Securing your Future with your own Hands

NETTUR TECHNICAL TRAINING FOUNDATION
DIPLOMA IN COMPUTER ENGINEERING AND IT INFRASTRUCTURE – CP08

Syllabus
For
SEMESTER – V

Issued & Verified By
Syllabus & Infrastructure Department

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Compiled by
Program Manager – CP08

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LIST OF SUBJECTS WITH TIME ALLOCATION PER SEMESTER

1. THEORY

SL.NO.	SUBJECT CODE	SUBJECT NAME	H/Wk	SEMESTER HOUR	CREDIT
1	CP08515T	Cloud Computing	4	80	4
2	CP08516T	Cyber Security	3	60	3
3	CP08517T	Software Testing	2	40	2
4	CP08518T	Organizational Behaviour and Project Management	2	40	2
5	CP08519T	ITIL,DevOps (Testing)	2	40	2
TOTAL				**260**	

2. PRACTICAL

SL.NO.	SUBJECT CODE	SUBJECT NAME	H/Wk	SEMESTER HOUR	CREDIT
1	CP08520P	AWS Cloud Lab	4	80	3
2	CP08521P	Cyber Security Lab	4	80	3
3	CP08522P	Software Testing Lab	3	60	2
4	CP08523P	DevOps Lab	3	60	2
5	CP08524P	DBA Lab	3	60	2
TOTAL				**340**	

TIME DISTRIBUTION FOR SEMESTER –V

CODE	ACTIVITY	HOURS
Content Unique to NTTF (CUN)		
C (P)	Rope In Programme	8
C (P)	Shop Talk (Trainees)	20
C (P)	Shop Talk (Instructor)	20
C (P)	Weekend Projects (Self Study @ Home)	0
C (P)	Discovery Learning	20
C (P)	Quality Circle	0
C (P)	Technical Enrichment (Ex.Faculty)	10
C (P)	Maintenance (Part of Practical)	0
C (P)	Inspection (Part of Practical)	0
C (P)	Heat treatment (Part of Practical)	0
C (P)	5S (Part of Practical)	0
C (P)	Technical Seminar (Staff/Trainee)	10
EC	Mentoring	0
EC	Village Camp	0
EC	Week Celebration	4
EC	Ind. visits / Study Tour / Seminar	12
EC	Green / Red rack presentation (Part of Practical)	0
EC	Physical Education	40
EC	ELSD	20
CUN Sub Total		**164**
Theory/Practical		
C(T)	Theory	260
C (P)	Practical	340
Theory/Practical SubTotal		**600**
Test & Exams		
Ex(T)	Intermediate - 1	16
Ex(T)	Intermediate - 2	12
Ex(T)	Intermediate - 3	16
EX(P)	Internal Practical	24
EX	Semester Exam	80
	NSDC	0
Test & Exams Sub Total		**148**
Cultural & Sports Activities		
	Kalasangama/Kreedasangama	0
	Sports day	0
	Annual day	0
SubTotal		**0**
Leave & Holidays		
GN	Holidays	56
GN	Semester Vacation	72
Leave & Holidays SubTotal		**128**
Grand Total		**1040**

GN – General, C (P) - Curriculum Practical, C(T) - Curriculum Theory, EX(T) - Curriculum Exam Theory

EX(P) - Curriculum Exam Practical, EC – Extra Curricular, CC- Co-curricular

CLOUD COMPUTING

SUBJECTCODE	CP08515T
SEMESTER	V
SEMESTER HOUR	80H
REV. NO.	
REV. DATE	

COURSE OBJECTIVES:

To enable the trainees to learn the cloud computing fundamentals and various cloud web services provided by Amazon Web Services, to explore the cloud computing platform using the real world cloud services, to gain knowledge about IT infrastructure maintenance in cloud platform & to design, deploy and various cloud resources.

COURSE OUTCOME:

After successful completion of the course, the trainee should be able to:

1. Understand cloud computing fundamentals and different types of cloud and their services.
2. Understand the web-based business processes and cloud implications.
3. Understand the cloud instances and their working principles.
4. Understand the various types of cloud storage.
5. Understand cloud different type of databases and backup and recover the backup.
6. Understand the cloud virtual network setup and configure its features.
7. Understand the cloud security features.
8. Understand the scripting and software deployment in cloud platform.

Topics:

SL.NO	MAJOR TOPICS	HOURS ALLOTTED
1	Introduction: Cloud Computing Overview	16
2	Cloud Computing Platform :Operating Systems and Virtualization	16
3	Cloud Storage Platform: AWS Storage services	16
4	Cloud Database Platform: AWS Database & Migration Services	16
5	Cloud Networking & Security Platform : AWS Networking and	8
6	Cloud Software Development Platform: Scripting & Programming Programming	8
	Total Hours	**80H**

DETAILED SYLLABUS:

SL.NO	MAJOR TOPICS	ALLOTTED HOURS
1.0	**Introduction: Cloud Computing Overview**	**16H**
1.1	What is Cloud Computing, Goal of Cloud Computing, Essential Characteristics of Cloud Computing, Early history of Cloud Computing, Various Cloud service providers	2
1.2	Cloud terminologies – cloud provider, cloud broker, cloud consumer, cloud carrier, cloud auditor. Why cloud computing, Advantages and disadvantages of cloud computing	2
1.3	Hierarchy of service/delivery model, various cloud service models – SaaS, PaaS, IaaS and XaaS. Types of cloud deployment models – Public, Private and Hybrid.	2
1.4	Need of web-based business process, outsourcing of services, customer retention	2
1.5	Business process on cloud, migration of business from on-premises to cloud, running business on cloud.	2
1.6	Cloud for small business, effective usage of cloud services, effective usage of licenses, saving CAPEX and OPEX	2
1.7	Heights in cloud-based business, risks in cloud-based business	2
1.8	Popular cloud service providers – Amazon, Google, Microsoft, IBM, RackSpace, Salesforce- overview of their products.	2
2.0	**Cloud Computing Platform :Operating Systems and Virtualization**	**16H**
2.1	Operating Systems -Operating Systems -Introduction, Process and Thread Management, Resource Management and Communication, and Distributed Systems.	2
2.2	Amazon EC2 – AMI, instance types, regions & availability zones,VPC, Security Group	2
2.3	Linux Web Servers on Cloud, Basics Linux commands.	2
2.4	Microsoft Servers on the AWS Cloud.	2
2.5	EBS Volumes - Backing up and restoring EC2 instance EBS-backed volumes	2

