST OF EXERCISE :

1. Installing openstack - mitaka in Enterprise linux (RHEL 7 based – Centos 7) and verifying the answer file
2. Identify the physical network and Configure the ovs –vctl in Enterprise linux
3. Managing users, projects, flavors, quota for users and projects using keystone service
4. Adding, importing and creating the images using glance service
5. Configure the networking services with external and internal network using neutron
- 102
6. Creating the security groups and generate the key pair (RSA) for the instance of a project
7. Launching the instance in internal network and logging in using key pair
8. Configuring FWAAS in internal network of the private cloud
9. Configuring LBAAS in internal network of the private cloud
10. Configuring VPNAAS in internal network of the private cloud
11. Configuring object storage using swift
12. Monitoring instances using Ceilometer.

COURSE OUTCOME

CO4:Analyze and understand the functioning of different components involved in Amazon web services cloud platform.

CO5:Describe the functioning of Platform as a Service

CO6:Design & Synthesize Storage as a service using own Cloud

V SEM

BLOCKCHAIN LAB

0 0 4 2

LIST OF EXERCISES :

1. Create a Public Ledger vs. Private Ledger with the various attributes like Access, Network Actors, Native token, Security, Speed and examples.
2. How would a blockchain help in processing insurance claims of the insurance industry, which suffers from a number of issues like fraud, contract complexity, human error, information flows in reinsurance and claims processing? Use various aspects to summarize the solution.
3. Prepare your build system and Building Bitcoin Core.
4. Write Hello World smart contract in a higher programming language (Solidity).
5. Solidity example using arrays and functions
6. create a Maven project using Web3j.
7. Construct and deploy your contract (Use deploy method)
Implement an ICO on Ethereum.
8. Install IPFS locally on our machine, initialize your node, view the nodes in network and add files and directories install Swarm and run any test file.

TEXT BOOKS

1. Imran Bashir, "Mastering Blockchain: Distributed Ledger Technology, decentralization, and smart contracts explained", 2nd Edition, Packt Publishing Ltd, March 2018.
3. Bellaj Badr, Richard Horrocks, Xun (Brian) Wu, "Blockchain By Example: A developer's guide to creating decentralized applications using Bitcoin, Ethereum, and Hyperledger", Packt Publishing Limited, 2018.

REFERENCE BOOKS

1. Andreas M. Antonopoulos , "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O'Reilly Media Inc, 2015
2. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, "Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction", Princeton University Press, 2016.

**DISCIPLINE SPECIFIC ELECTIVE
(DSE)**

**DISCIPLINE SPECIFIC ELECTIVE
(DSE - I)**

DSE-1

BLOCKCHAIN ECO SYSTEM 3 0 0 3

COURSE OBJECTIVES:

- ✓ To understand the mechanism of Blockchain eco system.
- ✓ To understand the functionality of current implementation of blockchain technology.
- ✓ To understand the required cryptographic background.
- ✓ To explore the applications of Blockchain to cryptocurrencies and understanding limitations of current Block chain.
- ✓ An exposure towards recent research.

UNIT I Introduction to Cryptography and Cryptocurrencies 12

Cryptographic Hash Functions, Hash Pointers and Data Structures, Digital Signatures, Public Keys as Identities, A

Simple Cryptocurrency.

UNIT II Block Chain Storage Techniques 12

Decentralization-Centralization vs. Decentralization-Distributed consensus, Consensus with- out identity using a blockchain, Incentives and proof of work. Simple Local Storage, Hot and Cold Storage, Splitting and Sharing Keys, Online Wallets and Exchanges, Payment Services, Transaction Fees, Currency Exchange Markets.

UNIT III Mechanics of Bitcoin Mining and Anonymity 12

Bitcoin transactions, Bitcoin Scripts, Applications of Bitcoin scripts, Bitcoin blocks, The Bit- coin network, Limitations and improvements. The task of Bitcoin miners, Mining Hardware, Energy consumption and ecology, Mining pools, Mining incentives and strategies. Anonymity Basics, How to De-anonymize Bitcoin, Mixing, Decentralized Mixing, Zerocoin and Zerocash

UNIT IV Community, Politics, and Regulation 12

Consensus in Bitcoin, Bitcoin Core Software, Stakeholders: Who's in Charge, Roots of Bitcoin, Governments Notice on Bitcoin, Anti Money Laundering Regulation, New York's Bit License Proposal. Bitcoin as a Platform: Bitcoin as an Append only Log, Bitcoins as Smart Property, Secure Multi Party Lotteries in Bitcoin, Bitcoin as Public Randomness, Source-Prediction Markets, and Real World Data Feeds

UNIT V Altcoins and the Cryptocurrency Ecosystem 12

Altcoins: History and Motivation, A Few Altcoins in Detail, Relationship Between Bitcoin and Altcoins, Merge Mining Atomic Crosschain Swaps-6 Bitcoin Backed Altcoins, Side Chains, Ethereum and Smart Contracts, Recent Trends

TOTAL:60 hours

COURSE OUTCOMES:

At the end of this course, the Student will be able to

CO1: To Understand and apply the fundamentals of Cryptography in Cryptocurrency

CO2: To gain knowledge about various operations associated with the life cycle of Blockchain and Crypto currency

CO3: To deal with the methods for verification and validation of Bitcoin transactions

CO4: To demonstrate the general ecosystem of several Cryptocurrency

CO5: To educate the principles, practices and policies associated Bitcoin business

TEXT BOOKS

1.Narayanan, A., Bonneau, J., Felten, E., Miller, A., and Goldfeder, S. (2016). Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press.

REFERENCES

1. Antonopoulos, A. M. (2014). Mastering Bitcoin: unlocking digital crypto currencies. OReilly Media, Inc.

2. Franco, P. (2014). Understanding Bitcoin: Cryptography, engineering and economics. John Wiley and Sons

DSE I PUBLIC KEY INFRASTRUCTRE AND

TRUST MANAGEMENT 3 0 0 3

COURSE OBJECTIVES:

- ✓ The goal of this course is to enable the student to understand the
- ✓ foundational elements and complexity of a public key infrastructure.

UNIT – I 9

Uses of cryptography, the concept devil and Alice. Principle of Cryptography. PKCS standards IEEE P1363, Block cipher modes of operation and data transformation for asymmetrical algorithms,Data transformation for RSA algorithm, Cryptographic Protocols,Protocol properties, Attributes of cryptographic protocols.

UNIT – II 9

Crypto Hardware and software, Smart cards, Universal Cryptointerface, Real world attacks, Evaluation and certification, Public KeyInfrastructure, PKI Works.

UNIT – III 9

Directory service, Requesting certificate revocation information,Practical Aspects Of PKI Construction- The course of constructionof PKI, Basic questions about PKI construction,The most important PKI suppliers.

UNIT – IV 9

The internet and the OSI modelThe OSI model, Crypto standards for OSI Layers 1 and 2- Cryptoextensions for ISDN (Layer 1), Cryptography in the GSM standard(Layer 1), Crypto extensions for PPP (Layer 2), Virtual private networks.

UNIT – V 9

IPsec and IKE, IPsec, IKE, SKIP, Critical assessment of IPsec, Virtual private network with IPsec,SSL, TLS AND WTLS (Layer 4)-SSL working method, SSL protocol operation,Successful SSL, Technical comparison between IPsec and SSL, WTLS.

TOTAL : 45HRS

TEXT BOOKS:

1. Klaus schmeh: "Cryptography and public key infrastructure on the internet", 1st Edition, Allied Publishers, 2004.

REFERENCES:

1. Wenbo Mao: "Modern Cryptography : theory and practice", 1st Edition, Pearson Education, 2005.

COURSE OUTCOMES:

By the end of the course student can

CO1. Distinguish between public key technology and a public key infrastructure.

CO2. Understand the relationship of identity management to PKI

CO3. Understand the components of a public key infrastructure.

CO4. Understand the issues related to Trust management mechanisms.

CO5. Understand Secure Crypto protocols like SSL and so on.

DSE-I

BLOCKCHAIN FUNDAMENTALS

3 0 0 3

COURSE OBJECTIVES :

- ✓ To understand the history, types and applications of Blockchain
- ✓ To acquire knowledge about cryptography and consensus algorithms.
- ✓ Deploy projects using Web3j and design blockchain based applications

UNIT 1: INTRODUCTION TO BLOCKCHAIN

9

Distributed DBMS – Limitations of Distributed DBMS, Introduction to Block chain – History, Definition, Distributed Ledger, Blockchain Categories – Public, Private, Consortium, Blockchain Network and Nodes, Peer-to-Peer Network, Mining Mechanism, Generic elements of Blockchain, Features of Blockchain

UNIT 2: BLOCKCHAIN ARCHITECTURE

9

Operation of Bitcoin Blockchain, Blockchain Architecture – Block, Hash, Distributer P2P, Structure of Blockchain- Consensus mechanism: Proof of Work (PoW), Proof of Stake (PoS), Byzantine Fault Tolerance (BFT), Proof of Authority (PoA) and Proof of Elapsed Time (PoET)

UNIT 3: BLOCKCHAIN-BASED FUTURES SYSTEM

9

Project presentation- Futures smart contract: Blockchain oracles- Web3j: Setting up the Web3J- Installing web3j- Wallet creation, Java client: The wrapper generator- Initializing web3j- Setting up Ethereum accounts- Deploying the contract

UNIT 4: BLOCKCHAINS IN BUSINESS AND CREATING ICO

9

Public versus private and permissioned versus permission less blockchains- Privacy and anonymity in Ethereum- Why are privacy and anonymity important? - The Ethereum Enterprise Alliance- Blockchain-as-a-Service- Initial Coin Offering (ICO): Project setup for ICO implementation- Token contracts- Token sale contracts-Contract security and testing the code.

UNIT 5: DISTRIBUTED STORAGE IPFS AND SWARM

9

Ethereum Virtual Machine- Swarm and IPFS: Installing IPFS, Hosting our frontend: Serving your frontend using IPFS, Serving your frontend using Swarm, IPFS file uploader project: Project setup the web page

TOTAL: 45hours

COURSE OUTCOME:

Upon completion of this course, the students will be able to

CO 1:Contentedly discuss and describe the history, types and applications of Blockchain

CO 2:Gains familiarity with cryptography and Consensus algorithms.

CO 3:Create and deploy projects using Web3j.

CO 4:Implement an ICO on Ethereum

CO5 :Design blockchain based application with Swarm and IPFS

TEXT BOOKS

1. Imran Bashir, "Mastering Blockchain: Distributed Ledger Technology, decentralization, and smart contracts explained", 2nd Edition, Packt Publishing Ltd, March 2018.
3. Bellaj Badr, Richard Horrocks, Xun (Brian) Wu, "Blockchain By Example: A developer's guide to creating decentralized applications using Bitcoin, Ethereum, and Hyperledger", Packt Publishing Limited, 2018.

