Bachelor

of

Computer Applications

(B.C.A)

Specialization In

Cloud Technology and Information Security (CTIS)

CURRICULUM AND SYLLABUS

(Based on Choice Based Credit System)

Effective from the Academic year

2019 - 2022

DEPARTMENT OF INFORMATION TECHNOLOGY

SCHOOL OF COMPUTING SCIENCES

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

PEO1: Exhibit practical hands on experience on the core and fundamentals like Programming in C, Data Structures and algorithms.

PEO2: Display practical knowledge, with the fundamentals and essentials of Cloud Computing and information security

PEO3: Collaborate Work as a team in inter disciplinary and intra disciplinary projects to develop solutions in cloud infrastructure, etc

PEO4: Publish research findings and innovations in technical symposiums, hackathons, project presentations, and publication of research articles in peer reviewed and indexed conferences and journals.

PEO5: Analyze and resolve security issues in networks and computer systems to secure an IT infrastructure.

PEO6: Enable students to appreciate the importance of Cloud Computing and assess the need of resources for a given scenario

PEO7: Practically demonstrate various administrative features to be carried on servers running on different platforms including concepts of virtualization

PROGRAM OUTCOME (PO)

PO1: Critical Thinking: Apply knowledge of Computer Science to identify, analyze, problems and to provide effective solution in the area of Computing.

PO2: Computing Skills and Ethics: Analyze a problem, and identify and define the computing requirements appropriate to its solution.

PO3: Analytical skill: Ability to design, develop algorithms and provide software solutions to cater the industrial needs.

PO4: Modern Tool Usage: Use current techniques, skills, and tools necessary for computing practices

PO5: Employability Skills: Inculcate skills to excel in the fields of Information Technology and its Enabled services, Government and Private sectors, Teaching and Research.

PO6: Ethics: Insists ethical responsibilities, human and professional values and make their contribution to the society.

PO7: Self Directed and Life-long Learning: Engaged in lifelong learning to equip them to the changing environment and be prepared to take-up mastering programmes.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: Understand the basic concepts in computer.

PSO2: An ability to apply knowledge of mathematics, computer science and management in practice. An ability to enhance not only comprehensive understanding of the theory but its application too in diverse field

PSO3: Analyze and apply the latest technologies to solve problems in the areas of computer applications.

PSO4: Apply technical and professional skills to excel in business.

PSO5: Able to build software applications and tools through quantitative and qualitative techniques.

PSO6: Develop, valuate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training.

PSO7: Practice problem analysis and decision-making.

PSO8: Able to communicate effectively in both verbal and written form.

PSO9: Understand and appreciate the value of information to the modern organization.

PSO10: Awareness on ethics, values, sustainability and creativity aspects.

Vels Institute of Science Technology & Advanced Studies

School of Computing Sciences

Department of Information Technology

Board of Studies

Chairman **: Dr.P.Swaminathan**, Dean,

School of Computing Sciences,

Vels Instituute of Science,Technology and Advanced Studies,

Chennai.

Internal Board Member **:** 1. **Dr.P.Mayilvahanan**, Professor,

Department of Computer Applications,

School of Computing Sciences,

Vels Instituute of Science,Technology and Advanced Studies,

Chennai.

2. **Dr.S.Prasanna**, HOD,

Department of Computer Applications,

School of Computing Sciences,

Vels Instituute of Science,Technology and Advanced Studies,

Chennai.

3. **Dr.Kamalakannan**, HOD,

Department of Information Technology,

School of Computing Sciences,

Vels Instituute of Science,Technology and Advanced Studies,

Chennai..

4. **Dr.K.Kalaiselvi**, HOD,

Department of Computer Science,

School of Computing Sciences,

Vels Instituute of Science,Technology and Advanced Studies,

Chennai.

External Member **: Dr.K.R.Ananthapadmanaban**, Professor & HOD,

Department of Computer Science,

SRM Arts and Science College, Chennai.

Industry Member **: Dr.P.Magesh Kumar**,

Calibsoft Technologies Pvt Ltd., Chennai.

Special Invitees **: Dr.Jothi Venkateswaran**, HOD,

Department of Computer Science,

Presidency College, Chennai.

Alumni Member **: Mr.R.Balamurugan**, SCOPUS Ltd, Chennai.

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

BCA CLOUD TECHNOLOGY & INFORMATION SECURITY DEGREE COURSE

COURSES OF STUDY AND SCHEME OF ASSESSMENT

(TOTAL NO OF CREDITS: 140)

		Hours/Week				Maximum Marks		
Code No.	Course	Lecture	Tutorial	Practical	Credits	CA	SEE	Total
SEMESTER 1								
LANG	Tamil I/ Hindi / French	5	0	0	5	40	60	100
ENG	English I	5	0	0	5	40	60	100
CORE	Programming in C	4	1	0	5	40	60	100
CORE	Mathematics - I	4	0	0	4	40	60	100
CORE	Programming in C Lab	0	0	4	2	40	60	100
CORE	MS Office Lab	0	0	4	2	40	60	100
		18	1	8	23			
SEMESTER 2								
LANG	Tamil II / Hindi / French	5	0	0	5	40	60	100
ENG	English II	5	0	0	5	40	60	100
CORE	Data Structures and Algorithm	4	1	0	5	40	60	100
CORE	Mathematics II	4	0	0	4	40	60	100
CORE	Operating System Lab	0	0	4	2	40	60	100
CORE	Data Structures and Algorithm Lab	0	0	4	2	40	60	100
		18	1	8	23			

CA - Continuous Assessment

SEE - Semester End Examination

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

BCA CLOUD TECHNOLOGY & INFORMATION SECURITY DEGREE COURSE

Code No.	Course	Hours/Week			Credits	Maximum Marks		
		Lecture	Tutorial	Practical		CA	SEE	Total
SEMESTER 3								
CORE	Programming in Java	5	0	0	5	40	60	100
CORE	Server Administration	4	1	0	5	40	60	100
CORE	Cloud Computing	5	0	0	5	40	60	100
CORE	Information Security	4	0	0	4	40	60	100
CORE	Programming in Java Lab	0	0	4	2	40	60	100
CORE	Server Administration Lab	0	0	4	2	40	60	100
SEC	Soft Skills – I	2	0	0	2	40	60	100
		20	1	8	25			
SEMESTER 4								
CORE	Database Management Systems.	4	1	0	5	40	60	100
CORE	Principles of Virtualization	5	0	0	5	40	60	100
CORE	Ethical Hacking	4	0	0	4	40	60	100
CORE	Principles of Virtualization Lab	0	0	4	2	40	60	100
CORE	Ethical Hacking Lab	0	0	4	2	40	60	100
AECC	Environmental Studies	2	0	0	2	40	60	100
SEC	Soft Skills – II	2	0	0	2	40	60	100
		17	1	8	22			

CA - Continuous Assessment

SEE - Semester End Examination

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

BCA CLOUD TECHNOLOGY & INFORMATION SECURITY DEGREE COURSE

Code No.	Course	Hour / Week			Credits	Maximum Marks		
		Lecture	Tutorial	Practical		CA	SEE	Total
SEMESTER 5								
DSE	Discipline Specific Elective -1	4	1	0	5	40	60	100
DSE	Discipline Specific Elective -2	4	0	0	4	40	60	100
DSE	Discipline Specific Elective -3	4	0	0	4	40	60	100
DSE	Discipline Specific Elective -4	4	0	0	4	40	60	100
DSE	Discipline Specific Elective -3 Lab	0	0	4	2	40	60	100
GE	Generic Elective -1	2	0	0	2	40	60	100
SEC	SEC-1	2	0	0	2	40	60	100
		20	1	4	23			
SEMESTER 6								
DSE	Discipline Specific Elective -5	4	1	0	5	40	60	100
DSE	Discipline Specific Elective - 6	5	0	0	5	40	60	100
GE	Generic Elective -2	2	0	0	2	40	60	100
SEC/VAC	SEC -2	2	0	0	2	40	60	100
DE	Project Work	0	0	0	10	40	60	100
		13	1	0	24			

CA - Continuous Assessment

SEE - Semester End Examination

List of Discipline Specific Elective (DSE)

Subject code	Title of the Paper
DSE 1A	Network Administration
DSE 1B	Linux Administration
DSE 2A	Network Security
DSE 2B	Cryptography
DSE 3A	Infrastructure Solutions on Cloud
DSE 3B	Cloud Web Services
DSE 4A	Cloud Security
DSE 4B	Database Security.
DSE 3AL	Infrastructure Solutions on Cloud Lab
DSE 3BL	Cloud Web Services Lab
DSE 5A	Storage & Datacentre
DSE 5B	Cloud Architecture and Deployment
DSE 6A	Digital Forensics
DSE 6B	Security Threats and Trends

List of Generic Elective (GE)

Subject Code	Title of the Paper
GE 1A	Web Technology Fundamentals
GE 1B	Computer Organization & Architecture
GE 1C	Server side Scripting Language
GE 1D	Advanced Excel
GE 2A	Python Programming
GE 2B	Internet of Things
GE 2C	Artificial intelligence
GE 2D	Disaster Recovery and Business continuity Management

List Of Languages

Subject Code	Title of the Paper
18LEN001	Foundation Course English I
18LTA001	Foundation Course Language I
18LHN001	Hindi Paper – I
18LFR001	French Paper - I
18LEN002	Foundation Course English II
18LTA002	Foundation Course Language II
18LHN002	Hindi Paper – II
18LFR002	French Paper - II

List of Skill Enhancement Course (SEC)

Subject Code	Title of the Paper
SEC 1	Soft Skill -I
SEC 2	Soft Skill - II
SEC 3	Personality Development
SEC 4	National Service Scheme (NSS).
SEC 5	Ethics & Values

List of Ability Enhancement Compulsory Course (AECC)

AECC 1	Environmental Science

Semester – I

Syllabus

TAMIL I/HINDI /FRENCH **5 0 0 5**

18LTA001 தமிழ் மொழி, இலக்கிய வரலாறு – அறிமுகம் 5 0 0 5

நோக்கம்:

தமிழ்மொழி மற்றும் இலக்கியத்தின் வரலாற்றை அறிமுகம் செய்யும் நோக்கில் இப்பாடம் வடிவமைக்கப்பட்டுள்ளது. தமிழ்மொழியின் வரலாற்றை அறிவியல் கண்ணோட்டத்துடனும் மொழிக்குடும்பங்களின் அடிப்படையிலும்விளக்குகிறது. சங்க இலக்கியம் தொடங்கி, இக்கால இலக்கியம் வரையிலான தமிழிலக்கிய வரலாற்றை இலக்கிய வரலாறு அறிமுகப்படுத்துகின்றது. அரசு வேலை வாய்ப்பிற்கான போட்டித் தேர்வுகளுக்குப் பயன்படும் வகையிலும் இப்பாடம் அமைந்துள்ளது.

அலகு 1 தமிழ் மொழி வரலாறு 13 மணி நேரம்

மொழிக்குடும்பம் - இந்திய மொழிக்குடும்பங்கள் - இந்திய ஆட்சி மொழிகள் - திராவிட மொழிக்குடும்பங்கள் - திராவிட மொழிகளின் வகைகள் –திராவிட மொழிகளின் சிறப்புகள் - திராவிட மொழிகளின் வழங்கிடங்கள் - திராவிட மொழிகளுள் தமிழின் இடம் - தமிழ்மொழியின் சிறப்புகள் - தமிழ் பிறமொழித் தொடர்புகள்.

அலகு 2 சங்க இலக்கியம் 12 மணி நேரம்

சங்க இலக்கியம் - எட்டுத்தொகை - நற்றிணை - குறுந்தொகை - ஐங்குறுநூறு - பதிற்றுப்பத்து - பரிபாடல் - கலித்தொகை - அகநானூறு - புறநானூறு - பத்துப்பாட்டு – திருமுருகாற்றுப்படை – சிறுபாணாற்றுப்படை – பெரும்பாணாற்றுப்படை –

பொருநராற்றுப்படை – மலைபடுகடாம் – குறிஞ்சிப்பாட்டு, முல்லைப்பாட்டு, பட்டினப்பாலை –நெடுநல்வாடை – மதுரைக்காஞ்சி.

அலகு 3 அற இலக்கியங்களும் காப்பியங்களும் 11 மணி நேரம்

களப்பிரர் காலம் விளக்கம் – நீதி இலக்கியத்தின் சமூகத்தேவை - பதினெண்கீழ்க்கணக்கு நூல்கள் அறிமுகம் - திருக்குறள், நாலடியார்.காப்பியங்கள் – ஐம்பெருங்காப்பியங்கள் மற்றும் ஐஞ்சிறுங்காப்பியங்கள் அறிமுகம்–காப்பிய இலக்கணம் - சிலப்பதிகாரம் – மணிமேகலை – சீவகசிந்தாமணி – வளையாபதி – குண்டலகேசி.

அலகு 4 பக்தி இலக்கியங்களும் சிற்றிலக்கியங்களும் 11 மணி நேரம்

தமிழகப் பக்தி இயக்கங்கள் - பக்தி இலக்கியங்கள் - சைவ இலக்கியம் - நாயன்மார்கள் அறுபத்து மூவர் - சமயக்குரவர் நால்வர் - வைணவ இலக்கியம் - பன்னிரு ஆழ்வார்கள் - முதல் மூன்று ஆழ்வார்கள்.சிற்றிலக்கியக் காலம் - சிற்றிலக்கியங்கள் - வகைகள் - பரணி - கலிங்கத்துப்பரணி - குறவஞ்சி - குற்றாலக் குறவஞ்சி - பிள்ளைத்தமிழ் - மீனாட்சியம்மைப் பிள்ளைத்தமிழ் - தூது - தமிழ்விடு தூது - கலம்பகம் - நந்திக்கலம்பகம் - பள்ளு - முக்கூடற்பள்ளு.

அலகு 5 இக்கால இலக்கியங்கள் 13 மணி நேரம்

நவீன காலம் – நவீன இலக்கியம் – உள்ளடக்கம் - புதுக்கவிதை - தோற்றமும் வளர்ச்சியும்- நாவல் - முதல் மூன்று நாவல்கள் – நாவலின் வகைகள் - பொழுது போக்கு நாவல்கள் - வரலாற்று நாவல்கள் - சமூக நாவல்கள் - இக்கால நாவல்கள் - மொழிபெயர்ப்பு நாவல்கள் - சிறுகதை –வகைகளும் வளர்ச்சியும் – நாடகம் –காலந்தோறும் நாடகங்கள் - புராண இதிகாச

நாடகங்கள் - சமூக நாடகங்கள் - வரலாற்று நாடகங்கள் – மொழிபெயர்ப்பு நாடகங்கள் - நகைச்சுவை நாடகங்கள்.

மொத்தம்: 60 மணி நேரம்

பாட நூல்கள்

1. அகத்தியலிங்கம். ச., "திராவிடமொழிகள் தொகுதி 1", மணிவாசகர் பதிப்பகம், முதற்பதிப்பு, 1978.

2. சக்திவேல். சு., "தமிழ்மொழி வரலாறு", மணிவாசகர் பதிப்பகம், முதற்பதிப்பு 1998.

பார்வை நூல்கள்

1. பூவண்ணன், " தமிழ் இலக்கிய வரலாறு", சைவசித்தாந்த நூற்பதிப்புக் கழகம், முதற்பதிப்பு, 1998.

2. வரதராசன். மு., "இலக்கிய வரலாறு",சாகித்ய அகாதெமி, ஒன்பதாம் பதிப்பு, 1994.

3. விமலானந்தம். மது.ச., "இலக்கிய வரலாறு", பாரி நிலையம், மறுபதிப்பு, 2008.

HINDI I **5 0 0 5**

COURSE OBJECTIVE

To train the students in the use of Karyalayin Basha.To enable the students to develop the communication skill in Hindi language**.**

UNIT I GADYA AUR KARYALAYIN BASHA 12

Mamata, -Yogyatha evam vyavasay kaa Chunaav Paribashik shabdavalil prashasanik vakyansh,padanam

UNIT II GADYA AUR SARKARI PATRA 12

Rajneethi kaa Bhantwara, , Samanya sarkari patra,gyapan,karyalay gyapan

UNIT III GADYA AUR SARKARI PATRA 12

Computer nayi krantee kee dastak, , Karyalay aadesh,Ardha sarkari patra paripatra,Adhisoochana

UNIT IV GADYA AUR SAMANYA PATRA 12

Raspriya, Samanya patra- chutti patra,sampadak ke naam patra, shikayati patra,

pustak vikretha ke naam patra

UNIT V YAVASAAYIK PATRA 12

Bankon mein bach khaata kholne ke liye – chek buk ke liye, run lene hetu, chek buk gum ho jane hetu, kitaabon kaa krayadesh

Total No of Hours: 60 Hrs

TEXT BOOK

1. Gadya Aur Prayojanmulak Hindi ed by Dr.N.Lavanya Mayura Publishers, edition 2008.

FRENCH I **5 0 0 5**

COURSE OBJECTIVE:

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

UNIT I INTRODUCTION **12**

Introduction - Alphabet – Comment prononcer, écrire et lire les mots- Base : Les prénoms personnel de 1er, 2ème et 3ème personnes – Conjugaisons les verbes être et avoir en forme affirmative, négative et interrogative

UNIT II LEÇONS 1- 3 **12**

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

UNIT III LEÇONS 4- 6 **12**

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 tirés 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 VI LEÇONS 7- 9 **12**

Leçons7. Trois visages de l'aventure,- 8. A moi, Auvergne,- 9. Recit de voyage - Réponses aux questions tirés de la leçon - Grammaire : Adjectif possessif – Les Phrases au Présent de l'indicatif - Les phrases avec les verbes pronominaux au présent

UNIT V COMPOSITION **12**

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 : 60 Hrs

TEXT BOOK

1. Jacky GIRARDER & Jean Marie GRIDLIG, « Méthode de Françai PANORAMA », Clé Internationales, Goyal Publication, New Delhi., Edition 2004

REFERENCE BOOKS

1. DONDO Mathurin , " Modern French Course", Oxford University Press., New Delhi., Edition 1997

2. Nitya Vijayakumar, "Get Ready French Grammar – Elementary", Goyal Publications, New Delhi., Edition 2010

ENGLISH I **5 0 0 5**

COURSE OBJECTIVE:

- To enable the students to develop their communication skills effectively. To make students familiar with the English Language.
- To enrich vocabulary in English
- To develop communicative competent

UNIT I - Preparatory Lesson **12**

1. Competition Matters
   Suzanne Sievert
2. A Personal Crisis May Change History
   Dr. A.P.J. Abdul Kalam
3. Why Preserve Biodiversity
   Prof. D. Balasubramanian

UNIT II –Prose **12**

1. The Unexpected
   Robert Lynd
2. My Greatest Olympic Prize
   Jesse Owens
3. If You are wrong, admit it
   Dale Carnegie

UNIT III –Poetry **12**

1. The Night of the Scorpion
Nissim Ezekiel
2. Pulley or The Gift of God
   George Herbert
3. La Bella Dame Sans Merci
   John Keats

UNIT IV- Short Story **12**

1. The Gift of Magi
   O Henry
2. Three Questions
   Leo Tolstoy

UNIT V – One Act Play **12**

1. The Shirt
   Francis Dilion
2. The Pie and the Tart
   Hugh Chesterman

Total: 60 Hours

COURSE OUTCOME

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

CO 1 Examine the difference between poetic language and the language of the prose.