2.6	Autoscaling –launch template, launch configuration, autoscaling group, scaling policies	2
2.7	Public IP, Private IP, Elastic IP of EC2 instance, Amazons pool of addresses	2
2.8	Virtualization - Virtualization – virtual machine, VM import/export, containers. AWS and VMware: VMware Cloud on AWS	2
3.0	**Cloud Storage Platform: AWS Storage services**	**16H**
3.1	Storage – object storage, file storage, block storage	2
3.2	Object storage - Amazon S3 - features, storage classes, buckets, objects, security and access management, bucket policy	2
3.3	S3 – versioning, static web hosting, lifecycle	2
3.4	File storage - Amazon EFS – features, file system ,storage classes, performance mode, bursting mode, mounting file system	2
3.5	Block storage - Amazon EBS – features, snapshots, volume types, data lifecycle manager	2
3.6	Backup – AWS Backup – features, backup plan, types of backup, assign AWS resources, monitor, modify, restore of backups, backup scheduling	2
3.7	Data transfer – AWS Storage Gateway – features, file gateway, tape gateway, volume gateway, hardware appliances	2
3.8	Edge computing and storage – AWS Snow Family – features, Snowcone, Snowball	2
4.0	**Cloud Database Platform: AWS Database & Migration Services**	**16H**
4.1	What is cloud migration, benefits of cloud migration, cloud migration process, 7 step migration model	2
4.2	Databases: Data Structures – Fundamentals, data structure in the cloud, Architecting Cloud Backup and Recovery Solutions.	2
4.3	Different database services – relational, document, in-memory, graph, ledger, time series	2
4.4	Relational Database – Amazon RDS, features, DB engines, db instance, endpoints, backup and restore db instance	2
4.5	DynamoDB- features, NoSQL database, migration, DynamoDB Accelerator	2

4.6	Amazon Aurora – features, Aurora Serverless, MySQL &PostGre compatibility	2
4.7	Data Migration - AWS Database Migration Service, Cloud Data Migration Strategies, 6 Strategies for Getting Data into AWS.	2
4.8	Schema conversion tool, heterogeneous DB migration, using AWS SCT with AWS DMS	2
5.0	**Cloud Networking & Security Platform : AWS Networking and Security Services**	**8H**
5.1	Amazon VPC, Modular and Scalable Virtual Network Architecture with Amazon VPC, Security in Your VPC, VPC and Subnet Basics, Log Analysis AWS	2
5.2	Content delivery network & DNS services – CloudFront- features, edge locations, Route 53 – features, domain registration, resolving DNS queries	2
5.3	Security services – IAM (Identity and Access Management), identities – users, groups, roles	2
5.4	Policies, permissions, data protection, logging and monitoring	2
6.0	**Cloud Software Development Platform: Scripting & Programming**	**8H**
6.1	Software Development: Introduction- Software Architecture, Software Development Processes and Methodologies, Software Architecture & Design	2
6.2	Scripting – CLI- AWS Command Line Interface (CLI), Javascript, AWS SDK for JavaScript in Node.js	2
6.3	Scripting – PHP - PHP Syntax, PHP for Web Development, AWS SDK for PHP	2
6.4	Scripting – Powershell - AWS Tools for Windows PowerShell. Scripting – Ruby- Ruby Developer Center AWS, AWS SDK for Ruby.	2
	Total Hours	**80H**

Reference Books:

1.Cloud Computing: From Beginning to End ,Ray J Rafaels , Createspace Independent Publishing Platform,Second Edition,2015

2.AWS Certified Solutions Architect Official Study GuideAuthors: Joe Baron, Tim Bixler, Hisham Baz, Biff Gaut, Sean Senior, Kevin E. Kelly, John Stamper, Subex Publisher, Third Edition,Associate Exam - Originally published: 2016,

CYBER SECURITY

SUBJECTCODE	CP08516T
SEMESTER	V
SEMESTER HOUR	60 H
REV. NO.	
REV. DATE	

COURSE OBJECTIVES:

To Enable the Trainees to learn Cyber security, protecting the data and integrity of computing assets belonging to or connecting to an organization's network, defend those assets against all threat actors throughout the entire life cycle of a cyber attack.

COURSE OUTCOME:

After successful completion of the course , the trainee should be able to:

1. Understand different types of Cyber attacks and protection mechanism.
2. Understand the different types of Classical Encryption Techniques and its application.
3. Understand the different types of malware and roles of firewall.
4. Understand Ethical Hacking, penetration testing and tools.
5. Identify the security challenges in cloud generation.

Topics:

SL.NO	MAJOR TOPICS	HOURS ALLOTTED
1	The Need of Cyber security	10
2	Information security Overview	8
3	Security Threats and Vulnerabilities	10
4	Cryptography/Encryption	10
5	Security Management	10
6	Cyber security Legal and Ethical Issues	12
	Total Hours	**60H**

DETAILED SYLLABUS:

SL.NO	MAJOR TOPICS	ALLOTTED HOURS
1.0	**THE NEED OF CYBER SECURITY**	**10H**
1.1	Attacks, concepts and techniques	
	Personal data ,organized data	3
1.2	Attackers and cyber security professional	3
1.3	Protecting the organizaton	2
1.4	Overview of cyberwarefare	2
2.0	**INFORMATION SECURITY OVERVIEW**	**8H**
2.1	Background and current scenario	1
2.2	Types of attacks and analyzing a cyber attack	2
2.3	Cyber security landscape	2
2.4	Types of malware	3
3.0	**SECURITY THREATS AND VULNERABILITIES**	**10H**
3.1	Overview of security threats	1
3.2	Weak/strong passwords cracking	1
3.3	Protecting your data and privacy	2
3.4	Malicious code	2
3.5	Programming bugs	2
3.6	Cyber crime and cyber terrorism	2
4.0	**CRYPTOGRAPHY/ENCRYPTION**	**10H**
4.1	Introduction, classical encryption techniques	1
4.2	Data encryption standards, advanced eccryption standard	2
4.3	Public key infrastructure, hash functions digital signatures	2
4.4	Behaviour approach in cyber security	2
4.5	Firewalls	3
5.0	**SECURITY MANAGEMENT**	**10H**
5.1	The cyber security world	1
5.2	Cyber security cube	1

5.3	CIA triad , states of data	2
5.4	Deception	1
5.5	Attacks ,dos, sniffing, snoofing	2
5.6	Business continuity and disaster recovery	2
5.7	Obscuring data	1
6.0	**CYBER SECURITY LEGAL AND ETHICAL ISSUES**	**12H**
6.1	Ethical hacking	2
6.2	Ethical hacking terminologies	2
6.3	Sniffing tools	2
6.4	Security challenges of cloud generation	2
6.5	End point security for cloud generation	2
6.6	Server hardening tips and tricks	2
	Total Hours	**60H**

Reference books:

1.Cyber Security Essentials-Edited by James Graham, Richard Howard, Ryan Olson, Auerbach Publication, Kindle edition, 2016.

2.CCNA : Introduction to Cyber Security from https://www.netacad.com/

3.CCNA:Cyber security Essentials from https://www.netacad.com/

SOFTWARE TESTING

SUBJECTCODE	CP08517T
SEMESTER	V
SEMESTER HOUR	40
REV. NO.	
REV. DATE	

COURSE OBJECTIVES:

To enable the trainees to acquire basic knowledge and understanding of the testing concept.

COURSE OUTCOME:

After completion of the course, the trainee should be able to:

1. Understand the different testing types and techniques.
2. Understand the different testing tools and its deployment.
3. Understand the importance of tester role to produce a quality product.

Topics:

SL.NO	MAJOR TOPICS	ALLOTTED HOURS
1.0	Introduction and fundamentals	04
2.0	Levels of Testing	04
3.0	Testing Technique	06
4.0	Types of Testing	06
5.0	Testing Plan	04
6.0	Defect Life cycle	05
7.0	Testing Tools	05
8.0	Introduction of Selenium	06
	Total Hours	**40H**

DETAILED SYLLABUS:

SL.NO	MAJOR TOPICS	ALLOTTED HOURS
1.0	**INTRODUCTION AND FUNDAMENTALS**	**4H**
1.1	Software testing fundamentals	1
1.2	Testing policy Vs Quality Policy	1
1.3	Test Proposal Preparation	1
1.4	Testing Economics and Testing Cost	0.5
1.5	Testers Role in Organization	0.5
2.0	**LEVELS OF TESTING**	**4H**
2.1	Testing Levels	1
2.2	Unit testing	1
2.3	Integration testing	1
2.4	System Testing	0.5
2.5	Acceptance Testing	0.5
3.0	**TESTING TECHNIQUE**	**6H**
3.1	Testing Techniques	2
3.2	White box testing	1
3.3	Black box testing	1
3.4	Incremental testing	1
3.5	Thread	1
4.0	**TYPES OF TESTING**	**6H**
4.1	Special test types	1
4.2	Performance testing	1
4.3	Usability testing	1
4.4	Interoperability	1
4.5	Vendor validation	0.5
4.6	Recovery	0.5
4.7	Configuration	0.5
4.8	Benefits Realization	0.5
5.0	**TESTING PLAN**	**4H**
5.1	Test Plan Preparation	1
5.2	Test case design	1
5.3	Test case Execution and Test Log preparation	2
6.0	**DEFECT LIFE CYCLE**	**5H**
6.1	Defect tracking and Management	2
6.2	Test traceability matrix	1
6.3	Testing metrics	1
6.4	Test reports	1
7.0	**TESTING TOOLS**	**5H**
7.1	Manual testing Vs Automated Testing	1

7.2	Evaluation and selection of automated tools	1
7.3	Overview of Automated Tools	1
7.4	Performance Test tools	2
8.0	**INTRODUCTION OF SELENIUM**	**6H**
8.1	Introduction to selenium	2
8.2	Selenium features and Limitations	2
8.3	Selenium Web driver architecture	2
	Total Hours	**40H**

Reference Books:

1. EdKit: Software testing in the real world, ACM Press, Addison-Wesley Pub, First edition,1995
2. Effective methods for Software Testing, William Perry , John Wiley & Sons, third edition ,1999
3. Software testing techniques, Beizer B, Published by Van Nostrand Reinluold , Second Edition, 1990
4. The Art of Software Testing, MyersGJ, Published by John Wiley & Sons, Third edition,1979

ORGANIZATION BEHAVIOUR AND PROJECT MANAGEMENT

SUBJECTCODE	CP08518T
SEMESTER	V
SEMESTER HOUR	40 H
REV. NO.	
REV. DATE	

COURSE OBJECTIVES:

To enable the trainee to understand the human behaviour in organization and the ability to lead people to achieve more effectively towards increased organizational performance.

COURSE OUTCOME:

After completion of the Course, the trainee should be able to:

1. Understand individual behaviour in organizations, including diversity, attitudes, job satisfaction, emotions, moods, personality, values, perception, decision making and motivational theories.
2. Understand group behaviour and discussions in organizations, including communication, leadership, power and politics, conflict and negotiations.
3. Understand the organizational system, including organizational structures, culture, human resources and change.
4. Understand Principles of Management.