REFERENCE BOOKS

1. Andreas M. Antonopoulos , "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O'Reilly Media Inc, 2015
2. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, "Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction", Princeton University Press, 2016.

**DISCIPLINE SPECIFIC ELECTIVE
(DSE - II)**

DSE-2 BICOIN MINING

3 0 0 3

COURSE OBJECTIVE

- ✓ To build a bitcoin payment system and to perform auctions in Ethereum.
- ✓ To study about cryptocurrencies and their functions.
- ✓ To understand about Bitcoin and Ethereum and the role of Blockchain in various domains.

UNIT I

9

Introduction to Crypto and Cryptocurrencies – Crypto and crypto currencies differences – how does crypto currencies work – Crypto currencies types - Crypto currencies examples- Cryptocurrencies Furture- Cryptocurrencies Fraud

UNIT II

9

Economics of Bitcoin – Green Agents- Red agents – Analysis – Equilibrium conditions for speculations- Implication of Monetary Policy - Bitcoin Decentralization –Bitcoin Mechanics– Bitcoin storage and uses Bitcoin Mining – Bitcoin and Anonymity- Bitcoin Community – Politics – Regulations

UNIT III

9

Bitcoin as platform – Understanding Bitcoin – Bitcoin’s Blockchain technology- Bitcoin platform – Hyperledger Fabric- Ethereum – Corda - Bitcoin Exchange – Bitcoin and Blockchain difference -

UNIT IV

9

Altcoins and the cryptocurrency Ecosystem – Innovation – Utility – Decentralization – Bitcoin Ecosystem -Drawbacks – Altcoins universe - Future

UNIT –V

9

Enterprise applications - Scalability in Blockchain - Blockchain Interoperability - Blockchain Applications – - Blockchain and its future and Adoption

TEXT BOOKS :

- 1.Imran Bashir, “Mastering Blockchain: Distributed Ledger Technology, decentralization, and smart contractsexplained”, 2nd Edition, Packt Publishing Ltd, March 2018.
2. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfede, “Bitcoin and CryptocurrencyTechnologies”, Princeton University Press, 2016.

REFERENCE BOOKS :

1. Brojo Kishore Mishra , Sanjay Kumar Kuanar “Handbook of IoT and Blockchain: Methods, Solutions, and

Recent Advancements (Internet of Everything (IoE)) “, CRC Press; 1st edition , November 2020.

2. Jai Singh Arun , Jerry Cuomo , Nitin Gaur Blockchain for Business- For Understanding transformation, growth and new models of Business -First Edition Published by Pearson Paperback–12December2019

COURSE OUTCOME :

Upon completion of this course, the students will be able to

CO1. Build a bitcoin payment system.

CO2. Building their own Cryptocurrency and perform Auctions in Ethereum.

CO3. Grasp what is Cryptocurrency and how it functions

CO4. Recall about Bitcoin and Ethereum

CO5. Apply Blockchain in various domains

DSE-2

BLOCK CHAIN AND MONEY

3003

COURSE OBJECTIVE :

- ✓ To deploy Blockchain and smart contracts on Ethereum.
- ✓ To understand the importance of consensus
- ✓ To implement Blockchain money for various use cases.

UNIT - 1: BUILDING A BITCOIN PAYMENT SYSTEM

9

The emergence of blockchain and cryptocurrency-What is blockchain? - Interact with the blockchainTypes of blockchains: Classification of blockchains, Building A Bitcoin payment system: Getting startedwith Bitcoin, Building a payment gateway. Hands on 1. Run a bitcoin client. - 2. Synchronize the blockchain-3. Set up a Regtest environment4. Build a payment request URI

UNIT 2: CRYPTOCURRENCY AND AUCTIONS IN ETHEREUM

9

Building Your Own Cryptocurrency- Compiling Bitcoin from source- New cryptocurrency – Readercoin:Cloning Bitcoin, Readercoin rebranding- Peer-to-Peer Auctions in Ethereum: Introduction to Ethereum,Building an auction DApp: Auction description, Auction contract in Solidity- Contract code analysisEnumerations, Arrays, Mappings, Structures, Functions, Modifiers, Inheritance.

UNIT 3: CRYPTOCURRENCIES AND BITCOIN

9

Introduction to Cryptocurrencies, Tokens – Cryptosecurities, Players involved - Cryptocurrency Users,Miners, Cryptocurrency exchanges, Trading platforms, Wallet providers, Coin inventors, Coin offerors.Distributed Ledger Technology (DLT), Bitcoin (BTC) – Genesis Block, Buy Bitcoin, Transactions, UnspentTransaction Output (UTXO), Bitcoin Mining, Value of Bitcoin, Advantages and Disadvantages

UNIT 4: ETHEREUM CRYPTOCURRENCY

9

Ethereum (ETH) – Smart Contracts, UTXO, Types of Accounts - Externally controlled accounts andContract account, Merkle Tree, Ether, Components of Ethereum Transaction, DApps, Hard & Soft Fork,Bitcoin Stack versus Ethereum Stack.

UNIT 5: Blockchain Business models

9

Introduction to Blockchain Business Models-Need for Blockchain business modelsTraditional business models-Types of Blockchain Business Models- Blockchain As A Service(BaaS)-Token Economy- Utility Token Business Model-Blockchain-Based Software ProductsP2P Blockchain Business Model-Blockchain Professional Services. Block chain for Bankingand Financial transactions.

TEXT BOOKS

1. Andreas M. Antonopoulos , “Mastering Bitcoin: Unlocking Digital Cryptocurrencies”,

2. Melanie Swa “Blockchain”, First Edition, O’Reilly Jan 2015

REFERENCE BOOKS

1. Hyperledger Fabric - <https://www.hyperledger.org/projects/fabric>
2. Zero to Blockchain - An IBM Redbooks course, by Bob Dill, David Smits -
3. <https://www.redbooks.ibm.com/Redbooks.nsf/RedbookAbstracts/crse0401.html>

COURSE OUTCOME :

Upon completion of this course, the students will be able to

CO1. Recall the structure and mechanism of Bitcoin, Ethereum, Hyperledger and Multichain Blockchain platforms

CO2. Infer the importance of consensus in transactions and how transactions are stored on Blockchain.

CO3. Setup your own private Blockchain and deploy smart contracts on Ethereum.

CO4. Deploy the business network using Hyperledger Composer.

CO5. Implement Blockchain for various use cases

DSE-2 SMART CONTRACT ESSENTIALS**3 0 0 3****COURSE OBJECTIVES:**

- ✓ This course is designed for developers that have familiarity with other high-level programming languages.
- ✓ The main element of this course is to provide students with a solid understanding of the many opportunities for building decentralized applications using the Web3 stack and the Turing-complete Solidity language over the Ethereum Virtual Machine (EVM).

UNIT – I Introduction to Blockchain and Ethereum**9**

Introduction - Blockchain - Blockchain Architectural Overview - The Web of Trust - Ethereum's main components - Ethereum's sub-protocols - The new generation of the Web - Smart Contracts and Decentralized Applications - Web apps vs. dApps

UNIT – II Introduction to Smart Contracts**9**

An overview to the history of smart contracts - life-cycle of a smart contract - Ethereum's smart contract languages - Interfacing with Ethereum - The Solidity Programming Language - Development Environments - Blockchain technology Supporting Turing-Complete Languages - A comparison of Ethereum and Bitcoin - Overview of Ethereum's tech stack, architecture.

UNIT – III Virtual Machines and Beyond**9**

History of Virtual Machines - State replication, consensus and the Ethereum Architecture - Introduction to the Ethereum Virtual Machine and EVM Byte Code interpretation - Incentivisation structures, rewards schemes, and gas pricing - Development Pipeline - development with Solidity - Development environments (Truffle) - Intro to Solidity - Smart contract layout - The structure of .sol source file

UNIT – IV Deep-dive into Solidity**9**

Understanding the different compiler versions - Authoring smart contracts - Contract definitions - Basic data types - Local and State Variables

UNIT – V Global Variables and Functions**9**

Predefined Global Variables - Structs and Enums - Mapping and Arrays - Build-in o User Functions - Expressions and Control Structures - Valid expressions of the language - Exception Handling Object Oriented Constructs- Experimenting with Front-end Libraries -Unit Testing and Debugging Contracts

TEXT BOOKS :

1. Mastering ethereum: building smart contracts and dapps Antonopoulos, Andreas M., and Gavin Wood O'Reilly Media 2018
2. Ethereum: A secure decentralised generalised transaction ledger Wood, Gavin Ethereum project yellow paper 151, no. 2014 (2014): 1-32. <http://gavwood.com/paper.pdf> 2014
3. The science of the blockchain Wattenhofer, Roger CreateSpace Independent Publishing Platform 2016
4. Swap, Swear, and Swindle: Incentive System for Swarm Trón, Viktor, Aron Fischer, Dániel A. Nagy, Zsolt Felföldi, and Nick Johnson 2016
5. A survey of attacks on ethereum smart contracts (sok) Atzei, Nicola, Massimo Bartoletti, and Tiziana Cimoli Springer, Berlin, Heidelberg 2017

COURSE OUTCOME:

After completion of the course students are expected to be able to:

CO1: Understand and evaluate the components of blockchain-based technologies which support Turing-complete languages

CO2: Explain in detail the architecture of Ethereum and the structure of the Ethereum VirtualMachine (including Byte Code interpretation)

CO3: Understand the inner workings of smart contracts as means for developing decentralized applications;

CO4: Understand the interaction between the enclosed smart contract network and the external world, be aware of further implications these interactions pose to the aspect of decentralization

CO5: Reuse common implementation patterns, like modifiers and contract driven development;

DISCIPLINE SPECIFIC ELECTIVE
(DSE - III)

DSE-3 BLOCKCHAIN TECHNOLOGIES: BUSINESS INNOVATION

AND APPLICATIONS 3 0 0 3

COURSE OBJECTIVE

- ✓ To learn the basics of Blockchain and apply cryptographic algorithms
- ✓ To identify the consensus methods for an application
- ✓ To use Blockchain for business models

UNIT 1: Introduction 9

History of Blockchain-Terminologies in Blockchain-Types of Blockchain-Applications of BlockchainHow blockchain works-Ingredients of Blockchain.

UNIT 2: Cryptography Algorithms 9

Introduction to cryptography-Encryption and Decryption-Ciphers-Cryptography using arithmetic modulo primes-hashing algorithms-SHA-256 algorithm-Application of SHA algorithm.

UNIT 3: Cryptography Algorithms 9

Introduction to cryptography-Encryption and Decryption-Ciphers-Cryptography using arithmetic modulo primes-hashing algorithms-SHA-256 algorithm-Application of SHA algorithm.

UNIT 4: Blockchain Technology Stack 9

Data structures for Blockchain-Merkle trees-Shared data- Protocols—Fat protocols-PlatformsDAPPS-Smart Contracts.

