# Model Curriculum

# JUNIOR SOFTWARE DEVELOPER

**SECTOR:** **IT-ITES**
**SUB-SECTOR:** **IT SERVICES**
**OCCUPATION:** **APPLICATION DEVELOPMENT**
**REFERENCE ID:** **SSC/Q0508, V1.0**
**NSQF LEVEL:** **4**

# TABLE OF CONTENTS

# Junior Software Developer

**CURRICULUM / SYLLABUS**

This program is aimed at training candidates for the job of "Junior Software Developer" in the "IT-ITeS Sector/Industry" and aims at building the following key competencies in the learner.

| Program Name | Junior Software Developer | | |
|---|---|---|---|
| **Qualification Pack Name & Reference ID.** | SSC/Q0508, V1.0 | | |
| **Version No.** | 1.0 | **Version Update Date** | 01/05/2019 |
| **Pre-requisites to Training** | 12th Pass with good aptitude | | |
| **Training Outcomes** | **After completing this programme, participants will be able to:** <br>• Assist in performing software construction and software testing entry-level tasks in the IT Services industry. <br>• Undertake problem solving and problem design <br>• Design basic algorithms and application development <br>• Manage your work to meet requirements. <br>• Work effectively with colleagues. <br>• Maintain a healthy, safe and secure working environment. <br>• Provide data/information in standard formats. <br>• Develop your knowledge, skills and competence. | | |

This course encompasses 6 out of 6 National Occupational Standards (NOS) of "Junior Software Developer" Qualification Pack issued by "IT-ITeS SSC".

| Sr. No. | Module | Key Learning Outcomes | Equipment Required |
|---|---|---|---|
| 1. | **IT-ITES/BPM Industry – An Introduction**<br><br>**Theory Duration** (hh:mm)<br>07:00<br><br>**Practical Duration** (hh:mm)<br>10:00<br><br>**Corresponding NOS Code**<br>Bridge Module | • Establish the nature and scope of IT-ITeS/BPM Industry with their sub-sectors.<br>• Collate information, evidence, and artifacts regarding the IT- ITeS/BPM industry.<br>• Identify the processes involved in maintaining and managing the IT- ITeS/BPM industry with their sub-sectors.<br>• Review the scope of the industry with appropriate people and incorporate their inputs. | • Whiteboard and Markers<br>• LCD Projector and Laptop for presentations<br>• Lab equipped with the PCs/Laptops and Internet with WiFi (Min 2 Mbps Dedicated)<br>• Chart paper and sketch pens |
| 2 | **IT Services – An Introduction**<br><br>**Theory Duration** (hh:mm)<br>08:00<br><br>**Practical Duration** (hh:mm)<br>10:00<br><br>**Corresponding NOS Code**<br>Bridge Module | • Establish the nature and scope of IT services in the ITITeS/ BPM industry.<br>• Identify the various categories of services and sub-sectors under the IT industry along with their scope.<br>• Liaise with appropriate people to gather data/information required for maintaining IT services in an organization.<br>• Organize data/ information required for maintaining and managing IT services along with their sub- sectors services.<br>• Provide immediate support to appropriate people for maintaining IT services in an organization.<br>• Participate in discussions/ review meetings, as required. | • Whiteboard and Markers<br>• LCD Projector and Laptop for presentations<br>• Lab equipped with the following: PCs/Laptop, Internet with WiFi (Min 2 Mbps Dedicated) |
| 3 | **Basics of IT**<br><br>**Theory Duration** (hh:mm)<br>15:00<br><br>**Practical Duration** (hh:mm)<br>30:00<br><br>**Corresponding NOS Code**<br>SSC/N0506 | • Determine basic components of a computer, Windows and Linux OS, file systems and task and process management.<br>• Train participants to use web browsers, surf the World Wide Web, internet mail, internet search, web- based social media applications and web programming. | • Whiteboard and Markers<br>• LCD Projector and Laptop for presentations<br>• Lab equipped with the PCs/Laptops and Internet with WiFi (Min 2 Mbps Dedicated)<br>• Chart paper and sketch pens<br>• Computer Lab with 1:1 PC : trainee ratio and having internet connection, MS Office / Open office, Browser, Outlook /Any other Email Client and chat tools. |