Topics:

SL.NO	MAJOR TOPICS	HOURS ALLOTTED
1.0	Introduction to organization behaviours	5
2.0	Conflict	4
3.0	Leadership	5
4.0	Stress Management & Group Discussion	5
5.0	Motivation	4
6.0	Personality	6
7.0	Principles of Management	11
	Total Hours	**40H**

DETAILED SYLLABUS:

SL.NO	MAJOR TOPICS	HOURS ALLOTTED
1.0	**Introduction to organization behaviour**	**5H**
1.1	Organizational Behaviour, Nature of Organization, Concepts, Features	1
1.2	Understanding of Human Behaviour	1
1.3	Management Functions, Management Roles, Management Skills	1
1.4	Challenges & opportunities for OB, OB Model, Organizational Goals	1
1.5	Types of Organization	1
2.0	**Conflict**	**4H**
2.1	Inter-personal Conflict	1
2.2	Horizontal and vertical conflicts	1
2.3	Group Conflict	1
2.4	Intra and Inter group conflicts	1
3.0	**Leadership**	**5H**
3.1	Concept of Leadership	1
3.2	Theories of leadership	1
	3.2.1Trait theory	
	3.2.2 Behaviour theory	
	3.2.3 Situational theory	
3.3	Leadership Styles, Motivational styles, Power Styles	1
3.4	Orientation Styles consideration and Initiating	1
3.5	Styles based on authority	1
4.0	**Stress Management &Group Discussion**	**5H**
4.1	stress, positive/negative stress	1
4.3	Causes for stress and how to manage stress	1
4.5	What is G.D, Types of G.D	1
4.6	Uses of group in an organization	1
4.7	Why a group fails	1
5.0	**Motivation**	**4H**
5.1	Definition of Motivation	1
5.2	Theories of Motivation	1
5.3	Maslow's need hierarchy	1
5.4	Herzberg's Motivation Model	1

6.0	**Personality**	**6H**
6.1	Concept of Personality	0.5
6.2	Theories of Personality	0.5
6.3	Psycho-Analytical theory the ID, the Ego	0.5
6.4	Super Ego Socio-Psychological personality theory	0.5
6.5	Trait theory Self theory Self-image, Ideal self	0.5
6.6	Looking glass self, Real self	0.5
6.7	Determinates of personality	0.5
6.8	Personality and behaviours	0.5
6.9	Self-concept and self esteem	0.5
6.1	Need patterns, Machiavellianism, Locus of control,	0.5
6.11	Tolerance of Ambiguity, Type A and B	0.5
6.12	Introversion and extroversion,	0.5
7.0	**Principles of Management**	**11H**
7.1	Concept of Management	1
7.2	Management functions/principles	1
7.3	Planning objectives, policies, procedures, rules	2
7.4	Budgets Planning	1
7.5	Steps in planning, Organizing, Staffing,	1
7.6	Leading, Controlling, Establishing standards	1
7.7	Measurement of performance	1
7.8	Correction of deviations	1
7.9	Principles of management	1
7.10	Classical management theory	1
	Total Hours	**40H**

Reference Books:

1. Organizational Behaviour, K Aswathappa, Himalaya publications,Twelfth edition,2017
2. Organizational Behaviour, Stephen P Robheins, Pearson Education Publisher, Eighteenth edition,2018
3. Essentials of Management , Koontz and Weihrich ,Tata McGraw Hill ,Tenth edition,2015

ITIL,DevOps (Testing)

SUBJECTCODE	CP08519T
SEMESTER	V
SEMESTER HOUR	40 H
REV. NO.	
REV. DATE	

COURSE OBJECTIVES:

To enable the trainees to learn components of ITIL and their specific functions, architecture of ITIL,HPSM and OTRS Architecture, Service Design, Service transition, the SDLC models, Lean, ITIL, Agile,to design and deploy the various devops tools-Jenkins Architecture, Chef for configuration, Docker, Ansible and Maven.

COURSE OUTCOME:

After successful completion of the course, the trainees should be able to:

1. Understand the ITIL components and their functions.
2. Explain the stages of ITIL & Analyze the various functions.
3. Experiment the various Devops Tools-Chef, Puppet, Jenkins, Docker.
4. Apply Version Control System in software development.
5. Design and deploy software in cloud platform using –AWS OpsWorks.
6. Apply containerization concepts in software deployment.

Topics:

SL.NO	MAJOR TOPICS	HOURS ALLOTTED
1	Introduction to ITIL	5
2	ITIL Service Lifecycle processes and functions	5
3	Introduction to Devops	10
4	DevOps Tools	20
	Total Hours	**40H**

DETAILED SYLLABUS:

SL.NO	MAJOR TOPICS	HOURS ALLOTTED
1.0	**Introduction to ITIL**	**5H**
1.1	ITIL History, components of ITIL and their specific functions	1
1.2	Service Management for IT Technology and architecture of ITIL, HPSM and OTRS	1
1.3	ITIL Service Strategy, service portfolio management and process objective, demand management process	3
2.0	**ITIL Service Lifecycle processes and functions**	**5H**
2.1	Service life cycle, approach to IT service Management (IT SM),5 Stages of the ITIL-Service Strategy-financial management, service portfolio management, demand management, Strategy operations	1
2.2	**Service Design-** Service level management, capacity management, continuity management, information security management, service catalogue management, supplier management	1
2.3	**Service transition** – change management, asset management and configuration management, release and deployment, transition planning and support, service validation and testing, evaluation, knowledge management	1
2.4	**Service Operations** –incident management, problem management, access management, event management, request fulfilment , technical management, application management , IT operations management	1
2.5	Continual Service Improvement – 7 step process improvement	1
3.0	**Introduction to Devops**	**10H**
3.1	Define Devops, What is Devops, SDLC models, Lean, ITIL, Agile, Why Devops?, History of Devops	2
3.2	Devops Stakeholders, Devops Goals, Important terminology, Devops perspective, Devops and Agile, Devops Tools	3

