



QUALIFICATION FILE

Assistant Technician Information Technology

- ☐ Short Term Training (STT) ☒ Long Term Training (LTT) ☐ Apprenticeship
☐ Upskilling ☐ Dual/Flexi Qualification ☐ For ToT ☐ For ToA
☒ General ☐ Multi-skill (MS) ☐ Cross Sectoral (CS) ☐ Future Skills ☐ OEM

NCrF / NSQF Level: 3.5

Submitted By:

NETTUR TECHNICAL TRAINING FOUNDATION
23/24, II PHASE, PEENYA INDUSTRIAL AREA,
BENGALURU - 560058, KARNATAKA

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Section 1: Basic Details

1.	Qualification Name	Assistant Technician Information Technology	
2.	Sector/s	IT- ITeS	
3.	Type of Qualification: ☒ New ☐ Revised ☐ Has Electives/Options ☐ OEM	NQR Code & version of existing/previous qualification: (change to previous, once approved)	Qualification Name of existing/previous version: Assistant Technician Information Technology
4.	a. OEM Name b. Qualification Name (Wherever applicable)	NA	
5.	National Qualification Register (NQR) Code & Version (Will be issued after NSQC approval)	QG-3.5-IT-01986-2024-V1-NTTF	6. NCrF/NSQF Level: 3.5
7.	Award (Certificate/Diploma/Advance Diploma/ Any Other) (Wherever applicable specify multiple entry/exits also & provide details in annexure)	Certificate	
8.	Brief Description of the Qualification	The Candidate will be able to integrate office automation solutions with business processes. Able to develop simple software applications using C Program. Solve programming problems that involve data structures and algorithms The subjects covered in this Programme are – English, Mathematics, Applied Science, Computing System, Python Programming, Algorithm problem solving techniques and flowchart, Basics of Electrical and Electronics, Software Engineering, Data Structures using Python, Data Base Design and Development, Computer Networks, Employability Skill, Basics of Electrical and Electronics Lab, Office Solution Development Lab, Web Programming Lab, C - Programming Lab, SQL Server Lab, Data Structures with Python lab, Computer Networks Lab, OJT	

9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience:					
		S. No.	Academic/Skill Qualification (with Specialization - if applicable)			Required Experience (with Specialization - if applicable)	
		01	Minimum 10 th Pass OR 8th pass + 2 years ITI in following trades: Computer operator & programming assistant, Mechanic computer hardware, Multimedia & animation OR 8th pass + Level 3.0 in relevant trade			NA	
10.	Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	Total Credit – 40			11. Common Cost Norm Category (I/II/III) (Wherever applicable): NA		
12.	Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)	NA					
13.	Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)	☐ Offline ☐ Online ☒ Blended					
		Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT/Project Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)
		Classroom (offline)	600	390	90	-	1080
		Online	120	-	-	-	120
(Refer Blended Learning Annexure for details)							
14.	Aligned to NCO/ISCO Codes (if no code is available mention the same)	NCO Code – 2015/3512.9900, 2015/3514.0300					
15.	Progression path after attaining the qualification. (Please show Professional and Academic progression)	Professional Progression: After completion of 1 year, can work as Technician IT, Software Engineer, Desktop Support Engineer, Software Test Engineer, After Completion of 3 years of Full Time Programme and after 3 years of Industry Experience the Job holder can work as Software Developer, Web Developer, FullStack Developer, Test Engineer, Data Analyst and Quality Assurance Specialist. Academic Progression: Advance Certificate –Software Developer (Level 4.0), Diploma in Information Technology and Data Science, Post- Diploma, B VoC and B.Tech Degree Course in Relevant Areas.					
16.	Other Indian languages in which the Qualification &	Hindi					