| 4. | Problem Solving and Program Design<br><br>**Theory Duration** (hh:mm)<br>30:00<br><br>**Practical Duration** (hh:mm)<br>30:00<br><br>**Corresponding NOS Code**<br>SSC/N0506 | • Demonstrate a strategy for using skills in problem solving over an extended period of time.<br>• Monitor progress and adapt the strategy as necessary, to achieve the quality of outcomes required when tackling a complex problem.<br>• Demonstrate aptitude for analyzing information and making logical conclusions.<br>• Demonstrate knowledge of the foundational mathematical concepts in computing. | • Whiteboard and Markers<br>• LCD Projector and Laptop for presentations<br>• Lab equipped with the PCs/Laptops and Internet with WiFi (Min 2 Mbps Dedicated)<br>• Chart paper and sketch pens |
| --- | --- | --- | --- |
| 5. | Basic Algorithms and Application Development<br><br>**Theory Duration** (hh:mm)<br>20:00<br><br>**Practical Duration** (hh:mm)<br>30:00<br><br>**Corresponding NOS Code**<br>SSC/N0506 | • Design algorithms to solve problems and convert them into code using the appropriate programming language constructs.<br>• Read and execute a test case and record the outcome in the appropriate template.<br>• Read detailed program specification and implement it using a programming language<br>• Extract data from database using query tables<br>• Communicate effectively with appropriate people w.r.t. assigned roles in simple English – both oral and written. | • Whiteboard and Markers<br>• LCD Projector and Laptop for presentations<br>• Lab equipped with the PCs/Laptops and Internet with WiFi (Min 2 Mbps Dedicated)<br>Chart paper and sketch pens |

| 6. | Manage your work to meet requirements

Theory Duration (hh:mm) 20:00

Practical Duration (hh:mm) 25:00

Corresponding NOS Code SSC/N9001 | • Establish and agree with your work requirements with appropriate people.<br>• Keep your immediate work area clean and tidy.<br>• Utilize your time effectively.<br>• Treat confidential information correctly.<br>• Work in line with your organization's policies and procedures.<br>• Work within the limits of your job role.<br>• Obtain guidance from appropriate people, where necessary.<br>• Ensure your work meets the agreed requirements. | • Whiteboard and Markers.<br>• LCD Projector and Laptop for presentations.<br>• Trainingorganization's confidentiality policy. |
|---|---|---|---|
| 7. | Work effectively with colleagues

Theory Duration (hh:mm) 20:00

Practical Duration (hh:mm) 25:00

Corresponding NOS Code SSC/N9002 | • Communicate with colleagues clearly, concisely and accurately.<br>• Work with colleagues to integrate your work effectively with theirs.<br>• Pass on essential information to colleagues in line with organizational requirements.<br>• Work in ways that show respect for colleagues.<br>• Carry out the commitments you have made to colleagues.<br>• Let colleagues know in good time if you cannot carry out your commitments, explaining the reasons.<br>• Identify any problems you have working with colleagues and take the initiative to solve these problems.<br>• Follow the organization's policies and procedures for working with colleagues. | • Whiteboard and Markers.<br>• LCD Projector and Laptop for presentations.<br>• Provision to write emails and send in the lab.<br>• Lab with provision for internet, email, word processor and presentation software.<br>• Chart paper, markers, picture magazines and old newspapers. |

| 8. | **Maintain a healthy, safe and secure working environment**<br><br>**Theory Duration** (hh:mm)<br>20:00<br><br>**Practical Duration** (hh:mm)<br>25:00<br><br>**Corresponding NOS Code**<br>SSC/N9003 | • Comply with your organization's current health, safety and security policies and procedures.<br>• Report any identified breaches in health, safety, and security policies and procedures to the designated person.<br>• Identify and correct any hazards that you can deal with safely, competently and within the limits of your authority.<br>• Report any hazards that you are not competent to deal with to the relevant person in line with organizational procedures and warn other people who may be affected.<br>• Follow your organization's emergency procedures promptly, calmly, and efficiently.<br>• Identify and recommend opportunities for improving health, safety, and security to the designated person.<br>• Complete any health and safety records legibly and accurately. | • Whiteboard and Markers<br>• LCD Projector and Laptop for presentations The training organization's current health, safety and security policies and procedures<br>• Provision for online research in the Lab<br>• A sample health and safety policy document<br>• Emergency broadcast system and mock emergency signage in the appropriate areas of the training institute |

