CCEK – NSQF ALIGNED PROGRAM

COURSE SYLLABUS

FOR

Web Development

CCEK - NATIONAL SKILL DEVELOPMENT TRAINING PROGRAM

Web Development

CCEK – NSDC course package covers the following Qualification Packs and leads to the following NSDC certifications. The students who successfully completed the course programs are entitled to get NSDC certification after undergoing the assessment process of NSDC as per the rules and regulations stipulated by NSDC from time to time.

SL. NO.	QUALIFICATIONS PACK	QUALIFICATIONS PACK CODE	NSQF LEVEL
1	**Application Developer - Web & Mobile** **Brief Job Description**: Individuals in this job are responsible for designing, maintaining, evaluating and testing architectures of webbased or mobile-based products and solutions. They create enterprise policies and guidelines for software implementation and governance. They assess third party tools, APIs and service providers for developing software solutions.	**SSC/Q8403**	6

COURSE DETAILS

Web Development

EXAMINATION DETAILS

COURSE NAME	COURSE CODE	ELIGIBILITY	DURATION
Web Development	G24	UG or diploma with courses related to Engg./ Science	420

SL. NO.	EXAM	EXAM CODE	MAXIMUM MARK	INTERNAL	TOTAL MARK
THEORY PAPERS					
1	Front-End & Back-End Development (HTML, CSS, JavaScript,PHP, Node.js, Databases)	T001	100	50	150
2	Mobile Application Development (Android/iOS)	T002	100	50	150
PRACTICAL PAPERS					
1	Mobile Application Development Project	L001	100	50	150
TOTAL MARKS					
1	Total Examination Marks (Theory Online + Practical Examination)				300
2	Total Internal Marks				150
3	**Total Marks (Total Internal Marks + Total Examination Marks)**				**450**

Web Development

INTERNAL MARK CRITERIA FOR EACH

SL NO.	MODULE	MODULE CODE	MAXIMUM MARK	INTERNAL MARK	TOTAL MARK
1	Front-End & Back-End Development (HTML, CSS, JavaScript,PHP, Node.js, Databases)	T001	100	50	150
2	Mobile Application Development (Android/iOS)	T002	100	50	150
3	Mobile Application Development Project	L001	100	50	150
	TOTAL		300	150	450

ATTENDANCE	GENERAL PERFORMANCE	INTERNAL EXAMINATIONS/ PROJECTS/ ASSIGNMENTS	TOTAL MARKS
5	5	40	50

COURSE SYLLABUS

FOR

Web Development

COURSE	Web Development	
TOTAL MARKS	Mark: 450	Internal Mark: 150
TOTAL HOURS	420 Hrs	

DEFENITION OF CREDIT

1 Credit	15Hrs Theory/ 30Hrs Practical
Skill Components	60 – 70 % of Total Credit

MODULES INCLUDED IN THIS SUBJECT

SL NO	MODULE NAME	CREDIT BREAKUP
1	Module 1: IT-ITeS Industry – An Introduction	0.5
2	Module 2: Web technology – An Introduction	0.5
3	Module 3: Mobile Development	0.5
4	Module 4: Development Tools & Usage	0.5
5	Module 5: Continuous Integration, Delivery and Deployment	2
6	Module 6: Test Engineering	1
7	Module 7: Bugs fixing and performance improvement	1
8	Module 8: Application Performance Monitoring	1
9	Module 9: Inclusive and environmentally sustainable workplaces	1
10	Module 10: Introduction to Employability Skills	0.5
11	Module 11: Constitutional values – Citizenship	0.5

12	Module 12: Becoming a Professional in the 21st Century	0.5
13	Module 13: Basic English Skills	0.5
14	Module 14: Career Development and Goal Setting	0.5
15	Module 15: Communication skills	0.5
16	Module 16: Diversity and Inclusion	0.5
17	Module 17: Financial and Digital Literacy	0.5
18	Module 18: Essential Digital Skills	0.5
19	Module 19: Entrepreneurship	0.5
20	Module 20: Customer Service	0.5
21	Module 21: Getting Ready for Apprenticeship and Jobs	0.5
	Total	14