UNIT 5: Blockchain Business models 9

Introduction to Blockchain Business Models-Need for Blockchain business modelsTraditional business models-Types of Blockchain Business Models- Blockchain As A Service (BaaS)-Token Economy- Utility Token Business Model-Blockchain-Based Software ProductsP2P Blockchain Business Model-Blockchain Professional Services. Block chain for Banking and Financial transactions.

TOTAL : 45 Hrs

TEXT BOOKS

1. Brojo Kishore Mishra , Sanjay Kumar Kuanar “Handbook of IoT and Blockchain: Methods, Solutions, and Recent Advancements (Internet of Everything (IoE)) “, CRC Press; 1st edition , November 2020.
2. Jai Singh Arun , Jerry Cuomo , Nitin Gaur Blockchain for Business- For Understanding transformation, growth and new models of Business -First Edition Published by Pearson Paperback–12December2019

REFERENCES

1. <https://iabtechlab.com/wp-content/uploads/2018/07/Blockchain-Technology-Primer.pdf>
2. <https://www.blockchain-council.org/blockchain/the-best-blockchain-business-models/>

COURSE OUTCOME

CO 1:Discuss the basics of Blockchain

CO 2:Apply the Cryptographic techniques in Blockchain

CO 3:Identify the appropriate Consensus methods for application

CO 4 :Describe the technology stack for Blockchain

CO 5:Apply the Blockchain for business models

DSE-3

BLOCKCHAIN ARCHITECTURE DESIGN

3 0 0 3

COURSE OBJECTIVE:

- ✓ To understand the fundamentals of network and symmetric ciphers.
- ✓ To apply asymmetric ciphers and data integrity algorithms.
- ✓ To explore the basics of cryptocurrencies and use Ethereum programming.

UNIT 1: INTRODUCTION TO BLOCKCHAIN

9

Distributed DBMS – Limitations of Distributed DBMS, Introduction to Block chain – History, Definition, Distributed Ledger, Blockchain Categories – Public, Private, Consortium, Blockchain Network and Nodes, Peer-to-Peer Network, Mining Mechanism, Generic elements of Blockchain, Features of Blockchain, and Types of Blockchain.

UNIT 2: BLOCKCHAIN ARCHITECTURE

9

Operation of Bitcoin Blockchain, Blockchain Architecture – Block, Hash, Distributer P2P, Structure of Blockchain- Consensus mechanism: Proof of Work (PoW), Proof of Stake (PoS), Byzantine Fault tolerance (BFT), Proof of Authority (PoA) and Proof of Elapsed Time (PoET)

UNIT 3: BLOCKCHAIN-BASED FUTURES SYSTEM

9

Project presentation- Futures smart contract: Blockchain oracles- Web3j: Setting up the Web3J- Installing web3j- Wallet creation, Java client: The wrapper generator- Initializing web3j- Setting up Ethereum accounts- Deploying the contract

UNIT 4: BLOCKCHAINS IN BUSINESS AND CREATING ICO

9

Public versus private and permissioned versus permission less blockchains- Privacy and anonymity in Ethereum- Why are privacy and anonymity important? - The Ethereum Enterprise Alliance- Blockchain as a Service- Initial Coin Offering (ICO): Project setup for ICO implementation- Token contracts- Token sale contracts- Contract security and testing the code.

UNIT 5: DISTRIBUTED STORAGE IPFS AND SWARM

9

Ethereum Virtual Machine- Swarm and IPFS: Installing IPFS, Hosting our frontend: Serving your frontend using IPFS, Serving your frontend using Swarm, IPFS file uploader project: Project setup the web page

TOTAL : 45 Hrs

TEXT BOOKS

1. Imran Bashir, "Mastering Blockchain: Distributed Ledger Technology, decentralization, and smart contracts explained", 2nd Edition, Packt Publishing Ltd, March 2018.
2. Bellaj Badr, Richard Horrocks, Xun (Brian) Wu, "Blockchain By Example: A developer's guide to creating decentralized Applications using Bitcoin, Ethereum, and Hyperledger", Packt Publishing Limited, 2018.

REFERENCE BOOKS

1. Andreas M. Antonopoulos , "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O'Reilly Media Inc, 2015
2. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, "Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction", Princeton University Press, 2016.

E BOOKS

1. <https://www.velmie.com/practical-blockchain-study>
MOOC
2. <https://www.udemy.com/course/build-your-blockchain-az/>

3. Wood, G. (2014). Ethereum: A secure decentralised generalised transaction ledger. Ethereum project yellow paper, 151(2014), 1-32.

REFERENCE BOOKS

1. William Stallings, Network Security Essentials (Applications and Standards), Pearson Education, India, 2017
2. Imran Bashir, "Mastering Blockchain: Distributed Ledger Technology, Decentralization and Smart Contracts Explained", Second Edition, Packt Publishing, 2018.

COURSE OUTCOMES:

At the conclusion of the course, students should have:

CO1 :Understanding of blockchain technology basics, application of blockchain to digital transformation of the financial industry, and relevant research directions in the field.

CO2 : Capability of self-development of new research methods, changing the scientific and production profile of activities.

CO3 :Ability to use modern information technologies and software in professional activities, to set tasks for specialists in the development of R software for solving professional problems.

CO4:Explore the basics of cryptocurrencies.

CO5:Use Ethereum programming

**DISCIPLINE SPECIFIC ELECTIVE
(DSE - IV)**

DSE-4

CRYPTOCURRENCY TECHNOLOGIES

3 0 0 3

COURSE OBJECTIVE

- ✓ To understand the fundamentals of network and symmetric ciphers.
- ✓ To apply asymmetric ciphers and data integrity algorithms.
- ✓ To explore the basics of crypto currencies and use Ethereum programming.

UNIT 1: INTRODUCTION TO CYBER SECURITY

9

Introduction to Cyber Security, Need for security, Concept of Cyber Space, Cyber Crimes and Cyber-attack. Fundamental security principles – threats, attacks and vulnerability. Key Security triad – Confidentiality, Integrity and Availability. Key components of cybersecurity network architecture. Introduction to basic Security Management and Policies - Authentication, Authorization, Access control, Identification and Accounting.

UNIT 2: SYMMETRIC CIPHERS

9

Cryptography – Private key Cryptography - Classical Encryption Techniques - Substitution Techniques - Transposition Techniques - Rotor Machines - Steganography - Data Encryption Standard - Advanced Encryption Standard - Multiple Encryption and Triple DES .

UNIT 3: ASSYMMETRIC CIPHERS AND DATA INTEGRITY ALGORITHMS

9

Public-Key Cryptography - RSA algorithm - Diffie-Hellman Key Exchange - Elgamal Cryptographic System - Elliptic Curve Arithmetic - Elliptic Curve Cryptography. MD5 message digest algorithm - Secure hash algorithm (SHA) Digital Signatures: Digital Signatures - authentication protocols - digital signature standards (DSS) - proof of digital signature algorithm -

UNIT 4: CRYPTOCURRENCIES

9

History, A basic crypto currency, Creation of coins, Payments and double spending, Bitcoin – Digital Signatures as Identities – eWallets – Personal Crypto security - Bitcoin Mining – Mining Hardware – Energy Consumption – Mining Pools – Mining Incentives and Strategies.

UNIT 5: ETHEREUM

9

The Ethereum Network – Components of Ethereum Ecosystem – Ethereum Programming Languages: Runtime Byte Code, Blocks and Blockchain, Fee Schedule – Supporting Protocols – Solidity Language.

TOTAL : 45 Hrs

TEXT BOOKS

1. William Stallings, "Cryptography and Network security Principles and Practices", Pearson/PHI,2017.
2. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, "Bitcoin and
3. Cryptocurrency Technologies: A Comprehensive Introduction", Princeton University Press, July, 2016.

REFERENCE BOOKS

4. William Stallings, Network Security Essentials (Applications and Standards), Pearson Education, India,2017
5. Imran Bashir, "Mastering Blockchain: Distributed Ledger Technology, Decentralization and Smart
6. Contracts Explained", Second Edition, Packt Publishing, 2018.

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

CO1:Recall the network security fundamentals.

CO2:Employ various symmetric ciphers.

CO3:Apply asymmetric ciphers and data integrity algorithms.

CO4:Explore the basics of cryptocurrencies.

CO5:Use Ethereum programming

DSE-4 BITCOIN AND CRYPTO CURRENCY TECHNOLOGIES 3 0 0 3

COURSE OBJECTIVE

- ✓ To deploy Private Blockchain and smart contracts on Ethereum.
- ✓ To understand the importance of consensus
- ✓ To implement Blockchain for various use cases.
- ✓ To build a bitcoin payment system and to perform auctions in Ethereum.
- ✓ To study about cryptocurrencies and their functions.
- ✓ To understand about Bitcoin and Ethereum and the role of Blockchain in various domains

UNIT I

9

Introduction to Crypto and Cryptocurrencies – Crypto and crypto currencies differences – how does crypto currencies work – Crypto currencies types - Crypto currencies examples- Cryptocurrencies Furture- Cryptocurrencies Frauds–

UNIT II

9

Economics of Bitcoin – Green Agents- Red agents – Analysis – Equilibrium conditions for speculations- Implication of Monetary Policy - Bitcoin Decentralization –Bitcoin Mechanics– Bitcoin storage and uses Bitcoin Mining – Bitcoin and Anonymity- Bitcoin Community – Politics – Regulations

UNIT III

9

Bitcoin as platform – Understanding Bitcoin – Bitcoin’s Blockchain technology- Bitcoin platform – Hyperledger Fabric- Ethereum – Corda - Bitcoin Exchange – Bitcoin and Blockchain difference -

UNIT IV

9

Altcoins and the cryptocurrency Ecosystem – Innovation – Utility – Decentralization – Bitcoin Ecosystem -Drawbacks – Altcoins universe - Future

UNIT V

9

Role of AI in Cryptocurrency - Cryptocurrency Trading: Issues & Considerations, Benefits of AI in Crypto Trading - Making Price Predictions with AI: Issues with Price Prediction, Benefits of AI in Prediction, Time series forecasting with ARIMA, Applications of algorithmic or quant trading in Cryptocurrency

TEXT BOOKS

1. Andreas M. Antonopoulos , “Mastering Bitcoin: Unlocking Digital Cryptocurrencies”, O’Reilly Media Inc, 2015
2. Melanie Swa “Blockchain”, First Edition, O’Reilly Jan 2015

REFERENCE BOOKS/E-BOOKS

1. Hyperledger Fabric - <https://www.hyperledger.org/projects/fabric>
2. Zero to Blockchain - An IBM Redbooks course, by Bob Dill, David Smits -
3. <https://www.redbooks.ibm.com/Redbooks.nsf/RedbookAbstracts/crse0401.htm>

COURSE OUTCOME:

Upon completion of this course, the students will be able to

- CO 1: Recall the structure and mechanism of Bitcoin, Ethereum, Hyperledger and Multichain lockchain platforms
- CO2: Infer the importance of consensus in transactions and how transactions are stored on Blockchain.
- CO 3: Setup your own private Blockchain and deploy smart contracts on Ethereum.
- CO 4: Deploy the business network using Hyperledger Composer.
- CO 5: Implement Blockchain for various use case

DISCIPLINE SPECIFIC ELECTIVE
(DSE - V)

COURSE OBJECTIVE

- ✓ Assess the current security landscape, including the nature of the threat,
- ✓ the general status of common vulnerabilities, and the likely consequences of security failures;
- ✓ Assess how all domains of security interact to achieve effective systemwide security at the enterprise level.
- ✓ Appraise the interrelationships among elements that comprise a modern security system, including hardware, software, policies, and people;
- ✓ Compare and contrast logical and physical security

UNIT 1: INTRODUCTION TO CYBER SECURITY 9

Introduction to Cyber Security, Need for security, Concept of Cyber Space, Cyber Crimes and Cyber-attack. Fundamental security principles – threats, attacks and vulnerability. Key Security triad – Confidentiality, Integrity and Availability.