3.3	GIT: Version Control- Introduction, What is Git, About Version Control System and Types, Difference between CVCS and DVCS, A short history of GIT, GIT Basics, GIT Command Line	3
3.4	Git Essentials, repository, Cloning, check-in and committing, Fetch pull and remote, Branching	2
4.0	**DevOps Tools**	**20H**
4.1	Chef for configuration management -Overview of Chef, Workstation Setup, Organization Setup, Test Node Setup, Node Objects and Search, Environments, Roles, Attributes, Data bags	2
4.2	AWS OpsWorks, managed configuration management service, Chef Automate, Puppet Enterprise, Stacks Templated Infrastructure Provisioning- AWS Cloud Formation, model it all, automate and deploy, it's just code	2
4.3	Puppet for configuration management-What is Puppet? Puppet Architecture, Master and Agents, Puppet Language Basics, Templates, Puppet Forge	2
4.4	Introduction-Understanding continuous integration, Introduction about Jenkins, Build Cycle, Jenkins Architecture, Jobs, Build Deployments, Securing Jenkins	2
4.5	Docker– Containers- What is a Docker, Dockers vs. Virtualization, Architecture, Docker Hub-Docker images, AWS ECS- Understanding the containers, images, Docker Networking	2
4.6	**Ansible** What Ansible is Ansible? Why we use Ansible ? • Introduction to Ansible • Creating a playbook with YAML language to define the automation job. What is Playbook? • YAML , YAML Basics, Variables. • Inventory • Ansible Modules • Ad hoc Commands • Creating a New Role on Ansible	3
4.7	**Maven** -What is Maven? Overview about POM • Build Life Cycle, Build Profiles , Types of Build Profile. • Managing Plugins	2

	Jenkins – Maven Setup	
4.8	**Git&Github** • Basic Concepts, Life Cycle • What is Branches on Git? • Performing following operations on Git, • Distributed version-control system vs centralized version control system. • Understanding SCM.	3
4.9	**Nagios** What is Nagios? Why Continuous Monitoring on DevOps? Install Nagios Core, Nagios Plugins And NRPE (Nagios Remote Plugin Executor)	2
	Total Hours	**40H**

Reference Books:

1.ITIL For Beginners: The Complete Beginner's Guide To ITIL , Clydebank Technology(Author), Create space Independent Publication, Second edition, 2015

2.ITIL For Beginners: The Complete Beginner's Guide To ITIL , Clydebank Technology (Author) , Kindle Edition, 2017

3.Effective DevOps: Building a Culture of Collaboration, Affinity, and Tooling at Scale , Jennifer Davis (Author), Ryn Daniels (Contributor) ,Orally publications, 1st Edition, 2016

4.Infrastructure as code:Managing Servers in the Cloud Kief Morris, Orally publications, 1st Edition, 2016

AWS CLOUD LAB

SUBJECTCODE	CP08520P
SEMESTER	V
SEMESTER HOUR	80H
REV. NO.	
REV. DATE	

COURSE OUTCOME:

After successful completion of the course, the trainee should be able to:

1. Deploy the EC2 instance and its configurations - load balancing, auto scaling.
2. Experiment the process of taking snapshot and recover the instance.
3. Demonstrate the different storage services like S3, EBS, EFS, create, store data and retrieve the same from cloud.
4. Configure the different cloud databases RDS, DynamoDB, create and configure the database , access the database from EC2 instance.
5. Implement the function as a service using Lambda, create and execute the function.
6. Demonstrate the networking concepts, create configure the different types of VPC deployment.
7. Make use of the public IP, private IP, elastic IP configurations in AWS.
8. Apply the security configurations and enhancement of resource using Identity and Access Management.
9. Deploy the various AWS Software Development Kits for different software development platform.

LIST OF EXERCISES:

SL NO	MAJOR TOPICS	HOURS ALLOTTED
1.0	**Create Your First Amazon EC2 Instance (Windows)**	**4H**
1.1	Create a Windows EC2 instance	1
1.2	Retrieve the Administrator password using the Keypair	1
1.3	Connect to a Windows instance using a Remote Desktop connection	1
1.4	Get the EC2 instance metadata (Windows) and Terminate the EC2 instance	1
2.0	**Create Your First Amazon EC2 Instance (Linux)**	**4H**

2.1	Creating an EC2 Instance	1
2.2	Converting a PEM Key to a PPK Key	1
2.3	Connecting to an Instance using SSH	1
2.4	Getting the EC2 Instance Metadata and Terminating the EC2 Instance	1
3.0	**Create an EBS-Backed Linux AMI as public**	**4H**
3.1	Create a basic Linux web server instance	1
3.2	Create a snapshot of the instance	1
3.3	Create an AMI starting from an EBS-backed instance	1
3.4	Make an AMI public and launch the new instance	1
4.0	**Getting Started with Amazon EC2 Auto Scaling**	**4H**
4.1	Create a Launch Template	1
4.2	Create an Auto Scaling Group	1
4.3	Configure Your Auto Scaling Group to Send Notifications and Test the Notification Configuration	1
4.4	Delete Your Scaling Infrastructure	1
5.0	**Work with Elastic IP addresses**	**4H**
5.1	Allocate an Elastic IP address from Amazon's Pool of address	1
5.2	Associate the Elastic IP address to the instance	1
5.3	Access the instance using Elastic IP address	1
5.4	Disassociate and release Elastic IP address	1
6.0	**Getting Started with Network Load Balancers**	**4H**
6.1	Choose a Load Balancer Type	1
6.2	Configure Your Load Balancer and Listener	1
6.3	Configure Your Target Group&Register Targets with Your Target Group	1
6.4	Create and Test Your Load Balancer&Delete Your Load Balancer	1
7.0	**Create your first Cloud Storage bucket using Amazon Simple Storage Service (Amazon S3)**	**4H**

