

# ***BACHELOR OF VOCATION***

**(SOFTWARE DEVELOPMENT AND SYSTEM ADMINISTRATION)**

**SYLLABUS - 2014**



**ST. JOSEPH'S COLLEGE (AUTONOMOUS)**

Special Heritage Status Awarded by UGC  
Accredited at "A" Grade (3rd Cycle) by NAAC  
College with Potential for Excellence by UGC

**TIRUCHIRAPPALLI – 620 002, INDIA**

**Semester I NSQF LEVEL 4: Junior Software Developer**

Sem	Part	Subjects	Qualification Pack	Type	General Education Component	Skill Component	Credits
I	GE	Language-I		Theory	2	-	2
	GE	English – I		Theory	2	-	2
	GE	C Programming		Core - Theory	3	-	3
	GE	Foundations of Computer Science		Allied-Theory	3	-	3
	GE	Value Education : Essentials of Humanity			2		2
	SC	Junior Software Developer	SSC/ Q 0508	Theory	-	4	4
				Labs		5	5
				Corporate Workshops	-	4	4
Internship				5		5	
<b>Total for Semester I</b>					<b>12</b>	<b>18</b>	<b>30</b>

Language-I : Tamil I /Hindi –I/Sanskrit – I/French-I

**Semester- II NSQF LEVEL 5: Web Developer**

Sem	GE/SC	Subjects	Qualification Pack	Type	General Education Component	Skill Component	Credits
	GE	Language II		Theory	2		2
	GE	English – II		Theory	2		2
	GE	User Interface Design		Core - Theory	3	-	3
	GE	Graphic Design		Allied-Theory	3	-	3
	GE	Value Education : Environmental Science			2		2
	SC	Web developer	SSC/ Q 0503	Theory		4	4
				Labs		5	5
				Corporate Workshops		4	4
Internship				5		5	
<b>Total for Semester II</b>					12	18	30

Language-II: Tamil II /Hindi –II /Sanskrit – II/French-II

**Semester III NSQF LEVEL 6: Master Trainer for Junior Software Developer**

Sem	GE/SC	Subjects	Qualification Pack	Type	General Education Component	Skill Component	Credits	
III	GE	Language– III :		Theory	2	-	2	
	GE	English – III :		Theory	2	-	2	
	GE	Java Programming		Core – Theory	3	-	3	
	GE	System Concepts I		Allied-Theory	3	-	3	
	GE	Soft Skills			2		2	
	SC	Master Trainer for Junior Software Developer	SSC/ Q0509	Theory			4	4
				Labs			5	5
				Corporate Workshops	-		4	4
Internship						5	5	
	<b>Total for Semester III</b>				12	18	30	

Language-III : Tamil III /Hindi –III /Sanskrit – III/French-III

**Semester IV NSQF LEVEL 6: Master Trainer for Software Development**

Sem	GE/SC	Subjects	Qualification Pack	Type	General Education Component	Skill Component	Credits	
IV	GE	Language – IV :		Theory	2	-	2	
	GE	English – IV :		Theory	2	-	2	
	GE	Advanced Java		Core Theory	3	-	3	
	GE	System Concepts II		Allied Theory	3	-	3	
	GE	Life Coping Skills			2		2	
	SC	Master Trainer for Junior Software Developer	SSC/ Q0509	Theory		-	4	4
				Labs			5	5
				Corporate Workshops	-		4	4
Internship						5	5	
	<b>Total for Semester IV</b>			Theory	12	18	30	

Language-IV : Tamil IV /Hindi –IV /Sanskrit – IV/French-IV

**Semester V NSQF LEVEL 7: Software Developer**

Sem	GE/SC	Subjects	Qualification Pack	Type	General Education Component	Skill Component	Credits
V	GE	Distributed Technologies		Core Theory	4	-	4
	GE	Software Engineering		Core Theory	4	-	4
	GE	RDBMS		Core Theory	2	-	2
	GE	Critical thinking			2	-	2
	SC	Software Developer	SSC/ Q 0501	Theory	-	4	4
				Labs		5	5
				Corporate Workshops	-	4	4
				Internship		5	5
		<b>Total for Semester V</b>			12	18	30

**Semester VI NSQF LEVEL 7: Software Developer**

Sem	GE/SC	Subjects	Qualification Pack	Type	General Education Component	Skill Component	Credits
VI	GE	Fundamentals of Computer Networks		Core Theory	4	-	4
	GE	LAMP		Core Theory	4	-	4
	GE	Introduction to mobile computing		Core Theory	2	-	2
	GE	Personality Development		Theory	2	-	2
	SC	Software Developer	SSC/ Q 0501	Theory	-	4	4
				Labs		5	5
				Corporate Workshops	-	4	4
				Internship		5	5
		<b>Total for Semester VI</b>			12	18	30

Sem. I  
14UGT110001

Hours/Week : 2  
Credit : 2

தமிழ்வழிக் கணினி -- I

தமிழ் - I

### நோக்கம்

தமிழ் மொழி வாயிலாகக் கணினியின் பல்வேறு வளர்ச்சி நிலைகளை அறியச்செய்தல்.

கணினியில் தமிழ்மொழி மென்மேலும் வளர மாணவர்களை ஈடுபடச் செய்தல்.

### அலகு -1

கணினி அறிமுகம் - கணினி ஒருங்கமைவு - புதிய கணிப்பொறிகளின் முன்னோடிகள்.

### அலகு -2

உள்ளீட்டு, வெளியீட்டுக் கருவிகள் - நினைவக நிலைகள் - கணினியின் வளர்ச்சி நிலைகள் - மென்பொருள் - (வன்பொருள்)

### அலகு -3

கணினியின் திறனறி அளவுகள் - விண்டோஸ் இயக்கத் தொகுப்பு - இயக்கத் தொகுப்பின் வளர்ச்சி நிலைகள், பணிகள் - கட்டளைகள்.

### அலகு -4

எம்.எஸ்.வேர்டு (சொல்லாய்வி) - தரவுகள் உருவாக்கம்

### அலகு -5

குழசஅயவ உருவாக்கம் - உள்ளீடு செய்தல் - படங்கள், வரைபடங்கள் (புசயிர) உருவாக்கம்.

### செய்முறைப் பயிற்சிகள்

1. தமிழ் உயிரெழுத்துக்களை எம்.எஸ்.வேர்டில் (சொல்லாய்வி) அட்டவணை (வுயடிடந) உருவாக்கி தட்டச்சு செய்தல்.
2. எம்.எஸ்.வேர்டில் (சொல்லாய்வி) தமிழ் அல்லது ஆங்கிலத்தில் கல்லூரி முதல்வருக்கு விடுப்பு வேண்டி கடிதம் தட்டச்சு செய்தல்.
3. தமிழ் மெய்யெழுத்துக்களை எம்.எஸ்.வேர்டில் (சொல்லாய்வி) அட்டவணை (வுயடிடந) உருவாக்கி தட்டச்சு செய்தல்.
4. யு4 தாள் அளவில் 1உஅ அளவு (ஆயசபடை) அமைத்து அப்பக்கத்தில் படம் ஒன்று உள்ளீடு செய்து அப்படத்தைப் பற்றி முறையாக ஒரு பத்தி தட்டச்சு செய்தல்.
5. எம்.எஸ். எக்ஸல் மூலம் உனது வகுப்பு மாணவர்களின் முதல் ஐவரின் மதிப்பெண்களைக் கொண்டு வரைபடம் உருவாக்கி சொல்லாய்வியில் உள்ளீடு செய்தல்.

### **பாடநூல்கள்**

1. பாஸ்கரன்.க., தமிழில் கணிப்பொறியியல் கணிப்பொறியில் தமிழ், உமா பதிப்பகம், தஞ்சாவூர்.

### **பார்வை நூல்கள்**

1. சிவலிங்கம்.மு., கம்ப்யூட்டர் இயக்கமுறைகள், பழனியப்பா பிரதர்ஸ், சென்னை, 2001
2. ஆண்டோ பீட்டர்.மா., தமிழும் கணிப்பொறியும், கற்பகம் புத்தகாலயம், சென்னை, 2002

Sem. I

14UGT110002

Hours/Week : 2

Credit :

தமிழ் செய்முறைப் பயிற்சி - 1 :

தமிழ்வழிக் கணினி

1. தமிழ் உயிரெழுத்துக்களை எம்.எஸ்.வேர்டில் (சொல்லாய்வி) அட்டவணை (Table) உருவாக்கி தட்டச்சு செய்தல்.
2. எம்.எஸ்.வேர்டில் (சொல்லாய்வி) தமிழ் அல்லது ஆங்கிலத்தில் கல்லூரி முதல்வருக்கு விடுப்பு வேண்டி கடிதம் தட்டச்சு செய்தல்.
3. தமிழ் மெய்யெழுத்துக்களை எம்.எஸ்.வேர்டில் (சொல்லாய்வி) அட்டவணை (Table) உருவாக்கி தட்டச்சு செய்தல்.
4. A4 தாள் அளவில் 1cm அளவு (Margin) அமைத்து அப்பக்கத்தில் படம் ஒன்று உள்ளீடு செய்து அப்படத்தைப் பற்றி முறையாக ஒரு பத்தி தட்டச்சு செய்தல்.
5. எம்.எஸ். எக்ஸல் மூலம் உனது வகுப்பு மாணவர்களின் முதல் ஐவரின் மதிப்பெண்களைக் கொண்டு வரைபடம் உருவாக்கி சொல்லாய்வியில் உள்ளீடு செய்தல்.