Training Outcomes

- Explain the nature of work across the IT-ITeS sector, the various sub sectors under it and different types of occupations under the Future Skills sub sector
- Explain different types of web technologies, their evolution, their use cases and business applications
- Leverage different types of mobile technologies, explain their use cases and demonstrate application of different types of tools, frameworks, platforms, libraries and software packages to test hardware and software systems
- Assess global standards and regulations for aspects of data administration and governance such as storage, security, privacy and monitoring
- Use development tools, frameworks, platforms, libraries and packages to test hardware and software systems
- Implement the principles for continuous delivery, continuous integration and continuous deployment in the software development process
- Test applications for software bugs by developing appropriate test case and automating the testing process using suitable tools and APIs
- Identify, report and fix software bugs using best practices
- Monitor the performance of web and mobile based application by defining and tracking Key Performance Indicators (KPIs)

MODULES

Module 1: IT-ITeS/BPM Industry – An Introduction

THEORY

- Explain the relevance of the IT-ITeS sector.
- State the various sub- sectors in the IT-ITeS sector.
- Detail the nature of work performed across the sub- sectors.
- List organizations in the sector.
- Discuss the evolution of the sub sectors and the way forward.
- Explain the disruptions happening across the IT- ITeS sector.
- Provide an overview of the Future Skills sub- sector.
- Explain the various occupations under this sub-sector.
- List key trends across the occupations in this sub-sector.
- List various roles in the Future Skills sub- sector.

PRACTICAL

- Develop a presentation on present the evolution of the understanding on IT-ITeS Sector and sub sectors.

Module 2: Web Technology – Introduction

THEORY

- Define the terms "Internet" and "Web technology".
- Provide an overview of different components of the internet.
- Discuss the evolving information technology landscape and the importance and relevance of Web technologies.
- State the key business drivers for adoption of web technologies.
- Discuss the different types of web technologies.
- List prospective use cases and applications of different types of web technologies

PRACTICAL

- Analyze different use cases and applications of web technologies and their applications across industries.

Module 3: Mobile Development – An Introduction

THEORY

- Define "Mobile technology" and its different components.
- Discuss the commonly used Mobile development platforms (such as iOS, Android etc.)

- Discuss the evolving information technology landscape and the importance and relevance of Mobile technologies,
- State the key business drivers for adoption of Mobile technologies.

PRACTICAL

- Analyze different use cases and applications of Mobile technologies and their applications across industries.
- List prospective use cases and applications of different Mobile technologies.

Module 4: Development Tools and Usage

THEORY

- Examine good programming styles and documentation habits
- Use scripting languages to automate tasks and write simple programs
- Use appropriate tools for building, debugging, testing, tuning, and maintaining programs
- Identify software development needs and changes
- Use various cloud computing platforms and services
- Apply principles of code and design quality

PRACTICAL

- Configure operating system components

Module 5: Continuous Integration, Delivery and Deployment

THEORY

- Discuss the principles of continuous integration, continuous delivery and continuous deployment
- Explain what version control is
- Discuss how to secure the source code repository
- Examine and evaluate standard practices for code tagging, branching, merger and integration
- Explain different types of application environment variables and how to manage the configurations of target environments
- Explain how to continuously integrate bugs fixes in the application builds
- Discuss best practices for application deployment

PRACTICAL

- Present Demonstrate how to manage changes to source code using standard version control tools
- Demonstrate how to integrate version control systems with the deployed project management tools
- Demonstrate how to automate application testing using standard tools and scripts

- Demonstrate how to write test cases to indent failure
- Demonstrate how to push applications to their appropriate services (such as web servers, API services, database services etc.)
- Demonstrate how to automate the CI/CD (continuous integration/continuous delivery) pipeline using standard automation tools (such as Chef, Bamboo etc.)

Module 6: Test Engineering

THEORY

- Assess how different business and technical requirements translate into products
- Assess different types of testing and testing requirements such as unit, sub-system, system, etc.
- Evaluate reusability of test scenarios, test cases, scripts and tools
- Assess the type of test data that should be created
- Recommend modifications to the design of software and hardware system based on the test data

PRACTICAL

- Apply the different types of testing methodologies
- Develop test cases for software components of the system
- Develop test cases for hardware components of the system
- Use tools such as Selenium to design automated test scripts
- Develop simulations for testing software and hardware systems

Module 7: Bugs fixing and performance improvement

THEORY

- Explain how to identify and record software bugs
- Explain different types of bugs (such as unexpected, null, bad input, etc.)
- Discuss how to continuously iterate and develop software code free of any bugs
- Log all activities of the application
- Analyze abnormal system behavior using application log