7.1	Creating an S3 Bucket	1
7.2	Uploading a File to S3	1
7.3	Granting Public Access to an S3 Object	1
7.4	Accessing the S3 object using unique url	1
8.0	**Introductions to the Elastic File System**	**4H**
8.1	Create an EFS file system	1
8.2	Mount the file system in EC2 instance	1
8.3	Test the file system	1
8.4	Clean up the instance and file system	1
9.0	**Hosting static website using S3 bucket**	**4H**
9.1	Create S3 bucket and upload the web content	1
9.2	Enable static web hosting for the bucket	1
9.3	Configure the index document for the website	1
9.4	Access the website using the endpoint	1
10.0	**Working with AWS Backup**	**4H**
10.1	Open the AWS Backup console&Create an On-Demand Backup	1
10.2	Choose the resource for backing up – eg EC2	1
10.3	Choose name or ID of the resource	1
10.4	Initiate the backup process and verify the backup	1
11.0	**Restoring the AWS Backup**	**4H**
11.1	Open the AWS Backup console& choose Protected resources	1
11.2	Select the resource ID in the resource details page	1
11.3	Select the Network & Role as default	1
11.4	Restore the backup and verify	1
12.0	**Create an RDS instance in AWS**	**4H**

12.1	Create a database cluster using RDS with MySQL DB Engine	1
12.2	Setup security group rules for connecting to the RDS instance	1
12.3	Create an EC2 instance with a key pair & connect to a remote shell using an SSH connection	1
12.4	Connect to RDS using the endpoint and verify	1
13.0	**Migrating a SQL server database to Amazon Aurora**	**4H**
13.1	Install the SQL Drivers and AWS Schema Conversion Tool on Your Local Computer	1
13.2	Configure Your Microsoft SQL Server Source Database and Aurora Target Database	1
13.3	Use AWS SCT to Convert the SQL Server Schema to Aurora MySQL and Create AWS DMS Source and Target Endpoints	1
13.4	Create and Run Your AWS DMS Migration Task	1
14.0	**Setting up Amazon VPC with IPv4**	**4H**
14.1	Create the VPC&Create a Security Group	1
14.2	Adding inbound & outbound rules in the security group	1
14.3	Launch an Instance into Your VPC	1
14.4	Assign an Elastic IP Address to Your Instance and access the	1
15.0	**Creating AWS IAM account and managing**	**4H**
15.1	Creating Your First IAM Admin User and Group and Creating	1
15.2	How Users Sign in to Your Account	1
15.3	Delegate Access Across AWS Accounts Using IAM Roles and	1
15.4	Enable Your Users to Configure Their Own Credentials and MFA	1
16.0	**Access s3 bucket from an amazon ec2 without access credentials**	**4H**
16.1	Create VPC&Create Key Pair	1
16.2	Create S3 Bucket and objects inside buckets	1
16.3	Create IAM Policy and Role	1
16.4	Connect to the instance and access the S3 bucket	1
17.0	**Monitor the EC2 instance with Cloud Watch**	**4H**

17.1	Enable and Disable detailed monitoring	1
17.2	List the available CloudWatch metrics for your instances	1
17.3	Add stop actions to Amazon CloudWatch alarms	1
17.4	Add terminate actions to Amazon CloudWatch alarms	1
18.0	**Managing Amazon EC2 Instances Using the AWS SDK for PHP Version 3**	**4H**
18.1	Describe Amazon EC2 instances using Describe Instances.	1
18.2	Enable detailed monitoring for a running instance using Monitor Instances and Disable monitoring for a running instance	1
18.3	Start an Amazon EBS-backed AMI that you've previously stopped using Start Instances and Stop an Amazon EBS-backed	1
18.4	Request a reboot of one or more instances using Reboot	1
19.0	**Deploy a Node.js Stack Web App**	**4H**
19.1	Launch an Elastic Beanstalk Environment	1
19.2	Add Permissions to Your Environment's Instances	1
19.3	Deploy the Sample Application(Eg: Node.js) and access the	1
19.4	Upload the new Node.js code to the application and verify	1
20.0	**AWS Tools for PowerShell**	**4H**
20.1	Install and configure AWS Tools for PowerShell	1
20.2	Create a keypair through PowerShell cmdlets	1
20.3	Create a Security Group through PowerShell cmdlets	1
20.4	Find an AMI and launch the instance through PowerShell cmdlets	1
	Total Hours	**80H**

CYBER SECURITY LAB

SUBJECTCODE	CP08521P
SEMESTER	V
SEMESTER HOUR	80 H
REV. NO.	
REV. DATE	

COURSE OUTCOME:

After successful completion of the course, the trainee should be able to:

1. Understand different types of attacks and how to ensure the security settings.
2. Understand and perform Port scanning, OS scan and other types of scan to gather information of any Demo Network.
3. Identify different types of malware, Roles of firewall and Perform Inbound/Outbound rules.
4. Examine Ethical hacking tool and do penetration testing.

LIST OF EXERCISES:

S.NO	MAJOR TOPICS	ALLOTTED HOURS
1	Steps to ensure Security of any one web browser (Mozilla Firefox/Google Chrome)	8
2	Study of different types of vulnerabilities for hacking a websites / Web Applications.	8
3	Study of the features of firewall in providing network security and to set Firewall Security in windows.	8
4	Perform Demo Port Scanning Using Nmap /Zen map Tool and perform Reconnaissance .	8
5	Study the steps to Protect Microsoft word document of different version with different operating system and Steps to Remove passwords from Microsoft word	8
6	Study “How to make strong passwords” and “passwords cracking techniques”. Study the steps to hack a strong password.	8
7	Hiding confidential information within image or in Audio using Steganography tools.	8
8	Practice the best ways to protect Phishing attacks.	8
9	Using Burp Suite Professional evaluate the security of web-based applications.	8
10	Perform Google Hacking commands, to display specific results and to display Public CC Camera.	8
	Total Hours	**80H**

SOFTWARE TESTING LAB

SUBJECTCODE	CP08522P
SEMESTER	V
SEMESTER HOUR	60H
REV. NO.	
REV. DATE	

COURSE OUTCOME:

After completion of the course, the trainee should be able to:

1. Understand how to write the manual test cases for different scenarios.
2. Understand how to apply automation test tool to validate the software project.