CO 2 Utilize instructions on fundamentals of grammar

CO 3 Develop their own style of writing after studying diverse prose essays.

CO 4 Classify different poems on the basis of their types.

CO 5 Conclude the textual content of both prose and poetry.

Books Prescribed:

- Confluence - AnuChithra Publications

PROGRAMMING IN C **4 1 0 5**

COURSE OBJECTIVE

- This course introduces the basic concepts of programming in C.
- This subject deals various methods programming using the C languages.
- On successful completion the students should have programming ability on C.

UNIT I OVERVIEW OF PROGRAMMING 12

Introduction to computer based problem solving, Program design and implementation issues- Flowcharts & Algorithms, Top down design & stepwise refinement, Programming environment – Machine language, assembly language, high level languages, Assemblers, Compilers, Interpreters.

UNIT II FUNDAMENTALS OF C PROGRAMMING 12

Overview of C, Data Types, Constants & Variables, Operators & Expressions, Control constructs-if then, for, while, Arrays- single & multidimensional arrays, Functions-fundamentals – general form, function arguments, return value, Basic I/O-formatted and Unformatted I/O, Advanced features- Type modifiers and storage class specifiers for data types, Bit operators, ? operator, &operator, * operator, Type casting, type conversion.

UNIT III ADVANCED PROGRAMMING TECHNIQUES 12

Control constructs- Do while, Switch statement, break and continue, exit() function, go to and label, Scope rules- Local & global variables, scope rules of functions, Functions-parameter passing, call by value and call by reference, calling functions with arrays, argc and argv, recursion- basic concepts, ex-towers of Hanoi

UNIT IV DYNAMIC DATA STRUCTURES IN C 12

Pointers- The & and * operator, pointer expression, assignments, arithmetic, comparison, malloc vs calloc, arrays of pointers, pointers to pointers, initializing pointers, pointers to functions, function retuning pointers, **Structures**- Basics, declaring, referencing structure elements, array of structures, passing structures to functions, structure pointers, arrays and structures within structures, **Unions** –

Declaration, uses, enumerated data-types, typedef.

UNIT V ADDITIONAL FEATURES 12

File Handling – The file pointer, file accessing functions, fopen, fclose, puc, getc, fprintf, C Preprocessor- #define, #include, #undef, Conditional compilation directives, C standard library and header files: Header files, string functions, mathematical functions, Date and Time functions

TOTAL HOURS: 60

COURSE OUTCOME

After completion of the course the student will be able:

CO1: To be able to use the basic concepts of Computer components.

CO2: To be able to design, implement, test, debug and document programs in C.

CO3: To be able to use functions, and functions with parameters passing option.

CO4: To be able to use pointers and arrays, perform pointer arithmetic.

CO5: To be able to understand the advance topics in C like file handling functions and the concept of Standard C library.

CO6: To be able to learn the concept of C preprocessor and its application in program development.

TEXT BOOK

1. Let us C by Yashwant Kanetka, 6th Edition, PBP Publication

REFERENCE BOOKS

1. The C programming Language by Richie and Kenninghan, 2004, BPB Publication
2. Programming in ANSI C by Balaguruswamy, 3rd Edition, 2005, Tata McGraw Hill.

MATHEMATICS – I **5 0 0 5**

COURSE OBJECTIVE

- To develop the skills of the students in the areas of Trigonometry, Set Theory, Calculus and Algebra.

UNIT I TRIGNOMENTRY **18**

Introduction – Angles – Expansions of sinn cosn,tann. Expansion of sin, cos, tan, in terms of - Simple problems.

UNIT II SET THEORY **18**

Sets – Operations on sets – Relations – Relations and functions: Equivalence relations – Partial order relation.

UNIT III MATRICES **18**

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 IV THEORY OF EQUATIONS **18**

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 equations, Newton's method to find the root approximately.

UNIT V DIFFERNTIAL CALCULUS **18**

Differentiation – Successive differentiation – Partial differentiation – Maxima and Minima of functions of two variables.

Total No of Hours: 90

COURSE OUTCOME

At the end of this course the students can

CO1: Apply the concepts of trigonometry function. .

CO2: Build set and equivalence function

CO3: Construct matrix using various techniques.

CO4: Experiment with theory of equation with example

CO5: Analysis differential calculus with example.

TEXT BOOK

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

REFERENCE BOOK

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

PROGRAMMING IN C LAB **0 0 4 2**

COURSE OBJECTIVE

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

LIST OF EXPERIMENTS

Part A

1 Printing the reverse of an integer.
2 Printing the odd and even series of N numbers.
3 Get a string and convert the lowercase to uppercase and vice--versa using getchar() and putchar().
4 Input a string and find the number of each of the vowels appear in the string.
5 Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.
6 Printing the reverse of a string.

Part B

1 Searching an element in an array using pointers.
2 Checking whether the given matrix is an identity matrix or not.
3 Finding the first N terms of Fibonacci series.
4 Declare 3 pointer variables to store a character, a character string and an integer respectively. Input values into these variables. Display the address and the contents of each variable.
5 Define a structure with three members and display the same.
6 Declare a union with three members of type integer, char, string and illustrate the use of union.
7 Recursive program to find the factorial of an integer.
8 Finding the maximum of 4 numbers by defining a macro for the maximum of two numbers.
9 Arranging N numbers in ascending and in descending order using bubble sort.
10 Addition and subtraction of two matrices.
11 Multiplication of two matrices.
12 Converting a hexadecimal number into its binary equivalent.
13 Check whether the given string is a palindrome or not.
14 Demonstration of bitwise operations.

15 Applying binary search to a set of N numbers by using a function.

16 Create a sequential file with three fields: empno, empname, empbasic. Print all the details in a neat format by adding 500 to their basic salary.

Total No. Of Hours: 60

COURSE OUTCOME

At the end of this course the students can

CO1: Understand the basic terms, syntax and semantics of high--level languages

CO2: Able to differentiate structured and Un-Structured, Procedural and Non-Procedural Language

CO3: Able to develop conditional statements

CO4: Able to apply the concepts of structures and Unions

CO5: Able to develop create small applications using C program

MS OFFICE LAB **0 0 4 2**

LIST OF EXPERIMENTS

1. Text Manipulation using MS-WORD.
2. Usage of Bullets and Numbering, Header and Footer using MS-WORD.
3. Usage of Spell check, Find & Replace using MS-WORD.
4. Table Manipulation using MS-WORD.
5. Picture Insertion and Alignment using MS-WORD.
6. Usage of Spell check, Find & Replace using MS-WORD.
7. Creation of documents using templates using MS-WORD.
8. Cell Editing using MS-EXCEL.
9. Data Sorting using MS-EXCEL.
10. Usage of Formulas & Built In Functions using MS-EXCEL.
11. Worksheet Preparation using MS-EXCEL.
12. Drawing Graphs using MS-EXCEL.
13. Inserting ClipArt's & Pictures using MS-EXCEL.
14. Slide Transitions and Animation using MS-POWER POINT.
15. Organization Chart using MS-POWER POINT.

Total No of Hours: 60

COURSE OUTCOME

At the end of this course the students can

CO1: Understand the basic tools and icons in IDE and able to format a document in word document

CO2: Able to mail a document to more than two people through mail merge concept.

CO3: Able to develop power point presentation.

CO4: Able to apply to mathematical functions in table.

CO5: Able to develop create small applications Ms Excel

Semester – II

Syllabus

TAMIL I/HINDI /FRENCH **5 0 0 5**

18LTA002 தமிழிலக்கியம் 5 0 0 5

நோக்கம்:

சங்க காலம் தொடங்கி தற்காலம் வரையிலும் தமிழில் உள்ள படைப்பிலக்கியங்களை இப்பாடம் அறிமுகம் செய்கின்றது. தமிழ் இலக்கியத்தில் தேர்ந்தெடுக்கப்பட்ட மிக முக்கியமான செய்யுட்கள், கவிதைகள், கதைகள், உரைநடை ஆகியவற்றைக்கொண்டு இப்பாடம் கட்டமைக்கப்பட்டுள்ளது. மாணாக்கரிடம் இலக்கியத் தேடலை உருவாக்குவதும், தற்சார்புடைய அறிவை மேம்படுத்துவதும் இப்பாடத்தின் நோக்கமாகும்.

அலகு 1 செவ்வியல் இலக்கியங்கள் 12 மணி நேரம்

திருக்குறள்- அன்புடைமை, ஒழுக்கமுடைமை, பெரியாரைத்துணைக்கோடல் –மூன்று அதிகாரங்கள் முழுமையும்.புறநானூறு- பாடல் எண்: 18, 55, 182, 183, 192 –ஐந்து பாடல்கள்.குறுந்தொகை- பாடல் எண்: 2, 167, 27, 202, 184 - ஐந்து பாடல்கள்.

அலகு 2 காப்பியங்கள் 12 மணி நேரம்

சிலப்பதிகாரம்- கனாத்திறம் உரைத்தக் காதை முழுவதும்.மணிமேகலை- பவத்திறம் அறுக எனப் பாவை நோற்ற காதை முழுவதும்.கம்பராமாயணம் - மந்தரைச் சூழ்ச்சிப்படலம் (தேர்ந்தெடுக்கப்பட்ட ஒன்பது பாடல்கள்).

அலகு 3 கவிதையும் புதுக்கவிதையும் 11 மணிநேரம்

பாரதிதாசனின் ‘தமிழியக்கம்’ -(i) நெஞ்சு பதைக்கும் நிலை - (ii) இருப்பதைவிட இறப்பது நன்று - இரண்டு கவிதைகள்.ஈரோடு தமிழன்பனின், “அந்த நந்தனை எரித்த நெருப்பின் மிச்சம்” என்னும் தொகுதியில் இடம்பெற்றுள்ள ‘விடிகிறது’ என்னும் புதுக்கவிதை.

அலகு 4 சிறுகதைகள் 12 மணி நேரம்

தி. ஜானகிராமனின் ‘சக்தி வைத்தியம்’ கி. ராஜநாராயணனின்‘கதவு’ - இரண்டு கதைகள்

அலகு 5 உரைநடை 13 மணி நேரம்

வைரமுத்து எழுதிய ‘சிற்பியே உன்னைச் செதுக்குகிறேன்’ முழுவதும்

மொத்தம்: 60 மணி நேரம்

பாட நூல்கள்

1. இரவிச்சந்திரன். சு. (ப.ஆ), “செய்யுள் திரட்டு”, வேல்ஸ் பல்கலைக்கழகம், முதற்பதிப்பு, 2008.

2. வைரமுத்து. இரா., “சிற்பியே உன்னைச் செதுக்குகிறேன்”, திருமகள் நிலையம், பதினேழாம் பதிப்பு, 2007.

பார்வை நூல்கள்

1. பாலச்சந்திரன்.சு., “இலக்கியத் திறனாய்வு”, நியூ செஞ்சுரி புக் ஹவுஸ், பத்தாம் பதிப்பு, 2007.

2. மாதையன்.பெ., “தமிழ்ச் செவ்வியல் படைப்புகள்”, நியூ செஞ்சுரி புக் ஹவுஸ், முதல் பதிப்பு, 2009.

3. வரதராசன்.மு., “குறள் காட்டும் காதலர்”, பாரி நிலையம், மறுபதிப்பு, 2005.

HINDI II **5 0 0 5**

COURSE OBJECTIVE

- To enable the students to have the knowledge in contemporary literature of the modern era. It also provides an idea how translation to be effected.

UNIT I KAHANI AUR EKANKI **12**

Poos Kee Raat., - Duzhazar

UNIT II EKANKI AUR KAHANI **12**

Vaapasi, Akeli, . Akbhari vigyapan

UNIT III KAHANI AUR ANUVAD **12**

Sharandatha - Anuvad anuched angreji se hindi me karne ke liye.

UNIT IV EKANKI AUR ANUVAD **12**

Raat ke Raahi Main Bhi Maanav hoon Anuvad anuched angreji se hindi me karne ke liye.

UNIT V KAHANI ,EKANKI AUR ANUVAD **12**

Parda - Yeh Meri Janma Bhoomi Hai -anuvad anuched angreji se hindi me karne ke liye.

Total No of Hours: 60 Hrs

TEXT BOOK

1.Sankalan Kahani evam Ekankied by Dr.N.Lavanya, Mayura Publishers,edition 2010

FRENCH II **5 0 0 5**

COURSE OBJECTIVE:

- To fortify the grammar and vocabulary skills of the students.
- Enable the students have an idea of the French Culture and Civilization

UNIT I **LEÇONS 10 – 11** **12**

Les affaires marchent,- 11. Un après midi à problemes- Réponses aux questions tirés de la leçon - Grammaire : Présent progressif, passé récent ou future proche - Complément d'objet directe - Complément d'objet indirecte .

UNIT II **LEÇONS 12 – 13** **12**

Tout est bien qui fini bien,- 13. Aux armes citoyens – Réponses aux questions tirés de la leçon - Grammaire : Les pronoms « en ou y » apporter des paroles - Les pronoms relatifs que, qui, ou où ,

UNIT III **LEÇONS 14 – 15** **12**

Leçons 14. Qui ne risqué rien n'a rien,- 15. La fortune sourit aux audacieux – Réponses aux questions tirés de la leçon - Grammaire : Comparaison – Les phrases au passé composé

UNIT IV **LEÇONS 16 – 18** **12**

Leçons16 La publicite et nos reves 17 La france le monde 18 Campagne publicitaire Réponses aux questions tirés de la leçon - Grammaire :- Les phrases à l' Imparfait - Les phrases au Future

UNIT V **COMPOSITION** **12**

A écrire une lettre de regret// refus à 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 : 60 Hrs

TEXT BOOK

1. Jacky GIRARDER & Jean Marie GRIDLIG, « Méthode de Françai PANORAMA », Clé Intérnationale , Goyal Publication, New Delhi., Edition 2004

ENGLISH II **5 0 0 5**

COURSE OBJECTIVE:

- To enable the students to develop their communication skills effectively. To make students familiar with the English Language.
- To enrich vocabulary in English
- To develop communicative competent

UNIT-I Prose **12**

1. The Words of Wisdom
   ChetanBhagat
2. Forgetting
   Robert Lynd
3. My Early Days
   Dr. A.P.J. Abdul Kalam

UNIT II –Poetry **12**

1. Ozymandias
   Percy Bysshe Shelley
2. Mending Wall
   Robert Frost
3. Where the Mind is Without Fear
   Rabindranath Tagore

UNIT III –Short Story **12**

1. Am I Blue?
   Alice Walker
2. The Last Leaf
   O' Henry
3. The Selfish Giant
   Oscar Wilde

UNIT IV – One Act Play **12**

1. Soul Gone Home
   Langston Hughes

UNIT V **12**

1. Lexical Skills
2. Vocabulary
3. Communication and Grammar at the end of all lessons

Total: 60 Hours

COURSE OUTCOME

At the end of the course students can,

CO1: Understand the in-depth Concepts of Prose

CO2: Understand the in-depth Concepts of Prose II

CO3: Able to understand and Develop Short Stories

CO4: Able to apply the fundamental concepts of basic grammar

CO5: Able to apply and analyze advanced grammar.

Books Prescribed:

Radiance - Emerald Publications

DATA STRUCTURES AND ALGORITHMS **4 1 0 5**

COURSE OBJECTIVE

- A data structure is a particular way of storing and organizing data in a computer so that it can be used efficiently.
- Different kinds of data structures are suited to different kinds of applications and some are highly specialized to specific tasks.
- This course covers the basic concepts of different data structures which are the basic building blocks of Programming and problem solving.

UNIT I INTRODUCTION TO DATA STRUCTURES **12**

Definition, Classification of data structures: primitive and non-primitive, Elementary data organization, Time and space complexity of an algorithm (Examples), String processing. Dynamic memory allocation and pointers: Definition of dynamic memory allocation, Accessing the address of a variable, Declaring and initializing pointers, Accessing a variable through its pointer, Meaning of static and dynamic memory allocation, Memory allocation functions: malloc(), calloc(), free() and realloc(). Recursion: Definition, Recursion in C (advantages), Writing Recursive programs – Binomial coefficient, Fibonacci, GCD

UNIT II SEARCHING AND SORTING **12**

Basic Search Techniques: Sequential search: Iterative and Recursive methods, Binary search: Iterative and Recursive methods, Comparison between sequential and binary search. Sort: General background and definition, Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort.

UNIT III STACK AND QUEUE **12**

Stack – Definition, Array representation of stack, Operations on stack: Infix, prefix and postfix notations, Conversion of an arithmetic expression from Infix to postfix, Applications of stacks. Queue: Definition, Array representation of queue, Types of queue: Simple queue, Circular queue, Double ended queue (deque), Priority queue, Operations on all types of Queues.

UNIT IV LINKED LIST **12**

Definition, Components of linked list, Representation of linked list, Advantages and Disadvantages of linked list. Types of linked list: Singly linked list, doubly linked list, Circular linked list, Operations on singly linked list: creation, insertion, deletion, search and display.

UNIT V TREE GRAPHS AND THEIR APPLICATION **12**

Definition : Tree, Binary tree, Complete binary tree, Binary search tree, Heap Tree terminology: Root, Node, Degree of a node and tree, Terminal nodes, Non-terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node. Binary tree: Array representation of tree, Creation of binary tree. Traversal of Binary Tree: Preorder, Inorder and postorder. Graphs, Application of Graphs, Depth First search, Breadth First search.