UNIT 2: SECURITY ATTACKS, PRINCIPLES AND MANAGEMENT 9

Introduction to different classes of security attacks - active and passive. Impact of attacks on an organization and individuals. Principles of Cybersecurity cybersecurity architecture principles. Cybersecurity models (the CIA triad, the star model, the Parkerian hexad).

UNIT 3: SECURITY PLANS, POLICIES AND PROCEDURES 9

Defining a Cyber Security policy, General security expectations, roles and responsibilities in the organization – Stakeholders.

UNIT 4: OVERVIEW OF SECURITY COUNTERMEASURE TOOLS 9

Introduction to key security tools including firewalls, anti-virus and cryptography –Identify security tools and hardening techniques – Prevention of cyber-attacks. Security Countermeasure tools and techniques - Encryption standards.

UNIT 5: TESTING, DIGITAL FORENSICS AND NEXT GENERATION SECURITY 9

Cyber security testing – Penetration testing. System Level Solutions – Intrusion Detection System (IDS) and Intrusion Protection System (IPS). Basic Concept of Ethical Hacking. Protecting against Cyber Crime – Identity Theft, Cyber Stalking and Investment fraud

TEXT BOOKS

1. William Stallings, (2016)“Principle of Computer Security”, McGraw Hill Education, FourthEdition

REFERENCE BOOKS

1. William, Stallings. (2018). Effective Cyber security: A Guide to Using Best Practices and Standards, Addison - Wesley Professional Publishers, 1st Edition.

E BOOKS

<https://bookauthority.org/books/best-network-security-ebooks>

COURSE OUTCOME :

Upon completion of this course, the students will be able to

CO1:Outline the Cyber Issues in Real World.

CO2: Evaluate the trends and patterns that will determine the future state of cyber security.

CO3: Identify the attacks on WWW

CO4: Describe the Internet Security Protocols

CO5: Identify and explore the authentication mechanisms over internet

DSE-5

WEB SECURITY

3 0 2 4

COURSE OBJECTIVES:

- ✓ To study and practice fundamental techniques in developing secure web based applications
- ✓ To identify and find the vulnerabilities of web based applications and to protect those applications from attacks

UNIT : 1 INTRODUCTION

9

Introduction - Evolution of Web Applications - Web Application Security - Core Defence Mechanisms - Handling User Access - Handling User Input- Handling Attackers - Managing the Application - The OWASP Top Ten List

UNIT:2 WEB APPLICATION TECHNOLOGIES

9

Web Functionality Encoding Schemes Mapping the Application - Enumerating the Content and Functionality Analysing the Application Bypassing Client Side Controls : Transmitting Data Via the Client Capturing User Data Handling Client Side Data Securely - Input Validation, Blacklist Validation - Whitelist Validation - The Defence-in-Depth Approach - Attack Surface Reduction Rules of Thumb

UNIT :3 WEB APPLICATION AUTHENTICATION

9

Authentication Fundamentals- Two Factor and Three Factor Authentication - Password Based, Built-in HTTP, Single Sign-on Custom Authentication- Secured Password Based Authentication: Attacks against Password, Importance of Password Complexity - Design Flaws in Authentication Mechanisms - Implementation Flaws in Authentication Mechanisms - Securing Authentication

UNIT 4 SESSION MANAGEMENT

9

Need for Session Management Weaknesses in Session Token Generation Weaknesses in Session Token Handling Securing Session Management; Access Control : Access Control Overview, Common Vulnerabilities Attacking Access Controls Securing Access Control.

UNIT :5 WEB SECURITY PRINCIPLES

9

Origin Policy, Exceptions Cross Site Scripting, Cross Site Forgery Scripting; File Security Principles: Source Code Security, Forceful Browsing, Directory Traversals- Classifying and Prioritizing Threats Origin Policy.

Total : 45 hours

TEXT BOOK(S)

1. B. Sullivan, V. Liu, and M. Howard, Web Application Security, A B Guide. New York: McGraw-Hill Education, 2011. (ISBN No.: 978-0-07-177616-5).
2. D. Stuttard and M. Pinto, , 2nd ed. Indianapolis, IN: Wiley, John Sons, 2011. (ISBN No. : 978-1-118-02647-2)

REFERENCE BOOKS

1. Hanqing and L. Zhao, Web Security: A Whitehat Perspective. United Kingdom: Auerbach Publishers, 2015.(ISBN No.: 978-1-46-659261-2).
2. M. Shema and J. B. Alcover, Hacking Web Apps: Detecting and Preventing Web Application Security Problems. Washington, DC, United States: Syngress Publishing, 2014.(ISBN No. 978-1-59-749951-4)

COURSE OUTCOME:

- CO1.To understand security-related issues in Web-based systems and applications.
- CO2.To understand the fundamental mechanisms of securing a Web-based system.
- CO3.To be able to implement security mechanisms to secure a Web-based application.
- CO4.To be able to evaluate a Web-based system with respect to its security requirements

DSE-5

INFORMATION SECURITY

3 0 2 4

COURSE OBJECTIVE

- ✓ Understand the Factors of Security.
- ✓ Learn Security Goals.
- ✓ Learn about physical security and network security

UNIT I THE CIA TRIAD

9

Confidentiality, Integrity & Availability, what is Information Security? Identification and Authentication, Authorization and Access Control, Auditing and Accountability

UNIT II CRYPTOGRAPHY, OPERATIONS SECURITY

9

Modern Cryptography Tools, Protecting Data at rest, In motion, And In Use, Origins Of Operations Security, The Operations Security Process, Laws Of Operations Security, Operations Security in our Personal Lives

UNIT III PHYSICAL SECURITY AND NETWORK SECURITY

9

Introduction, Physical Security Controls, Protecting People, Data and Equipment. Protecting Networks, Protecting Network Traffic. Network Security Tools

UNIT IV OPERATING SYSTEM AND APPLICATION SECURITY

9

Operating System Hardening, Protecting Against Malware, Software Firewalls and Host Intrusion Detection, Operating System Security Tools, Software Development Vulnerabilities, Web Security, Database Security, Application Security Tools.

UNIT V INFORMATION SECURITY - AUDIT AND MONITORING,

INTELLIGENCE, COMPLIANCE, MANAGEMENT AND GOVERNANCE

9

Change and Security Implications, System Models, Targets and Methods, Log Management, Data Aggregation and Reduction, Notifications and Reporting, Monitoring and Control Challenges, Auditing Standards, SAS 70 Audits, Sarbanes-Oxley, Addressing Multiple Regulations for Information Security Technical Frameworks for IT Audits, Intelligence and Compliance, Management and Governance.

TOTAL: 45

COURSE OUTCOME:

The student should be able to:

CO 1: Abide the 4 factors of security

CO 2: Have an overview on cryptography.

CO 3: Know the basic tools of information security

TEXT BOOK :

1. William Stallings, Lawrie Brown, Computer Security: Principles and Practice, 3rd edition, 2014.
2. Nina Godbole, Information Systems Security: Security Management, Metrics, Frameworks and Best Practices, Wiley, 2017. Nina Godbole, Sunit Belapure, Cyber Security- Understanding cyber-crimes, computer forensics and legal perspectives, Wiley Publications, 2016
3. Andrew Vladimirov Michajlowski, Konstantin, Andrew A. Vladimirov, Konstantin V. Gavrilenko, Assessing Information Security: Strategies, Tactics, Logic and Framework, IT Governance Ltd, O'Reilly, 2010

REFERENCE BOOKS :

1. Charles P. Pfleeger, Security in Computing, 4th Edition, Pearson, 2009.
2. Christopher J. Alberts, Audrey J. Dorofee, Managing Information Security Risks, Addison-Wesley Professional, 2004
3. Peter Zor, The Art of Computer Virus Research and Defense, Pearson Education Ltd, 2005
4. Lee Allen, Kevin Cardwell, Advanced Penetration Testing for Highly-Secured Environments – Second Edition, PACKT Publishers, 2016
5. Chuck Easttom, System Forensics Investigation and Response, Second Edition, Jones & Bartlett Learning, 2014
6. David Kennedy, Jim O'Gorman, Devon Kearns, and Mati Aharoni, Metasploit The Penetration Tester's Guide, No Starch Press, 2014

**DISCIPLINE SPECIFIC ELECTIVE
(DSE - VI)**

DSE-VI

DATA PRIVACY

3

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0

3

COURSE OBJECTIVES:

- ✓ To recognize the need of data privacy.
- ✓ To categorize the statistical and computational techniques needed to share data, with a primary focus on the social, behavioural and health sciences.
- ✓ To formulate architectural, algorithmic and technological foundations for the maintenance of the privacy of individuals, the confidentiality of organizations, and the protection of sensitive information, despite the requirement that information be released publicly or semi-publicly

UNIT: 1 Data Privacy and its Importance

9

Need for Sharing Data, Methods of Protecting Data, Importance of Balancing Data Privacy and Utility, Disclosure, Tabular Data, Micro data, Approaches to Statistical disclosure control, Ethics, Principles, guidelines and regulations

UNIT: 2 Microdata

9

Disclosure, Disclosure risk, Estimating re-identification risk, Non-perturbative microdata masking, Perturbative microdata masking, Information loss in microdata

UNIT: 3 Static Data Anonymization on Multidimensional Data

9

Privacy Preserving Methods, Classification of Data in a Multidimensional Data Set, Group- Based Anonymization, k- Anonymity, l-Diversity, t-closeness

UNIT: 4 Static Data Anonymization on Complex Data Structures

9

Privacy Preserving Graph Data, Privacy Preserving Time Series Data, Time Series Data Protection Methods, Privacy Preservation of Longitudinal Data, Privacy Preservation of Transaction Data.