LIST OF EXERCISE:

SLNO	MAJOR TOPICS	ALLOTED HOURS
	Manual Testing	4
1	Write the Test cases for Login Page of Gmail, Facebook.	
2	Write all the test cases using the appropriate testing techniques wherever applicable for the below requirement.	4
	REQUIREMENT 1: Here is a KSRTC application. This application is used to search KSRTC Buses for travelling different locations. The below screen will help the user to search KSRTC Buses based on Trip, Date, Time, Number of Passengers, Ladies, Service Class. Fields: Trip - Radio button (One Way or Round Trip) From: Text Box is alphanumeric, This field can accept 256 characters. The values that is available in the current database is "Bangalore, Chennai, Mumbai, Pune" To: Text Box, This field can accept 256 characters. Text box is alpha numeric. The values that is available in the current database is "Bangalore, Chennai, Mumbai, Pune"	

	REQUIREMENT 2: Here is a KSRTC application. This application is used to search KSRTC Buses for travelling different locations. The below screen will help the user to search KSRTC Buses based on Trip, Date, Time, Number of Passengers, Ladies, Service Class. 1. Onward Date: Text is view only; On clicking calendar Icon, Calendar will be displayed and user can select the date of travel. Date is displayed in DD/MM/YYYY format. Time: Dropdown. Current values displayed in database is (9 a.m, 10a.m, 11a.m, 12p.m, 1p.m, 2p.m) Return Date: Text is view only; On clicking calendar Icon, Calendar will be displayed and user can select the date of travel. Date is displayed in DD/MM/YYYY format.	6
	REQUIREMENT 3: Here is a KSRTC application. This application is used to search KSRTC Buses for travelling different locations. The below screen will help the user to search KSRTC Buses based on Trip, Date, Time, Number of Passengers, Ladies, Service Class. > Time: Dropdown. Current values displayed in database is (9 a.m, 10a.m, 11a.m, 12p.m, 1p.m, 2p.m) > Number of Passengers: Drop down. Current values in database is (1, 2, 3, 4) > All Ladies Checkbox > Service Class: Drop down. Current values in database is (Premium, Luxury, Deluxe, Express) > On submitting the forum by clicking “Search available services”, “Search results of all the KSRTC buses based on the criteria should be displayed in “KSRTC Search Results “ page along with query provided by the user.	6
	UI screenshot	
		

	Selenium	
1	Introduction to Selenium & its components.	4
2	Write a selenium web driver script for opening a login page of demo.actitime.com	4
3	Demonstrate Title check point Text Checkpoint	4
4	Demonstrate URL check point	4
5	Demonstrate element checkpoint	4
6	Demonstrate working with single select dropdown	4
7	Demonstrate working with multi select dropdown.	4
8	Demonstrate selecting and deselecting option from multi select dropdown	4
9	Demonstrate to get all the option which are there in the dropdown and print it in the console.	4
10	Demonstrate Synchronization	4
	Total Hours	**60H**

Reference:

1. Testing in 30+ Open Source Tools, Rahul Shende, Shroff Publishers & Distributor Pvt. Ltd, ISBN 13: 9789350231005 (page numbers from 15 to 117)
2. http://seleniumhq.org/
3. http://sourceforge.net/projects/sahi/
4. The art of software Testing: MyersGJ, Published by John Wiley & Sons, Inc.,Third edition,1979

DevOps LAB

SUBJECTCODE	CP08523P
SEMESTER	V
SEMESTER HOUR	60 H
REV. NO.	
REV. DATE	

COURSE OUTCOME:

After completion of the course, the trainee should be able to:

1 .Deploy Jenkins on Windows, downloading and installing proper version.
2. Configure GitHub & Git, working on GitHub with sample experiment.
3. Demonstrate working with Software provisioning and configuration management with Ansible
4. Deploy Wordpress using Cloud Formation.
5. Build first OpsWorks stack.
6. Develop and Deploy an application with AWS CodeStar.

LIST OF EXERCISES:

Sl No	MAJOR TOPICS	ALLOTED HOURS
1.0	**Hands on with GitHub & Git**	**4**
1.1	Creating new free GitHub account online.	
1.2	Creating new repository and commit the codes to newly created repository	
1.3	Importing the codebase from different Github account to your Github account	
1.4	Understanding different operations on Github	
2.0	**Using Chef Solo on Linux for AWS**	**4**
2.1	Configure a Chef node in AWS using Chef Solo	
2.2	Write Chef cookbooks and recipes	
2.3	Use Chef attributes and templates to generalize your cookbooks	
2.4	Create Chef roles to define Chef node functions	
3.0	**Build your first OpsWorks stack**	**4**

3.1	Build the infrastructure and automate code deployment for a PHP application with OpsWorks	
3.2	1. **Registering the Instance (Linux) in OpsWorks**	
3.3	2. **Deploying Apps- Deploy test PHP application**	
3.4	Execute other commands – Undeploy, Rollback, Start Web Server, Stop Web Server, Restart Web Server	
4.0	**Getting Started with Jenkins on Windows (Hyper or Oracle VM box)**	**8**
4.1	Build the server on Hyper or Oracle VM box on on premise machine	
4.2	Install and configure a Jenkins server	
4.3	Add plugins and create Jenkins jobs	
4.4	Run Jenkins jobs and examine outputs and results	
5.0	**Software provisioning and configuration management with Ansible**	**8**
5.1	Introduction to Ansible hands-on	
5.2	YAML and Hands-on Exercises	
5.3	Build Ansible Inventory Files and modules	
5.4	Automate provisioning and web server deployment	
6.0	**Linux Command Line Byte Session**	**4**
6.1	Understand what the Linux command line	
6.2	Directory Manipulations commands	
6.3	Use common commands for working with files and directories	
6.4	Installing Software in Linux CLI	
6.5	Sending E-mails	
7.0	**Create AWS Resources with Terraform**	**6**
7.1	Install Terraform on Linux	
7.2	Configure Terraform providers	
7.3	Create AWS resources with Terraform	
8.0	**Deploy Word press using Cloud Formation**	**8**