| 9. | **Provide data/information in standard formats**<br><br>**Theory Duration** (hh:mm)<br>20:00<br><br>**Practical Duration** (hh:mm)<br>25:00<br><br>**Corresponding NOS Code** SSC/N9004 | • Establish and agree with appropriate people the data/information you need to provide, the formats in which you need to provide it, and when you need to provide it.<br>• Obtain the data/information from reliable sources.<br>• Check that the data/information is accurate, complete and up-to-date.<br>• Obtain advice or guidance from appropriate people where there are problems with the data/information.<br>• Carry out rule-based analysis of the data/information, if required<br>• Insert the data/information into the agreed formats.<br>• Check the accuracy of your work, involving colleagues where required.<br>• Report any unresolved anomalies in the data/information to appropriate people.<br>• Provide complete, accurate and up-to-date data/information to the appropriate people in the<br>• Required formats on time. | • Whiteboard and markers.<br>• LCD Projector and Laptop for presentations.<br>• Provision for online research in the lab. |

| 10. | **Develop knowledge, skills and competence**<br><br>**Theory Duration** (hh:mm)<br>20:00<br><br>**Practical Duration** (hh:mm)<br>25:00<br><br>**Corresponding NOS Code**<br>SSC/N9005 | • Obtain advice and guidance from appropriate people to develop your knowledge, skills and competence.<br>• Identify accurately the knowledge and skills you need for your job role.<br>• Identify accurately your current level of knowledge, skills and competence and any learning and development needs.<br>• Agree with appropriate people a plan of learning and development activities to address your learning needs.<br>• Undertake learning and development activities in line with your plan.<br>• Apply your new knowledge and skills in the workplace, under supervision.<br>• Obtain feedback from appropriate people on your knowledge and skills and how effectively you apply them.<br>• Review your knowledge, skills and competence regularly and take appropriate action. | • Whiteboard and Markers.<br>• LCD Projector and Laptop for presentations.<br>• Provision for online access to all students in the lab. |

| Total Duration: | Unique Equipment Required: |
| --- | --- |
| **Theory Duration (hh:mm)** **165:00** **Practical Duration (hh:mm)** **235:00** | Training room should be fully furnished with the following equipment / tools / accessories. Additional / specific resources. **General:** • Comfortable seats with adequate lighting, controlled temperature and acoustics for training and learning • White Board, Markers and Eraser • Projector with screen • Flip chart with markers • Faculty's PC/Laptop with latest configuration and internet connection • Supporting software / applications for projecting audio, video, recording, • Presentation Tools to support learning activities: Intranet, Email, IMs • Learning management system e.g. Moodle, Blackboard to enable blended learning • Microphone / voice system for lecture and class activities • Handy Camera • Stationery kit – Staples, Glue, Chart Paper, Sketch Pens, Paint Box, Scale, A4 Sheets • For IT Lab sessions: Computer Lab with 1:1 PC : trainee ratio and having internet connection, MS Office /Open office, Browser, Outlook /Any other Email Client and chat tools. • Assessment and Test Tools for day to day online Tests and Assessments • For team discussions: Adequate seating arrangement in full / half circle format for one or more teams as per planned team composition. • Reading Resources: Access to relevant sample documents and learning forums to enable self-study before and after each training session. |

Grand Total Course Duration: **400 Hours 0 Minutes**

*(This Syllabus/Curriculum has been approved by IT-ITeS Sector Skills Council NASSCOM.)*