	Model Curriculums are being submitted		
17.	Is similar Qualification(s) available on NQR-if yes, justification for this qualification	☐ Yes ☒ No URLs of similar Qualifications: NA	
18.	Is the Job Role Amenable to Persons with Disability	☐ Yes ☒ No If “Yes”, specify applicable type of Disability:	
19.	How Participation of Women will be Encouraged	Yes - Admission open to women candidates (30% seats reserved for women)	
20.	Are Greening/ Environment Sustainability Aspects Covered (Specify the NOS/Module which covers it)	☐ Yes ☒ No	
21.	Is Qualification Suitable to be Offered in Schools/Colleges	Schools ☐ Yes ☒ No Colleges ☐ Yes ☒ No	
22.	Name and Contact Details of Submitting / Awarding Body SPOC (In case of CS or MS, provide details of both Lead AB & Supporting ABs)	Name: Mr. R Rajagopalan Position in the Organization: Joint Managing Director Email: rg@nttf.co.in Tel. number: 080 - 28390215 Contact Number: 9844013448 Website: nttftrg.com	
23.	Final Approval Date by NSQC: 31 Jan 2024	Validity Duration: 3 years	Next Review Date: 01 Feb 2027

Section 2: Module Summary**NOS/s of Qualifications** (In exceptional cases these could be described as components)**Mandatory Module/ NOS/s:** Specify the training duration and assessment criteria at NOS/ Module level. For further details refer curriculum document. – In Annexure**Th.-Theory Pr.-Practical OJT-On the Job Man.-Mandatory Training Rec.-Recommended Proj. -Project**

Sl. No.	NOS/Module Name	NOS/ Module Code & Version	Core/ Non-Core	NCrF/ NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
Semester - 1																
1	Communication English	CP09101T , V1.0	Core	3.5	19	60	-	-	-	60	62.5	-	-	37.5	100	
2	Applied Mathematics – I	CP09102T , V1.0	Core	3.5		60	-	-	-	60	100	-	-	-	100	
3	Applied science	CP09103T , V1.0	Core	3.5		40	-	-	-	40	100	-	-	-	100	
4	Algorithm problem solving techniques and flowchart	CP09104T , V1.0	Core	3.5		100	-	-	-	100	100	-	-	-	100	
5	Basics of Electrical and Electronics	CP09105T , V1.0	Core	3.5		40	-	-	-	40	100	-	-	-	100	
6	Computing system	CP09106T , V1.0	Core	3.5		20	-	-	-	20	100	-	-	-	100	
7	Basics of Electrical and Electronics Lab	CP09106P , V1.0	Core	3.5		-	60	-	-	60	-	80	-	20	100	
8	Web Programming Lab	CP09108P , V1.0	Core	3.5		-	60	-	-	60	-	80	-	20	100	
9	Office Solution Development Lab	CP09109P , V1.0	Core	3.5		-	60	-	-	60	-	80	-	20	100	
10	C – Programming Lab	CP09110P , V1.0	Core	3.5		-	40	-	-	40	-	80	-	20	100	
11	Employability Skill	CP09111T , V1.0	Core	3.5		30	-	-	-	30	75	-	-	25	100	
Duration (in Hours)/ Total Marks					19	350	220	-	-	570	637.5	320	-	142.5	1100	
Semester – 2																
12	Python Programming	CP09206T , V1.0	Core	3.5		60	-	-	-	60	100	-	-	-	100	

13	Applied Mathematics – II	CP09207T, V1.0	Core	3.5	21	40	-	-	-	40	100	-	-	-	100	
14	Software Engineering	CP09208T, V1.0	Core	3.5		60	-	-	-	60	100	-	-	-	100	
15	Data Structures using Python	CP09209T, V1.0	Core	3.5		80	-	-	-	80	100	-	-	-	100	
16	Data Base Design and Development	CP09210T, V1.0	Core	3.5		60	-	-	-	60	100	-	-	-	100	
17	Computer Networks	CP09211T, V1.0	Core	3.5		40	-	-	-	40	100	-	-	-	100	
18	SQL Server Lab	CP09212P, V1.0	Core	3.5		-	60	-	-	60	-	80	-	20	100	
19	Data Structures with Python Lab	CP09213P, V1.0	Core	3.5		-	60	-	-	60	-	80	-	20	100	
20	Computer Networks Lab	CP09214P, V1.0	Core	3.5		-	50	-	-	50	-	80	-	20	100	
21	Employability Skill	CP09215T, V1.0	Core	3.5		30	-	-	-	30	75	-	-	25	100	
22	OJT	CP09216P, V1.0	Core	3.5		-	-	90	-	90	-	75	-	25	100	
Duration (in Hours) / Total Marks					21	370	170	90	-	630	675	315	-	110	1100	
Total					40	720	390	90	-	1200	1312.5	635	-	252.5	2200	