UNIT: 5 Data Anonymization Threats

9

Threats to Anonymized Data, Threats to Data Structures, Threats by Anonymization Techniques, Randomization, k- Anonymization, l-Diversity, t-Closeness. Dynamic Data Protection: Tokenization, Understanding Tokenization, Use Cases for Dynamic Data Protection, Benefits of Tokenization Compared to Other Methods, Components for Tokenization.

TOTAL : 45 hrs

TEXT BOOKS:

1. Nataraj Venkataramanan, AshwinShriram, Data Privacy: Principles and Practice, Taylor Fran- cis, 2016. (ISBN No.: 978-1-49-872104-2).
2. Anco Hundepool, Josep Domingo-Ferrer, Luisa Franconi, Sarah Giessing, Eric Schulte Nordholt, Keith Spicer, Peter-Paul de Wolf, Statistical Disclosure Control, Wiley, 2012. (ISBN No.: 978- 1-11-997815-2)

REFERENCE BOOKS

1. George T. Duncan. Mark Elliot, Juan-Jose Salazar-GonZalez, Statistical Confidentiality: Principle and Practice. Springer, 2011. (ISBN No.: 978-1-44-197801-1).
2. Aggarwal, Charu C., Yu, Philip S., Privacy-Preserving Data Mining : Models and Algorithms, Springer, 2010. (ISBN No.: 978-0-38-770991-8).

COURSE OUTCOME:

CO1.Characterize basic rules and principles for protecting privacy and personal information.

CO2.Design enhanced privacy protection methods by envisioning the basic attacks to happen.

CO3.Formulate data that supports useful statistical inference while minimizing the disclosure of sensitive information

DSE-VI INTERNET TRANSACTIONS 3 0 0 3

COURSE OBJECTIVES

- ✓ To develop an understanding of concepts of Internet and Data exchange.
- ✓ To examine aspects of retailing Architecture.
- ✓ To develop and execute plans to deal with security.

UNIT – I INTRODUCTION 9

Overview of developments in Information Technology and Defining E-Commerce: The scope of E commerce, Electronic Market, Electronic Data Interchange, Internet Commerce, Benefits and limitations of E-Commerce, Produce a generic framework for E-Commerce, Architectural framework of Electronic Commerce, Web based

UNIT – IIINTERNET TRANSACTONS ARCHITECTURE 9

Consumer Oriented E Commerce E-Retailing: Traditional retailing and e retailing, Benefits of e retailing, Key success factors, Models of e-retailing, Features of e retailing. E services: Categories of e-services, Web-enabled services, matchmaking services, Information-selling on the web, e entertainment, Auctions and other specialized services. Business to

UNIT – III Business Electronic Commerce 9

Electronic Data Interchange: Benefits of EDI, EDI technology, EDI standards, EDI communications, EDI Implementation, EDI Agreements, EDI Security. Electronic Payment Systems, Need of Electronic Payment System: Study and examine the use of Electronic Payment system and the protocols used, Study Electronic Fund Transfer and secure electronic transaction protocol for credit card payment. Digital economy: Identify the methods of payments on the net – Electronic Cash, cheques and credit cards on the Internet.

UNIT – IV Security in Internet Transactions 9

Threats in Computer Systems: Virus, Cyber Crime Network Security: Encryption, Protecting Web server with a Firewall, Firewall and the Security Policy, Network Firewalls and Application Firewalls, Proxy Server.

UNIT V Issues in Internet Transactions 9

Understanding Ethical, Social and Political issues in E-Commerce: A model for Organizing the issues, Basic Ethical Concepts, Analyzing Ethical Dilemmas, Candidate Ethical principles Privacy and Information Rights: Information collected at E-Commerce Websites, The Concept of Privacy, Legal protections Intellectual Property Rights: Types of Intellectual Property protection. Governance.

TEXT BOOKS :

1. Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.
2. RaviKalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley.
3. Efraim Turban, Jae Lee, David King, H.Michael Chung, "Electronic Commerce–A ManagerialPerspective",
Addison-Wesley.

REFERENCE :

1. Elias M Award, "Electronic Commerce from Vision to Fulfilment", 3rd Edition, PHI,
Judy Strauss, Adel El-Ansary, Raymond Frost, "E-Marketing", 3REdition, Pearson Education.

DISCIPLINE SPECIFIC ELECTIVE
(DSE - VII)

DSE VII BLOCKCHAIN ETHICS: IMPACT AND ETHICS OF CRYPTOCURRENCY AND BLOCKCHAIN TECHNOLOGY 3 0 0 3

COURSE OBJECTIVES:

- ✓ To understand the mechanism of Block chain and Cryptocurrency.
- ✓ To understand the functionality of current implementation of block chain technology.
- ✓ To understand the required cryptographic background.
- ✓ To explore the applications of Block chain to cryptocurrencies and understanding limitations of current Block chain.
- ✓ An exposure towards recent research.

UNIT-1 BLOCK CHAIN ETHICS 9

Block chain Ethics- Ethics and trust – Conceptual model – Code of ethics - Ethical decision Making – Reasoning

UNIT II ETHICS OF CRYPTO CURRENCIES 9

Ethics of Block chain Technology stack – Key difference- Ethics of crypto currencies – Ethics of smart contracts

UNIT III BITCOIN TRANSACTIONS 9

Bitcoin transactions, Bitcoin Scripts, Applications of Bitcoin scripts, Bitcoin blocks, The Bit- coin network, Limitations and improvements. Ethics Training – Education – Ethical Leadership

UNIT IV BITCOIN MINING 9

New Technology – Strategic view of Innovations - Ethics of block chain decentralization- Conclusion and future research Cryptographic Hash Functions, Hash Pointers and Data Structures, Digital Signatures, PublicKeys as Identities, A Simple Cryptocurrency and Use.

Role of AI in Cryptocurrency - Cryptocurrency Trading: Issues & Considerations, Benefits of AI in Crypto Trading - Making Price Predictions with AI: Issues with Price Prediction, Benefits of AI in Prediction, Time series forecasting with ARIMA, Applications of algorithmic or quant trading in Cryptocurrency

9

Total Lecture hours: 45 h

TEXT BOOKS :

1. Mastering Blockchain: A deep dive into distributed ledgers, consensus protocols, smart contracts, DApps, cryptocurrencies, Ethereum, and more, 3rd Edition, Imran Bashir, Packt Publishing, 2020, ISBN: 9781839213199, book website: <https://www.packtpub.com/product/mastering-blockchain-third-edition/9781839213199>

REFERENCES :

1. Hyperledger Tutorials - <https://www.hyperledger.org/use/tutorials>
2. Ethereum Development Resources - <https://ethereum.org/en/developers>

COURSE OUTCOME:

CO1. To Understand and apply the fundamentals of Cryptography in Cryptocurrency

CO2. To gain knowledge about various operations associated with the life cycle of Blockchain and Cryptocurrency

CO3. To deal with the methods for verification and validation of Bitcoin transactions

CO4. To demonstrate the general ecosystem of several Cryptocurrency

CO5. To educate the principles, practices and policies associated Bitcoin business

UNITV: BLOCKCHAIN APPLICATIONS

9

Internet of Things-Medical Record Management System-Blockchain in Government andBlockchainSecurity-BlockchainUseCases–FinanceTutorial&Practical:NaiveBlockchainconstruction, Memory Hard algorithm - Hashcash implementation, Direct Acyclic Graph,Play with Go-ethereum, Smart Contract Construction, Toy application using Blockchain,Miningpuzzles .

TotalNo ofHours: 45

TEXTBOOK:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and StevenGoldfeder.Bitcoinandcryptocurrencytechnologies:acomprehensiveintroduction.PrincetonUniversity Press, 2016.(Freedownloadavailable)

REFERENCEBOOKS:

Antonopoulos,MasteringBitcoin:UnlockingDigitalCryptocurrencies

SatoshiNakamoto,Bitcoin:APeer-to-PeerElectronicCashSystem

DR. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger,"Yellowpaper.2014.

NicolaAtzei,MassimoBartoletti,andTiziana Cimoli,AsurveyofattacksonEthereumsmart

WEBSITES

Www.w3schools.com

Www.tutorialspoint.com

<https://en.wikipedia.org>

Www.geeksforgeeks.org

www.investopedia.com

www.guru99.com

WEBSOURCES

<https://www.slideshare.net/asrithak/blockchain-technology-ppt>

<https://www.slideshare.net/Mithileysh/blockchain-technology-181440314>

<https://scet.berkeley.edu/wp-content/uploads/BlockchainPaper.pdf>

COURSE OUTCOMES

CO1: Design, build, and deploy a distributed application. CO2: Explain design principles of Bitcoin and Ethereum. CO3: Explain Nakamoto consensus.

CO4: Explain the Simplified Payment Verification protocol.

CO5: List and describe differences between proof-of-work and proof-of-stake consensus.

DSE VII

DISASTER RECOVERY AND BUSINESS CONTINUITY MANAGEMENT 3 0 0 3

COURSE OBJECTIVES

- ✓ To develop an understanding of concepts of risk management
- ✓ To examine aspects of incident response and contingency planning consisting of incident response plans, disaster recovery plans, and business continuity plans.
- ✓ To develop and execute plans to deal with contingency, incident response, disaster recovery and business continuity

UNIT - I: DISASTER RECOVERY AND BUSINESS CONTINUITY INTRODUCTION

9

Disaster Different source of disaster and types of disasters. Disaster Recovery Operational cycle of disaster recovery, disaster recovery cost, incidents that requires disaster recovery plans, evaluating disaster recovery - methods, team, phases, objectives, checklist. Best practises for disaster recovery - Business continuity - Business continuity vs. disaster recovery

UNIT II: DISASTER RECOVERY PLANNING AND IMPLEMENTATION 9

Introduction - Aspects of security - Application security - Database security - Distributed system security - Firmware security - Industrial security. Profiles Operational profile, Appli- cation profiles, Inventory profile, Disaster recovery plan - Business impact analysis - Disaster recovery roles and responsibilities - Disaster recovery planning steps - Disaster preparedness - Notification and activation procedures

UNIT -III: BUSINESS CONTINUITY MANAGEMENT 9

Introduction - Elements of business continuity management. Business continuity plan - Businesscontinuity planning and strategies - BCP standards and guidelines - BCP Project Organization – Crisis communication plan - Emergency response plan - Contingency planning

UNIT- IV: MANAGING, ASSESSING AND EVALUATING RISKS 9

Introduction - Importance of risk management - Risk management methodology - Attack methods and Countermeasures - Cost benefits analysis of risk management - Risk assessment responsibilities - Responsibilities of security professional - Information system auditing and monitoring - Verification

Business recovery planning process mobilizing business recovery team, Assessing extent of damage and business impact, Preparing specific recovery plans, Assess damaged property and documents, Backup recovery site, Monitoring progress, Keeping stockholders informed, Handling business operation back to regular management. Planning recovery activities Communication systems, Human resources, Corporate proprietary information and documentation, IT systems Software architecture recovery.