## Trainer Prerequisites for Job role: "Junior Software Developer" mapped to Qualification Pack: "SSC/Q0508, V1.0"

| Sr. No. | Area | Details |
|---|---|---|
| 1 | Description | To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "SSC/Q0508,V1.0" |
| 2 | Personal Attributes | Aptitude for conducting training, and pre/ post work to ensure competent, Employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organized and focused, eager to learn and keep oneself updated with the latest in this field. |
| 3 | Minimum Educational Qualifications | 12th pass with good aptitude |
| 4a | Domain Certification | Certified for Job Role "Junior Software Developer" mapped to Qualification Pack "SSC/Q0508, V1.0". Minimum accepted score is 80%. |
| 4b | Platform Certification | Recommended that the trainer is certified for the Job role "Trainer" mapped to the Qualification Pack "MEP/Q2601". Minimum accepted score is 80% aggregate |
| 5 | Experience | Field experience: 0-2 years of work experience/internship in Software Development<br>Training experience: 1 year preferred |

## Assessment Criteria

| | |
|---|---|
| **Job Role** | Junior Software Developer |
| **Qualification Pack** | SSC/Q0508,V1.0 |
| **Sector Skill Council** | IT-ITeS |

| Sr. No. | Guidelines for Assessment |
|---|---|
| 1 | Criteria for assessment for each Qualification Pack (QP) will be created by the Sector Skill Council (SSC). Each performance criteria (PC) will be assigned Theory and Skill/Practical marks proportional to its importance in NOS. |
| 2 | The assessment will be conducted online through assessment providers authorized by SSC. |
| 3 | Format of questions will include a variety of styles suitable to the PC being tested such as Multiple-choice questions, fill in the blanks, situational judgment test, and simulation and Programming test. |
| 4 | To pass a QP, a trainee should achieve 70% aggregate. |
| 5 | For latest details on the assessment criteria, please visit www.sscnasscom.com. |

| Assessable Outcomes | Assessment Criteria for Outcomes | Mark Allocation | | | |
|---|---|---|---|---|---|
| | | Total Marks | Out of | Theory | Skills Practical |
| **1.SSC/N0506 ( Assist in performing software construction and software testing entry-level tasks in the IT Services Industry)** | PC 1. Demonstrate basic computer and internet literacy including operating a computer, describing its major components and how they work, using Windows and Linux OS, operating a browser, searching the internet, managing mails and using Social internet media. | **100** | 10 | 0 | 10 |
| | PC 2. Demonstrate aptitude for analyzing Information and making logical conclusions. | | 25 | 10 | 15 |
| | PC 3. Demonstrate knowledge of the Foundational mathematical concepts in computing. | | 20 | 5 | 15 |
| | PC 4. Design algorithms to solve problems and convert them into code using the appropriate programming language Constructs. | | 30 | 10 | 20 |
| | PC 5. Read and execute a test case and Record the outcome in the appropriate template. | | 10 | 5 | 5 |
| | PC 6. Be able to communicate effectively with appropriate people w.r.t. assigned roles in simple English – both oral and written. | | 5 | 0 | 5 |
| | **Total** | **100** | **30** | **70** | |
| **2. SSC/N9001 (Manage your work to meet requirements)** | PC1. Establish and agree your work requirements with appropriate people. | **100** | 7 | 0 | 7 |
| | PC2. Keep your immediate work area clean And tidy. | | 12 | 6 | 6 |
| | PC3. Utilize your time effectively. | | 12 | 6 | 6 |
| | PC4. Use resources correctly and Efficiently. | | 19 | 6 | 13 |
| | PC5. Treat confidential information Correctly. | | 7 | 1 | 6 |
| | PC6. Work in line with your organization's Policies and procedure. | | 12 | 0 | 12 |
| | PC7. Work within the limits of your job role. | | 6 | 0 | 6 |
| | PC8. Obtain guidance from appropriate People, where necessary. | | 6 | 0 | 6 |
| | PC9. Ensure your work meets the agreed Requirements. | | 19 | 6 | 13 |
| | **Total** | **100** | **25** | **75** | |
| **3. SSC/N9002 (Work effectively with colleagues)** | PC1. Communicate with colleagues clearly, Concisely and accurately. | | 20 | 0 | 20 |
| | PC2. Work with colleagues to integrate your Work effectively with theirs. | | 10 | 0 | 10 |
| | PC3. Pass on essential information to Colleagues in line with organizational Requirements. | | 10 | 10 | 0 |