Elective Modules / NOS/s: NA

Sl. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/ Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
1.																
2.																
Duration (in Hours) / Total Marks																

Optional Modules / NOS/s: NA

Sl. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/ Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
1.																
2.																

Duration (in Hours) / Total Marks														
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Assessment - Minimum Qualifying Percentage

*Please specify **any one** of the following:*

Minimum Pass Percentage: *(Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear assessment)*

To pass the Qualification, the trainee should score Minimum 40% in each Theory module, 50% in each Practical module and 60% in Project.

Section 3: Training Related

1.	Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Diploma in relevant field with 3 years as trainer or industry experience B. Tech or BE with 2 years of trainer or industry experience
2.	Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Diploma in relevant field with 5 years as trainer or industry experience B. Tech or BE with 5 years of trainer + industry experience
3.	Tools and Equipment Required for Training	☒ Yes ☐ No (If "Yes", details to be provided in Annexure)
4.	In Case of Revised Qualification, Details of Any Upskilling Required for Trainer	NA

Section 4: Assessment Related

1.	Assessor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Diploma with 4 years as trainer or industry experience B. Tech or BE with 3 years as trainer or industry experience
2.	Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Diploma or B. Tech or BE with 2 years of experience
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Diploma with 4 years as trainer or industry experience B. Tech or BE with 3 years as trainer or industry experience
4.	Assessment Mode (Specify the assessment mode)	Blended theory (online and offline in the centre) and practical
5.	Tools and Equipment Required for Assessment	Same as for training ☒ Yes ☐ No (details to be provided in Annexure-if it is different for Assessment)

Section 5: Evidence of the need for the Qualification*Provide Annexure/Supporting documents name.*

1.	Research Reports: The following reports establish the Skilled Resource requirement for Computer Hardware and IT areas. 1. MSDE/ NSDC Report on Human Resources and Skill Requirements in the IT and ITes Sector (2013- 2017, 2017 – 2022) 2. Annual Report 2021-22 of Ministry of Electronics and Information Technology The above Reports predict Higher growth in IT Sector
2.	Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): Yes Report by India Brand EQUITY Foundation on Indian IT and BPM Industry-2022 The Report Forecast a higher growth in demand for Skilled Manpower with Computer and IT skills.
3.	Government /Industry initiatives/ requirement (Yes/No): Yes 1. Study on Job Role of the Future by Indian Institute of Skills. 2. National policy for skill Development and Entrepreneurship 2015 by MSDE has predicted skilled manpower requirement across key sectors by 2022 and has framed many initiatives.
4.	Number of Industry validation provided: 41
5.	Estimated nos. of persons to be trained and employed: 300 / year
6.	Evidence of Concurrence/Consultation with Line Ministry/State Departments: (Letter to be sent to the concerned ministry and copy attached) If “No”, why: Under Process

Section 6: Annexure & Supporting Documents Check List*Specify Annexure Name / Supporting document file name*