PRACTICAL

- Demonstrate best practices for logging bugs in a case tracking system
- Demonstrate how to identify user behavior prior to bug identification
- Demonstrate how to analyze and isolate portion of source code where the bug occurs
- Demonstrate how build unit test cases to identify and isolate software bugs

Module 8: Application Performance Monitoring

THEORY

- Explain how application performance is related to business outcomes.
- Discuss the different types of cloud deployment models.
- Explain cloud resource utilization patterns.
- Explain how to define KPIs (Key Performance Indicators) to measure the performance of systems deployed on cloud.
- Describe the parameters for monitoring performance of cloud systems.
- Examine application log reports to find clues to problems related to application performance.
- Explain how to automate the performance monitoring process using scripting language
- List popular Application Performance Monitoring (APM) tools.
- Study sample reports and evaluate the performance of applications and deployed systems.
- Discuss ways to provide actionable insights for re-engineering the application.

PRACTICAL

- Demonstrate how to monitor KPIs to review performances of application and deployed systems.
- Demonstrate the methods to optimize cost and resource utilization.
- Demonstrate the use of log data in reducing performance issues and stabilizing the deployed systems.
- Demonstrate how to automate performance monitoring using scripting languages.
- Create and document application performance reports from application monitoring tools.

Module 9: Inclusive, and Environmentally Sustainable Workplace

THEORY

- Describe different approaches for resourceful energy utilisation and waste management.
- Describe the importance of following the diversity policies.
- Identify stereotypes and prejudices associated with differently abled people and its negative consequences.
- Discuss the importance of promoting, sharing and implementing gender equality and PwD sensitivity guidelines at organization level.

PRACTICAL

- Practice the segregation of recyclable, non-recyclable and hazardous waste generated.
- Demonstrate different methods of energy resource optimization and conservation.
- Demonstrate essential communication methods in line with gender inclusiveness and PwD sensitivity.

Module 10: Introduction to Employability Skills

THEORY

- Discuss the Employability Skills required for jobs in various industries
- List different learning and employability related GOI and private portals and their usage

Module 11: Constitutional values - Citizenship

THEORY

- Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
- Show how to practice different environmentally sustainable practices

Module 12: Becoming a Professional in the 21st Century

THEORY

- Discuss importance of relevant 21st century skills.
- Exhibit 21st century skills like Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
- Describe the benefits of continuous learning

Module 13: Basic English Skills

THEORY

- Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
- Read and interpret text written in basic English
- Write a short note/paragraph / letter/e -mail using basic English

Module 14: Career Development and Goal Setting

THEORY

- Create a career development plan with well-defined short- and long-term goals

Module 15: Communication skills

<u>**THEORY**</u>

- Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
- Explain the importance of active listening for effective communication
- Discuss the significance of working collaboratively with others in a team

Module 16: Diversity and Inclusion

<u>**THEORY**</u>

- Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
- Discuss the significance of escalating sexual harassment issues as per POSH

Module 17: Financial and Digital Literacy

<u>**THEORY**</u>

- Outline the importance of selecting the right financial institution, product, and service
- Demonstrate how to carry out offline and online financial transactions, safely and securely

Module 18: Essential Digital Skills

<u>**THEORY**</u>

- Describe the role of digital technology in today's life
- Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
- Discuss the significance of displaying responsible online behaviour while browsing, using various social media platforms, e-mails, etc., safely and securely
- Create sample word documents, excel sheets and presentations using basic features
- utilize virtual collaboration tools to work effectively

Module 19: Entrepreneurship

<u>**THEORY**</u>

- Explain the types of entrepreneurship and enterprises
- Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan

- Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
- Create a sample business plan, for the selected business opportunity

Module 20: Customer Service

THEORY

- Describe the significance of analysing different types and needs of customers
- Explain the significance of identifying customer needs and responding to them in a professional manner.
- Discuss the significance of maintaining hygiene and dressing appropriately

Module 21: Getting Ready for Apprenticeship and Jobs

THEORY

- Create a professional Curriculum Vitae (CV)
- Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
- Discuss the significance of maintaining hygiene and confidence during an interview
- Perform a mock interview
- List the steps for searching and registering for apprenticeship opportunities