Sem. I  
14UGE120101

Hours/Week : 2  
Credit : 2

**ENGLISH – I: REMEDIAL GRAMMAR AND  
VOCABULARY**

**Objectives:**

- \*To train students to speak and write fluently and correctly.
- \*To increase students vocabulary to be ready for global communication.

**Unit –I**

1. Subject-verb agreement
2. Tenses
3. Active voice and passive voice (10)

**Unit-II**

4. Do Forms
5. Use of negatives
6. Prepositions (10)

**Unit-III**

7. Vocabulary I and II
8. Word stress and rhythm
9. Weak forms and strong forms (10)

**Unit-IV**

10. Listening Test
11. Reading Test (10)

**Unit –V**

12. Test of Accuracy
13. Test of Fluency (10)

**Textbooks**

**Units I to V:**

1. Dutt, Kiranmai, P., “Basic communication skills”, New Delhi:Foundation Books, 2013.
2. Sasikumar, V., Dutt, Kiranmai, P., Rajeevan Geetha, Oral Communication skills, New Delhi: Cambridge University Press, 2012.

**Sem. I**  
**14UGE120102**

**Hours/Week : 2**  
**Credit : 1**

**ENGLISH: PRACTICAL LAB - I**

1. Listening Test
2. Reading Test
3. Test of Accuracy
4. Test of Fluency

**B.VOC-2016**

**Sem. I**

**Hours/Week : 4**

**Credit : 3**

**C PROGRAMMING**

**Objectives:**

To learn the problem solving techniques along with features of 'C' language and to develop programming skills.

**Unit – I:**

Features of C language : Data Types - Variables - Operators - Control structures - Looping structures – Simple structure. (15)

**Unit – II:**

Arrays -Functions – Built-in-functions – User defined functions - Scope of Variables Passing Arrays to function. (15)

**Unit – III:**

String : Declaring and Initializing String Variable- Reading Strings from Terminal – Reading a line of Text – Writing strings to Screen – Putting strings together – Comparison of two strings – String handling functions - Structure – Union. (15)

**Unit – IV:**

Pointers - Pointer to Array - Pointer Array - Pointer Arithmetic - Pointer of Pointer - Functions and Pointers – Call by value and call by reference - Structures and Pointers (15)

**Unit – V:**

Files: Text file - Sequential File – Random Access file - Command Line Arguments. (15)

**BOOK(S) FOR STUDY:**

1. E. Balagurusamy, “Programming in ANSI C”, Tata McGraw Hill, New Delhi, Fifth Edition, 2008.

**BOOK(S) FOR REFERENCE:**

1. Byron S. Gottfried, “Programming with C”, Schaum’s Outline Series, Tata McGraw Hill Edition, New Delhi, 1991.
2. Brian W. Kernighan, Dennis M. Ritchie, “The C Programming Language”, Prentice Hall of India Pvt. Ltd., New Delhi, 1989.
3. E. Karthikeyan, “A Textbook on C Fundamentals, Data Structures and Problem Solving”, Prentice-Hall of India Private Limited, New Delhi- 110001, 2008.

**B.VOC-2016**

**Sem. I**

**Hours/Week : 4**

**Credit : 3**

## **FOUNDATIONS OF COMPUTER SCIENCE**

**Objectives:-**

- To give sound basics of organization of digital computer, system software, networking algorithm development, system analysis and design.

**Unit – I:**

Organization of computer: Computer Generation – Features - CPU – Types of Computers – memory – Input and output devices: Input devices –output devices – storage devices: Magnetic disk – Magnetic tape – optical technology – CD ROM technology. (15)

**Unit – II:**

System Software- Prewritten Software: application packages – system software packages – computer protocol and Buffers – Network topology– LAN, MAN, WAN- Basic elements of Networking – Network connecting processing techniques – Functions of OS: Compiler – assembler and Interpreter – Loader and Linker – Introduction to MSDOS, Unix and Windows. (15)

**Unit – III:**

Network: Data communication: Forms of communication- Types of channel – Methods of transmission – devices – Internet. (15)

**Unit – IV:**

Flow charts: convention – Advantages and Limitations – Types of Logic Illustration – examples – Algorithms – Examples. (15)

**Unit – V:**

E-mail: Sending – Reading – Replaying – Deleting – Existing –Sending mail to more than one person – Sending folder – Forwarding a mail– Checking the spelling – Attaching signature – Filling the messages –Managing the address book. (15)

**BOOK(S) FOR STUDY**

S. Jaiswal, “ IT Today”, Galgotia publication private ltd., New Delhi, 2004.

**BOOK(S) FOR REFERENCE**

Suresh K Basendra, “ Computers Today”, Galgotia publication private ltd.,New Delhi, 2001.

**B.VOC-2016**

**Sem. I**

**Hours/Week : 2**

**Credit : 2**

**VALUE EDUCATION – ESSENTIALS OF HUMANITY**

**Objectives :**

- To create an awareness among students on Human values
- To involve in a process of analyzing , appreciating and personalizing values as our own

**Unit I:** Principles of value Education -Introduction - What is value Education - Characteristic of values - Kinds of values. (10)

**Unit II:** Development of Human Personality – Personality traits – Theories of Personality - Discovering self – Defense Mechanism – Power of Positive Thinking – Why Worry? (10)

**Unit III:** Dimensions of Human Development – Physical development – Intellectual Development – Emotional Development – Social Development - Moral Development- Spiritual Development. (10)

**Unit IV:** Responsible parenthood – Human sexuality – Sex and Love - Becoming a spouse (10)

**Unit V:** Gender Equality and Empowerment – Historical perspective – Education and Economic Development – Crimes against women – Women rights. (10)

**Book for Study:**

S. Papu Benjamin Elango, V. Francis, Marie Serena Mc Connell, S. Antony Sakthi, X. John Paul “Essentials of Humanity”, (7<sup>th</sup> Revised Edition) St. Joseph’s College(Autonomous), Tiruchirappalli

## QUALIFICATION FILE SUMMARY

<b>Qualification Title</b>	Junior Software Developer(SSC/Q0508)		
<b>Body/bodies which will assess candidates</b>	IT-ITeS Sector Skills Council NASSCOM (SSC NASSCOM)		
<b>Body/bodies which will award the certificate for the qualification.</b>	SSC NASSCOM		
<b>Body which will accredit providers to offer the qualification.</b>	SSC NASSCOM Presently, Accreditation is not prescribed; affiliation is one of the models.		
<b>Occupation(s) to which the qualification gives access</b>	Application Development		
<b>Proposed level of the qualification in the NSQF.</b>	4		
<b>Notional Learning Hours</b>	400 hours approx. (customisable as per learner background)		
<b>Entry requirements / recommendations.</b>	12th pass with good aptitude		
<b>Progression from the qualification.</b>	As shown in the career map (attachment sl.no. 4) As this qualification was added last year based on urgent industry demand, occupational career maps were not updated to include the specific job role. The same are scheduled for update in the next cycle of review and revision of occupational analysis		
<b>Planned arrangements for RPL.</b>	<ul style="list-style-type: none"> <li>- Response to market forces for RPL</li> <li>- RPL assessments will be the same as our normal assessments.</li> <li>- MOUs / Agreement in place for institutions, Retail is work in progress</li> </ul>		
<b>Formal structure of the qualification</b>			
<b>Title of unit or other component</b> (include any identification code used)	<b>Mandatory/ Optional</b>	<b>Estimated size (learning hours)</b>	<b>Level</b>
<b>SSC/ N 0506 (Assist in performing software construction and software testing entry-level tasks in the IT Services industry)</b>	<b>Mandatory</b>	<b>200</b>	<b>4</b>

<b>SSC/N9001 (Manage your work to meet requirements)</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9002 (Work effectively with colleagues )</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9003 (Maintain a healthy, safe and secure working environment)</b>	<b>Mandatory</b>	<b>25</b>	
<b>SSC/N9004 (Provide data/information in standard formats)</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9005 (Develop your knowledge, skills and competence)</b>	<b>Mandatory</b>	<b>25</b>	

B.VOC-2016

Sem. II  
14UGT210003

Hours/Week : 2  
Credit : 2

jkpo; - II :

தமிழ்வுழிக் கணினி - II

### நோக்கம்

கணினியின் பயன்பாட்டு மென்மங்களைத் தமிழ்வுழியில் அறியச்செய்தல்.  
கணினியில் தமிழ்மொழி மென்மேலும் வளர மாணவர்களை ஈடுபடச் செய்தல்.  
கற்றலின் வாயிலாக சுய தொழில் தொடங்கி வாழ்க்கைத் தரத்தை உயர்த்துதல்.

### அலகு -1

எம்.எஸ்.எக்சல் (ஆளு. நுஔஔநுடு) - எக்சலின் அமைப்பு - ருழசம டிழழம உருவாக்கம் - நிரல் நிறை உருவாக்கம்.

### அலகு -2

எம்.எஸ்.எக்சல் செல் பாயிண்டர் இடப்பெயர்ச்சிகள் - எம்.எஸ்.எக்சல் கட்டளைகள்.