1.	Annexure 1: NCrf/NSQF level justification based on NCrf Level / NSQF descriptors (<i>Mandatory</i>)	Yes
2.	Annexure 2: List of tools and equipment relevant for qualification (<i>Mandatory, except in case of online course</i>)	Yes
3.	Annexure 3: Industry Validations Summary	Yes
4.	Annexure 4: Training & Employment Details	Yes
5.	Annexure 5: Blended Learning (<i>Mandatory, in case selected Mode of delivery is "Blended Learning"</i>)	Yes
6.	Annexure 6: Detailed Assessment Criteria (<i>Mandatory</i>)	Yes
7.	Annexure 7: Assessment Strategy (<i>Mandatory</i>)	Yes
8.	Annexure 13: Multiple Entry-Exit Details (<i>Mandatory, in case qualification has multiple Entry-Exit</i>)	No
9.	Annexure: Acronym and Glossary (<i>Optional</i>)	Yes
10.	Supporting Document: Model Curriculum (<i>Mandatory – Public view</i>)	Digital content available to trainees through Edusquares ERP (Will be made public after the qualification is approved) (Annexure 8)
11.	Supporting Document: Career Progression (<i>Mandatory – Public view</i>)	Yes (Annexure 9)
12.	Supporting Document: Occupational Map (<i>Mandatory</i>)	Yes (Annexure 11)
13.	Supporting Document: Assessment SOP (<i>Mandatory</i>)	Yes (Annexure 10)
14.	Supporting Document: Key Learning Outcome	Yes (Annexure 12)
15.	Any other document you wish to submit:	No

Annexure 1: Evidence of Level

NCrF/NSQF Level Descriptors	Key requirements of the job role/ outcome of the qualification	How the job role/ outcomes relate to the NCrF/NSQF level descriptor	NCrF/NSQF Level
Professional Theoretical Knowledge/Process	Explain to design efficient algorithms and data structures to solve problems. Describe the basic concepts of computer hardware and software. Describe computer architecture, operating systems, and programming languages. Describe about the various levels of SDLC. Explain about the efficient ways of organizing and managing data.	Identify the Electrical safety and protective devices. Perform Mathematical calculations related to IT and Data Science. Processing data and producing meaningful information to support various applications and users. Systematically design, build, test, deploy, and maintain high-quality software solutions to meet specific requirements. Ability to solve programming problems that involve data structures and algorithms. Ability to ensure that data is organized in a manner that supports various applications and enables efficient data retrieval and manipulation.	3.5
Professional and Technical Skills/ Expertise/ Professional Knowledge	Ability to read circuit diagrams. Identify the Electrical and Electronic components and their values. Learn to create web applications using programming languages and tools that are specifically designed for the web. Learn to use computer systems and software to automate and streamline various office tasks and processes. Learn to create C programs for simple Engineering applications.	Perform different types of Electrical wirings. Assembling of Electronics components. Able to create dynamic and interactive web pages. Able to integrate office automation solutions with business processes. Able to develop simple software applications using C Program Solve programming problems that involve data structures and algorithms.	3.5

	Able to develop simple Python programming. Can design and develop networks and configure network devices with IP addressing. Learn about SQL Server architecture and data management.	Able to design and implement databases that meet the requirements of users and stakeholders using MS SQL Server. Able to troubleshoot network problems using tools such as ping, traceroute, and Wireshark.	
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	Describe good behaviour and work ethics. Explain constitutional values. Read, write and comprehend English Language. Communicate and expressive.	Demonstrate responsible behaviour, good work culture, valued citizens of the country. Perform day to day activities effectively, report day to day happenings from time to time, and write official / personal communication to the superiors.	3.5
Broad Learning Outcomes/Core Skill	Problem-solving techniques for basic aspects of computer systems. Develop web applications.	Able to create databases that efficiently store and manage data, provide fast and accurate query responses, and ensure data integrity and security.	3.5
Responsibility	Aware of Personal/Industrial goals Adapt to changes in the work area.	Work with caution and with due diligence to safety. Advocate safety to peers. Can work with minimum supervision.	3.5

Annexure 2: Tools and Equipment (Lab Set-Up)
Tools and Equipment requirement for a batch of 30 Trainees
Electronics Lab

Sl. No.	Equipment	Specification	Quantity
1	Digital Oscilloscope	No of Channels - 2, Bandwidth: DC - 30 MHz	10
2	Variable Regulated Power supply	0-30V/2A	10
3	Dual - Fixed Power Supply	15-0-15 V/2A	10
4	Function Generator	Frequency Range: 0.3 Hz to 3 MHz, Functions: Sine, Square, Triangle, DC Sweep	10
5	Digital Trainer Kit	Fixed +5V/ 1Amp, 16pin ZIF Socket, Logical switch with I/O Indicators, 4mm patch cords with short circuit and Overload Protection.	10
6	Electronics Work Bench	To be Fabricated	3