TOTAL HOURS: 60

COURSE OUTCOME

After completion of the course the student will be able:

CO1: Understand and implement the both array based and linked-list based data structures, including singly, doubly, and circular linked-lists.

CO2: Understand and implement the Stack data structure and stack operations.

CO3: Understand and implement the both array based circular queue and linked-list based queue implementations.

CO4: Understand and implement general tree data structures, including binary tree, both array based and reference based implementations.

CO5: Understand and implement binary search trees.

TEXT BOOK

1. Weiss, Data Structures and Algorithm Analysis in C, II Edition, Pearson Education, 2001.
2. Lipschutz: Schaum's outline series Data structures Tata McGraw-Hill.
3. Robert Kruse Data Structures and program designing using 'C'.

REFERENCE BOOKS

1. Trembley and Sorenson Data Structures
2. E. Balaguruswamy Programming in ANSI C.
3. Bandyopadhyay, Data Structures Using C Pearson Education, 1999
4. Tenenbaum, Data Structures Using C. Pearson Education, 2006
5. Kamthane: Introduction to Data Structures in C. Pearson Education 2005.
6. Hanumanthappa M., Practical approach to Data Structures, Laxmi Publications, Fire Wall media 2006
7. Langsam, Ausenstein Maoshe & M. Tanenbaum Aaron Data Structures using C and C++ Pearson Education

MATHEMATICS – II **5 0 0 5**

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 DIFFERENTIAL CALCULUS **18**

Differential Calculus: Functions and limits – Differentiation – Successive Differentiation – Partial Differentiation – Maxima and Minima of Functions of two variables.

UNIT II INTEGRAL CALCULUS **18**

Integral Calculus: Integration – Definite Integrals – Reduction Formulae.

UNIT III EULER'S EQUATION **18**

Ordinary differential equations: Second order and non-homogenous linear differential equations with constant coefficients – Second order linear differential equations with variable coefficients. (Euler's form only).

UNIT IV PARTIAL EQUATION **18**

Formation of Partial differential equations by eliminating arbitrary constants and arbitrary function – Solutions of standard types of First order equations – $f(p,q)= 0$; $f(x,p,q)= 0$, $f(y,p,q)= 0$, $f(z,p,q)= 0$, $z= px+qy+ f(p,q)$ – Lagrange method of solving linear partial differential equations $Pp+Qq=R$.

UNIT V FOURIER SERIES **18**

Fourier series of periodic functions on the interval [c, c+2□] – Half range series.

Total No of Hours: 90

COURSE OUTCOME

At the end of this course the students can

CO1: Apply the concepts of integral calculus.

CO2: Develop ordinary differential equation

CO3: Examine partial differential equation.

CO4: Analyze Fourier transformation function.

CO5: Understand the concept of Dissect Laplace transform function

TEXT BOOK

1. Higher engineering mathematical by B.S Grewal

REFERENCE BOOK

1. Mathematical foundations by P.R. Vittal.

OPERATING SYSTEM LAB **0 0 4 2**

COURSE OBJECTIVE

- This course introduces the basic concepts of UNIX programming.
- This course practices the student to write Vi Editor

LIST OF EXPERIMENTS

1. Execute 25 basic commands of UNIX.

2. Basics of functionality and modes of VI Editor.

3. WAP that accepts user name and reports if user is logged in.

4. WAP which displays the following menu and executes the option selected by user:

1. ls 2. Pwd 3. ls –l 4. ps –fe

5. WAP to print 10 9 8 7 6 5 4 3 2 1 .

6. WAP that replaces all "*.txt" file names with "*.txt.old" in the current.

7. WAP that echoes itself to stdout, but backwards.

8. WAP that takes a filename as input and checks if it is executable, if not make it executable.

9. WAP to take string as command line argument and reverse it.

10. 1. Create a data file called employee in the format given below:

a. EmpCode Character

b. EmpName Character

c. Grade Character

d. Years of experience Numeric

e. Basic Pay Numeric

$vi employee

A001	ARJUN	E1	01	12000.00
A006	Anand	E1	01	12450.00
A010	Rajesh	E2	03	14500.00
A002	Mohan	E2	02	13000.00
A005	John	E2	01	14500.00
A009	Denial Smith	E2	04	17500.00
A004	Williams	E1	01	12000.00

Perform the following functions on the file:

a. Sort the file on EmpCode.

b.Sort the file on

(i) Decreasing order of basic pay

(ii) Increasing order of years of experience.

c. Display the number of employees whose details are included in the file.

d. Display all records with ‘smith’ a part of employee name.

e. Display all records with EmpName starting with ‘B’.

f. Display the records on Employees whose grade is E2 and have work experience of 2 to 5 years.

g.Store in ‘file 1’ the names of all employees whose basic pay is between 10000 and 15000.

h.Display records of all employees who are not in grade E2

TOTAL HOURS: 60

COURSE OUTCOME

At the end of the course students can,

CO1: Ability to analyze and synthesize various basic concepts and services of operating system and its along with its implementation in Inter Process Communication (IPC) using Message Queues and pipes.

CO2: Ability to apply and examine the wait and signal using counting semaphores and Atomic Counter update problem

CO3: Ability to interpret and evaluate the concept of Signaling processes and Deadlock detection for message passing between processes.

CO4: Ability to understand and demonstrate the concept of Process Scheduling using the non-preemptive FCFS Process Scheduling and Least Frequently Used scheduling algorithms and Round Robin preemptive Process Scheduling.

CO5: Ability to explain the classical problems of synchronization and interpret the Producer-Consumer problem with limited buffers

DATA STRUCTURES AND ALGORITHMS LAB **0 0 4 2**

COURSE OBJECTIVE

- Students will benefit from the knowledge of Data Structures and different operating one can perform on these like searching, sorting, stacking and etc
- This forms a very strong foundation for programming in different languages that the students will take up in subsequent semesters or in any other course1. Building Simple Applications.

LIST OF EXPERIMENTS

Part A

1. Use a recursive function to find GCD of two numbers.
2. Use a recursive function to find the Fibonacci series.
3. Use pointers to find the length of a string and to concatenate two strings.
4. Use pointers to copy a string and to extract a substring from a given a string.
5. Use a recursive function for the towers of Hanoi with three discs.
6. Insert an integer into a given position in an array.
7. Deleting an integer from an array.
8. Write a program to create a linked list and to display it.
9. Write a program to sort N numbers using insertion sort.
10. Write a program to sort N numbers using selection sort.

Part B

1. Inserting a node into a singly linked list.
2. Deleting a node from a singly linked list.
3. Pointer implementation of stacks.
4. Pointer implementation of queues.
5. Creating a binary search tree and traversing it using in order, preorder and post order.
6. Sort N numbers using merge sort.

Total No of Hours 60

COURSE OUTCOME

CO1: Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.

CO2: Implementing the Basic data structures such as arrays, linked lists, stacks and queues.

CO3: Describe the hash function and concepts of collision and its resolution methods

CO4: Solve problem involving graphs, trees and heaps

CO5: Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data

Semester – III

Syllabus

PROGRAMMING IN JAVA **5 0 0 5**

COURSE OBJECTIVE

- To make students familiar with oops & applet programming
- Java programming can be used to develop both web based & console based application & stand-alone application
- Java is one of the top most languages used in most of the IT companies. It is a job assured course.

UNIT I INTRODUCTION TO JAVA **12**

History and Overview of Java, Object Oriented Programming, Control statements- if and for loop. Using Blocks of codes, Lexical issues - White space, identifiers, Literals, comments, separators, Java Key words, Data types - Integers, Floating point, characters, Boolean, A closer look at Literals, Variables, Type conversion and casting. Automatic type promotion in Expressions Arrays. Operators - Arithmetic operators, Bit wise operators, Relational Operators, Boolean Logical operators, Assignment Operator, Operator Precedence. Control Statements – Selection Statements - if, Switch, Iteration Statements - While, Do-while, for Nested loops, Jump statements.

UNIT II CLASSES **12**

Class Fundamentals, Declaring objects, Assigning object reference variables. Methods - constructors, "this" keyword, finalize ( ) method A stack class, Over loading methods. Using objects as parameters, Argument passing, Returning objects. Recursion, Access control, Introducing final, understanding static. Introducing Nested and Inner classes. Using command line arguments. Inheritance – Basics, Using super, method overriding, and Dynamic method Dispatch, Using abstract classes and final with Inheritance.

UNIT III PACKAGES **12**

Definition. Access protection importing packages. Interfaces: Definition and implementation. Exception Handling – Fundamentals, types, Using try and catch and Multiple catch clauses, Nested try Statements, throw, throws, finally. Java's built-in exception, using Exceptions.

UNIT IV MULTITHREADED PROGRAMMING **12**

Java thread model – main thread, creating single and multiple thread. Is alive ( ) and join ( ). Thread – Priorities, Synchronization, Inter thread communication, suspending, resuming and stopping threads, using multi-threading. I / O basics – Reading control input, writing control output, Reading and Writing files. Applet Fundamentals – AWT package, AWT Event handling concepts, the transient and volatile modifiers. Using instance of using assert..

UNIT V JAVA Database Connectivity (JDBC) **12**

Database connectivity – JDBC architecture and Drivers. JDBC API - loading a driver, connecting to a database, creating and executing JDBC statements, handling SQL exceptions. Accessing result sets: types and methods. An example - JDBC application to query a database.

Total No of Hours: 60

COURSE OUTCOMES:

CO1: Read and understand Java-based software code of medium-to-high complexity.

CO2: Use standard and third party Java's API's when writing applications.

CO3: Understand the basic principles of creating Java applications with graphical user interface (GUI).

CO4: Understand the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation.

CO5: Understand the basic approaches to the design of software applications.

CO6: Apply the above to design, implement, appropriately document and test a Java application of medium complexity, consisting of multiple classes.

TEXT BOOKS

1. The complete reference Java –2: V Edition by Herbert Schildt Pub. TMH.

REFERENCE BOOKS

1. Personality Development & Soft Skills,Barun K. Mitra,Oxford University Press.

SERVER ADMINISTRATION **4 1 0 5**

COURSE OBJECTIVE

- To recognize and explore various services provided the windows server 2012
- To analyze and apply centralized services with client nodes of the network
- To recognize the importance of active directory and dynamic access control services while applying the same in the server network infrastructure
- To justify the minimal management and attain improved performance with Hyper v client.

UNIT I INTRODUCTION TO SERVER 2012 AND ITS SERVICES 12

Administering Windows Server 2012 -The Deploy Manage and Maintain Servers Section- Install and Configure Windows Deployment Services (WDS)-Deploy and Manage Server Images-Install and Configure Windows Server Update Services (WSUS) - Implement Patch Management Monitor Servers -The Configure File and Print Services Section.

UNIT II FILE SYSTEM AND POLICIES 12

Install and Configure Distributed File System (DFS) - Manage Distributed File System (DFS) - Configure File Server Resource Manager (FSRM) - Configure File and Disk Encryption - Configure Advanced Audit Policies.

UNIT III NETWORK SERVICES 12

The Configure Network Services and Access Section - Configure DNS Zones - Configure DNS Records - Install and Configure Remote Access - Configure VPN - Configure Web Application Proxy - Configure Direct Access – server virtualization in windows - introduction to Hyper v – managing hyper v- steps to improve the client hyper – v.

UNIT IV NETWORK POLICIES 12

The Configure a Network Policy Server (NPS) Infrastructure Section- Configure Network Policy Server - Configure NPS Policies - Configure Network Access Protection-The Configure and Manage Active Directory Section.

UNIT V ACTIVE DIRECTORY AND GROUP POLICIES 12

Configure Service Authentication -Configure Domain Controllers -Maintain Active Directory - Configure Account Policies- The Configure and Manage Group Policy Section- Configure Group Policy Processing - Configure Group Policy Settings - Manage Group Policy Objects GPOs) - Configure Group Policy Preferences GPP)

COURSE OUTCOMES:

CO1: Recognize the various services of Server 2012

CO2: Configuration of Active directory and manage the domains

CO3: Administrate and manage the AD domains in server 2012

CO4: Maintain and manage the group policies

TEXT BOOKS

1. MCSA Windows Server 2012 R2 3-in-1 Complete Study Guide - 2015 edition by William Panek
2. Insalling And Configauration Windows Server 2012 R2 by Craig Zacker - 2014 edition – wiley pubications

REFERENCE BOOK

1. 70-411 Administering Windows Server 2012 R2 – wiley publications

CLOUD COMPUTING **5 0 0 5**

COURSE OBJECTIVE

- To provide students with the fundamentals and essentials of Cloud Computing.
- To provide students a sound foundation of the Cloud computing so that they are able to identify the vendors and assess the risk involved in cloud migration.
- To enable students be aware of the various governance issues in cloud and how to manage the same.

UNIT I INTRODUCTION **12**

Introduction to Cloud Computing, History and Evolution of Cloud Computing, Types of clouds, Private Public and hybrid clouds, Cloud Computing architecture, Cloud computing infrastructure, Merits of Cloud computing, , Cloud computing delivery models and services (IaaS, PaaS, SaaS), obstacles for cloud technology, Cloud vulnerabilities, Cloud challenges, Practical applications of cloud computing.

UNIT II CLOUD COMPUTING COMPANIES AND MIGRATING TO CLOUD **12**

Web-based business services, Delivering Business Processes from the Cloud: Business process examples, Broad Approaches to Migrating into the Cloud, The Seven-Step Model of Migration into a Cloud, Efficient Steps for migrating to cloud., Risks: Measuring and assessment of risks, Company concerns Risk Mitigation methodology for Cloud computing, Case Studies

UNIT III CLOUD COST MANAGEMENT AND SELECTION OF CLOUD PROVIDER **12**

Assessing the Cloud: software Evaluation, System Testing, Seasonal or peak loading, Cost cutting and cost-benefit analysis, selecting the right scalable application. Considerations for selecting cloud solution. Understanding Best Practices used in selection of Cloud service and providers, Clouding the Standards and Best Practices Issue: Interoperability, Portability, Integration, Security, Standards Organizations and Groups associated with Cloud Computing, Commercial and Business Consideration.

UNIT IV GOVERNANCE IN THE CLOUD 12

Industry Standards Organizations and Groups associated with Cloud Computing, Need for IT governance in cloud computing, Cloud Governance Solution: Access Controls, Financial Controls, Key Management and Encryption, Logging and Auditing, API integration. Legal Issues: Data Privacy and Security Issues, Cloud Contracting models, Jurisdictional Issues Raised by Virtualization and Data Location, Legal issues in Commercial and Business Considerations.

UNIT V TEN CLOUD DO AND DONOTS 12

Don't be reactive, do consider the cloud a financial issue, don't go alone, do think about your architecture, don't neglect governance, don't forget about business purpose, do make security the centerpiece of your strategy, don't apply the cloud to everything, don't forget about Service Management, do start with a pilot project.

COURSE OUTCOMES:

CO1: Analyze the Cloud computing setup with its vulnerabilities and applications using different architectures.

CO2: Analyze the risks involved in migrating the existing infrastructure to cloud.

CO3: Assess various cloud service providers and generate effective cloud infrastructure by optimizing the cost involved.

CO4: Broadly educate to know the impact of engineering on legal and societal issues involved in addressing the security issues of cloud computing.

TEXT BOOKS

1. Cloud Computing: Principles and Paradigms, Rajkumar Buyya, James Broberg, Andrzej M. Goscinski,, John Wiley and Sons Publications, 2011

REFERENCE BOOK

1. Brief Guide to Cloud Computing, Christopher Barnett, Constable & Robinson Limited, 2010
2. Handbook on Cloud Computing, Borivoje Furht, Armando Escalante, Springer, 2010

INFORMATION SECURITY **4 0 0 4**

COURSE OBJECTIVE:

- To help students understand foundational concepts of information security
- To make it possible for students to appreciate the need for securing information from threats and risks
- To facilitate students to gain knowledge on managing user identity & access and secure systems, servers and Internet.

UNIT I INTRODUCTION 12

Security Definition, Why Security, Security and its need, Current Trends and Statistics, Basic Terminology, The C I A of Security the Relation: Security functionality and Ease of Use Triangle.

UNIT II USER IDENTITY AND ACCESS MANAGEMENT 12

Access Control and Privilege management. Hashing and Cryptography- Encryption and Decryption User identity and Access Management: Authentication, Account Authorization, Validation.

UNIT III SYSTEM AND SERVER SECURITY 12

System Security, Desktop & Server Security, Firewalls, Password cracking Techniques, Key-logger, viruses and worms, Malwares & Spy wares, Windows Registry.

UNIT IV INTERNET SECURITY 12

Internet Security: LAN Security, Email Security, Hacking attacks, preventive measures.

UNIT V RISK ASSESSMENT AND CYBER LAWS 12

Vulnerability Assessment, Penetration Testing**,** Risk Assessment, Threat, Vulnerability, Cyber Laws – Indian Context

Total Hours - 60

Course Outcomes:
Students can,

CO1: Explain basic concepts and importance of information security.

CO2: Identify threats to information security, analyse their impact and propose suitable countermeasures.

CO3: Describe various aspects of securing systems, servers, Internet, user identity and management.

TEXT BOOKS

1. Information Systems Security: Security Management, Metrics, Frameworks And Best Practices - Nina Godbole, ISC2 Press, 2010
2. Mark Stamp's Information Security: Principles and Practice (WIND) Paperback – 2009 by Deven N. Shah, Wiley (2009)
3. Information Security Risk Analysis - Thomas R. Peltier, Third Edition, Pub: Auerbach, 2012
4. Information Security: The Complete Reference by Mark Rhodes-Ousley, McGraw Hill Education; Second edition (1 May 2013)
5. Cyber Security by Nina Godbole, Sunit Belapure, Wiley, 2011.

REFERENCE BOOKS

1. Principles of Information Security by Michael E. Whitman, Cengage Learning India Private Limited; 5 edition (2015)
2. Information Security Management Handbook, Volume 4 - Micki Krause, ISC2 Press, 2007

PROGRAMMING IN JAVA LAB **0 0 4 2**

COURSE OBJECTIVE:

- To make students familiar with oops & applet programming
- Java programming can be used to develop both web based & console based application & stand-alone application
- Java is one of the top most languages used in most of the IT companies. It is a job assured course.