TEXT BOOKS :

1. John W. Rittinghouse and James F. Ransome, Business Continuity and Disaster Recovery for Info Sec Managers. Elsevier: Elsevier Digital Press, 2005. (ISBN: 978-0-52-119019-0)
2. EC Council Press. Disaster Recovery, 1st Ed. Course Technology, 2011. (ISBN: 978-1-55558-339-2)

REFERENCE BOOKS :

1. ISO 27001:2013 A specification for an information security management system
2. David Alexander, Amanda Finch, David Sutton, Andy Taylor. Information Security Management Principles, 2nd Ed. BCS Shop, 2013. (ISBN: 9781780171753)
- 3 ISO Guide 73:2009 Definitions of generic terms related to Risk Management
- 4 ISO Guide 27005:2011 Guidelines for information security risk management
- 5 ISO 31010:2010 Risk Management Risk Assessment Techniques
- 6 Mark Talabis, Jason Martin. Information Security Risk Assessment Toolkit Practical Assessments through Data Collection and Data Analysis. Syngress Imprint, 2013. (ISBN: 978-1-59-749735-0).

COURSE LEARNING OUTCOMES

CO1:Understand the concept of business continuity

CO2:Learn the importance of a BCP(business continuity planing)

CO3:See how load balancing maintains business continuity

CO4:Discover how a DCP(Disaster recover plan) is a second line of defense

CO5:Learn how to choose the right fail over solution

SKILL ENHANCEMENT COURSE
(SEC)

21SSKU11

SOFTSKILL-I

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2

COURSE OBJECTIVE:

- ✓ To train the students to improve the vocabulary and reading comprehension.
- ✓ To train the students to participate in group discussion
- ✓ To elevate their comprehension skills and conversation.

UNIT I: EFFECTIVE COMMUNICATIONS SKILLS

06

Talking about your company – Making Polite requests – Introducing yourself and others

Socialising with others – Talking about work activities – Talking about your job

Communication practice – Role plays

UNIT II: WRITTEN BUSINESS COMMUNICATION

06

Essential Email writing skills – Formal and Informal E-mails – Usage of formal language

Report Writing – Writing project reports – Extended writing practice – Email Etiquette

Understanding Business E-mails

UNIT III: TELEPHONE ETIQUETTE

06

The basics of Telephone Etiquette – Customer Service – Being courteous – Making arrangements – Giving clear and concise information – Tone and Rate of speech – Pronunciations – Summarisation – Mock Telephonic Conversations

UNIT IV: LEADERSHIP SKILLS

06

Essential Leadership Skills – Interpersonal Skills – Team Building – Teamwork – Do's and Don'ts of Leadership skills – Importance of communication in Leadership – Delegating and Handling of Projects

UNIT V: LISTENING AND ANSWERING QUESTION

06

Listening for the main ideas – Listening for details – Listening for specific information – Predicting and listening for opinions – Recognising context – Listening for sequence – Understanding Pronunciation – Listening practice

Total: 30 Hours

COURSE OUTCOME

On Completion of this course, students can able to

CO1: To enhance participant's Business Communication Skills

CO2: To enhance the participant's Reading, Speaking, Listening and Writing capabilities

CO3: To engage in a conversation with others to exchange ideas
CO4: To impart leadership qualities among the participants
CO5: To express opinion to enhance their social skills

TEXTBOOKS

Raman, M. & Sangeeta Sharma. Technical Communication. OUP. 2008

Taylor, Grant. English Conversation Practice. Tata McGraw Hill Education Pvt. Ltd. 2005

Tiko, Champa & Jaya Sasikumar. Writing with a Purpose. OUP. New Delhi. 1979

WEBSOURCES

<https://www.skillsyouneed.com/ips/communication-skills.html>

<https://blog.smarp.com/top-5-communication-skills-and-how-to-improve-them>

<https://blog.hubspot.com/service/phone-etiquette>

COURSE OBJECTIVE:

- ✓ To train the students to improve their skills.
- ✓ To teach them soft skills and strength their foundation in time and stress management
- ✓ To elevate their interview skills

UNIT I: READING COMPREHENSION AND VOCABULARY 06

Reading Techniques–Types of Reading– Skimming –Scanning–Reading for detail

Identifying key words – Underlining unfamiliar key words – Vocabulary Building –Reading Comprehension practice

UNIT II: PRESENTATION SKILLS 06

Presentation Methods –Preparation and Practice–Organising content–Do’s and Don’ts of a Presentation – Presentation Techniques – Mock Presentation

UNIT III: GROUP DISCUSSION 06

Introduction to Group Discussion – Preparation for GD – Structure of GD’s – Do’s and Don’ts – Tips and Strategies – Etiquette and Practice – Body Language and Posture –Sharing Ideas with respect– Understanding Opinions– Mock GD Practice

UNIT IV: CONVERSATIONAL SKILLS 06

Introduction to Small talk – How to start and end a conversation – Exchanging ideas – Expressing Interests–Giving Opinions–Social skills and Etiquette–Informal Conversations– Formal Meetings– Group Practice

UNIT V: SELF –INTRODUCTION AND ROLEPLAY 06

Introducing oneself – Exchange of Greetings – Appropriate Greetings – Usage of Vocabulary–Rapport Building –Hand shakes and First Impressions–Basic Etiquette

Total No of Hours: 30 Hours

COURSE OUTCOME:

On Completion of this course, students can able to

CO1: To get students to understand the importance of communicating in English CO2:

To understand effective communication techniques

CO3: To increase self-confidence through regular

practice CO4: To encourage active participation in their regular class

CO5: To enable participants to face a large group of audience with confidence

TEXTBOOKS

1. English for Competitive Examinations by R.P. Bhatnagar & Rajul Bhargava Macmillan India Ltd. Delhi.
2. Carnegie, Dale. The Quick and Easy Way to Effective Speaking. New York: Pocket Books, 1977.
3. Kalish, Karen. How to Give a Terrific Presentation. New York: AMACOM, 1996

WEBSOURCES

<https://www.skillsyouneed.com/ips/communication-skills.html>

<https://venngage.com/blog/presentation-skills/>

<https://gdpi.hitbullseye.com/Group-Discussion.php>

SEC SOFTSKILL-III

2 0 0 2

COURSE OBJECTIVE:

1. To enable students to develop their soft skills and Body Language
2. To enhance students Reading, Writing, Listening and Speaking skills
3. To develop their self-confidence to excel at Interviews

UNIT I: SKILL ENHANCEMENT

06

Time Management – Planning and Organisation – Scheduling –
Prioritization Delegation – Task Management – Stress Management – Overcoming
anxiety Confidence Building – Body Language

UNIT II: RESUME/COVER LETTER WRITING

06

SWOT Analysis – Details and Resume Writing – Resume Examples – Building Resume using
SWOT – Writing Resume – Writing Cover Letter – Resume Correction – Resume Feedback

UNIT III: INTERVIEW SKILLS 06

Interview Do's and Don'ts – First Impression – Grooming – Body Language – Frequently asked
questions – Useful Language – Mock Interview

UNIT IV: QUANTITATIVE ABILITY 06

Permutation & Combinations – Probability – Profit & Loss – Ratio Proportions & Variations – Cubes – Venn
Diagrams – Logical Reasoning – Critical Reasoning

UNIT V: REVISIONARY MODULES 06

Group Discussions – HR Process – Interview Process – Mock Group Discussions

Total No of Hours: 30

COURSE OUTCOME

On Completion of this course, students can able to

CO1: To develop participant's social and professional skills

CO2: To help participants manage time effectively

CO3: To build a strong resume to suit corporate requirements

CO4: To face interviews confidently

CO5: To enhance their aptitude abilities

TEXTBOOKS

Meena.K andV.Ayothi(2013)ABookonDevelopmentofSoftSkills(SoftSkills:ARoad Map to Success)P.R. Publishers &Distributors.

Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, RamNagar, NewDelhi

Prasad, H. M. How to Prepare for Group Discussion and Interview. NewDelhi: TataMcGraw-HillPublishingCompany Limited, 2001.

Pease,Allan.BodyLanguage.Delhi:SudhaPublications,1998.

WEBSOURCES

<https://www.skillsyouneed.com/ips/communication-skills.html>

<https://www.businessnewsdaily.com/5836-top-interviewing-skills.html>

<https://gdpi.hitbullseye.com/Group-Discussion.php>

SEC NATIONALSERVICESHEME 2 0 0 2

COURSEOBJECTIVE:

- ✓ Socialawarenessprogramme
- ✓ Volunteerparticipationinsocialrelated campaign

UNITI SPECIALCAMPINGPROGRAMME 6

Natureanditsobjectives

Selectionofcampsiteandphysicalarrangement

Organizationof N.S.S.campthroughvariouscommitteesanddisciplineinthecamp.

Activitiesto beundertakenduring theN.S.S. camp.

Useof themass mediainthe N.S.S. activities

UNITII CONTRIBUTIONOFSOCIALREFORMS 6

MahatmaJotibaPhule

RajarshiShahuChhatrapati

Dr.B.R.Ambedkar

UNITIII SOCIALPROBLEMS 6

Waterscarcity

Womenharassment

UNITIVNATIONAL INTEGRATION 6

NeedforNational Integrity

VariousObstaclessuchascaste,religion,language

UNIT VS SPECIAL PROGRAMME**6**

Legal Awareness

Health Awareness

First-aid

Career Guidance

Total No of Hours: 30

COURSE OUTCOME

On Completion of this course, students can able to,

CO1: Develop documentation and reporting of an event.

CO2: Analyze the cost and planning and reports.

CO3: Analyze socio-Economic Problems

CO4: Explain the role of disaster management in modern life

CO5: List the various environment issues

TEXTBOOKS

Chhatrapati Shahu – The Pillar of Social Democracy, Ed. P. B. Salunkhe

National Service Scheme Manual, Govt. of India

REFERENCE BOOKS

Social service opportunities in Hospitals, Kapil K. Krishan, TISS

History of Social Reforms in Maharashtra, Ed. J. Y. Bhosale, S. U. Kolhapur

WEBSOURCES<http://www.igntu.ac.in/Download/aboutNSS.pdf>2. <https://www.slideshare.net/SiniAlby/nss-57278390>

SEC ETHICS AND VALUES 2 0 0 2

COURSE OBJECTIVE:

- ✓ To increase ethical sensitivity.
- ✓ To increase ethical knowledge.
- ✓ To improve ethical judgment.

UNIT-I INTRODUCTION

6

Why Value Education – Ethical Reflections – What is Ethics? Swami Vivekananda

UNIT:II APPROACH TO LIFE

6

Approach to Life - Happiness as Goal - Historical Perspective – Life in the Past Economic Awareness – Economic

UNIT:III KINDS OF VALUES

6

Kinds of Values S. Ignacimuthu S.J – Living Excellence Anthony Robbins – Concern for Influence of Science and Technology in Human's Social Life Social Relevance of Science and Technology Features – Status of Women – Mass Media and Values.