Computer Hardware Maintenance and Networking Lab

Sl. No.	Equipment	Specification	Quantity
1	Crimping Tool	Modular Plug Crimper	3
2	Screwdriver Set		3
3	Star Screwdriver Set		3
4	Cutting Plier		3
5	LAN Tester		3
6	Wire Stripper		3
7	Soldering Iron with Kit	25 W	3
8	Digital Multimeter	3 ½ digits display	3
9	Network Switch	8 ports	2
10	Router	Wi-Fi router	1
11	ESD Gloves		3
12	Punching Tool		1

Software Requirements

Sl. No.	Software details	Quantity
1	Office 365 - Licensed version in Laptops	
2	SQL Server Management Studio2019, SQL Server Engine 2012 – Developer Version (Latest)	1
3	SQL Server Management Studio 2019, CAL License – 10 users	1
4	Turbo C Compiler - Open source	
5	Anaconda PYTHON – Open source	
6	TINKERCAD – Open source	
7	Packet Tracer 8.1 - Academic support centre	
8	All Browser – Open source	

Note:

- The Tools and Equipments and other lab facilities are shared between Qualifications and batches.
- During admission the trainees are supplied with Laptop and toolkit.

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. White board
2. Projector with screen / Smart TV
3. Laptop / computer

Annexure 3: Industry Validations Summary

Provide the summary information of all the industry validations in table. This is not required for OEM qualifications.

Sl. No.	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile (if available)
1	Anvation Lab	Mr. Alok Pugalia		Bangalore	8297188867	alok.pugalia@anvationlabs.com	
2	Godigit	Mrs. Deepthy		Bangalore	7219166216	deepthy.m@godigit.com	
3	Lucidimaging	Mrs. Vidhya		Bangalore	7619211007	vidhya@lucidimaging.in	
4	Applied Materials	Mr. John		Bangalore	8066283840 338636327	John_Kumar@contractor.amat.com	
5	Thought works India	Mr. Ganesh		Bangalore	8754491374	stepchennai@thoughtworks.com	
6	Samsung	Mr. Sumit		Bangalore	8826363651	sumit.premi@samsung.com	
7	By tech India Pvt Ltd	Mr. Murali		Bangalore	7760965733	hadmin.blr@bytechindia.com	
8	Unibiz	Mrs. Prachi		Bangalore	080-40431501	Prachih@in.unibiz.com	
9	Aliment Software Technologies	Mrs. Jayanthi		Bangalore	9900179294	jayanthi@alimentglobal.com	
10	Happiest minds	Mr. Balaji		Bangalore	8061960731		
11	Uncanny Vision	Mr. Kiran		Bangalore	9743607299	kiran.sonar@uncannyvision.com	
12	Tosibha	Mr. Sermaichamy		Bangalore	8884575263	seemai@wimerasys.com	
13	Smart Ice	Mr. Ravikumar		Bangalore	8867106900		
14	Diya systems	Mr. Srinivas bhat		Bangalore	7022627311	shrinivas.b@glowtouch.com	
15	HGS	Mr. Thomotharan		Bangalore	9743501143		
16	Tata Elxsi Ltd	Ms. Chaitra.M		Bangalore	8022979687	chaithram@tataelxsi.co.in	
17	Pari automation	Mr. Dheraj		Bangalore	8380097138	dhirajc@parirobotics.com	
18	National Instruments	Mr. Harsha Thammaiah		Bangalore	9591997400	niranjan.bv@ni.com	
19	L&T	Mr. Samir Mahato		Bangalore	9740800907	Samir.Mahato @LntTechservices.com	
20	Shiksha-infotech	Mrs. Jyothi		Bangalore	9976048657	jyoti.katare@shikshainfotech.com	
21	Everest IMS	Mrs. Soumya		Bangalore	9663375546	hr@everest-ims.com	
22	Quali test	Mr. Mathew		Bangalore	9620774897	mathai.mathe w@qualitestgroup.com	
23	Uncanny Vision Solutions Pvt. Ltd.	Mr. Kiran		Bangalore	9743607299	saroj@uncannyvision.com	
24	Covalense systems	Mr. Ravi V		Bangalore		ravi.veeraswamy@covalensedigital.com	