Part A

1. Write a program to check whether two strings are equal or not.
2. Write a program to display reverse string.
3. Write a program to find the sum of digits of a given number.
4. Write a program to display a multiplication table.
5. Write a program to display all prime numbers between 1 to 1t000.
6. Write a program to insert element in existing array.
7. Write a program to sort existing array.
8. Write a program to create object for Tree Set and Stack and use all methods.
9. Write a program to check all math class functions.
10. Write a program to execute any Windows 95 application (Like notepad, calculator etc)
11. Write a program to find out total memory, free memory and free memory after executing garbage Collector (gc).

Part B

1. Write a program to copy a file to another file using Java to package classes. Get the file names at run time and if the target file is existed then ask confirmation to overwrite and take necessary actions.
2. Write a program to get file name at runtime and display number f lines and words in that file.
3. Write a program to list files in the current working directory depending upon a given pattern.
4. Create a textfileld that allows only numeric value and in specified length.
5. Create a Frame with 2 labels, at runtime display x and y command-ordinate of mouse pointer in the labels.

Total No of Hours: 60

COURSE OUTCOME

At the end of this course the students can

CO1: Build Java program with basic OOP concept

CO2: Examine the string concepts with string buffer class

CO3: Explain the database creation in Java programs

CO4: Apply the exception handling solve with thread based

CO5: Build java program utilize the Applet concepts

SERVER ADMINISTRATION LAB 0 0 4 2

COURSE OBJECTIVE:

- To recognize and explore various services provided the windows server 2012
- To analyze and apply centralized services with client nodes of the network
- To recognize the importance of active directory and dynamic access control services while applying the same in the server network infrastructure
- To justify the minimal management and attain improved performance with Hyper v client.

List of Experiments:

1. Installing and Configuring Windows Server 2012 Core Version and Converting from Core version to GUI.
2. Configuring Local storage using Disk management and Diskpart commands.
3. Installing and Configuring FSRM for Quota management and File Screening.
4. Configuring EFS and creating recovery agent.
5. Securing Disk and Drive using Bit Locker Drive Encryption
6. Installing and Configuring Primary DNS Server.
7. Installing and Configuring Secondary and Stub Zone for DNS Server
8. Installing and Configuring Windows Server Update Services [WSUS].
9. Configuring Group Policies for Updates so that clients can target WSUS Server.
10. Creating and Configuring Data Collector Set.

COURSE OUTCOME

CO1: Installing server operating systems.

CO2: Implementing local area network (LAN) / wide area network (WAN) technologies according to desired network plan.

CO3: Configuring services provided by servers (applications, web, communications, email, printing, faxing, and files) efficiently.

CO4: Configuring servers for DNS Server

CO5: Setting up printing plan to efficiently maximize the printing needs of users.

CO6: Determining best way to segment the network WSUS Updates

CO7: Implementing group policy for computers, users, groups, and authentication

SOFT SKILLS -I **2 0 0 2**

COURSE OBJECTIVE:

- To train students in the use of English language in varied literary and non-literary context
- To teach them soft skills and strengthen their foundation in grammar and composition
- To evaluate their comprehension skills.

Credit Hours

UNIT - I- Prose **12**

1. Two Gentleman of Verona - A.J. Cronin
2. Judas Iscariot - Bonnie Chamberlain
3. Dangers of Drug Abuse - J. V. S. Henbane

UNIT II - Short Stories **12**

1. Journey by Night - Norah Burke
2. The 2000-Mile Turtle - Henry Edward Fox
3. Fools Paradise - Isaac Bashevis Singer

UNIT III – Fiction **12**

R. L. Stevenson - Dr. Jekyll & Mr. Hyde (Retold by Kennet) – S. Chand & company Ltd.

UNIT IV - Functional English **12**

1. Paragraph Writing
2. Comprehension
1. Letter Writing
2. Report writing

a) News Paper Report
b) Reports for Government Official Attention
c) Definition

UNIT V – Conversation In Situations & Conversation Practice **12**

1. **Conversation in Situations**

a) At the Airport
b) In a Bank
c) On the Beach
d) At the Customs
e) At the Doctors'
f) In a Flight
g) In a Hotel
h) In a Restaurant
i) In a Shop
j) Tea Time
k) On the Telephone
l) In a Travel Agency
m) On a Country Walk
n) At the theatre
o) In a Street

2. **Conversation Practice**

a) Daily Activities
b) Asking Directions
c) Travel plans
d) Living in an Apartment
e) Money Problems
f) Weather Conditions
g) Dinner Conversations
h) Common Health Problems
i) Tag Questions
j) Office Conversations

3. **Expansion of Hints**

Total: 60 Hours

COURSE OUTCOME

At the end of the course students will,

CO1: Able to understand the Comprehension and Reading

CO2: Can able to improve the Listening Capability

CO3: Can able to involve them in Group Discussion

CO4: Able to converse on new topics

CO5: Can able to give a neat self – introduction and role play

Books Prescribed:

1. Effective English Communications for You – V. Syamala, Emerald Publishers, Chennai.
2. English Conversation Practice by D. H. Spencer, Oxford University Press
3. English Conversation Practice by Grant Taylor, Tata McCraw-Hill, Publishing Company Limited, New Delhi.

Semester – IV

Syllabus

DATABASE MANAGEMENT SYSTEMS **4 1 0 5**

COURSE OBJECTIVE:

- A database management system (DBMS) is collection of software meant to manage a Database. Many popular databases currently in use are based on the relational database model.
- RDBMSs have become a predominant choice for the storage of information in new databases used for financial records, manufacturing and logistical information, personnel data and much more.
- The course covers the basic concepts of databases in general with an emphasis on relational databases, modeling techniques and writing queries. Normalization techniques, Transaction processing, Concurrency Control techniques and Recovery of databases against crashes are also covered.

UNIT I INTRODUCTION **12**

Purpose of Database System -– Views of data – Data Models – Database Languages — Database System Architecture – Database users and Administrator – Entity– Relationship model (E-R model) – E-R Diagrams -- Introduction to relational databases.

UNIT II RELATIONAL MODEL **12**

The relational Model – The catalog- Types– Keys - Relational Algebra – Domain Relational Calculus – Tuple Relational Calculus - Fundamental operations – Additional Operations- SQL fundamentals, Oracle data types, Data Constraints, Column level & table Level Constraints, working with Tables, Defining different constraints on the table, Defining Integrity Constraints in the ALTER TABLE Command, Select Command, Logical Operator, Range Searching, Pattern Matching, Oracle Function, Grouping data from Tables in SQL, Manipulation Data in SQL.

UNIT III SQL **12**

Joining Multiple Tables (Equi Joins), Joining a Table to itself (self Joins), Sub queries Union, intersect & Minus Clause, Creating view, Renaming the Column of a view, Granting Permissions, - Updating, Selection, Destroying view Creating Indexes, Creating and managing User, Integrity – Triggers -

Security – Advanced SQL features –Embedded SQL– Dynamic SQL- Missing Information– Views – Introduction to Distributed Databases and Client/Server Databases.

UNIT IV DATABASE DESIGN **12**

Functional Dependencies – Non-loss Decomposition – Functional Dependencies – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form-Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form.

UNIT V TRANSACTIONS **12**

Transaction Concepts - Transaction Recovery – ACID Properties – System Recovery – Media Recovery – Two Phase Commit - Save Points – SQL Facilities for recovery –Concurrency – Need for Concurrency – Locking Protocols – Two Phase Locking – Intent Locking – Deadlock- Serializability – Recovery Isolation Levels – SQL Facilities for Concurrency

Total No of Hours: 60

COURSE OUTCOMES:

After completion of the course the student will be able:

CO1: Understand the Purpose of Database System

CO2: Understand the relational model

CO3: Describe Integrity Constraints

CO4: Describe SQL fundamentals

CO5: Understand Functional Dependencies

CO6: Describe the concepts of transaction

CO7: Understand ACID properties

TEXT BOOKS

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, “Database System Concepts”, Fifth Edition, Tata McGraw Hill, 2006.

2. Ramez Elmasri, Shamkant B. Navathe, “Fundamentals of Database Systems”, Fourth Edition, Pearson/Addision Wesley, 2007.

REFERENCE BOOKS

1. Raghu Ramakrishnan, “Database Management Systems”, Third Edition, McGraw Hill, 2003.

PRINCIPLES OF VIRTUALIZATION **5 0 0 5**

COURSE OBJECTIVE:

- To understand the virtualization and Cloud Technology
- Implementing Virtualization using Hypervisors
- To understand the vSphere components and its features.
- Understanding and implementing the Storage Virtualization
- Implementing Network virtualization using VMware NSX
- How to Secure the ESXi and vCenter Servers
- Monitoring the performance of resources used in SDDC

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UNIT I INTRODUCTION **12**

Introduction to Virtualization - Types of virtualization - Difference between cloud and virtualization - Physical infrastructure and virtual infrastructure - Virtualization approaches - Partitioning - Hosting - Isolation - Hardware independence - Virtual machine - Hypervisor - Types of hypervisor - Virtual machine manager - Types of hypervisor - Introduction to datacenter virtualization Esxi - Difference between Esxi and Esx - Versions of Esxi - Installation and configuration of Esxi 6.0 - vSphere 6.0.

UNIT II COMPONENTS OF VSPHERE 6.0 **12**

Components of VMware vSphere - vSphere 6.0: Overview and Architecture - Topology of vSphere 6.0 Data Center - vSphere 6.0 Configuration MaximumsvCenter Server - vCenter Server Features - Certificate Management - Alarms and Alerts - Monitoring Features - Template Management - Linked Mode Deployment - Storage Features in vSphere - Shared Storage - Storage Protocols - Datastores - Virtual SAN - Virtual Volumes - Networking Features in vSphere - Virtual Networking - Virtual Switches and its types.

UNIT III FEATURES OF VSPHERE AND NSX **12**

vSphere Resource Management Features - vMotion - Distributed Resource Scheduler (DRS) - - Distributed Power Management (DPM) - Storage vMotion - Storage DRS - Storage I/O Control -

Network I/O Control - vSphere Availability Features - vSphere Data Protection - High Availability - Fault Tolerance - vSphere Replication - Introduction to NSX.

UNIT IV VSPHERE SOLUTIONS TO DATA CENTER CHALLENGES AND VSPHERE SECURITY 12

Challenges - Availability Challenges - Scalability Challenges - Management Challenges - Optimization Challenges - Application Upgrade Challenges - Cloud Challenges - Security - Describe the features and benefits of VMware Platform Services Controller - Configure ESXi host access and authorization - Secure ESXi - vCenter Server - and virtual machines - Upgrade ESXi and vCenter Server instances.

UNIT V RESOURCE OPTIMIZATION AND RESOURCE MANAGEMENT 12

Network Optimization - Configure and manage vSphere distributed switches - Migrate virtual machines from standard switches to distributed switches - Explain distributed switch features such as port mirroring - LACP - QoS tagging - and NetFlow - CPU Optimization - Explain the CPU scheduler operation - NUMA support - and other features that affect CPU performance - Monitor key CPU performance metrics - Memory Optimization - Explain ballooning - memory compression - and host swapping techniques for memory reclamation when memory is overcommitted - Monitor key memory performance metrics - Storage Optimization - Diagnose storage access problems - Configure VMware vSphere Flash Read Cache - Monitor key storage performance metrics

TOTAL HOURS: 60

Course Outcomes:

They should be able to

CO1: Installing and configuring the SDDC using VMware products.

CO2: Implementing Fault tolerance and High availability for the Virtual machines

CO3: Securing the Virtual environment.

CO4: Resource Optimization and monitoring.

TEXT BOOK

1. Virtualization Essentials Paperback – 26 Apr 2012 by Matthew Portnoy - wiley publications
2. VMware Cookbook Paperback – 17 Jul 2012 by Troy - Shroff/O'Reilly; Second edition (17 July 2012).

REFERENCE BOOKS

1. Mastering VMware vSphere 5.5 (SYBEX) Paperback – 2014 by Scott Lowe, Nick Marshall, Forbes Guthrie , Matt Liebowitz , Josh Atwell - Wiley (2014) edition.

ETHICAL HACKING **4 0 0 5**

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 12

Hacking Methodology, Process of Malicious Hacking, and Foot printing and scanning: Foot printing, scanning. Enumeration: Enumeration. System Hacking and Trojans: System Hacking, Trojans and Black Box Vs. White Box Techniques.

UNIT II HACKING METHODOLOGY 12

Denial of Service, Sniffers, Session Hijacking and Hacking Web Servers: Session Hijacking, Hacking Web Servers. Web Application Vulnerabilities and Web Techniques Based Password Cracking: Web Application Vulnerabilities, Web Based Password Cracking Techniques.

UNIT III WEB AND NETWORK HACKING 12

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.

UNIT IV REPORT WRITING & MITIGATION 12

Introduction to Report Writing & Mitigation, requirements for low level reporting & high level reporting of Penetration testing results, Demonstration of vulnerabilities and Mitigation of issues identified including tracking

UNIT V ETHICAL HACKING AND LEGAL SYSTEM 12

Overview of India's Information Technology Amendment Act 2008 (IT Act 2008), hacker vs cracker, liabilities – civil and penal, cyber theft and IPC sec 378, IT Act 2008 – sections 43, 65 and 66, how to file a complaint of suspected hacking, Case Studies, understanding how hacking is legally dealt with among BRICS countries.

Total No of Hours: 60

COURSE OUTCOME:

Students can,

CO1: Explain the importance of ethical hacking in achieving the goals of information security.

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

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

CO4: Justify the need for meticulous documentation in writing reports for consumption of both technical and management audiences.

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

TEXT BOOK

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, BecomeShakespeare.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 BOOK

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

PRINCIPLES OF VIRTUALIZATION LAB **0 0 4 2**

COURSE OBJECTIVE:

CO5: To understand the virtualization and Cloud Technology

CO6: Implementing Virtualization using Hypervisors

CO7: To understand the vSphere components and its features.

CO8: Understanding and implementing the Storage Virtualization

CO9: Implementing Network virtualization using VMware NSX

CO10: How to Secure the ESXi and vCenter Servers

CO11: Monitoring the performance of resources used in SDDC

LIST OF EXPERIMENTS:

List of Experiments:
Hardware:
CPU: i3/i5
Network Card: 100Mbps/1Gbps
Memory: 8 GB
Storage: 256 GB/500GB

Software Requirements:

ESXi 5.5/6.0[Hypervisor]
vSphere Client
Google Chrome/ IE with Flash Player installed.

The infrastructure required to complete the lab exercises from Lab2 to Lab10 are as follows:

Windows 7/8/10
Internet Speed: 2Mbps
Web link for Online VMware Labs: http://labs.hol.vmware.com/HOL/catalogs/catalog/681

Web link for HOL lab Manuals: http://docs.hol.vmware.com/

S.No	Name of Lab Exercise		
1	Installing and configuring ESXi 5.5/6.0 Server [On Premise]		
2	HOL-1810-01-SDC	Virtualization 101	1. Introduction to Management with vCenter Server

			2. Introduction to vSphere Networking And Security
3	HOL-1810-01-SDC	Virtualization 101	3. Introduction to vSphere Storage
4	HOL-1808-01-HCI - vSAN v6.6 - Getting Started	vSAN v6.6 - Getting Started	1. vSAN 6.6 Setup and Enablement 2. vSAN Scale Out with Configuration Assist 3. vSAN All Flash Capabilities
5	HOL-1808-01-HCI - vSAN v6.6 - Getting Started	vSAN v6.6 - Getting Started	4. vSAN iSCSI Target 5. vSAN Encryption
6	HOL-1808-01-HCI - vSAN v6.6 - Getting Started	vSAN v6.6 - Getting Started	6. vSAN PowerCLI and ESXCLI 7. vSAN Stretched Cluster
7	HOL-1803-01-NET - VMware NSX - Getting Started	VMware NSX	1. NSX Manager Installation and Configuration 2. Logical Switching
8	HOL-1803-01-NET - VMware NSX - Getting Started	VMware NSX	3. Logical Routing 4. Edge Services Gateway
9	HOL-1811-04-SDC - vSphere Security - Getting Started	vSphere Security	1. Automating Password Complexity for ESXi Users 2. Forensic Security with vRealize Log Insight
10	HOL-1811-04-SDC - vSphere Security - Getting Started	vSphere Security	3. VM Encryption and Encrypted vMotion 4. Secure Boot for Hosts and VMs 5. No-Cryptography Administrator Roles and Permissions

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COURSE OUTCOME

CO1:Understanding Virtual machines and Implementation of virtual machines.

CO2:Understanding virtualization and various ways of using virtualization

CO3:Implementation of private cloud platform using virtualization

CO4:Use virtual machines of public cloud platform

CO5:Use of vSphere and its environment

CO6:Implementation of vMotion, ESXi server

Total Hours: 30

ETHICAL HACKING LAB **0 0 4 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

List of Experiments:

Hardware:

CO1: I3/ I5 processor; 8GB RAM; 250GB HDD

Software:

- VM Player; Windows server; Windows 7/ 10; Kali Linux; All-in-one keylogger; DELmE virus maker

Experiments:

1. Perform network scan to revile active hosts, open ports and services running
2. Perform privilege escalation attack on Client operating system and gain control of a Client operating system and write a short note on its mitigation strategy
3. Demonstrate ARP Poisoning and detect ARP Poisoning in switch-based network
4. Perform man-in-the-middle attack and hijack an established session of a user. Write a report on the same with mitigation strategy
5. Crack FTP credentials using dictionary attack and write a report of possible suggestion on hardening the login services
6. Perform user system surveillance and write a mitigation report on the same
7. Exploiting NetBIOS vulnerability and password revelation from browsers and social networking application using Key Logger and Trojan
8. Perform denial service attack on a server operating system and write a report on the same with mitigation strategy.

Total Hours: 30

COURSE OUTCOME

CO1: Knowledge: Students will learn the underlying principles and techniques associated with the cybersecurity practice known as penetration testing or ethical hacking.

CO2: They will become familiar with the entire penetration testing process including planning, reconnaissance, scanning, exploitation, post-exploitation and result reporting.

CO3: Skills: For every offensive penetration technique the students will learn the corresponding remedial technique.