UNIT IV GOALS AND HUMAN RIGHTS

6

Use Goals to help you grow David J. Schwartz – essential Characteristics of Human Rights.

UNIT V INFLUENCE OF SCIENCE AND TECHNOLOGY

6

Social Relevance of Science and Technology – Economic Awareness – Economic Features – Status of Women – Mass Media and Values.

TOTAL : 30 HRS

COURSE OUTCOME :

At the end of the course students can,

CO1: Can able to develop the ethical value defined by Swami Vivekananda.

CO2: Able to analyze the obstacles in life and to reach the goal.

CO3: Able to understand the status of women in this society

CO4: Able to understand the influence of science & technology in Human Life.

CO5: Able to understand the economic drive.

TEXTBOOKS

1. Touchstone: Synergy of Values – University of Madras.
2. In Harmony - Value Education at College Level - Dept. of Ethics and Religious Studies Loyola College, Madras.

WEBSOURCES

1. https://vit.ac.in/files/Ethics_Manual.pdf 2. <https://soaneemrana.org/onewebmedia/Professional%20Ethics%20and%20Human>

[%20Values%20by%20R.S%20NAAGARAZAN.pdf](https://soaneemrana.org/onewebmedia/Professional%20Ethics%20and%20Human)

<https://eng.rizvi.edu.in/wp-content/uploads/2020/04/Handbook-Human-Values-and-Professional-Ethics.pdf>

SEC ETHICAL HACKING 2 0 0 2

COURSE OBJECTIVE:

- ✓ To help students understand how ethical hacking is used as a method to prevent hacking.
- ✓ To make it possible for students to learn the process of identifying vulnerabilities and exploits of the technological ecosystem comprising of various hardware, software, network, OS and applications and identify suitable countermeasures.
- ✓ To facilitate students, appreciate the need for understanding non-technology aspects of ethical hacking such as legal frameworks, documentation and report writing.

UNIT I INTRODUCTION TO ETHICAL HACKING 6

Hacking Methodology, Process of Malicious Hacking, and Foot printing and scanning:
Footprinting, scanning. Enumeration: Enumeration.

UNIT II TYPES OF HACKING 6

System Hacking and Trojans: System Hacking, Trojans and Black Box Vs. White Box Techniques.

UNIT III HACKING METHODOLOGY 6

Denial of Service, Sniffers, Session Hijacking and Hacking Web Servers: Session Hijacking, Hacking Web Servers.

UNIT IV WEB APPLICATION 6

Web Application Vulnerabilities and Web Techniques Based Password Cracking: Web Application Vulnerabilities, Web Based Password Cracking Techniques.

UNIT V WEB AND NETWORK HACKING 6

SQL Injection, Hacking Wireless Networking, Viruses, Worms and Physical Security: Viruses and Worms, Physical Security. Linux Hacking: Linux Hacking. Evading IDS and Firewalls: Evading IDS and Firewalls.

Total No of Hours: 30

COURSE OUTCOME

On Completion of this course, students can able to

CO1: Justify the need for meticulous documentation in writing reports for consumption of both technical and management audiences

CO2: Differentiate the processes of vulnerability assessment and ethical hacking from penetration testing.

CO3: Comprehend the importance of appropriate countermeasures for managing vulnerabilities.

CO4: Explain the importance of ethical hacking in achieving the goals of information security.

CO5: Articulate the rationale for having an adequate legal framework for dealing with hacking and ethical hacking.

TEXTBOOKS

1. Gray Hat Hacking The Ethical Hackers Handbook, 3rd Edition Paperback – 1 Jul 2017 by Allen Harper, Shon Harris, Jonathan Ness, Chris Eagle, McGraw Hill Education; 3 ed (1 July 2017)
2. CEH v9: Certified Ethical Hacker Version 9 Study Guide by Sean-Philip Oriyano, Sybex; Stg edition (17 June 2016)
3. Hacking for Beginners: Ultimate 7 Hour Hacking Course for Beginners. Learn Wireless Hacking, Basic Security, Penetration Testing by Anthony Reynolds, CreateSpace Independent Publishing Platform (10 April 2017)
4. An Ethical Guide To WI-FI Hacking and Security by Swaroop Yermalkar, Become Shakespeare.com; First edition (15 August 2014)
5. Hands-On Ethical Hacking and Network Defense by Michael T. Simpson | Kent Backman | James Corley, Cengage India 1st edition (2016)

REFERENCE BOOKS

1. The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy by Patrick Engebretson, Syngress; 2 edition (12 September 2013)
2. Hacking With Python: The Complete Guide to Ethical Hacking, Basic Security, Botnet Attack, Python hacking and Penetration Testing Kindle Edition by John C. Smalls

WEBSITES

1. www.javatpoint.com 2. www.tutorialspoint.com WEBSOURCES

1. <https://www.javatpoint.com/ethical-hacking-tutorial> 2. https://www.tutorialspoint.com/ethical_hacking/index.htm

SEC MATLABPROGRAMMING 2 0 0 2

COURSEOBJECTIVE:

To makethestudentstobefamiliarinMatlabtoolcontainingmanytoolboxesuchasdatamining, imageprocessing, signal processing andso on.

UNIT-I Introductionto MATLAB	BriefIntroduction
	InstallationofMATLAB
	History
	UseofMATLAB
	Keyfeatures
MATLABsoftware	Introductionto MATLABSoftware
	MATLABwindow
	Command window
	Workspace
	Command history
	Settingdirectory
	WorkingwiththeMATLABuserinterface
	Basiccommands
	Assigningvariables
	Operationswithvariables
DatafilesandDatatypes	Characterandstring
	Arraysand vectors
	Columnvectors
	Rowvectors
UNIT-II BasicMathematics	BODMASRules
	Arithmeticoperations
	Operatorsandspecial characters
	Mathematicalandlogicaloperators
	Solvingarithmeticequations

Operations on matrix	Crating rows and columns Matrix
	Matrix operations
	Finding transpose, determinant and inverse
	Solving matrix
UNIT- III M-Files	Writing Script file
	Executing script files
	The MATLAB Editor
	Saving m files
Plots	Plotting vector and matrix data
	Plot labelling, curve labelling and editing
GUI Design	Introduction Of Graphical User Interface
	GUI Function Property
	GUI Component Design
	GUI Container
	Writing the code of GUI Callback

	Dialog Box
	Menu Designing
	Applications
UNIT IV	Automating commands with scripts
MATLAB Programming	Writing programs with logic and flow control
	Writing functions
	Control statement Programming
	Conditional Statement Programming
	Examples
Loops and Conditional Statements	Control Flow Conditional Control — if, else, switch
	Loop Control — for, while, continue, break
	Program Termination — return
UNIT-V	Importing and Visualizing Images
Image Processing with MATLAB	Importing and displaying images
	Converting between image types
	Exporting images
	Interactive Exploration of Images
	Obtaining pixel intensity values
	Extracting a region of interest
	Computing pixel statistics
	Measuring object sizes
	Creating a custom interactive tool
	Preprocessing Images
	Adjusting image contrast
	Reducing noise in an image
	Using sliding neighborhood operations
	Using block processing operations

COURSE OUTCOME:

On Completion of this course, Students can able to

CO1: Develop simple .M files in Matlab

CO2: Analyze various toolboxes available in Matlab.

CO3: Apply mathematical Functions, arrays, matrices in specified applications..

CO4: Interpret plots and export this for use in reports and presentations. CO5: Execute and manipulate images using image processing toolbox. .

TEXTBOOKS

1. Introduction to Programming in MATLAB – Sam H. Davis
2. Introduction to MATLAB – Ela Pekalska

WEBSITES

1. www.tutorialspoint.com WEBSOURCES

<https://www.tutorialspoint.com/matlab/index.htm>

<https://www.slideshare.net/ashishmeet/introduction-to-matlab-18425069>

WISEM SECV ENTREPRENEURSHIP DEVELOPMENT 2 0 0 2

COURSE OBJECTIVE:

- ✓ To develop and strengthen entrepreneurial quality and motivation in students
- ✓ To impart basic entrepreneurial skills and understanding to run a business efficiently and effectively.
- ✓ To understand the concept and process of entrepreneurship and its contribution in and role in the growth hand development of individual and the nation.

UNIT I ENTREPRENEURSHIP 6

Entrepreneur – Personality characteristics of successful entrepreneur – Types of Entrepreneurs – Knowledge and skills required for an entrepreneur – Difference between Entrepreneur and Intrapreneur

UNIT II BUSINESS 6

Definition, Classification – Characteristics, Ownership Structures – Project Formulation – Steps involved in setting up a Business – Market Survey and Research – Techno Economic Feasibility Assessment

UNIT III BUSINESS PLAN PREPARATION 6

Sources of product for business – Pre-feasibility study – Criteria for selection of product – Ownership

Capital – Budgeting project profile preparation – Matching entrepreneur with the project – Feasibility report preparation and evaluation criteria.

UNIT IV SUPPORT TO ENTREPRENEURS 6

Sickness in small Business – Concept, Magnitude, Causes and Consequences, Corrective Measures – Business Incubators – Government Policy for Small Scale Enterprises – Growth Strategies in small industry.

UNIT V ENTREPRENEURSHIP DEVELOPMENT PROGRAMME 6

Meaning, Objectives – Phases of EDP – steps in EDP – Strategies for Entrepreneurship development – Institutions in aid of Entrepreneurship Development Programme – Use of IT enabled services in entrepreneurship - E Licensing, E filing.

Total No of Hours: 30 hrs

COURSE OUTCOMES:

At the end of the course, a student will be able to

CO1: Understand the concept of Entrepreneurship

CO2: Identify, create and analyze entrepreneurial opportunities.

CO3: Assess the economic feasibility of a Business Plan

CO4: Create Business Plans

CO5: State various statutory institutions involved in the process of Entrepreneurship development

TEXTBOOKS:

Hisrich RD, Peters MP, "Entrepreneurship" 8th Edition, Tata McGraw-Hill, 2016

Khanka S.S., "Entrepreneurial Development" S Chand & Company; edition, 2016

REFERENCE BOOKS:

Sharma, "Entrepreneurship Development", PHILEARNING PVT LTD, (2017)

Abhinav Ganpule & Aditya Dhobale, "Entrepreneurship Development", Kindle Edition, Jatayu Publication; 1st edition, 2018.