8.1	Create your first cloud infrastructure using Amazon Cloud Formation	
8.2	Use CloudFormation to launch an EC2 (Linux) instance	
8.3	Create the Stack and choose template for launching instance	
8.4	Perform Wordpress full installation in the instance	
9.0	**Develop and Deploy an Application with AWS CodeStar**	**6**
9.1	Create AWS CodeStar projects	
9.2	Monitor project activity	
9.3	Develop and deploy code using AWS CodeStar	
9.4	Manage teams inside of AWS CodeStar projects	
10.0	**Use AWS Fargate for Serverless Deployment of Container Applications**	**8**
10.1	Use application source files to create Docker container images and place them in Amazon ECR	
10.2	Create an Amazon ECS cluster	
10.3	Use the Amazon ECR images to create ECS task definitions and services	
10.4	Implement the services in ECS by using AWS Fargate enjoying the advantages of serverless	
10.5	Register ECS tasks with an Application Load Balancer (ALB) target group	

DBA LAB

SUBJECTCODE	CP08524P
SEMESTER	V
SEMESTER HOUR	60 H
REV. NO.	
REV. DATE	

COURSE OUTCOME:

After completion of the course, the trainee should be able to:

1. Explain installation and configuration of SQL Server.
2. Set up the database in SQL Server.
3. Explain how to manage security in SQL Server.
4. List different backup and recovery methods.
5. Observe the use of automation using SQL Agent.
6. Discuss database Maintenance and query tuning.

LIST OF EXERCISES:

SL.NO	MAJOR TOPICS	HOURS ALLOTTED
1	Introduction	**1H**
2	Installation of SQL Server 2012	**2 H**
	2.1 Lab Exercise : Step by Step Installation guide for SQL Server 2012	2
3	SQL Server Management Studio (SSMS)	**2 H**
	3.1 Lab Exercise - Exploring the SSMS	1
	3.2 Lab Exercise - SSMS Configurations, Tips and Issues	1
4	Architecture	**2H**
	4.1 SQL Server QUERY TREE Viewer (optional demo)	1
	4.2 Lab Exercise: Viewing a QUERY PLAN	1
5	Setting up DB	**4 H**
	5.1 Lab Exercises to CREATE, ALTER AND DELETE User Databases	4
6	Security Management	**12 H**
	6.1 Demo : Security Components	4
	6.2 Lab Exercise : Create Login, User, assign Permission	5
	6.3 SQL Server Data Encryption	1.5
	6.4 Lab Exercise : Row Level Security (RLS)	1.5
7	Backup and Recovery	**12 H**
	7.1 Lab Exercise: Types of recovery models	1
	7.2 Understanding SQL Server Backup Types	2
	7.3 Backup Commands T-SQL Recap	3

	7.4 Create backup using SQL Server Management Studio SSMS	3
	7.5 SQL Server Restore Options and Commands Tutorial	3
8	SQL Server Agent	**6H**
	8.1 Demo of Jobs and Schedules	5
	8.2 Analyzing Problems with SQL Server Agents	1
9	Project 1 : Security	**3H**
10	DB Maintenance	**6H**
	10.1 Lab Exercise : Maintenance Plan Wizard - Backup Schedule	3
	10.2 Lab Exercise: Page Level Restore for a Corrupted database using DBCC	3
11	Performance Tuning	**10H**
	11.1 Example of Indexing Tuning	1
	11.2 Tools and Utilities: DMV – Dynamic Management Views	1
	11.3 Tools and Utilities: DB Engine Tuning Advisor	2
	11.4 Tools and Utilities: Profiler	2
	11.5 Tools and Utilities : Performance Monitor or PerfMon	2
	11.6 Deadlocks	2
	Total Hours	**60H**

MODULAR PROGRAM

TECHNICAL WRITING

SUBJECTCODE	
SEMESTER	V
SEMESTER HOUR	20 H
REV. NO.	
REV. DATE	

Topics:

SL NO.	MAJOR TOPICS	HOURS ALLOTTED
1	Email Writing	1
2	Resume Building	1
3	Report Writing	2
4	Passage Writing & Extempore	2
5	Status Reporting, Minutes of the Meeting	1
6	Presentation Skills	2
7	Group Discussion	3
8	Interview Skills	3
9	Telephonic Conversation	1
10	Blogging, Storytelling and Effective use of Social Media	1
11	Business Etiquettes and Personal Grooming	1
12	Business Requirement Documentation	2
	TOTAL	**20 H**

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

SUBJECTCODE	
SEMESTER	V
SEMESTER HOUR	20 H
REV. NO.	
REV. DATE	

Topics:

Sl. No.	MAJOR TOPICS	ALLOTTED HOUR
1	Introduction to Machine Learning	3
2	Machine Learning Applications & Landscape	2
3	Training Models	6
4	Tools for AI & ML	9
TOTAL		**20H**

SL NO.	MAJOR TOPICS	HOURS ALLOTTED
1.0	**Introduction to Machine Learning**	**3H**
1.1	Introduction to Machine Learning(ML) Artificial Intelligence(AI)	1
1.2	Need of ML, Machine Learning vs. Traditional Programming	1
1.3	Data in Machine Learning	1
2.0	**Machine Learning Applications & Landscape**	**2H**
2.1	Different types of Machine Learning(Classifications)	2
	Supervised, Unsupervised, Reinforcement, BSemi supervised learning	
	Classification Regression Clustering	
3.0	**Training Models**	**6H**
3.1	Linear Regression	2
3.2	Logistic Regression	2
3.3	K- Nearest Neighbor	1
3.4	Decision tree	1
4.0	**Tools for AI & ML**	**9H**
4.1	Numerical Tools – NumPy, SciPy, Pandas	3
4.2	Data Visualization - Matplotlib, Seaborn	3
4.3	Machine Learning - Scikit-learn	3
	Total Hours	**20 H**