CO4: By this, the students will develop a practical understanding of the current cybersecurity issues and the ways how the errors made by users, administrators, or programmers can lead to exploitable insecurities.

ENVIRONMENTAL STUDIES **2 0 0 2**

COURSE OBJECTIVE:

- To train students to locate and comprehend relationships between the natural, social and cultural environment.
- To develop an understanding based on observation and illustration, drawn from lived experiences and physical, biological, social and cultural aspects of life, rather than abstractions.
- To create cognitive capacity and resourcefulness to make the students curious about social phenomena.

UNIT I INTRODUCTION **10**

The multidisciplinary nature of Environment of studies – Definition - Scope and Importance - Need for Public Awareness.

UNIT II NATURAL RESOURCES **10**

Natural resources and associated problem - Renewable and Non- Renewable resources:.-Forest Resources-Mineral Resources-Food Resources - Energy Resources -Land Resources: Role of an individual in conservation of natural resources-Equitable use of resources of sustainable lifestyles.

UNIT III ECO SYSTEM **10**

Concepts of an Ecosystem - Structure and Functions of an Ecosystem - Procedures, Consumers and Decomposers - Energy flow in the ecosystem - Food chains, Food webs and ecological pyramids - Introduction, types, Characteristics features - Structures and functions of the following ecosystem :Forest ecosystem, Grass land ecosystem, Desert ecosystem, Aquatic ecosystem.

Total No Of Hours : 30 Hrs

COURSE OUTCOME

At the end of the course students can,

CO1: Define basic concepts of environment

CO2: Explain the types of natural resources

CO3: Apply natural resource concept to maintain Ecosystem

CO4: Understand the need for bio diversity

CO5: Predict the causes of environmental pollution

TEXT BOOK

1. Dr. Shradha sinha, Dr.Manisha shukula, Dr. Ranjana Shukla

REFERENCE BOOK

1. P.Venugopala Rao,"Textbook of Environmental Engineering", Eastern Economy Edition, 2006.

SOFT SKILLS-II **2 0 0 2**

COURSE OBJECTIVE:

- To train students in the use of English language in varied literary and non-literary context
- To teach them soft skills and strength their foundation in grammar and composition
- To elevate their comprehension skills.

Credit Hours

UNIT I – Prose **12**

1. Walking Tours - R. L. Stevenson
2. All About a Dog - A. G. Gardinar
3. No Man is an Island - MinnoMasani

UNIT II - Short Stories **12**

1. The Man Who Likes Dickens - Evelyn Waugh
2. Lamb to the Slaughter - Roald Dahl
3. Buck Hears the Call - Jack London

UNIT III – Drama **12**

1. Selected Scenes from Shakespeare's Plays – Book I, Emerald Publishers
   a) Funeral Oration (Julius Caesar)
   b) Trial for a Pound of Flesh (The Merchant of Venice)
   c) Patterns of Love (As You Like It)

UNIT IV **12**

1. General Essay Writing & Group Discussion
2. Persuasive Writing and Role Play

UNIT V **12**

1. Notice, Agenda, Minutes.

Total: 60 Hours

COURSE OUTCOME

At the end of the course students can,

CO1: Able to improve their presentation skill and voice modulation.

CO2: Able to improve the Articulateness

CO3: Able to prepare resume of their own.

CO4: Able to face the interview confidently.

CO5: Able to analyze the interview questions.

Books Prescribed:

1. Invitation to English Prose – A. E. Varadarajan& S. Jagadisan, Orient Black Swan, Chennai

Semester – V

Syllabus

DISCIPLINE SPECIFIC ELECTIVE (DSE)-1

DSE 1A- NETWORK ADMINISTRATION 4 1 0 5

COURSE OBJECTIVE:

CO12: This course introduces the architecture, functions, and components of the Internet and computer networks, the principles and structure of IP addressing and sub netting, the fundamentals of Ethernet, the architecture, components and operations of routers, routing protocols and switches in a network.

CO13: Topics include TCP/IP, Ethernet, IPv4, routers, switches. As we cover these topics, the students will learn how the internals of the Internet work to support the Web and other networked applications..

CO14: After completing the course the students will develop a detailed understanding of how to configure, implement and troubleshoot widely-used networking technologies

UNIT I NETWORKING FUNDAMENTALS 12

The TCP/IP and OSI Networking Models, Fundamentals of Ethernet LANs, Fundamentals of WANs, Fundamentals of IPv4 & IPv6 Addressing, Fundamentals of TCP/IP Transport and Application.

UNIT II ETHERNET LANS AND SWITCHES 12

Building Ethernet LANs with Switches, Cisco LAN Switches, Configuring Ethernet Switching, Configure, verify, and troubleshoot VLANs (normal range) spanning multiple switches, Configure, verify, and troubleshoot interswitch connectivity, Configure, verify, and troubleshoot port security.

UNIT III IP VERSION 4 ADDRESSING AND SUBNETTING 12

Perspectives on IPv4 Subnetting, Analyzing Classfull IPv4 Networks, Analyzing Subnet Masks, Analyzing Existing Subnets, Implementing IP Version 4: Operating Cisco Routers, Configuring IPv4 Addresses and Routes, Implementing Ethernet Virtual LANs, Troubleshooting Ethernet LANs, Spanning Tree Protocol Concepts, Troubleshooting LAN Switching.

UNIT IV LAN ROUTING 12

Configure IPv4 Routing, Configure and Verify Host Connectivity, Advanced IPv4 Addressing Concepts, Describe the boot process of Cisco IOS routers; Operation status of a serial interface; Manage Cisco IOS files; Routing and Routing Protocols; OSPF (multi-area); EIGRP (single AS); Passive Interface.

UNIT V INFRA-STRUCTURE SERVICES 12

Basic IPv4 Access Control Lists, Advanced IPv4 ACLs and Device Security, Network Address Translation, Recognize high availability (FHRP); Describe SNMP v2 and v3, Configure and verify DHCP on a router .

Total No of Hours: 60

COURSE OUTCOME:

CO1: After completion of the course the student will be able to manage Network for a small Organization.

CO2: They will learn to design to impart knowledge about detailed knowledge of Computer Networks, various protocols used in Communication, Managing and configuring Cisco Switches and Routers and various WAN technologies.

TEXT BOOK

1. CCNA Cisco Certified Network Associate: Study Guide (With CD) 7th Edition (Paperback), Wiley India, 2011
2. CCENT/CCNA ICND1 640-822 Official Cert Guide 3 Edition (Paperback), Pearson, 2013

REFERENCE BOOK

1. Routing Protocols and Concepts CCNA Exploration Companion Guide (With CD) (Paperback), Pearson, 2008.
2. CCNA Exploration Course Booklet: Routing Protocols and Concepts, Version 4.0 (Paperback), Pearson, 2010.

DISCIPLINE SPECIFIC ELECTIVE (DSE)-1

DSE 1B- LINUX ADMINISTRATION 4 1 0 5

COURSE OBJECTIVE:

- RHEL is a high performing operating system that. RHEL 6 is the sixth generation of the long term and predictable operating platform.
- With the flexibility to deploy on physical hardware, as a virtual host, as a virtual guest or in the cloud, Red hat Enterprise Linux 6 is the ideal foundation for next-generation datacenters.
- The fresh system administrators need to have a strong functional knowledge of RHEL 6 in any current IT work environment. The unit explores the security and network access controls in Linux, organizing network system and Mail Services, Securing Data and Account Management.

UNIT I INTRODUCTION TO LINUX 12

Introduction to Operating system - Types of Operating system - Multi user operating system - Open source licensing - History of Linux - Unix Vs Linux - Flavors of Linux - Benefits and characteristics of Linux - Installation of Linux - Linux booting process - Log in and switch users in multiuser run levels - Shell and bash features - Linux kernel - sudo vs su - Date and time configuration – Linux run levels.

Directories and files:

Directory structure - System directory - Absolute path and relative path -Creating and removing directory - Changing directory path - Creating - removing - copying and moving files - File Permissions - Links – hard link and soft link - Input and output redirection - Filters and pipes - Locate - read - and use system documentation including man page

UNIT II PACKAGE, USER AND GROUP MANAGEMENT 12

RPM - YUM - Archive - Compress - unpack and uncompress files using tar - star - gzip - and bzip2 - Create - delete - and modify local user accounts - Change passwords for local user accounts - Create - delete - and modify local groups and group memberships - Changing owner and modes.

UNIT III CONFIGURING LOCAL STORAGE AND FILESYSTEM 12

List - create - delete - and partition type for primary - extended - and logical partitions - Create and remove physical volumes - assign physical volumes to volume groups - Create and delete logical Volumes. - Create - mount - unmount - ext2 - ext3 - and ext4 file systems. - Mount - unmount - and LUKS-encrypted file systems - Access control list.

UNIT IV MANAGING SYSTEM AND INFRASTRUCTURE SERVICES 12

Managing system services - Shutting down - suspending and hibernating the system - Controlling systemd on remote machine - Creating and modifying systemd unit files – DHCP Configuration - HTTP server Configuration - FTP server Configuration - Mail server Configuration - Samba server Configuration - NTP server Configuration - NFS server Configuration.

UNIT V OPENSSH AND LINUX SECURITY 12

OPENSSH - The SSH Protocol - Configuring OpenSSH and Starting an OpenSSH Server Key-Based Authentication in OpenSSH - OpenSSH Clients - Using the ssh Utility - scp Utility and sftp Utility - Configure firewall settings using system-config-firewall or iptables - Set enforcing and permissive modes for SELinux - List and identify SELinux file and process context.

Total No of Hours: 60

COURSE OUTCOME

CO1: Students will attain skills required to manage and administer systems and servers using Linux Operating System.

CO2: The operating system used for this unit is Red hat Enterprise Linux 6 (RHEL 6).

CO3: Students may also appear for RED HAT Certification exam in Linux Administration after the completion of this course.

TEXT BOOK

1. "Orsaria, Jang, "RHCSA/RHCE Red Hat Linux Certification Study Guide Exams EX200 & EX300", McGraw-Hill Education, July 2017.

REFERENCE BOOK

1. Sander Van Vugt, "Red Hat RHCSA/RHCE 7 Cert Guide: Red Hat Enterprise Linux 7 (EX200 and EX300)", Phi Learning Pvt Ltd, 2009.

DISCIPLINE SPECIFIC ELECTIVE (DSE)-2

DSE 2A- NETWORK SECURITY **4 0 0 4**

COURSE OBJECTIVE:

CO15: To help students understand various characteristics of network security, threats and risks to securing network

CO16: To make it possible for students to learn important network security protocols and means of achieving an effective network security

CO17: To facilitate students, gain hands-on experience of identifying and providing solutions for common network security challenges using various security tools and techniques.

UNIT I INTRODUCTION TO NETWORK SECURITY **12**

Perimeter Security – Overview of Network Security, Access Control, Device Security, Security features on Switches, Firewall, Types of firewall, Access Management, Multifactor Authentication, Wireless LAN (WLAN) Security and Network Admission Control (NAC)

UNIT II THREATS, VULNERABILITIES AND ATTACKS **12**

Threat; Vulnerabilities; Attacks – Application Attack, Network Attack and Mitigating & Deterring Attacks; Network Security – Security through network devices, Security through Network Technologies and Security through Network Design Elements, Administering a Secure Network.

UNIT III NETWORK SECURITY MANAGEMENT **12**

Secure Socket Layer (SSL) – Introduction to SSL, Open SSL basics, Problems with SSL, Cryptography, Message Digits Algorithms, Digital Signature and Public Key Infrastructure (PKI); Data Privacy – IPsec VPN, Dynamic Multipoint VPN (DMVPN), Group Encrypted Transport VPN (GET VPN), Secure Sockets Layer VPN (SSL VPN) and Multiprotocol Label Switching VPN (MPLS VPN)

UNIT IV NETWORK SECURITY CONTROLS **12**

Network Intrusion Prevention – Overview of Intrusion Prevention System (IPS), Intrusion Detection System (IDS), Deploying IPS and IPS high Availability; host Intrusion Prevention; Anomaly Detection and Mitigation.

UNIT V NETWORK MANAGEMENT 12

Security Monitoring and correlation; Security Management - Security and Policy Management and Security Framework and Regulatory Compliance; Best Practices Framework, Case Studies.

Total No of Hours: 60

Students can,

CO1: Relate fundamental concepts of information security with network and connectivity

CO2: Apply their understanding of network security in identifying common issues and propose suitable solutions

CO3: Articulate the importance of managing the network using policies, processes and framework for effective and efficient security

TEXT BOOK

1. Network Security Bible by Eric Cole, Wiley; Second edition (2009)
2. Network Security: Private Communication in a Public World by Charlie Kaufman, Radia Perlman, Mike Speciner, Pearson Education; Second edition (15 September 2016)
3. Network Security and Administration by Adesh K. Pandey, S.K. Kataria & Sons; Reprint 2013 edition (2013)
4. Network Security: A Beginners Guide by Eric Maiwald, McGraw Hill Education; Third edition (1 November 2012)
5. Information Security: The Complete Reference by Mark Rhodes-Ousley, McGraw Hill Education; Second edition (1 May 2013)
6. Information Systems Security: Security Management, Metrics, Frameworks and Best Practices by Nina Godbole, Wiley, 1st ed; 2008.

REFERENCE BOOK

1. Network security. Principles and practice. Fifth edition. William Stallings. Prentice Hall.
2. Cryptography and Network Security Principles and Practices, Fourth Edition. By William Stallings. Publisher: Prentice Hall
3. Network Security Assessment: Know Your Network by Chris McNab, Shroff/O'Reilly; Third edition (1 December 2017)
4. Hacking Exposed 7: Network Security Secrets and Solutions by Stuart Mcclure, Joel Scambray, George Kurtz, McGraw Hill Education; 7 edition (16 March 2012)
5. Applied Network Security Monitoring: Collection, Detection, and Analysis by Chris Sanders, Jason Smith, Syngress (20 January 2014)
6. The Network Security Test Lab: A Step–by–Step Guide by Michael Gregg, John Wiley & Sons (9 October 2015).

DISCIPLINE SPECIFIC ELECTIVE (DSE)-2

DSE 2B- CRYPTOGRAPHY **4 0 0 4**

COURSE OBJECTIVE:

- To help students learn important concepts of cryptography
- To make it possible for students to understand various types of algorithms and processes used in cryptography and how they are applied in achieving the goals of cryptography such as confidentiality, integrity and authentication

UNIT I INTRODUCTION TO CRYPTOGRAPHY **12**

The Confidentiality, Integrity & Availability (CIA) Triad, Cryptographic concepts, methodologies &practices, Symmetric & Asymmetric cryptography, public& private keys, Cryptographic algorithms and uses, Construction & use of Digital signatures

UNIT II TYPES OF ALGORITHMS **12**

The basic functionality of hash/crypto algorithms (DES, RSA, SHA, MD5, HMAC, DSA) and effects on key length concepts in Elliptical Curve Cryptography & Quantum Cryptography

UNIT III KEY MANAGEMENT **12**

The basic functions involved in key management including creation, distribution, verification, revocation and destruction, storage, recovery and life span and how these functions affect cryptographic integrity.

UNIT IV APPLICATION OF CRYPTOGRAPHY **12**

Major key distribution methods and algorithms including Kerberos, ISAKMP etc., Vulnerabilities to cryptographic functions, the Use and functions of Certifying Authorities (CAs), Public Key Infrastructure (PKI) and System architecture requirements for implementing cryptographic functions, Web Services security, Cloud Security, VPNs.

UNIT V CRYPTOGRAPHY IN USER AUTHENTICATION 12

Basics of authentication, tokens, certificate-based and biometric authentication, extensible authentication protocols, and message digest, security handshake pitfalls, SSO, attacks on authentication schemes, email security.

Total No of Hours: 60

COURSE OUTCOME

Students can,

CO1: Explain fundamental concepts involved in cryptography and how they help in achieving the goals of information security.

CO2: Describe various algorithms and processes used in cryptography for authenticating users, securing information and communication

TEXT BOOK

1. Information Systems Security: Security Management, Metrics, Frameworks and Best Practices by Nina Godbole, Wiley, 1st ed; 2008
2. Cryptography and Security by C K Shyamala, N Harini and Dr T R Padmanabhan, Wiley India, 1st ed; 2011
3. Cryptography and Network Security by Atul Kahate, McGraw Hill India, 3rd ed; July 2017
4. Cryptography and Network Security by S. Bose, Pearson India, 1st ed; Mar 2016
5. Cryptography and Information Security by V. K. Pachghare, Prentice Hall India, 2nd rev ed; 2015.

REFERENCE BOOK

1. Understanding Cryptography: A Textbook for Students and Practitioners Hardcover, Springer, 1st ed; 2010

2. Introduction to Modern Cryptography by Jonathan Katz, Chapman & Hall/CRC Cryptography, 2nd ed; 2014

3. Everyday Cryptography: Fundamental Principles & Applications by Keith Martin, OUP Oxford, 2nd ed; 2017

DISCIPLINE SPECIFIC ELECTIVE (DSE)-3

DSE 3A- INFRASTRUCTURE SOLUTIONS ON CLOUD 0 0 4 2

COURSE OBJECTIVE:

- Windows Azure is a cloud computing platform and infrastructure, for building, deploying and managing applications and service through a global network of Microsoft-managed data centers.
- Cloud Computing has emerged in recent years as a new paradigm for hosting and delivering services over the Internet.
- This course is designed to introduce the concepts of Cloud Computing as a new computing paradigm. The students will have an opportunity to explore the Cloud Computing various terminology, principles and applications.
- The course will expose students to different views of understanding the Cloud Computing such as theoretical, technical and commercial aspects.
- A variety of real case studies and existing in market cloud- based tools will be identified and studied in order to provide students with a close overview to Cloud Computing applications.

UNIT I GETTING STARTED WITH AZURE 12

Overview of Cloud Computing – Various Cloud Offerings – Azure Basics – Azure Services – Azure Portals – Preview Portal, Management Portal, Subscription Management – Billing – Pricing Calculator - Azure Virtual Machines : Virtual Machine(VM) Basics – Status, IP Address, Creating and Configuring Virtual Machines – Configuring VM disks – Virtual Machine Management

UNIT II AZURE STORAGE 12

Storage Basics – Storage Types – Azure Storage Offerings – Understanding Azure Regions – Using Storage Accounts – Enabling Larger and Faster Storage – Resizing Azure Disks – Using Premium Storage – Monitoring Azure Storage Accounts – Best Practices for Azure Storage – Azure VM Storage Types – Azure Files – Managing Azure Storage.