### அலகு -3

ீழறநச ிழவை பக்கம் உருவாக்கம் - ளுடனைந ளுழற உருவாக்கம்.

### அலகு -4

ீழறநச ிழவை கட்டளகைகள் - தரவுப் பக்கங்களுக்கு இயக்கம் (யுஔஅயவழை) கொடுத்தல். ியபந-ஆயமநச ஓர் அறிமுகம் - பக்க உருவாக்கம் - தரவுகளை வடிவமைத்தல்.

### அலகு -5

படவில்லைகளை உள்ளீடு செய்தல் - அட்டவணையில் தரவுகள் உருவாக்குதல் - ியபந-ஆயமநச கட்டளைத் தொகுப்புகள்.

### செய்முறைப் பயிற்சிகள்

1. எம். எஸ். எக்சலில் மதிப்பெண் பட்டியல் உருவாக்குதல்.
2. எம். எஸ். எக்சலில் ஒரு மாதத்திற்கான வரவு செலவினங்களை பட்டியலிட்டு வரைபடம் உருவாக்குதல்.
3. ிழறநச ிழவை-இல் ஏதேனும் படங்களை உள்ளீடு செய்து அவை தொடர்பான செய்திகளை தமிழ் அல்லது ஆங்கிலத்தில் தட்டச்சு செய்து 5 நிமிடத்திற்கு (யுஔஅயவழை) ளுடனைந னுநளபைஇ (ளுழரனெள) உருவாக்குதல்.
4. ியபந-ஆயமநச-இல் ஒரு பக்க அளவில் உமது துறை கருத்தரங்கு (ளுநஅயைச) தொடர்பான அழைப்பிதழை உருவாக்குதல்.
5. ியபந-ஆயமநச-இல் அட்டவணை உருவாக்கி பின்புலத்தில் (டயஉமபசழரனெ) வண்ணங்கள் கொடுத்து அழகுபடுத்துதல்.

### பாடநூல்கள்

1. பாஸ்கரன்.க., தமிழில் கணிப்பொறியியல் கணிப்பொறியியல் தமிழ், உமா பதிப்பகம், தஞ்சாவூர்.
2. ிழறநச ிழவைஇ நர்மதா பதிப்பம், சென்னை.
3. தணிகை அரசு, ியபந ஆயமநசஇ நர்மதா பதிப்பம், சென்னை.

### பார்வை நூல்கள்

1. ஆண்டோ பீட்டர்.மா., தமிழும் கணிப்பொறியும், கற்பகம் புத்தகாலயம், சென்னை, 2002.

B.VOC-2016

Sem. II  
14UGT210004

Hours/Week : 2  
Credit : 2

தமிழ்செய்முறைப் பயிற்சி- II :

தமிழ்வழிக் கணினி

1. எம்.எஸ்.எக்சலில் மதிப்பெண் பட்டியல் உருவாக்குதல்.
2. எம்.எஸ்.எக்சலில் ஒரு மாதத்திற்கான வரவு செலவினங்களை பட்டியலிடுதல்.
3. Power point,y; ஏதேனும் படங்களை உள்ளீடு செய்து அவை தொடர்பான செய்திகளை தமிழ் அல்லது ஆங்கிலத்தில் தட்டச்சு செய்து 5 நிமிடத்திற்கு (Animation, Slide Design, Sounds) உருவாக்குதல்.
4. Page-Maker,y ஒரு பக்க அளவில் உமது துறை கருத்தரங்கு (Seminar) தொடர்பான அழைப்பிதழை உருவாக்குதல்.
5. Page-Maker,y; அட்டவணை உருவாக்கி பின்புலத்தில் (Background) வண்ணங்கள் கொடுத்து அழகுபடுத்துதல்.

**B.VOC-2016**

**Sem. II**  
**14UGE220103**

**Hours/Week : 2**  
**Credit : 2**

**FUNCTIONAL ENGLISH - II**  
**BASIC COMMUNICATION SKILLS**

**Objectives:**

- \*To gain proficiency in communication..
- \*To improve language with respect to communication.

**Unit-I**

1. Talking about yourself
2. Social English
3. Getting about (10)

**Unit-II**

4. Shopping
5. Going to the doctor's
6. At school (10)

**Unit-III**

7. Finding Work
8. At the Bank and Post office (10)

**Unit –IV**

9. Using the Telephone
10. Emergencies (10)

**Unit- V**

11. Understanding Regional Speech
12. Metaphor in Spoken English (10)

**Text Book:**

1. Massey Dorothy, Better English, 3<sup>rd</sup> ed, VIVA Books.

**Sem. II**  
**14UGE220104**

**Hours/Week : 2**  
**Credit : 1**

**ENGLISH: PRACTICAL LAB - II**

1. Using the Telephone
2. Emergencies
3. Understanding Regional Speech
4. Metaphor in Spoken English

**B.VOC-2016**

**Sem. II**

**Hours/Week : 4**

**Credit : 3**

## Graphics Design

**Objective :** To impart the knowledge of various designs like pattern, Greeting cards, Visiting card, Web banner using Photoshop

**UNIT – I:**

Introduction & Interface – What is Image? Pixel - Pixel – Resolution – Image Resolution – Printing Resolution – Monitor Resolution – Color Modes (RGB – CMYK – Lab Color – Gray Scale – Bitmap – Duotone – Indexed Color and Multi channel). Zoom In – Zoom Out – Planning – Fit to Screen – Actual Size – Rulers – Guides – Grid.

(15)

**UNIT – II:**

Tools Box – Selection Tools - Painting Tools – Healing – Brush Tool and Patch Tool – Brush Tool and Pencil Tool – Eraser Tool – Background Eraser Tool and Magic Eraser Tool – Dodge – Burn and Sponge.

(15)

**UNIT – III:**

Transforming the Images – Scale – Rotate – Skew – Distort – Perspective – Flip and Canvas – Rotate Canvas – Lassos – Polygonal – Tools and Options – Magic Wand and Options.

(15)

**Unit - IV:**

Automatic Image Correction – Levels – Curves – Color Balance – Hue/Saturation – Selective Color – Channel Mixer – Brightness/Contrast – Invert – Gradient Color – Shadow / High Light – Histogram – Variations – Photo Filter.

(15)

**UNIT – V:**

Filters : Artistic filters – Brush stroke filters – Distort filters – Pixelate filters – Render filters – Sketch filters – Stylish filters – Texture filters. Combining Images : combining Files – Working with animations.

(15)

**Books for Study:**

1. Lisa Da Nae Daley, “Adobe Photoshop CS6 BIBLE”, John Wiley & sons.
2. Jennifer Smith, “Adobe Photoshop Digital Classroom”, Wiley publications.

**B.VOC-2016**

**Sem. II**

**Hours/Week : 4**

**Credit : 3**

**USER INTERFACE DESIGN**

**Objective:**

To master web designing in better way by learning HTML tags including standard tags, formatting tags, frame tags in order to create static/ dynamic web pages and CSS3 to make the pages more attractive.

**Unit I**

**INTRODUCING HTML5:** A Basic HTML5 Template -doctype- HTML Element- Head Element - Defining Page's Structure- Header Element – Section Element - Article Element - Nav Tag Element - Aside Element - Footer Element. **(15)**

**Unit II**

**HTML5 SEMANTICS:** A New Perspective on Types of Content- The Document Online- New Elements in HTML5 - HTML5 Canvas. **HTML5 TABLES:** Table attributes and Elements.

**Unit III**

**HTML5 FORMS:** HTML5 Attributes- HTML5 Form Input Types- New Form Controls in HTML5 - Changes to Existing Form Controls and Attributes. **HTML5 AUDIO AND VIDEO:** Video Container Formats - Video Codecs - Audio Codecs - The Markup Attributes - Creating Custom Controls. **(15)**

**Unit IV**

**INTRODUCING CSS3:** CSS3 Selectors - CSS3 Colors- Drop Shadows – Text Shadow **CSS3 GRADIENTS:** Linear Gradients-Radial Gradients - Repeating Gradients. **(15)**

**Unit V**

**CSS TRANSFORMS AND TRANSITIONS:** Transforms - Transitions - Animations -Embedded Fonts - CSS3 Multicolumn Layouts - SVG and Drag and Drop. **(15)**

**Book for Study**

Alexis Goldstein, Louis Lazaris, Estelle Weyl, “HTML5 & CSS3 for the Real World”, SitePoint Pvt. Ltd., 2011.

**Book for Reference**

Terry Felke-Morris, “Basics of Web Design: HTML5 & CSS3”, Pearson Higher Ed Addison-Wesley representative, 3<sup>rd</sup> Edition, 2015.