Sangeeta Sharma, "Entrepreneurship Development", 10th Edition, Kindle Edition PHI Learning, 2018

WEBSITES

<http://www.simplynotes.in/e-notes/mbabba/entrepreneurship-development/>

<https://openpress.usask.ca/entrepreneurship-and-innovation-toolkit/chapter/chapter-1-introduction-to-entrepreneurship/>

WEBSOURCES

<https://articles.bplans.com/10-great-websites-for-entrepreneurs/>

<https://www.entrepreneur.com/article/272185>

GENERIC ELECTIVES (GE)

VI SEM GE INTERNET BASICS 3 0 0 3

COURSE OBJECTIVE:

- ✓ To make the student understand the overall view of internet.
- ✓ To inculcate the students about the various facilities available in internet.
- ✓ To gain practical knowledge about internet.

UNIT I INTRODUCTION 9

Internet and its history, defining and describing the Internet, Brief history, discussing the future of the Internet, Internet Resources. Describe the important features of the Web and Web browser software, Evaluate e-mail software and Web-based e-mail services

UNIT II EMAIL 9

Email, Parts of email, Email software, Web-based email, Email address, List servers, Newsgroups, Newsgroups names, Newsgroups readers, Chat rooms, Conferencing.

UNIT III INTERNET RESOURCES 9

Internet Resources, Games, File transfer protocol, Telnet, World Wide Web, Behavior on the Internet, Accessing the Internet, Types of access, Online services, Internet service providers, How and where to look for the service Browsing the Web, Browsing the Web.

UNIT IV FTP 9

Use FTP and other services to transfer and store data, Demonstrate the use of real-time chat and briefly describe the history of the wireless Internet. Use mailing lists, newsgroups, and newsfeeds, Create HTML documents and enhance them with browser extensions

UNIT V APPLICATIONS 9

Applications of Internet- education, business, government, Communication, Job searches, Health and medicine, Travel, Entertainment, Shopping, Stock market updates, Research.

Total No of Hours: 45

COURSEOUTCOME

At the end of the course students can able to,

CO1: Develop & design mail to his/her friends
CO2: Analyze the search engine (ie) browsers.
CO3: Use the applications of internet

CO4: Understand the basic concepts and features of Web.

CO5: Understand the security threats and electronic commerce.

TEXTBOOK

1. Rohit Khurana, "COMPUTER FUNDAMENTALS and INTERNET BASICS", Aph Publishing Corporation, 2010.

REFERENCEBOOK

2. Margaret Levine Young, "Internet Millennium Edition", Osborne Publications, 2000.

WEBSITES

www.w3schools.com

www.tutorialspoint.com

www.javapoint.com

WEBSOURCES

<https://www.oswaalbooks.com/download/freeresources/class10/175Quick%20Revision%20Notes%2010th%20Computer%20Application.pdf>

<https://fcit.usf.edu/internet/chap1/chap1.htm>

<https://www.slideshare.net/osuchin/internet-basics-13440260>

<https://www.slideshare.net/argusacademy/internet-40994977>

VI SEMGE WEBDESIGNING 3 0 0 3

COURSE OBJECTIVE:

- ✓ To explain to the student the major concepts of web designing.
- ✓ This course explains the graphics and animation.
- ✓ This course introduces basic concepts of CSS.

UNIT I WEB DESIGN PRINCIPLES 9

Basic principles involved in developing a web site , Planning process , Five Golden rules of web designing , Designing navigation bar , Page design , Home Page Layout , Design Concept.

UNIT II BASICS IN WEB DESIGN 9

Brief History of Internet , What is World Wide Web, Why create a website , Web Standards , Audience requirement.

UNIT III INTRODUCTION TO HTML 9

What is HTML , HTML Documents , Basic structure of an HTML document , Creating an HTML document, Markup Tags, Heading-Paragraphs, Line Breaks, HTML Tags, Elements of HTML, Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames , Working with Hyperlinks, Images and Multimedia. Working with Forms and controls.

UNIT IV INTRODUCTION TO CASCADING STYLE SHEETS 9

Concept of CSS , Creating Style Sheet , CSS Properties , CSS Styling (Background, Text Format, Controlling Fonts) , Working with block elements and objects , Working with Lists and Tables , CSS Id and Class , Box Model (Introduction, Border properties, Padding , Properties, Margin properties) .

UNIT V INTRODUCTION TO WEB PUBLISHING OR HOSTING 9

Creating the Web Site, Saving the site, working on the web site, Creating web site structure, Creating Titles for web pages, Themes-Publishing web sites.

Total No of Hours: 45

COURSE OUTCOME :

At the end of the course students can able to

CO1: Design static Websites using HTML.

CO2: Create websites using CSS.

CO3: Apply CSS properties & able to embed the stylesheet into HTML documents

CO4: Demonstrate web hosting.

CO5: Understand basic tags and CSS Properties

TEXTBOOK

1. Ivan Bayross, "HTML5 and CSS3 Made Simple", BPB publications, Dec 2012.

REFERENCE BOOK

1. Thomas A Powell, "HTML Complete Reference", McGraw Publications, 2000

WEBSITES

www.w3schools.com

www.tutorialspoint.com

www.javapoint.com

WEBSOURCES

1. https://www.tutorialspoint.com/html/html_tutorial.pdf 2. <https://wtf.tw/ref/duckett.pdf> 3. <https://www.shahucollegelatur.org.in/Department/StudyMaterial/bvoc/Web%20Hosting.pdf>

REFERENCEBOOK

1. Michael Kruckenberg, "ProMySQL", Apress Publications, 2005.

WEBSITES

www.w3schools.com

www.tutorialspoint.com

www.javapoint.com

WEBSOURCES

https://www.tutorialspoint.com/mysql/mysql_tutorial.pdf

<https://downloads.mysql.com/docs/mysql-tutorial-excerpt-5.7-en.pdf>

<https://www.slideshare.net/webhostingguy/mysqlppt-3672569>

<https://slideplayer.com/slide/13209422/>

**ABILITY ENHANCEMENT COMPULSORY COURSE
(AECC)**

ISEM AECC COMMUNICATION SKILLS 1 0 2 2

COURSE OBJECTIVE:

This course is to subject the students to practise the components in various units. To make students ready for placement interviews within campus.

To infuse confidence to face job situations.

Credit Hours

UNIT I 06

Resume and CV Writing

Complaint Letter

Social Correspondence

Letter of Enquiry

UNIT II 06

Short Essay Writing

UNIT III 06

Explaining Proverbs

UNIT IV 06

Use of Prepositions

UNIT V 06

Synonymous Words

Total No. of Hours: 30 Hours

COURSEOUTCOME:

On Completion of this Course, students can able

CO1:To enhance learners' confidence level.

CO2:To make learners feel the assimilation of skills.

CO3: To engage in a conversation with other to exchange ideas.

CO4: To impart leadership qualities among the participants.

CO5:To express opinions to enhance their social skills.

TEXTBOOKS

For Unit I–V Effective Communication For You – V. Syamala Emerald Publishers, Chennai.

Cameron, David. Mastering Modern English, Hyderabad: Orient Blackswan, 1978 (rpt. 1989, 1993, 1995, 1998).

Freeman, Sarah. Written Communication in English, Hyderabad: Orient Blackswan, 1977 (21st Impression, 2007).

Singh, Vandana R. The Written Word. New Delhi: Oxford University Press, 2003 (3rd Impression, 2007)

Seely, John. Oxford Guide to Effective Writing and Speaking. New Delhi: Oxford University Press, 2000 (4th Impression, 2008)

WEBSOURCES:

<https://www.myperfectresume.com/career-center/resumes/how-to/write>

<https://www.englishgrammar.org/>

COURSE OBJECTIVE

To inculcate the importance of environmental pollution, preservation of nature and environmental management for human welfare.

UNIT-I MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES, NATURAL RESOURCES 06

Definition, scope and importance, need for public awareness.

Renewable and non-renewable resources - Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams - benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.

Land resources: Land as a resource, land degradation, man-induced landslides, soil erosion and desertification - Role of an individual in conservation of natural resources - Equitable use of resources for sustainable lifestyles.

UNIT-II ECOSYSTEMS, BIODIVERSITY AND ITS CONSERVATION 06

Concept of an ecosystem. - Structure and function of an ecosystem Producers, consumers and decomposers. - Energy flow in the ecosystem. Ecological succession. - Food chains, food webs and ecological pyramids.

Introduction, types, characteristic features, structure and function of the following ecosystem: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Introduction - Definition, genetic, species and ecosystem diversity.

Biogeographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega-diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss,

poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-III ENVIRONMENTAL SCIENCE 06

Definition, Cause, effects and control measures of a) Air pollution b) Water pollution c) Soil pollution d) Marine pollution e) Noise pollution f) Thermal pollution g) Nuclear hazards. Solid waste Management. Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management- floods, earthquake, cyclone and landslides.

UNIT-IV SOCIAL ISSUES AND THE ENVIRONMENT 06

From Unsustainable to Sustainable development, Urban problems related to energy - Water conservation, rainwater harvesting, watershed management - Resettlement and rehabilitation of people; its problems and concerns. Case Studies - Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. Wasteland reclamation. Consumerism and waste products. Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act Issues involved in enforcement of environmental legislation. Public awareness.

UNIT-V HUMAN POPULATION AND THE ENVIRONMENT 06

Population growth, variation among nations. Population explosion - Family Welfare Programme. Environment and human health. Human Rights. Value Education. HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health. Case Studies. Fieldwork - Visit to a local area to document environmental assets river/forest/grassland/hill/mountain, Visit to a local polluted site - Urban/Rural/Industrial/Agricultural, Study of common plants, insects, birds, Study of simple ecosystems - pond, river, hill slopes, etc.

Total No of Hours: 30 hrs

COURSE OUTCOME

CO1: To understand the nature and facts about environment.

CO2: To find and implement scientific, technological, economic solutions to environmental problems.

CO3: To know about the interrelationship between living organisms and environment.

CO4: To understand the integrated themes and biodiversity, natural resources, pollution control and waste management.

CO5: To appreciate the importance of environment by assessing its impact on the human world.

TEXTBOOKS

2. DeAK, Environmental Chemistry, Wiley Eastern Ltd.
3. Bharucha Erach, 2003. The Bio diversity of India, Map in Publishing Pvt. Ltd, India.
4. Brunner RC, 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480 pgs.
5. Clark RS, Marine Pollution, Clarendon Press, Oxford (TB).

REFERENCE BOOKS

1. Agarwal KC, 2001. Environmental Biology, Nidi Publishers Ltd. Bikaner.
2. Gleick HP, 1993. Water in Crisis, Pacific Institute for Studies in Development, Environment and Security. Stockholm Environmental Institute, Oxford University Press, 473 pgs.
3. Heywood VH, and Watson RT, 1995. Global Biodiversity Assessment. Cambridge University Press 1140 pgs.
4. Jadhav H and Bhosale VM, 1995. Environmental Protection and Laws. Himalaya Publishing House, Delhi 284 pgs.
5. Miller TG, Jr. Environmental Science, Wadsworth Publishing CO. (TB)