25	Nxtgen	Mr. Suveen		Bangalore	9886302009	suveen@nxtgen.com	
26	Frontier Software	Mrs. Renee		Bangalore	9844244299	renee@frontier.in	
27	Tarams Technologies	Mr. Prashanth Murunnikara		Bangalore	9886488014	prasanth.murunnikara@tarams.com	
28	Computer Sciences Corporation India Pvt Ltd	Mr. Arham Husain		Bangalore	9980076150	ahusain2@csc.com	
29	Melange Systems Private Limited	Mr. Sairam Kummara/Mr.vijay		Bangalore		sairam.kummarara@melangesystems.com	
30	Tata elxsi Ltd	Ms. Chaitra.M		Bangalore	9008033720	chaithram@tataelxsi.co.in	
31	Skypro Technologies	Mr. Hussain		Bangalore	9886886884	hussain@skyprotechnologies.com	
32	Kites Softwares Pvt Ltd	Mr. Sreejith		Bangalore	9916320857	sreejith@kitesnet.com	
33	Terrance System Pvt Ltd	Mr.Nandan		Bangalore	09846700726, 0484-2345686	nandan.ajeton@gmail.com	
34	Future Focus Infotech	Mr.Sidhartha Ahiuwalia		Bangalore	9845029428	sidhartha@focusite.com	
35	Virtual Technologies	Mr.P.Viswanathan		Bangalore	9845481482	virtualtech@vsnl.net	
36	Baryons Software Solutions	Ms.Shweta		Bangalore	9448352924, 080-25563591	shweta@baryonssoftsolutions.com	
37	Aliment Software Technologies	Mrs.Jayanthi		Bangalore	9886038812	jayanthi@alimentglobal.com	
38	Acropetal Technologies	Mrs.Vandana		Bangalore	2536 6478 / 2554 2904 / 2554 4348	vandana.rao@acropetal.com	
39	Delopt (Deepthi Research)	Mrs.Seema		Bangalore	40870707	seema@delopt.co.in	
40	Thought Works	Mr.Rajani,Mr.Ganesh		Bangalore	9845094553	stepchennai@thoughtworks.com , stepadvisor@thoughtworks.com	
41	Collabera technologies	Mrs.Devaki S		Bangalore	0-89391-82320,+91 44 49018400	devaki.selvarangam@collabera.com	

Annexure 4: Training & Employment Details**Training and Employment Projections:** *Data to be provided year-wise for next 3 years*

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
2023	150	More than 2000	75	More than 750	-	
2024	250	More than 2000	125	More than 1250	-	
2025	400	More than 2000	200	More than 2000	-	

Training, Assessment, Certification, and Placement Data for previous versions of qualifications: (Previous years)

Qualification Version	Year	Total Candidates				Women				People with Disability			
		Trained	Assessed	Certified	Placed/ Higher Studies	Trained	Assessed	Certified	Placed/ Higher Studies	Trained	Assessed	Certified	Placed
	2017- 2020	31	26	25	25	11	11	10	10	NIL			
	2018 - 2021	53	49	47	47	16	16	15	15				
	2019 - 2022	74	68	62	62	25	25	24	24				

*Applicable for revised qualifications only, data to be provided year-wise for past 3 years.***List Schemes in which the previous version of Qualification was implemented:**

1st year of Three years Full Time Programme

Content availability for previous versions of qualifications:
☐ Participant Handbook
 ☐ Facilitator Guide
 ☒ Digital Content
 ☐ Qualification Handbook
 ☒ Any Other: In NTTF LMS and Edusquares ERP

Languages in which Content is available: English.