**B.VOC-2016**

**Sem. II**

**Hours/Week : 2**

**Credit : 2**

**ENVIRONMENTAL STUDIES**

**Objective :**

To understand the natural resources, ecosystems, biodiversity and its Conservation, Environmental Pollution, Social Issues and the Environment and Human Population and the Environment

**Unit 1: The multidisciplinary nature of environmental studies**

Definition, scope and importance – need for public awareness (10)

**Unit 2: Natural resources – renewable & non-renewable**

Natural resources and associated problems – a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people – b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams, benefits and problems – c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – e) Energy resources: Growing energy needs, renewable and non-renewable energy resources, use of alternative energy sources, case studies – f) Land resources: Land as a resource, land degradation, man-induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – equitable use of resources for sustainable lifestyles (10)

**Unit 3: Ecosystems**

Concept of an ecosystem – structure and function of an ecosystem producers, consumers and decomposers – energy flow in the ecosystem Ecological succession – food chain, food webs and ecological pyramids introduction, types, characteristic features, structure and function of the following ecosystems: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries) (10)

**Unit 4: Biodiversity and its Conservation**

Introduction – definition: genetic, species and ecosystem diversity Bio geographical classification of India – value of biodiversity: consumptive use, productive use, social, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India conservation of biodiversity: In situ and ex situ conservation of biodiversity (10)

### **Unit 5: Environmental Pollution**

Definition – causes, effects and control measures of a) air pollution b) water pollution c) soil pollution d) marine pollution e) Noise pollution f) thermal pollution g) nuclear hazards – solid waste management: causes, effects and control measures of urban and industrial wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquakes, cyclone and landslides. (10)

### **Unit 6: Social Issues and the Environment**

From Unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management \_resettlement and rehabilitation of people; its problems and concerns \_case studies – environmental ethics: Issues and possible solution \_climate changes, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust – case studies – wasteland reclamation consumerism and waste products – environment protection act – air prevention and control of pollution act – forest conservation act – Issues involved in enforcement of environmental legislation – public awareness. (10)

### **Unit 7: Human Population and the Environment**

Population growth, variation among nations – population explosion Family welfare programme – Environment and human health – human rights \_value education – HIV/AIDS – women and child welfare – role of information technology in environment and human health – case studies. (10)

### **Book for Study:**

Environmental Studies, Department of Foundation Course, St.Joseph's College, Trichy.

## QUALIFICATION FILE SUMMARY

Qualification Title	Web Developer (SSC/ Q 0503)		
Body/bodies which will assess candidates	IT-ITeS Sector Skills Council NASSCOM (SSC NASSCOM)		
Body/bodies which will award the certificate for the qualification.	SSC NASSCOM		
Body which will accredit providers to offer the qualification.	SSC NASSCOM Presently, Accreditation is not prescribed; affiliation is one of the models.		
Occupation(s) to which the qualification gives access	Application Development		
Proposed level of the qualification in the NSQF.	5		
Notional Learning Hours	400 hours approx. (customisable as per learner background)		
Entry requirements / recommendations.	Graduate degree/ diploma in web design/ media design or any other related field		
Progression from the qualification.	As shown in the career map (attachment sl.no. 4)		
Planned arrangements for RPL.	<ul style="list-style-type: none"> <li>- Response to market forces for RPL</li> <li>- RPL assessments will be the same as our normal assessments.</li> <li>- MOUs / Agreement in place for institutions, Retail is work in progress</li> </ul>		
Formal structure of the qualification			
<b>Title of unit or other component</b> (include any identification code used)	<b>Mandatory / Optional</b>	<b>Estimated size (learning hours)</b>	<b>Level</b>
<b>SSC/N0501 (Contribute to the design of software products and applications)</b>	<b>Mandatory</b>	<b>100</b>	<b>5</b>
<b>SSC/N0503 (Develop media content and graphic designs for software products and applications)</b>	<b>Mandatory</b>	<b>100</b>	
<b>SSC/N9001 ( Manage your work to meet requirements)</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9002 (Work effectively with colleagues )</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9003 (Maintain a healthy, safe and secure working environment)</b>	<b>Mandatory</b>	<b>25</b>	
<b>SSC/N9004 (Provide data/information in standard formats)</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9005 (Develop your knowledge, skills and competence)</b>	<b>Mandatory</b>	<b>25</b>	

B.VOC-2016

Sem. III

Hours/Week : 2

Credit : 2

**தமிழ் - III :**  
**தமிழ்வழிக் கணினி - III**

**நோக்கம்**

கணினியின் பயன்பாட்டு மென்மங்களைத் தமிழ்வழியில் அறியச்செய்தல்.

கற்றலின் வாயிலாக சுய தொழில் தொடங்கி வாழ்க்கைத் தரத்தை உயர்த்துதல்.

கணினியில் தமிழ்மொழி மென்மேலும் வளர மாணவர்களை ஈடுபடச் செய்தல்.

**அலகு -1**

வுயட்டல ஓர் அறிமுகம் - நிறுவன உருவாக்கம் - குறிப்பேடுகள், பெயரேடுகள் உருவாக்கம். (10)

**அலகு -2**

வியாபாரக் கணக்கு, இலாப நட்க் கணக்கு மற்றும் இருப்புநிலைக் குறிப்புகளை அறிதல். (10)

**அலகு -3**

கணினி - மொழி ஆய்வுக் கருவி - கணினி வழி உரை ஆய்வு. (10)

**அலகு -4**

கணினித்தமிழ் சிக்கல்களும் தேவைகளும். யுனிகோடு (ஒருங்குறி) ஓர் அறிமுகம். (10)

**அலகு -5**

தமிழ், ஆங்கிலம் ாழநெவலை ஆநவாழனள தட்டச்சு பயிற்சி முறை - தமிழ் வழியாக இணைய பக்கங்களை தேடுதல். (10)

**செய்முறைப் பயிற்சிகள்**

1. புதிய நிறுவனத்தை உருவாக்குதல் மற்றும் மாற்றம் செய்தல் (ஊசநயவந யனெ யுடவநச வாந ஊழஅியலெ)
2. ஏதேனும் 5 நடவடிக்கைகளுக்கு (வுசயளெயஉவழைளெ) குறிப்பேடுகளை (துழரசயெட நுவெசல) உருவாக்குக.
3. ஏதேனும் 5 நடவடிக்கைகளைப் பதிவு செய்து அதை வியாபார, இலாப நட்ட மற்றும் இருப்புநிலைக் குறிப்பினில் காண்பிக்க.
4. தமிழில் ரீஆ றுசவைநச மென்மத்தைப் (ளழகவறயசந) பயன்படுத்தி ாழநெவலை ஆநவாழன முறையில் ஒரு பக்கம் தட்டச்சு செய்து காட்டல்.
5. தமிழ் மொழி வாயிலாகத் தமிழ் இணையப் பக்கங்களைத் தேடுதல்.

**பாடநூல்கள்**

1. வுயட்டலஇ நர்மதா பதிப்பம், சென்னை.
2. பாஸ்கரன்.க., தமிழில் கணிப்பொறியியல் கணிப்பொறியில் தமிழ், உமா பதிப்பகம், தஞ்சாவூர்.
3. ஆண்டோ பீட்டர்.மா., தமிழும் கணிப்பொறியும், கற்பகம் புத்தகாலயம், சென்னை, 2002.

Sem. III

Hours/Week : 2  
Credit :

தமிழ்செய்முறைப் பயிற்சி - III :

தமிழ்வழிக் கணினி

1. புதிய நிறுவனத்தை உருவாக்குதல் மற்றும் மாற்றம் செய்தல் (Create and Alter the Company)
2. ஏதேனும் 5 நடவடிக்கைகளுக்கு (Transactions) குறிப்பேடுகளை (Journal Entry) உருவாக்குக.
3. ஏதேனும் 5 நடவடிக்கைகளைப் பதிவு செய்து அதை வியாபார, இலாப நட்ட மற்றும் இருப்புநிலைக் குறிப்பினில் காண்பிக்க.
4. தமிழில் NHM Writer மென்மத்தைப் (Software) பயன்படுத்தி Phonetic Method முறையில் ஒரு பக்கம் தட்டச்சு செய்து காட்டல்.
5. தமிழ் மொழி வாயிலாகத் தமிழ் இணையப் பக்கங்களைத் தேடுதல்.

**B.VOC-2016**  
**Sem. III**

**Hours/Week : 2**

**Credit : 2**

**ENGLISH-III : EFFECTIVE COMMUNICATION SKILLS**

**Unit- I**

Present continuous-Present simple- Present Continuous and Present simple (1)-Present continuous and present simple(2) –past simple-Past continuous- Present perfect- Present perfect (2)- Present perfect continuous- Present perfect continuous and simple. 10

**Unit-II**

How long have you (been)-When and How long- For and Since- Present perfect and past (1) – Present perfect and past (2) – past perfect –past perfect continuous- have and have got –Used to – Present tenses for the future-going to. 10

**Unit-III**

Will/shall- Will/shall(2)-I will and I am going to-Will be doing and will have done- When and if – Can, Could and able to- Could and Could have – must and can't – may and might- may and might(2). 10

**Unit-IV**

Must and have to- must, mustn't and needn't-Should (1) –Should (2)\_ Had better , It's time- Can, Could, Would you..etc-If I do and If I did – If I knew , If I do and If I did -If I knew , I wish I knew - If I had known, I wish I had known- Would , I wish. Would. 10

**Unit-V**

Passive(1)-Passive(2)-Passive(3)\_ It is said that ,He is said to, supposed to – Have something done- Reported speech(1)-Reported speech (2)-Questions (1)-Questions(2)-Auxiliary verbs. 10

**BOOK(S) FOR STUDY:**

Murphy Raymond, Essential English Grammar, 2nd edition, Cambridge University Press.