UNIT III AZURE NETWORKING 12

Basics of Virtual Networks –Address Spaces, Subnets, DNS Servers – Creating and Using Virtual Networks – Network Security Groups – Virtual Appliances – Load Balancer basics – Configuring Load Balancers – Creating and Using Load balancers – Azure VPN.

UNIT IV AZURE ACTIVE DIRECTORY 12

Introduction to Active Directory(AD), Identity and Authentication in Public Cloud – Introduction to Azure AD – Extending Active Directory into Azure – Azure AD and applications – Reporting and Monitoring Azure AD.

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UNIT V AZURE DATABASES 12

SQL Azure: Creating a SQL Server - Creating a SQL DB - Creating Tables - Adding Data to the Table - View Connection Strings - Security Configurations - Migrating on premise DB to SQL Azure.
Azure Websites: Creating a Website, Setting deployment credentials -Choosing a platform -Setting up Default page for website - Scaling - Auto Scaling by Time -Auto Scaling by Metric - Difference between Free, Shared, Basic and Standard websites - Creating a website using Visual studio

Total No of Hours: 60

Course Outcomes:

Students will be able to

CO1: Students will learn the basics of cloud technology in Windows Azure services like computer service, network service, data service and App service. Programming with windows azure is also covered in depth.

CO2: Introduce the broad perceptive of cloud architecture and model.

CO3: Apply different cloud programming model as per need.

CO4: Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.

TEXT BOOK

1. Michael Collier, Robin Shahan, “Fundamentals of Azure – Microsoft Azure Essentials”, Microsoft Press, 2015

REFERENCE BOOK

1. Michael W, “Implementing Microsoft Azure Infrastructure Solutions”, Phi Learning Pvt Ltd, 2009.

DISCIPLINE SPECIFIC ELECTIVE (DSE)-3

DSE 3B- CLOUD WEB SERVICES **0 0 4 2**

COURSE OBJECTIVE:

- 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.

UNIT I INTRODUCTION TO CLOUD COMPUTING AND AMAZON WEB SERVICES

12

Introduction to Cloud Computing, Cloud Service Delivery Models (IAAS, PAAS, SAAS), Cloud Deployment Models (Private, Public, Hybrid and Community), Cloud Computing Security, Case Study

Introduction to Amazon Web Services, Why Amazon? Use Cases, AWS Storage Options, AWS Compute Options, AWS Database Options, AWS Workflow Automation and Orchestration Options, AWS Systems Management and Monitoring Options, AWS Virtual Private Cloud Introduction, Pricing Concepts

UNIT II INTRODUCTION TO EC2 **12**

Introduction To EC2, Instance Types And Uses, Auto scaling Instances, Amazon Machine Images (AMIS), Modifying Existing Images, Creating New Images of Running Instances, Converting An Instance Store AMI To An EBS AMI, Instances Backed By Storage Types, Elastic IPS, Elastic Load Balancing

UNIT III WEB APPLICATIONS AND SECURITY **12**

Introduction to Elastic Beanstalk, Deploying Scalable Application On AWS, Selecting And Launching An Application Environment, Provisioning Application Resources with Cloud formation, Introduction to Cloud Lookout, Describe Amazon Cloud Watch metrics and alarms, AWS Messaging

Services(SNS,SQS,SES).

Introduction to AWS Security, Describe Amazon Identity and Access Management (IAM), AWS Directory Service, AWS Key Management Service, Securing Data at Rest and In Motion,

UNIT IV AWS STORAGE 12

Amazon Storage, S3 Storage Basics, Buckets and Objects, Creating A Web Server Using S3 Endpoints, Managing Voluminous Information with EBS, Glacier Storage Service , Describe Amazon Dynamo, Understand key aspects of Amazon RDS, Launch an Amazon RDS instance,

UNIT V AWS NETWORKING 12

Introduction to AWS Networking , Access Control Lists (ACLs), Setting Up a Security Group, Setting Up VPC And Internet Gateway, Setting Up A VPN, Setting Up A Customer Gateway For VPN, Setting Up Dedicated Hardware For VPC, Scenario 1:VPC With A Public Subnet Only (Standalone Web), Scenario 2: VPC with Public And Private Subnets (3 Tier App), Scenario 3:VPC With Public And Private Subnets And Hardware VPN Access (Web On The Cloud, Database and App On Prem) Scenario 4: VPC With A Private Subnet Only And Hardware VPN Access. (Extension Of Your Corporate Network), Route53 for DNS System, Cloud front, Case Study.

Total No of Hours: 60

Course Outcomes:

Students can,

CO1: To gain fundamental understanding of AWS cloud technologies.

CO2: Be able to start a Windows or Linux server in the cloud with its own private address.

CO3: Be able to start up a CRM / Word Press / etc. website hosted in cloud.

CO4: Be able to start a highly scalable MySQL or Oracle database in the cloud with multiple read-replica databases (for scalability of database)

CO5: Be able to setup a load-balancer in the cloud.

TEXT BOOK

1. Joe Baron, Hisham Baz , Tim Bixler , Biff Gaut , Kevin E. Kelly , Sean Senior , John Stamper , “AWS Certified Solutions Architect Official Study Guide: Associate Exam, John Wiley and Sons Publications, 2017

REFERENCE BOOK

1. Yohan Wadia , “AWS Certified Solutions Architect Official Study Guide: Associate Exam, John Packt Publishing, 2016

2. Bernald Golden, “Amazon Web Services for Dummies”, John Wiley & Sons, 2013

DISCIPLINE SPECIFIC ELECTIVE (DSE)-4

DSE 4A- CLOUD SECURITY **4 0 0 4**

COURSE OBJECTIVE:

- To help students relate concepts of information security with Cloud computing
- To make it possible for students to learn how important principles of Security are implemented in virtualization and Cloud platforms in managing issues and challenges
- To facilitate students to understand how security principles are useful in establishing privacy and trust in Cloud

UNIT I INTRODUCTION TO VIRTUALIZATION & CLOUD 12

Virtualization and Cloud computing concepts – private vs public cloud, IaaS, PaaS & SaaS concepts, Virtualization security concerns – hypervisor and host/ platform Security, Security communications between – guest instances, hosts and guests, security challenges and mitigation measures

UNIT II CLOUD SECURITY 12

Cloud Security vulnerabilities and mitigating controls, top threats to Cloud security, mitigation through Cloud Controls Matrix

UNIT III CLOUD TRUST PROTOCOL & TRANSPARENCY 12

Introduction to Cloud Trust Protocol & Transparency, Cloud Trust Protocol and Transparency, Transparency as a Service, Privacy & Compliance aspects of Cloud, CloudTrust 2.0, Security Content Automation Protocol, Case Study on building transparent cloud

UNIT IV CLOUD DATA SECURITY 12

Lifecycle, storage architecture security, foundational principles and strategies, data masking, secure migration and traceability technologies, encryption for data at rest and data in transit, platform and software specific Cloud Security aspects

UNIT V LEGAL ASPECTS IMPACTING CLOUD SECURITY AND PRIVACY 12

Understanding legal challenges involved in Cloud, liability, copyright, data protection, IPR, data portability, inter-country legal frameworks, personal data protection and privacy, data controller and processor, contracts, provider's insolvency risk

Total No of Hours: 60

COURSE OUTCOME

Students can,

CO1: Explain how security is implemented in virtualization and cloud computing.

CO2: Articulate the importance of security principles in achieving trust and privacy in Cloud

CO3: Rationalize the need for understanding legal aspects of security and privacy in Cloud computing

TEXT BOOK

1. Virtualization Security: Protecting Virtualized Environments by Dave Shackleford, Sybex (4 December 2012)
2. OpenStack Cloud Security by Fabio Alessandro Locati, Packt Publishing Limited (28 July 2015)
3. Cloud Security – A comprehensive Guide to Secure Cloud Computing by Ronald L. Krutz and Russel Dean Vines, Wiley, 2010
4. Cloud Security and Privacy by Mather Tim, Shroff Publishers & Distributers Private Limited - Mumbai; First edition (2009)

REFERENCE BOOK

1. Securing the Cloud: Cloud Computer Security Techniques and Tactics by Vic (J.R.) Winkler, Syngress (1 June 2011)
2. Practical Cloud Security: A Cross-Industry View by Melvin B. Greer Jr., Kevin L. Jackson CRC Press; 1 edition (2 August 2016)
3. CCSP (ISC)2 Certified Cloud Security Professional Official Study Guide 1st , Kindle Edition by Ben Malisow (Author)
4. www.cloudsecurityalliance.org

DISCIPLINE SPECIFIC ELECTIVE (DSE)-4

DSE 4B- DATABASE SECURITY **4 0 0 4**

COURSE OBJECTIVE:

- To help students relate concepts of information security with databases
- To make it possible for students to learn how important principles of Security are implemented in securing the database

UNIT I CONCEPTS OF DATABASE SECURITY MANAGEMENT SYSTEM 12

Database security concept, Importance of data, Levels of data security, Authorization in databases, Issues in database security, Concept of Least Privilege in User ID for databases. Perimeter security, firewalls, intrusion detection, and intrusion prevention

UNIT II CONCEPTS OF NOSQL 12

No SQL databases introduction, Differences from classical DBMS concepts with NoSQL, Advantages of NoSQL like Elastic Scaling, Big Data, Goodbye DBAs', Economics/Cost, Flexible Data models. Non/ partial applicability of ACID (Atomicity, Consistency, Isolation, Durability), BASE Properties, CAP theorem, comparison to traditional RDBMS databases. Horizontal scalability, Benefits of NoSQL Databases compared to traditional Databases.

Concept of UnSQL or Unstructured Query Language, Concept of Key Value & Tuple Store Databases, Concept of Graph Databases, Concept of Multimodel Databases.

UNIT III ENCRYPTION AND PERMISSIONS IN SQL SERVER 2012 12

Understanding permissions, creating and Using database roles, using schemas for security, configuring cross-database security. Code and Data Encryption- Using service and database master keys, creating and using symmetric and asymmetric keys, creating and storing hash values, Authenticating stored procedure by signature

UNIT IV SECURITY OF SQL SERVER 2012 12

User authorization, authentication and security, protecting data using permissions, roles, schemas, SQL firewall, web application firewall, securing dynamic SQL from injections, protecting SQL server from DoS and injection attacks.

UNIT V SQL SERVER AUDITING **12**

Auditing – Using the profiler to audit SQL server access, using DML trigger for auditing data modification, Using DDL triggers for auditing structure modification, configuring SQL server auditing, auditing and tracing user configurable events, policy based management, system centre advisor to analyze instances

Total No of Hours: 60

COURSE OUTCOME

On successful completion of the course, students will be able to,

CO1: Explain the different models in the Security Architecture.

CO2: Understand how to adjust policies and practices based on feedback mechanisms using different security models.

CO3: Establish strong passwords and manage resources through the use of profiles.

CO4: Compare and contrast database management system facilities for establishing access

CO5: Identify and define SQL injection exploits .

CO6: Describe common strategies used to exploit database infrastructure.

CO7: Conduct database auditing for security and reliability.

TEXT BOOK

1. Information Systems Security: Security Management, Metrics, Frameworks and Best Practices by Nina Godbole, Wiley, 1st ed; 2008
2. Database security by Silvana Castano, 2nd Edition, Pub: Addison-Wesley Professional, 2008
3. Microsoft SQL server 2012 Security Cookbook by Rudi Bruchez, Pub: PACKT publishing, 1st ed; 2012

REFERENCE BOOK

1. Handbook of database security: Applications and Trends Michael Gertz, Sushil Jajodia, Pub: Springer, 1st ed; 2008
2. Implementing database security and auditing, Ron Ben-Natan, Pub: Digital Press, 1st ed; 2005

DISCIPLINE SPECIFIC ELECTIVE (DSE)-3 Lab

DSE 3AL- INFRASTRUCTURE SOLUTIONS ON CLOUD LAB 4 0 0 4

COURSE OBJECTIVE

- Windows Azure is a cloud computing platform and infrastructure, for building, deploying and managing applications and service through a global network of Microsoft-managed data centers.
- Cloud Computing has emerged in recent years as a new paradigm for hosting and delivering services over the Internet.
- This course is designed to introduce the concepts of Cloud Computing as a new computing paradigm. The students will have an opportunity to explore the Cloud Computing various terminology, principles and applications.
- The course will expose students to different views of understanding the Cloud Computing such as theoretical, technical and commercial aspects.

  A variety of real case studies and existing in market cloud- based tools will be identified and studied in order to provide students with a close overview to Cloud Computing applications

LIST OF EXPERIMENTS

1. Create and document the process of creating a windows azure account
2. Create a virtual machine from available releases of windows server images
3. Create a virtual machine using the option “quick Create”
4. Create a custom VM and Capture the image
5. Create a vm from a captured image
6. Add a VMs to a cluster and deploy load balancer on the same
7. Create and publish / host a webpage in windows azure
8. Create a website using Visual studio
9. Create a SQL server DB , Create tables and add data to the table
10. Test basic SQl commands on the table created in the previous step.
11. Migrate an on premise DB to Azure
12. Create a storage account in Azure

COURSE OUTCOME

Students will be able to

CO1: Students will learn the basics of cloud technology in Windows Azure services like computer service, network service, data service and App service. Programming with windows azure is also covered in depth.

CO2: Introduce the broad perceptive of cloud architecture and model.

CO3: Apply different cloud programming model as per need.

CO4: Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.

DISCIPLINE SPECIFIC ELECTIVE (DSE)-3 Lab

DSE 3BL- CLOUD WEB SERVICES LAB **4 0 0 4**

COURSE OBJECTIVE

- 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 Experiments:

Hardware:

Intel core i3/i5 processor with virtualization support
Ethernet port
8 GB (minimum) RAM
100 GB (minimum) and 250 GB (Recommended)

Software:

Centos 7 (Infrastructure server version)
Open stack (Downloaded as package from Internet)

Network:

LAN
Internet (to download packages and services)

Experiments:

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

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

CO1: Define & implement Virtualization using different types of Hypervisors

CO2: Describe steps to perform on demand Application delivery using Ulteo .

CO3: Examine the installation and configuration of Open stack cloud

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

GENERIC ELECTIVE (GE)-1

GE 1A – WEB TECHNOLOGY FUNDAMENTALS 2 0 0 2

COURSE OBJECTIVE:

- To introduce students to web technologies such as HTML, CSS, XML, Java Script teach them to create static and simple dynamic web pages or applications using these technologies and to understand web application deployment and software architectures.
- Students will learn basic web application design, development and testing skills.
- On completion of this course the learner should be able to design and implement a variety of dynamic Website

UNIT I INTRODUCTION TO THE INTERNET AND THE WORLD WIDE WEB 6

Introduction, History of internet, Internet Design Principles, Internet Protocols - FTP, TCP/IP, SMTP, Telnet, etc., Client Server Communication, Web System architecture - Evolution of the Web, Web architectures, Web clients and servers, Static and Dynamic Web Applications, Front end and back end web development - HTML, CSS, JS, XML, Servlet & JSP, PHP and Ajax; HTTP, secure HTTP; URL, Web Services – SOAP, REST.

UNIT II HTML 6

Introduction to Html, Html Document structure, Html Editors, Html element/tag & attributes, Designing simple page - Html tag, Head tag, Body tag; More Html tags - Anchor tag, Image tag, Table tag, List tag, Frame tag, Div tag ; Html forms - Input type, Text area, Select , Button, Images.

Introduction to CSS: Syntax, Selectors, Embedding CSS to Html, Formatting fonts, Text & background colour, Inline styles, External and Internal Style Sheets, Borders & boxing

UNIT III JAVASCRIPT 6

Introduction to JS, Embedding JS into Html, Variables, Data types, Operators, Conditional statements, Looping statements, Strings, Arrays, Math Object, Date Object, Functions, Objects, Event Handling.

UNIT IV XML 6

Introduction to XML, Difference b/w Html & XML, XML editors, XML Elements & Attributes XML DTD, XML Schema, XML Parser, Document Object Model (DOM), XML DOM.

HTML 5 & CSS3: Introduction to HTML5, CSS3, New features, Local storage, Web SQL database, Web Sockets, Server events, Canvas, Audio & Video, Geolocation, Microdata, Drag and Drop. Browser life cycle and browser rendering stages. Service workers.

UNIT V PRACTICAL WEBSITE DEVELOPMENT 6

Commonly used Web Servers and browsers, setting up a server and domain name, website types and structures, web authoring tools, Web hosting, website maintenance, generating traffic to your website

Total No of Hours: 30

COURSE OUTCOME

CO1: Analyze given assignment to select sustainable web development and design methodology.

CO2: Develop web based application using suitable client side and server side web technologies.

CO3: Develop solution to complex problems using appropriate method, technologies, frameworks, web services and content management

TEXT BOOK

1. Practical Web Design for Absolute Beginners, Adrian W. West. Apress 2016
2. Jorg Krause, “Introducing Web Development”, APress Publications, 2017.

REFERENCE BOOK

1. Thomas Powell, “HTML & CSS: The Complete Reference”, McGraw Hill, Fifth Edition, 2010
2. Mathew Macdonald, “Creating a Website: The Missing Manual”, O’Reilly Publications, 2012, 3rd Edition.

GENERIC ELECTIVE (GE)-1

GE 1B – COMPUTER ORGANIZATION & ARCHITECTURE 2 0 0 2

COURSE OBJECTIVE:

- The basic knowledge of how a computer works is very important for any fresh networking or operating system professional.
- The functional knowledge of a computers working and its main building parts are paramount. The computers of today may come with variety of features but the basic working principles remain the same.
- Students will explore the fundamentals of organization of a computer and the principles and building units of a computer (its hardware). Also, they will be introduced to computer arithmetic, memory organization, and modes of data transfer.

UNIT I REGISTER TRANSFER AND MICRO-OPERATION 6

Register Transfer Language, Register Transfer, Bus and Memory Transfer: Three state bus buffers, Memory Transfer. Arithmetic Micro-operations: Binary Adder, Binary Adder-Subtrator, Binary Incrementor, Logic Micro-operations: List of Logic micro operations, Shift Micro-operations (excluding H/W implementation), Arithmetic Logic Shift Unit.