Annexure 5: Blended Learning**Blended Learning Estimated Ratio & Recommended Tools:**

Refer NCVET “Guidelines for Blended Learning for Vocational Education, Training & Skilling” available on:

<https://ncvet.gov.in/sites/default/files/Guidelines%20for%20Blended%20Learning%20for%20Vocational%20Education,%20Training%20&%20Skilling.pdf>

Sl. No.	Select the Components of the Qualification	List Recommended Tools – for all Selected Components	Offline : Online Ratio
1	Theory/ Lectures - Imparting theoretical and conceptual knowledge	Physical classroom, LMS, Web based	80:20
2	Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	Physical classroom, Workshops, Mock sessions, Case study, Role play, Group Discussions, LMS	85:15
3	Showing Practical Demonstrations to the learners	Workshop / Lab, Video recording, Simulators	70:30
4	Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	Workshop machines, Lab equipment, Simulators, Mini projects, Project	70:30
5	Tutorials/ Assignments/ Drill/ Practice	Class assignments, LMS assignments, Simulators	60:40
6	Proctored Monitoring/ Assessment/ Evaluation/ Examinations	Physical classroom, Labs, Workshop, Quiz tests, Project	75:25
7	On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	Industry	100:00

Annexure 6: Detailed Assessment Criteria

Detailed assessment criteria for each NOS/Module are as follows:

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Semester -1					
Communication English	Parts of Speech-Form meaningful Sentences	12.5	-	-	-
	Verb Tenses-Use of right verb and tenses	10	-	-	5
	Language and Skill Development Exercises –Exercises on writing sentences	10	-	-	-
	Writing Skills-Writing letters and reports	15	-	-	-
	Sentences-Forming right sentences	15	-	-	10
	Language Skill Development-Oral communication skills	-	-	-	22.5
	Total Marks	100			
Applied Mathematics -1	Fundamentals of Mathematics-Solving arithmetical problems	20	-	-	-
	Matrices and Determinants-Solving Problems	20	-	-	-
	Complex Numbers -Understanding Complex Numbers	10	-	-	-
	Trigonometry-Application in Engineering	20	-	-	-
	Differential Calculus-Fundamentals	15	-	-	-
	Statistics-Application in Engineering	15	-	-	-
	Total Marks	100			
Applied Science	Physical World-Physical quantities and units	10	-	-	-
	Force, Motion and Energy –Definition and units	10	-	-	-
	Composition and Resolution of Forces-Resolving Forces	8	-	-	-
	Friction-Definition, Application in Engineering	8	-	-	-
	Equilibrium of Forces-Determining equilibrium of forces	8	-	-	-
	Centre of Gravity and Moment of Inertia-Determining for different objects	12	-	-	-
	Properties of Solids and Fluids- Properties of Solids and Fluids-	12	-	-	-
	Heat-Definition, Unit	12	-	-	-
	Industrial Chemistry-Introduction to pollution, Corrosion	12	-	-	-
	Renewable Energy-Introduction to wind and solar energy	8	-	-	-
	Total Marks	100			
Algorithm problem solving Techniques and Flow chart.	Introduction to Algorithm –Develop Algorithms and Flowcharts	5	-	-	-
	Method for Developing an Algorithm –Types and Application	25	-	-	-
	Pseudo code (or Program Design Language)- Types and Application	25	-	-	-
	Problem solving-Techniques	25	-	-	-
	Programming using C	20	-	-	-