**B.VOC-2016**

**Sem. II**

**Hours/Week : 2**

**Credit :**

**ENGLISH: PRACTICAL LAB - III**

1. Negatives and Questions
2. Possessives

## **B.VOC-2016**

**Sem. III**

**Hours/Week : 4**

**Credit : 3**

### **SYSTEMS CONCEPTS- I**

Objectives:

- To provide a fundamental knowledge on data structures and development of algorithms
- To impart the basic knowledge about the operating systems and its management

#### **Unit I**

Stacks and queues: fundamentals- evaluation of expressions- Linked Lists: Singly Linked Lists-Linked stacks and queues- Trees: Basic terminology-Binary trees. (15)

#### **Unit II**

Complete Development of an algorithm : - Statement – model development – Design of an algorithm – Correctness – Implementation – Analysis and complexity -Testing – Documentation. (15)

#### **Unit III:**

Design methods of an Algorithm: Sub goals-Hill Climbing-Working Backward-Heuristic-Back Track – Recursion. (15)

#### **UNIT IV**

Operating system Overview –Basic concepts and terminologies operating system resource manager – process view point – Hierarchical and extended machine view -Processor management – Process State Model - job scheduling- Process scheduling – Multiprocessor systems – Process synchronization – resolving deadlocks. (15)

#### **UNIT V**

Device management – Techniques –device characteristics – I/O traffic controller – I/O scheduler and device handlers - virtual devices – spooling. (15)

#### **BOOK(S) FOR STUDY**

1. Ellis Horowitz, Sartaj Sahni, “Fundamentals of Data structure”, Galgotia Publications, New Delhi, 1985 - Units I
2. S.E. Goodman, S.T. Hedetniemi, “Introduction to the Design and analysis of algorithms”, McGrawHill, International edition, 1988 - Unit II, III
- S.E Madnick and J J Donovan “Operating Systems” McGraw Hill International Book Co, New Delhi , 1987. Unit IV, V.

#### **BOOK(S) FOR REFERENCE**

1. Tanenbaum A.M., Augustine M.J., “Data structures with Pascal”, Prentice Hall of India Ltd, New Delhi, 1985.
2. Ellis Horowitz, Sartaj Sahni, “Fundamentals of computer algorithms”, Galgotia Publications, New Delhi, 1985.
3. Andrew S. Tanenbaum, “Modern Operating Systems”, Prentice Hall, New Delhi, 1997.

**B.VOC-2016**

**Sem. III**

**Hours/Week : 4**

**Credit : 3**

## JAVA PROGRAMMING

### **Objective:**

To understand the fundamental concepts of the object oriented technology and the power of Java language.

### **Unit – I:**

**INTRODUCTION TO JAVA:** Primaries – Control Statements. **CLASSES AND OBJECTS:** General form of a class – Creation of Objects – Usage of Constructors – ‘this’ keyword- Constructor overloading- Copy constructors- Static Data Members – Static Methods- ‘finalize()’ Method. (15)

### **Unit – II:**

**INHERITANCE AND POLYMORPHISM:** Inheriting Variables in a Class – Inheriting Methods in a Class – Inheritance and Constructors – Abstract Classes – Final Classes. **INTERFACES AND PACKAGES:** Interfaces- Structure of an Interface – Implementation of an Interface – Interface Inheritance. Packages – Placing the Classes in a Package – Package Hierarchy – Access Control Modifiers. (15)

### **Unit – III:**

**APPLETS:** The Life Cycle of an Applet – The Applet Class – Development and Execution of a Simple Applet – Syntax of Applet Tag – Methods in the Graphics Class. **ABSTRACT WINDOWING TOOLKIT:** Events – Listeners – Event Handling Methods – Inheritance Hierarchy of Control Classes - Windows and Frames – Menus – Dialogs – Mouse Events and their Listeners. (15)

### **Unit – IV:**

**EXCEPTION HANDLING:** Default Exception Handling – Exception and Error Classes – Catch Block Searching Pattern – ‘Throw’ Statement – ‘Throws’ Statement – Custom Exceptions. **THREADS:** Life Cycle of a Thread – Creating and Running Threads – Methods in the Thread Class – Setting the priority of a thread – Synchronization – Dead Lock – Inter Thread Communication – Applets Involving Threads. (15)

### **Unit – V:**

**I/O STREAMS:** Input Stream and Output Stream classes – Reader and Writer classes – Data Output Stream and Data Input Stream Classes. **NETWORKING:** TCP Server Socket Class – TCP Socket Class - UDP Datagram Socket and Datagram Packet Classes. **DATABASE CONNECTIVITY:** JDBC-ODBC Connection. (15)

### **BOOK FOR STUDY:**

1. C.MUTHU, “Programming with JAVA”, Vijay Nicole Imprints, Chennai, 2004.

### **BOOK(S) FOR REFERENCE:**

1. Herbert Scheldt, “The Complete Reference Java 2.0”, Tata McGraw Hill, New Delhi, 2002.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, Prentice Hall, New Delhi, 1997

## B.VOC-2016

Sem. III

Hours/Week : 2

Credit : 2

### SOFT SKILLS

#### Objectives

\* This course is aimed at introducing the students to the nuances of developing the basic skills that required of an educated youth; and to train them to present the best of themselves as job seekers.

**Unit I:** Effective Communication & Resume Writing Basics of communication - definition of communication, Barriers of Communication, Non-verbal Communication; Effective Communication - Johari Window, The Art of Listening, Conversation Techniques, Good manners and Etiquettes.

**Unit II:** Resume Writing & Interview skills Resume Writing: What is resume? Types of Resume - Chronological, Functional and Mixed Resume, Steps in preparation of Resume. Interview Skills: Common interview questions, Attitude, Body Language, The mock interviews, Phone interviews, Behavioral interviews.

**Unit III:** Group Discussion Group Discussion Basics, GD Topics for Practice, Points for GD Topics. Personal Effectiveness: Self Discovery; and Goal Setting-

**Unit IV:** Numerical Ability Average, Percentage; Profit and Loss, Simple Interest, Compound Interest; Time and Work, Pipes and Cisterns; Time and Distance, Problems on Trains, Boats and Streams; and Calendar, Rations and Proportions.

**Unit V:** Test of Reasoning-Verbal Reasoning: Series Completion, Analogy; Data Sufficiency, Assertion and Reasoning; and Logical Deduction. Non-Verbal Reasoning: Series; and Classification

#### Books for study

1. Aggarwal, R.S. 2010. A Modern Approach to Verbal and Non Verbal Reasoning. S.Chand, New Delhi.
2. Covey, Stephen. 2004. 7 Habits of Highly effective people, Free Press.Egan, Gerard. (1994). The Skilled Helper (5th Ed). Pacific Grove, Brooks/Cole. 58 59
3. Khera, Shiv 2003. You Can Win. Macmillan Books , Revised Edition.
4. Murphy, Raymond. 1998. Essential English Grammar. 2<sup>nd</sup> ed., Cambridge University Press. Sankaran, K., & Kumar, M. Group Discussion and Public Speaking. M.I. Pub, Agra, 5th ed., Adams, Media.
5. Trishna's 2006. How to do well in GDs & Interviews, Trishna Knowledge Systems.
6. Yate, Martin. 2005. Hiring the Best: A Manager's Guide to Effective Interviewing and Recruiting.

B.VOC-2016

Sem. IV

Hours/Week : 2

Credit : 2

தமிழ் - IV :-

தமிழ்வழிக் கணினி- IV

**நோக்கம்**

இணையப் பக்கங்களில் தமிழின் வளர்ச்சி நிலைகளை அறியச்செய்தல்.  
இணையத்தைத் தமிழ்மொழி வாயிலாகப் பயன்படுத்தக் கற்றுக்கொள்ளல்.  
கணினியில் தமிழ்மொழி மென்மேலும் வளர மாணவர்களை ஈடுபடச் செய்தல்.

**அலகு -1**

இணையம் - விளக்கம் - ற.ற.ற. விளக்கம் - ிசழவழஉழுட விளக்கம்.

**அலகு -2**

வலையமைப்பு வகைகள் - தேடு பொறிகள் (ளுநயசஉா நுபெநெள).

**அலகு -3**

கல்வி சார்ந்த வலைதளங்கள் - வலைதளங்களில் தகவல்களைப் பெறுதலும், பிறர் அறியாத தகவல்களை உள்ளீடு செய்தலும் - தமிழ் மின்னிதழ்கள்.

**அலகு -4**

ர்வுஆடு அறிமுகம் - தகவல் தொடர்பியல் - பல்வேறு வகையான இணையப் பயன்பாடுகள்.

**அலகு -5**

வேலை தேடும் வலைதளங்கள் - அரசு இணைய தளங்கள் - சமூக வலைதளங்கள் மற்றும் அதன் பயன்பாடுகள்.

**செய்முறைப் பயிற்சிகள்**

1. வெவ்வேறு வகையான தேடு பொறிகளின் (ளுநயசஉா நுபெநெள) அமைப்பு முறைகளைக் (வுழமுடள) குறிப்பிடுதல்.
2. வ்யஅடை ஏசைவரயட ருனெளநசளவைலஇ மேழமுடயபயஅ போன்ற இணைய தளங்களுக்குள் சென்று அவற்றின் பயன்பாடுகளை அறிதல்.
3. தமிழ் மின்னிதழ்களைப் பட்டியலிடுக.
4. தமிழ்நாடு அரசு வேலைவாய்ப்பு பதிவக இணைய தளத்தில் உனது கல்வித் தகுதியைப் பதிவது மற்றும் புதுப்பித்தல் குறித்த செயல்முறை.
5. தமிழ்நாடு அரசு இணையதளத்தில் உள்ள பல்வேறு துறைசார்ந்த விண்ணப்பங்களை (முடெநெ) பெறுதல் மற்றும் உள்ளீடு செய்தல்.