UNIT II BASIC COMPUTER ORGANIZATION 6

Instruction Codes, Computer Registers: Common bus system, Computer Instructions: Instruction formats, Instruction Cycle: Fetch and Decode, Flowchart for Instruction cycle, Register reference instructions

UNIT III MICRO PROGRAMMED CONTROL UNIT 6

Control Memory, Address Sequencing, Conditional branching, Mapping of instruction, Subroutines, Design of Control Unit, Central Processing Unit: Introduction, General Register Organization, Stack Organization: Register stack, Memory stack; Instruction Formats, Addressing Modes

UNIT IV COMPUTER ARITHMETIC 6

Introduction, Addition and Subtraction, Multiplication Algorithms (Booth algorithm), Division Algorithms, Input – Output Organization: Peripheral devices, Input – Output interface, Introduction of Multiprocessors: Characteristics of multi-processors

UNIT V MODES OF DATA TRANSFER AND MEMORY ORGANIZATION 6

Modes of Data Transfer: Priority Interrupt, Direct Memory Access, Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory

Total No of Hours: 30

COURSE OUTCOME

CO1: Understand the theory and architecture of central processing unit.

CO2: Analyze some of the design issues in terms of speed, technology, cost, performance.

CO3: Design a simple CPU with applying the theory concepts.

CO4: Use appropriate tools to design verify and test the CPU architecture.

CO5: Learn the concepts of parallel processing, pipelining and interprocessor communication.

CO6: Understand the architecture and functionality of central processing unit.

CO7: Exemplify in a better way the I/O and memory organization.

CO8: Define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation

TEXT BOOK

1. Computer System Architecture by Morris Mano, PHI
2. Computer Organization and Architecture by William Stallings, PHI
3. Digital Computer Electronics: An Introduction to Microcomputers by Malvino, TMH
4. PC Hardware in a Nutshell by Barbara Fritchman Thompson, Robert Bruce Thompson, O'Reilly, 2nd Edition , 2010

REFERENCE BOOK

1. Fundamentals of Computer Organization and Architecture by Mostafa AB-EL-BARR and Hesham EL-REWNI, John Wiley and Sons
2. Fundamental Of computer Organization by Albert Zomaya, 2010

GENERIC ELECTIVE (GE)-1

GE 1C – SERVER SIDE SCRIPTING LANGUAGE 2 0 0 2

COURSE OBJECTIVE:

- To learn the server side scripting languages and their applications. To understand complementarity of the class of languages to systems languages, their strengths and weaknesses.
- To learn Frameworks and CMS. To get knowledge about server side scripting language python and ruby. Regular expressions, text processing, client- and server-level scripting and CGI, GUI programming using Python.
- Basic concepts: scripts and scripting, scripting versus programming, scriptable objects and component ware, Ajax.

UNIT I INTRODUCTION TO SERVER-SIDE SCRIPTING LANGUAGE 6

Server-side Scripting, Different Scripting Languages, Web services, Web application frameworks – MVC, General purpose frameworks – e.g., Django, RoR; Discussion forums, Wikis, Weblogs, Content management system (CMS).

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UNIT II INTRODUCTION TO PYTHON 6

How to set up the environment, Lexical conventions and Syntax, Variables, Data Types, Operators, Statements and Expressions, Decision making, Loops, Strings, Tuples, Lists, Dictionary, Recursion, Date and Time, Functions, Modules – math, random; Files I/O, Exceptions

UNIT III CGI AND GUI PROGRAMMING IN PYTHON 6

Classes and Objects, Regular Expressions, CGI Programming, Database Access Networking, Sending Email, Multithreading, XML Processing, GUI Programming, Extending and Embedding Python.

UNIT IV INTRODUCTION TO RUBY ON RAILS 6

MVC Architecture, How to install, Framework, Directory structure, Features, Basic Rails Application

UNIT V ADVANCED RAILS APPLICATIONS 6

Setting up the database, Active records, Migrations, Controllers, Routes, Views, Layouts, Scaffolding, AJAX, Uploading files, sending Email

Total No of Hours: 30

COURSE OUTCOME

At the end of this course students able to

CO1: Understand the core programming concepts of Python Programming Language.

CO2: Know the Looping and condition statements in Python Programming Language

CO3: Understand the different options in Data Management in Python Programming Language.

CO4: Understand the importance of data transformation and its need in Python Programming Language

CO5: Know elementary to advanced statistical methods in Python Programming environment

TEXT BOOK

1. Python: Essential Reference, by David M. Beazley
2. Core Python Programming, by Wesley J. Chun, Prentice Hall
3. Python Programming: An Introduction to Computer Science, by John M. Zelle, Franklin – Beedle and Associates.

REFERENCE BOOK

1. Professional Ruby on Rails by Noel Rappin, Wiley India Pvt Ltd
2. Learn Ruby on Rails: Book one, by Daniel Kehoe

GENERIC ELECTIVE (GE)-1

GE 1D – ADVANCED EXCEL **2 0 0 2**

- To make the student understand the special concepts in MS EXCEL.
- To practice the students how to work in list, data forms and records.
- To understand the concepts of filtering data.

UNIT I ADVANCED EXCEL **10**

Uses of Advance Excel Formulas -VLOOKUP, HLOOKUP, SUMIF, SUMIFS, SUMPRODUCT, SUM, COUNTIF, COUNTIFS, IF, IFERROR, ISERROR, ISNA, ISNUMBER, ISNONTEXT, OR, AND, SEARCH, INDEX

UNIT II CONDITIONALS **10**

Various Methods and Uses of IF Conditions, When should use the "IF" Conditions? , Creation of Multiple IF Conditions in One Cell, Use the IF Conditions with the Other Advance Functions, How to use nested IF statements in Excel with AND, OR Functions. Sorting, Data Forms, Adding Data Using the Data Form, Finding Records Using Criteria

UNIT III FILTERING AND SORTING **10**

Filtering Data, AutoFilter, Totals and Subtotals Total, Row, Various Methods of Filter and Advance Filter options, Creating and Updating Subtotals, Various Method of Sorting Data ,Creating, Formatting and Modifying Chart.

Total No of Hours: 30

COURSE OUTCOME

CO1: Use Microsoft Excel to create personal and/or business spreadsheets following current professional and/or industry standards.

CO2: Use critical thinking skills to design and create spreadsheets.

CO3: Communicate in a business setting using spreadsheet vocabulary.

TEXT BOOK

1. Jordan Goldmeler, “Advanced Excel Essentials” , A Press, 2015 edition.

REFERENCE BOOK

1 .John Walkenbach , “Microsoft Excel 2013 Bible” ,Wiley Publications ,2013

SKILLS ENHANCEMENT COURSE (SEC)

SEC 1 – PERSONALITY DEVELOPMENT 2 0 0 2

COURSE OBJECTIVES

- To make students understand the concept and components of personality, thereby to apply the acquired knowledge to themselves and to March towards excellence in their respective academic careers.
- To enable students to keep themselves abreast of general knowledge and current information.

UNIT I INTRODUCTION 10

Definition of Personality - Determinants of Personality- biological, psychological and socio-cultural factors. - Misconceptions and clarifications - Need for personality development

UNIT II SELF-AWARENESS AND SELF MOTIVATION 10

Self-analysis through SWOT and Johari window - Elements of motivation - Seven rules of motivation - Techniques and strategies for self-motivation - Motivation checklist and Goal setting based on principle of SMART - Self motivation and life - Importance of self-esteem and enhancement of self-esteem.

UNIT III MEMORY AND STUDY SKILLS 10

Definition and importance of memory - Causes of forgetting - How to forget (thought stopping), how to remember (techniques for improving memory) - The technique of passing exams-management of examination fear. **Total No of Hours : 30**

COURSE OUTCOME

CO1: Students will be well groomed and ready for placements by the end of the course.

CO2: They will also come out as more confident individuals with a lot of clarity and maturity in making decisions.

TEXT BOOKS

1. Mile, D.J (2004). Power of positive thinking. Delhi: Rohan Book Company.
2. Pravesh Kumar (2005). All about self- Motivation. New Delhi: Goodwill Publishing House.

REFERENCE BOOK

1. Dudley, G.A. (2004). Double you're learning power. Delhi: Konark Press. Thomas Publishing Group Ltd.

Semester – VI

Syllabus

DISCIPLINE SPECIFIC ELECTIVE (DSE)-5

DSE 5A- STORAGE & DATACENTER 4 1 0 5

COURSE OBJECTIVE:

CO1: The explosion in demand from businesses for data to be highly available and access it in a secure manner.
CO2: Data Center Architecture and its requirements.
CO3: The storage systems and infrastructure architectures.
CO4: Planning and designing of Data center.
CO5: Introducing Server Farms, its types and features.
CO6: The complexities and challenges in managing storage infrastructures.

UNIT I INTRODUCTION TO STORAGE AND DATA CENTERS: INFORMATION STORAGE 12

Data – Types of Data –Information - Storage , Evolution of Storage Technology and Architecture - Managing Storage Infrastructure - Information Lifecycle Management - ILM Implementation and Benefits. **Data Centers Overview -** Data Center Goals and Facilities, Roles of Data Centers in the Enterprise and Service Provider Environment, Data Center Architecture – Data Center Requirements.

UNIT II STORAGE SYSTEM ENVIRONMENT 12

Components of a Storage System Environment – Host –Connectivity – Storage, Disk Drive Components –Platter – Spindle - Read/Write Head - Actuator Arm Assembly - Controller - Physical Disk Structure - Zoned Bit Recording - Logical Block Addressing , Disk Drive Performance -1 Disk Service Time , Fundamental Laws Governing Disk Performance , Logical Components of the Host **RAID and Storage Networking Technologies :** Implementation of RAID - Software RAID - Hardware RAID -RAID Array Component -RAID Levels - Striping -Mirroring - RAID Impact on Disk-Performance - Introduction to Direct Attached Storage – Types of DAS – Introduction to SAN – Components of SAN – FC connectivity – FC topologies – Introduction to NAS – NAS components – NAS Implementation – NAS File sharing

UNIT III DATA CENTER DESIGN 12

Characteristics of an Outstanding Design, Guidelines for Planning a Data Center, Data Center Structures, No-Raised or Raised Floor, Aisles, Ramp, Compulsory Local Building Codes, Raised Floor Design and Deployment, Plenum, Floor Tiles, Equipment Weight and Tile Strength, Electrical

Wire ways, Cable Trays, Design and Plan against Vandalism, Data Center Design Case Studies, Modular Cabling Design, Points of Distribution, ISP Network Infrastructure, ISP WAN Links, Data Center Maintenance.

UNIT IV INTRODUCTION TO SERVER FARMS 12

Types of server farms and data centre, internet server farm, intranet server farm, extranet server farm, internet data center, corporate data center, software defined data center, data center topologies, Aggregation Layer, Access Layer, Front-End Segment, Application Segment, Back-End Segment, Storage Layer, Data Center Transport Layer, Data Center Services, IP Infrastructure Services, Application Services, Security Services, Storage Services.

UNIT V BUSINESS CONTINUITY AND DISASTER RECOVERY FUNDAMENTALS 12

Business continuance infrastructure services, the need for redundancy, Information availability , BC terminology , BC planning life cycle , BC technology solutions , backup and recovery considerations , backup technologies , Uses of local replicas , Local replication technologies , Restore and restart considerations , Modes of remote replications , remote replication technologies.

Total No of Hours: 60

Course Outcome:

CO1: To learn the basics of Data Center and its goals.

CO2: To clearly explain the Datacenter Architecture.

CO3: To clearly explain the Datacenter requirements.

CO4: To understand about Datacenter Design.

CO5: To understand about Types of server farms and data centre.

CO6: To understand the concept of Datacenter Services.

CO7: To understand the importance of Business Continuity.

CO8: To understand the concepts of BC Terminologies and types of Replications.

TEXT BOOK

1. EMC Education Services, “Information Storage and Management: Storing, Managing, and Protecting Digital Information”, Wiley Publishing Inc., 1st edition, 2009.
2. Mauricio Arregoces, Maurizio Portolani, “Data Center Fundamentals”, Cisco Press, 2003

REFERENCE BOOK

1. Robert Spalding , “Storage Networks: The Complete Reference “, Tata McGraw Hill Publication, 2003
2. Kailash Jayaswal, “Administering Data Centers – Servers, Storage and Voice over IP”, Wiley Publishing Inc., 2006.

DISCIPLINE SPECIFIC ELECTIVE (DSE)-5

DSE 5B- CLOUD ARCHITECTURE AND DEVELOPMENT 4 1 0 5

COURSE OBJECTIVE:

CO1: Understand the architecture of openstack

CO2: Recognize the services provided by the openstack

CO3: Identify the services of the openstack with respect to the infrastructure resources

CO4: Understand the deployment of various services

CO5: Configure the services of openstack using command line

UNIT I INTRODUCTION TO OPENSTACK 12

Introduction to openstack – Origin of openstack – overview – conceptual architecture – logical architecture – characteristics of openstack – deployment models supported by openstack – service models offered by openstack – openstack licensing– core services offered by openstack – releases of openstack – services introduced in ocata – ocata vs newton

.

UNIT II CORE SERVICES 12

Keystone: Identity service – Architecture – features **– Glance**: Image service – configuration – image formats – **Nova:** Compute service – Architecture – flavors – project- role – users- hypervisors – **Neutron**: Networking service – Architecture – neutron agent – open vSwitch – **Horizon**: user interface – **Swift**: Object storage service – swift rings – **Cinder**: Block storage service – block storage services – **Ceilometer**: Telemetry service – monitoring.

UNIT III DEPLOYMENT OF OPENSTACK 12

Compute node – Controller node – network node – determining the type of deployment – resource planning – **All in one deployment**: installing openstack_ocata – automating the services using packstack utility- generating and analyzing the answer file – modifying the answer file – deploying openstack with respect to answer-file – adding a compute node in an existing cloud

UNIT IV CONFIGURING CORE SERVICES USING CLI 12

Identifying admin key privilege – creating projects, users and roles – adding images in the cloud – creating a customized flavors – configuring bridge between neutron and physical network – creating an internal network – creating an external network – determining the floating ip – creating a router – creating a security groups – generating the RSA key in .PEM key format – launching an instance in the internal network – accessing the instances from physical network

UNIT V CONFIGURING ADVACED SERVICES USING GUI/CLI 12

Configuring DNS service using DESIGNATE – Configuring FWAAS – Configuring LBAAS – Configuring VPNAAS – Configuring object storage – Configuring block storage – adding an external disk in the controller node (.vmdk or .VDI) – Configuring ceilometer and monitor the resource management cloud orchestration using heat services – Configuring shared file system using manila. Configuring clustering service using senlin service.

Total No of Hours: 60

COURSE OBJECTIVE

CO1: Understand the architecture of openstack

CO2: Recognize the services provided by the openstack

CO3: Identify the services of the openstack with respect to the infrastructure resources

CO4: Understand the deployment of various services

CO5: Configure the services of openstack using command line

TEXT BOOK

1. OpenStack Essentials – Paperback – Import, 29 Jul 2016 by Dan Radez
2. Openstack Operations Guide Paperback – 1 Jul 2014 by Tom Fifield

REFERENCE BOOK

1. OpenStack Cloud Computing Cookbook – Second Edition Paperback – October 17, 2013 by Kevin Jackson, Cody Bunch

DISCIPLINE SPECIFIC ELECTIVE (DSE)-6

DSE 6A- DIGITAL FORENSICS **5 0 0 5**

COURSE OBJECTIVE:

- To help students understand how computer forensics is used as a powerful technique in digital investigation
- To make it possible for students to learn the process, various steps, tools and techniques involved in computer forensics
- To facilitate students, appreciate the need for understanding legal aspects of computer forensic investigation and need for meticulous documentation

UNIT I COMPUTER FORENSICS **12**

Introduction to Computer Forensics, Forms of Cyber Crime, First Responder Procedure- Non-technical staff, Technical Staff, Forensics Expert and Computer Investigation procedure, Case Studies

UNIT II STORAGE DEVICES & DATA RECOVERY METHODS **12**

Storage Devices- Magnetic Medium, Non-magnetic medium and Optical Medium, Working of Storage devices-Platter, Head assembly, spindle motor, Data Acquisition, Data deletion and data recovery method and techniques, volatile data analysis, Case Studies

UNIT III FORENSICS TECHNIQUES **12**

Windows forensic, Linux Forensics, Network forensics – sources of network-based evidence, other basic technical fundamentals, Mobile Forensics – data extraction & analysis, Steganography, Password cracking-Brute force, Cross-drive analysis, Live analysis, deleted files, stochastic forensics, Dictionary attack, Rainbow attack, Email Tacking – Header option of SMTP, POP3, IMAP, examining browsers, Case Studies

UNIT IV CYBER LAW **12**

Corporate espionage, digital evidences handling procedure, Chain of custody, Main features of Indian IT Act 2008 (Amendment), Case Studies, Incident specific procedures – virus and worm incidents, Hacker incidents, Social incidents, physical incident, Guidelines for writing forensic report

UNIT V FORENSIC ANALYSIS OF WEB APPLICATION 12

Forensic analysis of web server, network analysis of web server compromise, web server log analysis, web application forensic, forensic analysis of web application security, intruder profiling, forensic for code injection attack, Case Studies

Total No of Hours: 60

Course Outcomes:

CO1: Explain the importance of computer forensic in achieving the goals of information security.

CO2: Comprehend steps involved in recovering data stored in various devices and various techniques used in windows, linux, network and web application forensics.

CO3: justify the need for meticulous documentation in computer forensics

CO4: articulate the rationale for having an adequate legal framework when dealing with computer forensics.

TEXT BOOK

1. Computer Forensics: Computer Crime Scene Investigation by John Vacca, Laxmi Publications, 1st; 2015
2. Digital Forensic: The Fascinating World of Digital Evidences by Nilakshi Jain, et.al, Wiley, 1st ed; 2016
3. The Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics by John Sammons, Syngress, 2nd ed; 2014.

REFERENCE BOOK

1. Cyber Forensics in India: A Legal Perspective by Nishesh Sharma, Universal Law Publishing - an imprint of LexisNexis; First 2017 edition
2. Network Forensics:Tracking Hackers Throu by Davidoff, Pearson India, 1st ed; 2013.