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Skill Development
Corporation
Transforming the skill landscape

| | | | | | |
|---|---|---|---|---|---|
| | PC4. Work in ways that show respect for Colleagues. | | 20 | 0 | 20 |
| | PC5. Carry out commitments you have Made to colleagues. | **100** | 10 | 0 | 10 |
| | PC6. Let colleagues know in good time if You cannot carry out your Commitments, explaining the reasons. | | 10 | 10 | 0 |
| | PC7. Identify any problems you have Working with colleagues and take the initiative to solve these problems. | | 10 | 0 | 10 |
| | PC8. Follow the organization's policies and Procedures for working with colleagues. | | 10 | 0 | 10 |
| | | **Total** | **100** | **20** | **80** |
| **4. SSC/N9003 (Maintain a healthy, safe and secure working environment)** | PC1. Comply with your organization's Current health, safety and security policies and procedures. | | 20 | 10 | 10 |
| | PC2. Report any identified breaches in Health, safety, and security policies and Procedures to the designated person. | | 10 | 0 | 10 |
| | PC3. Identify and correct any hazards that You can deal with safely, competently and within the limits of your authority. | **100** | 20 | 10 | 10 |
| | PC4. Report any hazards that you are not competent to deal with to the relevant person in line with organizational procedures and warn other people who may Be affected. | | 10 | 0 | 10 |
| | PC5. Follow your organization's emergency Procedures promptly, calmly, and efficiently. | | 20 | 10 | 10 |
| | PC6. Identify and recommend opportunities For improving health, safety, and security to the designated person. | | 10 | 0 | 10 |
| | PC7. Complete any health and safety Records legibly and accurately. | | 10 | 0 | 10 |
| | | **Total** | **100** | **30** | **70** |
| **5. SSC/N9004 (Provide data/information in standard formats)** | PC1. Establish and agree with appropriate people the data/information you need to provide, the formats in which you need to Provide it, and when you need to provide it. | | 13 | 13 | 0 |
| | PC2. Obtain the data/information from Reliable sources. | | 13 | 0 | 13 |
| | PC3. Check that the data/information is Accurate, complete and up-to-date. | | 12 | 6 | 6 |
| | PC4. Obtain advice or guidance from Appropriate people where there are problems with the data/information. | | 6 | 0 | 6 |
| | PC5. Carry out rule-based analysis of the Data/information, if required. | **100** | 25 | 0 | 25 |
| | PC6. Insert the data/information into the Agreed formats. | | 13 | 0 | 13 |

| | | | | |
|---|---|---|---|---|
| | PC7. Check the accuracy of your work, Involving colleagues where required. | | 6 | 0 | 6 |
| | PC8. Report any unresolved anomalies in The data/information to appropriate people. | | 6 | 6 | 0 |
| | PC9. Provide complete, accurate and up-to-Date data/information to the appropriate People in the required formats on time. | | 6 | 0 | 6 |
| | **Total** | 100 | 25 | 75 |
| **6. SSC/N9005 (Develop your knowledge, skills and competence)** | PC1. Obtain advice and guidance from Appropriate people to develop your knowledge, skills and competence. | **100** | 10 | 0 | 10 |
| | PC2. Identify accurately the knowledge and skills you need for your job role. | | 10 | 0 | 10 |
| | PC3. Identify accurately your current level Of knowledge, skills and competence and any learning and development Needs. | | 20 | 10 | 10 |
| | PC4. Agree with appropriate people a plan Of learning and development activities to address your learning needs. | | 10 | 0 | 10 |
| | PC5. Undertake learning and development Activities in line with your plan. | | 20 | 10 | 10 |
| | PC6. Apply your new knowledge and skills in the workplace, under supervision. | | 10 | 0 | 10 |
| | PC7. Obtain feedback from appropriate People on your knowledge and skills and how effectively you apply them. | | 10 | 0 | 10 |
| | PC8. Review your knowledge, skills and competence regularly and take appropriate action. | | 10 | 0 | 10 |
| | **Total** | 100 | 20 | 80 |