**பாடநூல்கள்**

1. பாஸ்கரன்.க., கணிப்பொறித் தகவல் தொழில்நுட்பம், உமா பதிப்பகம், தஞ்சாவூர்.
2. சாந்தகுமாரி, கணினிக்கல்வி, சாரதா பதிப்பகம், சென்னை, 2010

**பார்வை நூல்.**

1. ஆண்டோ பீட்டர்.மா., தமிழும் கணிப்பொறியும், கற்பகம் புத்தகாலயம், சென்னை, 2002

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Sem. IV

Hours/Week : 2

Credit : 2

தமிழ் செய்முறைப் பயிற்சி - IV :

தமிழ்வழிக் கணினி

1. வெவ்வேறு வகையான தேடு பொறிகளின் (Search Engines) அமைப்பு முறைகளைக் (Tools) குறிப்பிடுதல்.
2. Tamil Virtual University, Noolagam போன்ற இணைய தளங்களுக்குள் சென்று அவற்றின் பயன்பாடுகளை அறிதல்.
3. தமிழ் மின்னிதழ்களைப் பட்டியலிடுக.
4. தமிழ்நாடு அரசு வேலைவாய்ப்பு பதிவக இணைய தளத்தில் உனது கல்வித் தகுதியைப் பதிவது மற்றும் புதுப்பித்தல் குறித்த செயல்முறை.
5. தமிழ்நாடு அரசு இணையதளத்தில் உள்ள பல்வேறு துறைசார்ந்த விண்ணப்பங்களை (Online) பெறுதல் மற்றும் உள்ளீடு செய்தல்.

**B.VOC-2016**

**Sem. IV**

**Hours/Week : 2**

**Credit : 2**

**ENGLISH –IV: ENGLISH LANGUAGE AND ITS USAGE**

**Objectives:**

- Giving importance to usage of the language.
- Focusing on Structure of the language

**Unit-I**

Conjunctions-Particular Conjunctions-Word order and sentence organization- Basic word order- Inversion – Fronting- Information structure- Emphasis.

**Unit-II**

Constructing text- discourse makers-paragraphs-Repetition-Correspondence-Special kinds of language-Politeness- Varieties and styles of English.

**Unit-III**

Topic areas- Spelling and Punctuation-Word building.

**Unit-IV**

Spoken Grammar- Contractions- Spoken structures and Tags – Short answers –reply questions.

**Unit-V**

Various structures-Questions- Question Tag-Negative structures-Imperatives-Exclamations- Direct speech- Indirect speech- relatives-Whoever, Whatever etc., - If –Preparatory it, Cleft sentences –Ellipsis.

**BOOK(S) FOR STUDY:**

Swan Michael, Practical English Usage, Oxford University Press

**B.VOC-2016**

**Sem. IV**  
**14UGE420108**

**Hours/Week : 2**  
**Credit :**

**ENGLISH: PRACTICAL LAB - IV**

1. Spoken Grammar
2. Various Structures

**B.VOC-2016**

**Sem. IV**

**Hours/Week : 4**

**Credit : 3**

**ADVANCED JAVA**

**Objective:**

To understand the concept of the server side - technology and to gain the knowledge about utility package & language features.

**Unit I :** Servlets: Introduction – Servlets –A simple servlet -Constituents of Javax .Servlet Package - Retrieving the values of Parameters- Procedure for Execution- Retrieving the values of Initialization parameters- The javax.servlet.http package- Constituents of Javax .Servlet.Http Package - Cookies – Creating a Cookie and sending it to the client – Retrieving the stored Cookies- Session Tracking. (15)

**Unit II:** Java.Util Package: Introduction- The collectioninterface- The Set Interface- The ArrayList Class- The Linked List Class – The HashSet Class- The Map Interface- The HashMap Class- The Collection Algorithms- The Enumeration Interface- The Vector Class- The Stack Class- The Dictionary and Hashable Class- The PropertiesClass- The Date Class- The GregorianCalendar Class-The StringTokenizer Class- The Random Class. (15)

**Unit III:** Java Server Pages : Introduction :Request –Response Cycle in JSP – Scriptlets – Expressions – Declarations- Directives- Implicit Objects- <jsp.include> standard Action - <jsp.forward> standard Action-<jsp.param> standard Action- <jsp.plugin> standard Action. (15)

**Unit IV:** Enterprise Java Beans : Introduction – EJB Container – EJB as a Component - EJB as a Framework - EJB Types – Session Bean – Message Driven Beans. (15)

**Unit V:** Java.Lang Package: Introduction – Type Wrappers – The Number Class – The Process Class – The Runtime Class – The System Class – The Object Class – The Class class – The Math Class – The String Class – StringBuffer Class. (15)

**BOOK FOR STUDY:**

Unit I &II : C.MUTHU, “Programming with JAVA”, Vijay Nicole Imprints, Chennai, 2004.  
Unit III – V : C.MUTHU, “Advanced JAVA”, Shalom Infotech Private Limited, , 2015.

**BOOK(S) FOR REFERENCE:**

1. Herbert Scheldt, “The Complete Reference Java 2.0”, Tata McGraw Hill, New Delhi, 2002.

**B.VOC-2016**

**Sem. IV**

**Hours/Week : 4**

**Credit : 3**

**SYSTEM CONCEPTS - II**

**Objectives:**

To understand the principles of Linux Operating System for effective System administration.

**Unit – I:**

Linux Introduction and Installation: Linux-Advantages-Red Hat Linux- New Features-Installation procedures and Methods. Using Desktop-GNOME-KDE-Linux Commands Accessing and Running Applications-Installing Red Hat Linux Applications, Running Window Application, Running Windows, DOS and Macintosh Applications – Tools for using Internet and Web. (15)

**Unit – II:**

Administration: Understanding System Administration: Root login super user-GUI tools, commands and Log files-Configuring Hardware-File System and Disk Management-Monitoring performances. Setting Up and Supporting users: Creating user accounts – Setting user defaults – Creating Desktops-Modifying and Deleting Accounts. (15)

**Unit – III:**

Security Issues: Hacker versus Cracker-Password Protection-Protection from break-in-Filtering Network Access-Firewalls- Detecting Instructions – Encryption techniques. (15)

**Unit – IV:**

Networking: Setting up a LAN- LAN- Wireless-LAN- Understanding IP Addresses connecting to Internet: Dial up connection- Red Hat Linux as a router-VPN connection-Red Hat Linux as a proxy server-proxy clients. (15)

**Unit – V:**

Setting up File Server: Setting up- NFS- Netware File Server Setting up a Web Server: Web Server-Starting Apache Web Server –Configuring Apache Server –Starting and Stopping the Server – Monitoring Activities. (15)

**BOOK(S) FOR STUDY:**

1. Christopher Negus “Red Hat Linux 9 Bible”, John Wiley & Sons, 2005.

**BOOK(S) FOR REFERENCE:**

1. Thomas Schenk, “Red Hat Linux System Administration”, Techmedia, New Delhi, 2003.  
2. Christopher Negus “Red Hat Linux 9 Bible”, WILEY Dreamtech, India Pvt. Ltd., New Delhi, First Ed, 2003.

**B.VOC-2016**

**Sem. IV**

**Hours/Week : 2**

**Credit : 2**

**LIFE COPING SKILLS**

**Objective:** To develop positive attitude and enhance their personality

**UNIT I:** Self Esteem And Personality Development: Self esteem-importance of self esteem- positive self development- self acceptance of strengths and weakness- personality development- methods- do's and don'ts-skills to develop

**UNIT II :** Positive Thinking - Right perception of life- emphasize good things- transform from soft to tough minded individuals- weak to strong men/women

**UNIT III:** Motivation And Goal Setting - Concept of motivation-energizing and directing efforts for goal- enhance motivation desires and aspirations- different types of goals- importance of pursuit of personal goalssetting goals- striving for goals

**UNIT IV:** Coping With Depression, Fear And Failure - Depression-nature-symptoms and causes- ways to overcome depression- types of failure- understanding failures- handling fear-overcoming failure and fear- understanding anger- hindering anger to achieve goals- coping with failures

**UNIT V:** Leadership - Leadership- Nature and types- characteristics of good leadership- leadership role courage and confidence