DISCIPLINE SPECIFIC ELECTIVE (DSE)-6

DSE 6B- SECURITY THREATS AND TRENDS 5 0 0 5

COURSE OBJECTIVE:

- To help students understand what are different types of current and emerging threats to security of information.
- To make it possible for students to learn how these threats can be managed.
- To facilitate students to understand the need for a model in management of threats.

UNIT I INTRODUCTION TO SECURITY THREATS AND CURRENT TRENDS 12

Current Security threat landscape, detailed study on data breaches, what happens to the stolen data, impact of security threats on privacy, emerging security threats to Cloud, mobile ecosystem, IoT, smart home, smart offices, smart cities, Industrial IoT, critical infrastructure.

UNIT II ADVANCED PERSISTENT THREATS 12

Introduction to APT, APT versus traditional threats, how APT how works - stealthy, targeted and data focused, characteristics of APT, APT attacks, integrated approach to managing APT, hardware and firmware security threats, Case Studies.

UNIT III SOFTWARE SECURITY THREATS 12

Introduction to Malware – malicious software, Viruses &Worms, the concept of how Viruses & Worms work, the various types of Viruses &Worms, the infection vectors of Viruses & Worms, managerial, technical & procedural controls to address Viruses & Worms, Introduction to Malware & Botnets, the concept of how Malware, Trojans & Botnets work, the concept of honeynets and honeypots, Managerial, technical& procedural controls to address Malware, Trojans & Botnets, Introduction to Remote Access Trojans & Rootkits, concepts, their working methods , their security implications and the managerial, technical and procedural controls to address RATs, ransomware, stages of ransomware attack, Case Studies

UNIT IV CYBER SECURITY THREATS 12

Emerging threats to web, introduction to cyber hate, cyber bullying, hacktivism, espionage, insider threats, social engineering, Human and Computer based Social Engineering, examples of Social Engineering Attacks, counter measures, cyber terrorism, cyber warfare, Case Studies.

UNIT V THREAT MODELING AND MANAGEMENT **12**

Threat Modelling, STRIDE approach, attack trees, attack libraries, managing and addressing threats, defensive tactics and technologies, trade-offs

Total No of Hours: 60

COURSE OUTCOME

CO1: Explain how various threats impact security

CO2: Justify the need for a model in identifying and analyzing these threats

CO3: Articulate various control measures available in managing these threats

TEXT BOOK

1. Future Crimes: Inside the Digital Underground and the Battle for Our Connected World by Marc Goodman, Corgi; Latest Edition edition (1 March 2016)
2. Threat Modeling: Designing for Security (MISL-WILEY) by Adam Shostack, Wiley, 2014
3. Cyber War: The Next Threat to National Security and What to Do About It by Richard A. Clarke, Robert Knake, Ecco; Reprint edition (10 April 2012)
4. Cyber Terrorism and Information Warfare by M. N. Sirohi, Alpha Editions; 1 edition (22 May 2015)
5. Windows Malware Analysis Essentials by Victor Marak, Packt Publishing Limited (31 August 2015)
6. Cuckoo Malware Analysis by Digit Oktavianto, Iqbal Muhardianto, Packt Publishing Limited (20 September 2013)
7. Tools and Techniques for Fighting Malicious Code: Malware Analyst's Cookbook by Michael Hale Ligh, Steven Adair, Blake Hartstein, Matthew Richard, Wiley (2010)
8. Information Security: The Complete Reference by Mark Rhodes-Ousley, McGraw Hill Education; Second edition (1 May 2013)
9. Information Systems Security: Security Management, Metrics, Frameworks and Best Practices by Nina Godbole, Wiley, 1st ed; 2008.

REFERENCE BOOK

1. Advanced Persistent Threat: Understanding the Danger and How to Protect Your Organization 1st , Kindle Edition by Eric Cole, Syngress; 1 edition (31 December 2012)
2. Advanced Persistent Threat Hacking: The Art and Science of Hacking Any Organization by Tyler Wrightson, McGraw-Hill Education (16 September 2014)
3. Darkweb Cyber Threat Intelligence Mining by John Robertson, Ahmad Diab, Ericsson Marin, Eric Nunes, Cambridge University Press; 1 edition (4 April 2017)
4. The Evolution of Cyber War: International Norms for Emerging-Technology Weapons by Brian Mazanec, Potomac Books Inc (1 November 2015)
5. Practical Malware Analysis – The Hands–On Guide to Dissecting Malicious Software by Michael Sikorski, Andrew Honig, No Starch Press; 1 edition (22 February 2013).

GENERIC ELECTIVE (GE)-2

GE 2A – PYTHON PROGRAMMING **2 0 0 2**

COURSE OBJECTIVE:

- To understand why Python is a useful scripting language for developers.
- To learn how to design and program Python applications.
- To learn how to use lists, tuples, and dictionaries in Python programs.
- To learn how to identify Python object types.
- To learn how to use indexing and slicing to access data in Python programs.
- To define the structure and components of a Python program.
- To learn how to write loops and decision statements in Python.
- To learn how to write functions and pass arguments in Python

UNIT I INTRODUCTION **6**

Introduction, What is Python, Origin, Comparison, Comments, Operators, Variables and Assignment, Numbers, Strings, Lists and Tuples, Dictionaries, if Statement, while Loop, for Loop and the range() Built-in Function, Files and the open() Built-in Function, Errors and Exceptions, Functions, Classes, Modules Syntax and Style Statements and Syntax, Variable Assignment, Identifiers, Basic Style Guidelines, Memory Management, Python Application Examples.

UNIT II PYTHON OBJECTS **6**

Types: Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types. **Numbers and Strings:** Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions. **Sequences:** Strings, Lists, and Tuples, Sequences, Strings, Strings and Operators, String-only Operators, Built-in Functions, String Built-in Methods, Special Features of Strings.

UNIT III FUNCTIONS AND DICTIONARIES 6

Operators, Built-in Functions, List Type Built-in Methods, Special Features of Lists, Tuples, Tuple Operators and Built-in Functions, Special Features of Tuples. Introduction to Dictionaries, Operators, Built-in Functions, Built-in Methods, Dictionary Keys, **Conditionals and Loops**: if statement, else Statement, elif Statement, while Statement, for Statement, break Statement, continue Statement, pass Statement, else Statement.

UNIT IV FILES AND INPUT / OUTPUT 6

File Objects, File Built-in Function, File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules.

UNIT V EXPRESSIONS AND EXCEPTIONS 6

Introduction/Motivation: Special Symbols and Characters for REs, REs and Python. **Exceptions:** What Are Exceptions? Exceptions in Python, Detecting and Handling Exceptions, Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions.

Course Outcomes:

At the end of this course students able to

CO6: Understand the core programming concepts of Python Programming Language.

CO7: Know the Looping and condition statements in Python Programming Language

CO8: Understand the different options in Data Management in Python Programming Language.

CO9: Understand the importance of data transformation and its need in Python Programming Language

Know elementary to advanced statistical methods in Python Programming environment.

TEXT BOOKS:

1. Chun, J Wesley, Core Python Programming, Second Edition, Pearson, 2007 Reprint 2010.

REFERENCE BOOKS:

1. Barry, Paul, Head First Python, 2nd Edition, O Rielly, 2010.

2. Lutz, Mark, Learning Python, 4th Edition, O Rielly, 2009.

GENERIC ELECTIVE (GE)-2

GE 2B – INTERNET OF THINGS **2 0 0 2**

- Vision and Concept of IoT.
- History & Evolution of IoT
- Understand IoT Market perspective.
- Data and Knowledge Management and use of Devices in IoT Technology.
- Understand State of the Art – IoT Architecture.
- Learn the fundamental concepts of how and why Cloud systems works
- Understands Cloud technologies that manifest these concepts, such as from Amazon AWS, Microsoft Azure, and Open Stack
- Learn Security issues under IoT Umbrella
- Learn Application area of IoT

UNIT I INTRODUCTION TO IOT **6**

M2M to IoT-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics.

M2M to IoT – A Market Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The International driven global value chain and global information monopolies.

UNIT II IOT TECHNOLOGY FUNDAMENTALS & ARCHITECTURE **6**

M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, M2M and IoT Analytics, Knowledge Management

IoT Architecture-State of the Art – Introduction, State of the art, **Architecture Reference Model-** Introduction, Reference Model, and architecture

UNIT III CLOUD COMPUTING BASICS 6

Cloud computing components- Infrastructure-services- storage applications-database services – Deployment models of Cloud- Services offered by Cloud- Benefits, and Limitations of Cloud Computing – Issues in Cloud security- Cloud security services and design principle.

UNIT IV IOT-PRIVACY, SECURITY, AND GOVERNANCE 6

Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security

UNIT V IOT APPLICATIONS 6

Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, eHealth.

Course Outcomes:

After completion of this subject student will able to understand:

CO1: Key concepts of Internet of things and Internet of Everything

CO2: The architecture view and strategy of deploying things using cloud

CO3: How cloud plays an important role in IoT Infrastructure

CO4: What are the real time applications and what is future scope related to same.

TEXT BOOKS:

1. Vijay Madisetti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, PVT, 2014.

REFERENCE BOOKS:

1. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013

2. Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, “Cloud Computing: A Practical Approach”, Tata McGraw Hill Edition, Fourth Reprint, 2010.
3. Kris Jamsa, “Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and more”, Jones & Bartlett Learning Company LLC, 2013.
4. “Internet of Things Applications - From Research and Innovation to Market Deployment” By Ovidiu Vermesan & Peter Friess, ISBN: 987-87-93102-94-1, River Publishers.

GENERIC ELECTIVE (GE)-2

GE 2C – ARTIFICAL INTELLIGENCE 2 0 0 2

COURSE OBJECTIVE:

- To familiarize students with Artificial Intelligence techniques for building well-engineered and efficient intelligent systems.
- Pattern-directed inference systems and different types of truth maintenance systems will be discussed in length from both theoretical and applied point of view.
- Some cutting edge applications of these systems will also be discussed. Introduction to Artificial Intelligence Programming using LISP will be provided to help students with the programming part of the course.

UNIT I INTRODUCTION 6

Artificial Intelligence Definition – Importance of Artificial Intelligence – Knowledge based Systems – Knowledge Representation – State space search – Production systems – Artificial Intelligence Programming Language – PROLOG – Heuristic search - Depth First Breadth first – Hill climbing – 4th algorithms – Game Playing.

UNIT II KNOWLEDGE REPRESENTATION 6

Prepositional Logic – Clause form – Predicate logic – Resolution – Inference Rules – Unification – Semantic networks – frames – conceptual dependency – Scripts – Representing Knowledge using rules.

UNIT III SYMBOLIC REASONING AND UNCERTAINTY 6

Non monotonic Reasoning – Truth maintenance systems – closed world assumption – modal and temporal Logics – Bayes Theorem - certainty factors – Bayesian networks – Dempster – Shafer Theory – Fuzzy logic.

UNIT IV NATURAL LANGUAGE PROCESSING 6

Overview of Linguistics – Grammars and Languages – Basic parsing techniques – semantic Analysis and representation structures – Natural language generation – natural language systems – Distributed Reasoning systems – Intelligent agents.

UNIT V EXPERT SYSTEMS 6

Architecture – Non production systems Architectures – Knowledge acquisition and validation – Knowledge system building tools – Types of Learning – General Learning model – Learning by induction – Generalization and specialization – Inductive bias – Explanation based Learning.

Total No Of Hours:30

Course Outcomes:

After completion of this subject student will able to understand:

CO1: Get to know about the basic principle of AI

CO2: To understand the concept of machine thinking

CO3: Understanding the modern concept in AI

CO4: Understand the concept of problem solving and thus to improve the problem solving skill

CO5: Understand the concept of gaming and know the decision making in checker, go games

TEXT BOOKS

1. Dan W. Patterson, "Introduction to Artificial Intelligence and Expert Systems", Prentice Hall of India, Delhi, 2001.
2. Elaine Rich and Kevin Knight, "Artificial Intelligence" Tata McGraw Hill Pub. Co., Delhi, 2001.

REFERENCE BOOK

1. George F Luger, "Artificial Intelligence, structures and strategies for complex problem solving", Pearson Education Delhi, 2001

GENERIC ELECTIVE (GE)-2

GE 2D – DISASTER RECOVERY AND BUSINESS CONTINUITY MANAGEMENT

2 0 0 2

COURSE OBJECTIVE:

- To help students understand the importance of disaster recovery (DR) and business continuity management (BCM) in achieving the availability objective of Information Security
- To make it possible for students to learn important steps and documentation involved in developing a business continuity plan (BCP) and how BCP, DRP and BCM are inter-related
- To facilitate students to learn various recovery strategies that are useful in BCP

UNIT I BUSINESS CONTINUITY MANAGEMENT (BCP) **6**

Introduction to Business Continuity Planning (BCP), Business Resumption Plan (BRP) or Disaster Recovery Plan (DRP), Common terminologies used in BCP and DRP, Business Continuity Management (BCM), NIST SP800-34 Emergency Action plan which includes the phases of Recover/Resume, Protect and Sustain, Causes of Disasters

UNIT II STAGES IN BCP **6**

BCP objectives. Information Protection Environment. Security Technology and Tools. Steps involved in creating a BCP, Phase 1: Project Management and Initiation. Phase 2: Business Impact Analysis. Phase 3: Recovery Strategies, Phase 4: Plan Development and Implementation

UNIT III BUSINESS RECOVERY STRATEGIES **6**

Facility and Supply Recovery strategies. User Recovery strategies. Technical Recovery strategies, Data Recovery strategies, Activation Phase- Major Disaster or Disruption, Intermediate Disaster or Disruption, Minor Disaster, Activating BC/DR Teams, Developing Triggers, Transition Trigger. Defining BC/DR Team and Key Personnel, Defining Tasks, Assigning Resources, Communication Plan.

UNIT IV TESTING,MAINTANANCE,AWARENESS & TRAINING MECHANISMS 6

Different types of tests including structured walk-through, checklist test, simulation, parallel test and full interruption test. Steps required to maintain a BCP.

UNIT V PREPARTION OF BCP 6

Requirements for BCP awareness and training, Conduct a case study of IT Organization and prepare a Business Continuity Plan for the same using the learning from this course.

Total No of Hours: 30

COURSE OUTCOME

- **CO1:** Implement a business continuity management plan for a system
- **CO2:** Perform the business impact analysis
- **CO3:** Understand the main concept of disaster recovery and identify the different types of disasters
- **CO4:** Understand the threats and vulnerabilities in information security network
- **CO5:** Recognize the vital data and be able to preserve the security of the data
- **CO6:** Understand the concept of risk, modeling techniques and analysis approaches
- **CO7:** Coordinate and response to an incident in computer network
- **CO8:** Describe a system recovery and backup plan for information security system
- **CO9:** Perform the data recovery plans for lost data after any type of disasters

TEXT BOOKS

1. Business Continuity and Disaster Recovery Planning for IT Professionals by Susan Snedaker, Syngress; 2 edition (31 October 2013)
2. Business Continuity and Disaster Recovery Planning by Stuart Hotchkiss, BCS, The Chartered Institute for IT, 1st ed; 2011
3. Information Systems Security: Security Management, Metrics, Frameworks and Best Practices by Nina Godbole, Wiley, 1st ed; 2008
4. Planning for Disaster: A Business Survival Guide by Harry Flowers, CreateSpace Independent Publishing Platform; 1 edition (15 August 2015)

REFERENCE BOOK

1. Disaster Management: How to Conduct Business Continuity and Disaster Recovery During Disaster Planning, Response and Recovery: 3 (Disaster Management How To Series) by Ian Watts, CreateSpace Independent Publishing Platform; 1 edition (28 November 2016)
2. Simple Guidelines for Successful Disaster Recovery Planning: What are the steps to create an emergency response plan, and how would you utilize this plan by Harry R Fisher, CreateSpace Independent Publishing Platform (27 January 2015)
3. Business Continuity from Preparedness to Recovery: A Standards-Based Approach by Eugene Tucker, Butterworth-Heinemann; 1 edition (5 January 2015)

SKILLS ENHANCEMENT COURSE (SEC)

SEC 2 – NATIONAL SERVICE SCHEME **2 0 0 2**

COURSE OBJECTIVE:

- Social awareness programme
- Volunteer participation in social related campaign

UNIT I SPECIAL CAMPING PROGRAMME **10**

A) Nature and its objectives
B) Selection of camp site and physical arrangement
C) Organization of N.S.S. camp through various committees and discipline in the camp.
D) Activities to be undertaken during the N.S.S. camp.
E) Use of the mass media in the N.S.S. activities

UNIT II CONTRIBUTION OF SOCIAL REFORMS **10**

A) Mahatma JotibaPhule
B) RajarshiShahuChhatrapati
C) Dr.B.R.Ambedkar

UNIT III SOCIAL PROBLEMS **10**

A) Water scarcity
B) Women harassment

Total No of Hours : 30

COURSE OUTCOME

At the end of the course students can,

CO1: Can able to name the various environment issues.

CO2: Ability to explain the role of disaster management in modern life

CO3: Analyze the cost and planning and reports.

CO4: Tell documentation and reporting of a event.

CO5: Organize workshop and seminar and camps

TEXT BOOKS

1. ChhatrapatiShahu – The Pillar of Social Democracy,Ed.P.B.Salunkhe
2. National Service Scheme Manual, Govt.of India

REFERENCE BOOKS

1. Social service opportunities in Hospitals, KapilK.Krishan,TISS
2. History of Social Reforms in Maharashtra, Ed.J.Y.Bhosale, S.U.Kolhapur.

SKILLS ENHANCEMENT COURSE (SEC)

SEC 3 –ETHICS AND VALUES 2 0 0 2

COURSE OBJECTIVE:

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

UNIT I INTRODUCTION 10

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

UNIT II APPROACH TO LIFE 10

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

UNIT III KINDS OF VALUES 10

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.

Total No of Hours : 30

COURSE OUTCOME

At the end of the course students can,

CO1: Can able to understand the ethical value defined by swami Vivekananda.

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

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

CO4: Learn the influence of science & technology in Human Life.

CO5: Able to understand the economic drive.

TEXT BOOK

1. Touchstone: Synergy of Values – University of Madras.

REFERENCE BOOK

1.In harmony- Value Education at College Level- Dept. of Ethics and Religious Studies Loyolla College, Madras.