**Book for Study:**

1. Alphonse, S.J. Xavier, ' We shall overcome', ICRDCE publication, Chennai, 5<sup>th</sup> edition, 2011

## QUALIFICATION FILE SUMMARY

<b>Qualification Title</b>	<b>Master Trainer for Junior Software Developer (SSC/Q0509)</b>		
<b>Body/bodies which will assess candidates</b>	IT-ITeS Sector Skills Council NASSCOM (SSC NASSCOM)		
<b>Body/bodies which will award the certificate for the qualification.</b>	SSC NASSCOM		
<b>Body which will accredit providers to offer the qualification.</b>	SSC NASSCOM Presently, Accreditation is not prescribed; affiliation is one of the models.		
<b>Occupation(s) to which the qualification gives access</b>	Application Development		
<b>Proposed level of the qualification in the NSQF.</b>	6		
<b>Notional Learning Hours</b>	400 hours approx. (customisable as per learner background)		
<b>Entry requirements / recommendations.</b>	Bachelor's Degree		
<b>Progression from the qualification.</b>	This qualification was added in response to the market requirement. The same is yet to be incorporated in the career maps. However, the progression path for this role can move either as a trainer or a practitioner in the occupation - Application Development (as shown in attachment sl.no. 4) .		
<b>Planned arrangements for RPL.</b>	<ul style="list-style-type: none"> <li>- Response to market forces for RPL</li> <li>- RPL assessments will be the same as our normal assessments.</li> <li>- MOUs / Agreement in place for institutions, Retail is work in progress</li> </ul>		
<b>Formal structure of the qualification</b>			
<b>Title of unit or other component</b> (include any identification code used)	<b>Mandatory/ Optional</b>	<b>Estimated size (learning hours)</b>	<b>Level</b>
SSC/ N 0506 (Assist in performing software construction and software testing entry-level tasks in the IT Services industry)	Mandatory	50	6

<b>SSC/ N 0507 (Employ Programming Lab Oriented Pedagogical Skills as a Master Trainer in the IT Industry)</b>	<b>Mandatory</b>	<b>75</b>	
<b>SSC/ N 0508 (Engage Pedagogical Skills as a Master Trainer)</b>	<b>Mandatory</b>	<b>100</b>	
<b>SSC/N9001 (Manage your work to meet requirements)</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9002 (Work effectively with colleagues )</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9003 (Maintain a healthy, safe and secure working environment)</b>	<b>Mandatory</b>	<b>25</b>	
<b>SSC/N9005 (Develop your knowledge, skills and competence)</b>	<b>Mandatory</b>	<b>50</b>	

**B.VOC-2016**

**Sem. V**

**Hours/Week : 4**

**Credit : 4**

## **DISTRIBUTED TECHNOLOGIES**

### **Objectives**

To know the architectures of Distributed systems, to understand and compare the technologies associated with J2EE and DOTNET.

**Unit I:** Client server architecture: 2-tier model – 3-tier model – n-tier model. (15)

**Unit II :** J2EE architecture – DOTNET architecture – MVC architecture. (15)

**Unit III:** ASP.NET : Introduction – architecture – ASP.NET Runtime – ASP.NET Parser – Assembly – Page class (15)

**Unit IV:** Web Server Controls – HTML Controls – AdRotator and Calendar controls – Validation Controls – Security Management. (15)

**Unit V:** ADO.NET: System.Data, SqlClient and Xml namespaces – Provider objects and Consumer objects – Disconnected data access – GridView & FormView. (15)

### **BOOK(S) FOR STUDY**

#### **Unit I, II**

1. Justin Couch, Daniel H.Steinberg, “J2EE Bible”, Wiley India(P) Ltd, New Delhi, 2002.

#### **Unit III**

2. Paul Tremblett, “Instant Enterprise Java y - Beans”, Tata McGraw Hill Publishing company, New Delhi, 2001.

#### **Unit IV, V**

3. Platt S David, “Introducing Micorsoft .Net”, Prentice Hall of India, New Delhi, 2003.

### **BOOK(S) FOR REFERENCE**

1. Stephanie Bodoff, Dale Green, Eric Jendrock, “The J2EE tutorial”, Addison-Wesley, 2002  
Hitesh Seth, “Microsoft .NET: Kick Start”, Sams Publishing, 2004.

**B.VOC-2016**

**Sem. V**

**Hours/Week : 4**

**Credit : 4**

## **SOFTWARE ENGINEERING**

**Objectives :**

To introduce the basic concepts of Software Engineering and the various phases in Software Development.

**UNIT I:**

Introduction: The Software Engineering Discipline - Software Development Projects - Emergence of Software Engineering - Software Life Cycle Models: Classical Waterfall Model - Iterative Waterfall Model - Prototyping Model - Spiral Model. (15)

**UNIT II:**

Software Project Management: Responsibilities of a Software Project Manager - Project Planning - Metrics for Project Size Estimation - Project Estimation Techniques - Empirical Estimation Techniques - COCOMO - Risk Management - Requirements Analysis and Specifications: Requirements Gathering and Analysis - SRS. (15)

**UNIT III:**

Software Design: Cohesion and Coupling - Function-Oriented Software Design: Structured Analysis - DFDs - Structured Design - Object Modeling: Overview of Basic Object-Oriented Concepts - UML Diagrams - Activity Diagram - State Chart Diagram - User Interface Design: Characteristics of a Good User Interface - Basic Concepts. (15)

**UNIT IV:**

Coding and Testing: Coding - Software Documentation - Testing - Unit Testing - Black-Box Testing - White-Box Testing - Debugging - Integration Testing - System Testing - Software Reliability and Quality Management: Software Reliability - Software Quality and Management System. (15)

**UNIT V**

Computer Aided Software Engineering: Case Environment - Characteristics of CASE Tools - Maintenance: Characteristics of a Software Maintenance - Software Reverse Engineering - Estimation of Maintenance Cost - Software Reuse: A Reuse Approach. (15)

**BOOK(S) FOR STUDY**

1. Rajib Mall, "Fundamentals of Software Engineering", PHI Learning, Private Limited, New Delhi, Third Edition, 2010.

**BOOK(S) FOR REFERENCE**

1. K.K. Aggarwal and Yogesh Singh, "Software Engineering", New Age International Publishers, Revised Second Edition 2005.

**B.VOC-2016**

**Sem. V**

**Hours/Week : 2**

**Credit : 2**

**RDBMS CONCEPTS**

**Objective**

To provide the fundamental concepts on Database systems, giving emphasis to Relational Model, Database Design, Transaction and Security Management.

**UNIT I**

**INTRODUCTION TO DATABASE SYSTEM:** Basic concepts and definitions - Data Dictionary – Database – DBMS – DBA - Disadvantages of File oriented System – Advantages and Disadvantages of DBMS – Schema, Subschema– Three-Level Architecture of DBMS - Functions and Services of DBMS - Database Languages – Data Models (Hierarchical, Network, and Relational Model) (10)

**UNIT II**

**RELATIONAL MODEL:** Relational Algebra – Relational Calculus – Codd’s Rules - Structured Query Language (SQL) – Entity – Relationship (ER) Model (10)

**UNIT III**

**DATABASE DESIGN:** Software Development Life Cycle (SDLC) - Database Development Life Cycle (DDL) – Functional Dependency. **NORMALIZATION:** First Normal Form (1NF) – Second Normal Form (2NF) – Third Normal Form (3NF) (10)

**UNIT IV**

**PL/SQL:** Fundamentals – Data types – Operators – Control Structures – Cursors –Exceptions - Procedures - Functions – Packages – Triggers (10)

**UNIT V**

**TRANSACTION AND SECURITY MANAGEMENT:** Transaction Concepts – Concurrency Control – Database Backup – Types of Database Failures – Database Recovery Types – Database Security (10)

**BOOK(S) FOR STUDY**

1. S. K. Singh, “Database Systems Concepts, Design and Applications”, 2<sup>nd</sup> Edition, Pearson Education, 2006. [Units: 1, 2, 3 and 5]
2. Nilesh Shah, “Database Systems using ORACLE”, Prentice Hall of India, 2005. [Unit: 4]

**BOOK(S) FOR REFERENCE**

1. Abraham Silberschatz, “Database Systems”, McGraw Hill International, 1997.
2. CJ Date, “An Introduction to Database Systems”, 6<sup>th</sup> Ed., Addison Wesley Publishing Company, New York, 1995.

**B.VOC-2016**

**Sem. V**

**Hours/Week : 2**

**Credit : 2**

**CRITICAL THINKING**

**Objective:**

To impart the knowledge of various critical thinking skills.

**Unit I:** What is critical thinking? - Introduction - What is critical thinking? - Reasoning - Why develop critical thinking skills? -Underlying skills and attitudes -Self-awareness for accurate judgement - Personal strategies for critical thinking - Critical thinking in academic contexts - Barriers to critical thinking - Critical thinking: knowledge, skills and attitudes - Priorities: developing critical thinking abilities. (10)

**Unit II :** How well do you think? - Develop your thinking skills -Introduction -Assess your thinking skills Scoring Sheet -Focusing attention -Focusing attention: Identifying difference - Focusing attention: Recognising sequence - Categorising - Activity: Categorising text - Close reading -Information about the sources. (10)

**Unit III :** What's their point? - Identifying arguments - Introduction - The author's position - Activity: Capturing the author's position -Argument: Persuasion through reasons - Identifying the argument Activity: Identifying simple arguments - Activity: Reasons and conclusions -Hunting out the conclusion summary of features. (10)

**Unit IV:** Is it an argument? Argument and non - argument -Introduction Argument and disagreement Activity: Argument and disagreement -Non-arguments: Description -Non-arguments: Explanations and summaries -Activity: What type of message? -Distinguishing argument from other-material Activity: Selecting out the argument Summary. (10)

**Unit V:** How well do they say it? - Clarity, consistency and structure-Introduction -How clear is the author's position? -Internal consistency -Activity: Internal consistency -Logical consistency Activity: Logical consistency -Independent reasons and joint reasons -Activity: Independent and joint reasons - Intermediate conclusions -Intermediate conclusions used as reasons-Activity: Intermediate conclusions - Summative and logical conclusions -Activity: Summative and logical -conclusions Logical order - Activity: Logical order. (10)

**Book for study**

“Critical Thinking Skills : Developing Effective Analysis and Argument”, Stella Cottrell, Palgrave Macmillan, Houndmills, Basingstoke,

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**Sem. VI**

**Hours/Week : 4**

**Credit : 4**

**FUNDAMENTALS OF COMPUTER NETWORKS**

**Objective:**

To give the concepts of network model and the applications of various layers in the network model.

**Unit-I**

Introduction to Computer Networks and Data Communication: Need for computer networks - evolution - Data Communication - Data Transmission - Transmission media - Topology. (15)

**Unit-II**

Classification of Networks - Switching and Routing - Routing - Multiplexing and Concentration Concentrator - Terminal Handling - Components of a Computer Network. (15)

**Unit-III**

Network Standards and OSI - Need for network standard – OSI reference model - Physical layer - Data link layer - Network layer – Transport layer - Session layer - Application layer. (15)

**Unit-IV**

LAN: Evolution - Architecture - Advantages and Services - Characteristics - LAN Topologies - LAN access Protocols. (15)

**Unit-V**

Networking and Internetworking Devices – Repeaters – Bridges – Routers – Gateways – Other Devices. (15)

**BOOK FOR STUDY:**

1. R.S.Rajesh, K.S.Eswarakumar & R. Balasubramanian, ‘Computer Networks - Fundamentals and Applications’, Vikas Publishing House Pvt. Ltd., First Edition, 2002.

**BOOK(S) FOR REFERENCE:**

1. Vijay Ahuja, “Design and Analysis of Computer Communication Networks”, McGraw Hill, New York, 1985.

2. Andrew S Tanenbaum , “Computer Networks” , Prentice Hall of India, New Delhi, 3rd Edition, 1999.

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**Sem. VI**

**Hours/Week : 4**

**Credit : 4**

<b>LAMP</b>
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**Objectives**

The objective of the paper is to enable the students to install and configure as well as to handle the components of the LAMP (Linux, Apache, MySQL, and PHP) infrastructure in an efficient way.

**Unit - I**

Linux: Introduction - Download and Install - Decisions, Decisions – Linux Partition Sizes - Accounts - Security - Basic UNIX: Shell - Owner, Groups, Permissions, Ownership - Processes - PATH and Environment - Commands- Basic File System Essentials - Useful Programs. (15)

**Unit - II**

Apache Web server: Starting and Stopping and Restarting Apache- Configuration - Securing Apache - Create the Web Site-Apache Log Files. (15)

**Unit - III**

My SQL: Commands - Database Independent Interface - Tables – Loading and Dumping Database. (15)

**Unit - IV**

PHP: Embedding PHP into HTML -Configuration - Language Syntax: Variables - Data Types - Web variables - Operators - Flow Control Constructs - Writing PHP Papers. (15)

**Unit - V**

Built in PHP function - Important Functions - Array Functions – String Functions - Other Functions - PHP and MySQL: MySQL Functions. (15)

**Books for Study**

1. James Lee, Brent Lee, “Open Source Development with LAMP - Using Linux , Apache, My SQL, Perl and PHP”, Pearson Education , 2009.

**Books for Reference**

1. JonGerner, Elizabeth Naramore , Morgan Owens, Matt Warden, “Professional LAMP - Using Linux , Apache, My SQL and PHP5Web development”, Wiley Publisher, 2006.

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**Sem. VI**

**Hours/Week : 4**

**Credit : 2**

## INTRODUCTION TO MOBILE COMPUTING

**Objectives:** To understand the concepts of mobile computing and learn the technologies for developing applications on mobile platforms.

**UNIT I:**

Wireless networks – emerging technologies – Blue tooth, WiFi, WiMAX, 3G, WATM – Mobile IP Protocols – WAP push architecture. (10)

**UNIT II:**

Wml scripts and applications - Mobile Computing environment – functions – architecture – design considerations, content architecture – CC/PP exchange protocol, context manager. (10)

**UNIT III:**

Data management in WAE Coda – file system – caching schemes – Mobility QOS. Security in Mobile computing. (10)

**UNIT IV:**

Handoff in wireless mobile networks – reference model – handoff schemes. Location management in cellular networks – Mobility Models. (10)

**UNIT V:**

Location and tracking management schemes –time, movement, profile and distance based update strategies - ALI technologies. (10)

**BOOK(S) FOR STUDY:**

1. Ivan stojmenovic, Hand book of Wireless Networks and Mobile computing, John wiley &sons Inc, Canada, 2002.
2. Asoke K Taukder, Roopa R Yavagal, Mobile Computing, Tata McGraw Hill Pub Co., New Delhi, 2005.

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**Sem. VI**

**Hours/Week : 2**

**Credit : 2**

### **PERSONALITY DEVELOPMENT**

**Objectives:**

To provide insights into a range of theoretical and conceptual theories of personality, Determinants of personality and Personality enrichment and assessment

**Unit I:** Personality - Defining Personality - Personality Development - Stability of Personality - Personality Change. (10)

**Unit II:** Theories of Personality - Psychoanalytical Theory of Personality - Humanistic Theory of Personality - Trait Theory of Personality Social Cognitive Theories - Behaviorism and Learning Approaches to Personality - Eastern Theory: Thriguna Theory (SRT). (10)

**Unit III:** Determinants of Personality - Cognitive Determinants: Intellectual Development and Intellectual Capacities - Deviant Intelligence - Major areas of adjustment affected by Intelligence – Socio-cultural Determinants : Family and Educational Determinants - Social Determinants. (10)

**Unit IV :** Emotional Determinants - Dominant Emotions, Emotional Expressions - Emotional Balance and Emotional Deprivation - Emotional Catharsis and Emotional Stress. (10)

**Unit V:** Personality Enrichment - Motivation and its Process-Life Skills for Personality –Development. (10)

**Book for Study:**

1. Cervone Daniel, Pervin. L.A, (2008), Personality Theory & Research, (10th Edn.), John Willey & Sons, Inc., United States of America.
2. Haslam Nick, (2007), Introduction to Personality and Intelligence, Sage Publications, New Delhi.
3. Hurlock, B. Elizabeth,(2007). Personality Development, Tata McGraw-Hill Publishing Company Limited, New Delhi.
4. Mangal S.K, (2008). An Introduction to Psychology, Sterling Publishing Private Limited.
5. Mischel Walter et al., (2008). Introduction to Personality, John Wiley and Sons, Inc. USA.
6. Rao K. Ramakrishna et al., (2008), Hand Book of Indian Psychology, Cambridge University Press India Pvt. Ltd., New Delhi.
7. Robert J. Gregory (2006). Psychological Testing, Pearsons Education, Inc, New Delhi.
8. Salkind J. Neil, (2004). An Introduction To Theories Of Human Development, Sage Publications, Inc, New Delhi.
9. Wallace. R. Harold & Masters Ann, (2008). Personality Development, Cengage Learning India Private Limited, New Delhi.
10. Calvin S. Hall Gardner Lindzey John B. Campbell (2007). Theories of Personality, Wiley India Pvt. Ltd, New Delhi

## 7. QUALIFICATION FILE SUMMARY

Qualification Title	Software Developer (SSC/Q0501)		
Body/bodies which will assess candidates	IT-ITeS Sector Skills Council NASSCOM (SSC NASSCOM)		
Body/bodies which will award the certificate for the qualification.	SSC NASSCOM		
Body which will accredit providers to offer the qualification.	SSC NASSCOM Presently, Accreditation is not prescribed; affiliation is one of the models.		
Occupation(s) to which the qualification gives access	Application Development		
Proposed level of the qualification in the NSQF.	7		
Notional Learning Hours	400 hours approx. (customisable as per learner background)		
Entry requirements / recommendations.	Bachelor's Degree in Computer Science or any related field		
Progression from the qualification.	As shown in the career map (attachment sl.no. 4)		
Planned arrangements for RPL.	<ul style="list-style-type: none"> <li>- Response to market forces for RPL</li> <li>- RPL assessments will be the same as our normal assessments.</li> <li>- MOUs / Agreement in place for institutions, Retail is work in progress</li> </ul>		
Formal structure of the qualification			
Title of unit or other component (include any identification code used)	Mandatory/ Optional	Estimated size (learning hours)	Level
<b>SSC/N0501 (Contribute to the design of software products and applications)</b>	<b>Mandatory</b>	<b>100</b>	<b>7</b>
<b>SSC/N0502 (Develop software code to specification)</b>	<b>Mandatory</b>	<b>100</b>	
<b>SSC/N9001 (Manage your work to meet requirements)</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9002 (Work effectively with colleagues )</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9003 (Maintain a healthy, safe and secure working environment)</b>	<b>Mandatory</b>	<b>25</b>	
<b>SSC/N9004 (Provide data/information in standard formats)</b>	<b>Mandatory</b>	<b>50</b>	
<b>SSC/N9005 (Develop your knowledge, skills and competence)</b>	<b>Mandatory</b>	<b>25</b>	