	Total Marks	100			
Basics of Electrical and Electronics	Atomic Structure and Introduction to electron current-Basic electron theory, ohms law, Concepts of ideal voltage and current source	10	-	-	-
	Resistors and Kirchhoff's Law-Applications of KVL and KCL, Resistors Series and Parallel	10	-	-	-
	Capacitors- Principles of working, capacitors series and parallel	10	-	-	-
	Number Systems –Conversion of different types of number systems and arithmetic	20	-	-	-
	Semiconductor Diodes, Zener Diodes and LED-. Application and characteristics	25	-	-	-
	Digital Fundamentals-Types and Applications of Logical gates	25	-	-	-
	Total Marks	100			
Computing Systems	Introduction to Computer Systems- Verifying the parts and types of Computer Systems.	25	-	-	-
	Functional Components-Verifying Functions of components, Hardware. Peripherals and System Building	25	-	-	-
	Software Installation-Verifying the Software, Installation and Configuration, Alternative Operating System, System Testing, Software Maintenance	25	-	-	-
	Software Testing-Testing and verifying of Hardware Maintenance, File Management.	25	-	-	-
	Total Marks	100			
Employability Skills	Introduction to Employability skills	20	-	-	5
	Behavior skills	20	-	-	5
	Constitutional Values and Citizenship	35	-	-	15
	Total Marks	100			
Basics of Electrical and Electronics Lab	Familiarization of Toolkit, CRO, Function Generator, Digital Millimeter	-	15	-	-
	Colour coding of resistor	-	10	-	-
	Verification of Ohm's law, KVL and KCL	-	10	-	4
	Rectifiers - Half Wave rectifier and center-tapped Full Wave rectifier	-	10	-	4
	Familiarization of Logic Gates, Characteristics of diode and zener diode	-	15	-	4
	Verification of Half adder and full adder circuit	-	10	-	4
	Simplification of given Boolean equation using Karnaugh Map	-	10	-	4
	Total Marks	100			
Web Programming Lab	Creating HTML Document, Ordered List ,Definition List	-	10	-	-
	Create an HTML document to implement an Image map. Create a HTML document and give different colors for text,	-	10	-	5
	Create an HTML document to create the following tables (Table with caption, Headings, Rowspan, Colspan, Cellpadding, Cellspacing, Add background color, background image in a table, Border properties)	-	15	-	5

	Create a HTML document to include CSS background properties.	-	10	-	5
	Create a HTML document to implement CSS pseudo-class	-	10	-	5
	Create a HTML document to include CSS Positioning properties	-	10	-	-
	Create a HTML document to implement CSS pseudo-element.	-	15	-	-
	Total Marks	100			
Office Solutions Development Lab	Application Software and Business Processes -Types, An Introduction to End-User Software Development-Types	-	15	-	-
	Verification of Advanced Features and Functions of the Microsoft Office Suite	-	15	-	-
	Verifying the Advanced Features and Functions of Microsoft Access, Excel and Word	-	15	-	5
	Understanding of VBA and Macros, Using Macros in Microsoft Word	-	15	-	5
	Using Macros in Microsoft Access,	-	10	-	5
	Using Macros in Microsoft Excel	-	10	-	5
	Total Marks	100			
C-Programming Lab	Writing of basic C Program structure	-	15	-	-
	Writing of basic C Program addition, checking of positive, Oval Etc.,	-	15	-	5
	Writing of basic C Program Fibonacci series, Reversing a number	-	15	-	5
	Writing of basic C Program for Prime Numbers	-	20	-	5
	Writing of basic C Program for loop, while loop	-	15	-	5
	Total Marks	100			
Semester -2					
Python Programming	Python Data types and Operators -Understanding of data types	10	-	-	-
	Python Program Flow Control –writing of flowchart	15	-	-	-
	Python Functions, Modules and Packages -Use of python function	20	-	-	-
	Exception Handling -Using in Program	15	-	-	-
	CGI Programming- Using in Program	15	-	-	-
	Databases -Understanding of Data Bases	10	-	-	-
	Web Scraping-Understanding of Web Scrapping	15	-	-	-
	Total Marks	100			
Applied Mathematics 2	Analytical Geometry-Solve the application-level problems in Analytical geometry.	15	-	-	-
	Integral Calculus-Solve the application-level problems in Integral calculus.	15	-	-	-
	Correlation and Regression-Apply statistical tools in communication theory	25	-	-	-
	Probability and Distribution-Apply statistical tools in communication theory	25	-	-	-
	Data Science-Perform data analytics and analysis the results.	20	-	-	-
	Total Marks	100			
Software Engineering	Software Engineering Overview -Types of software’s and understanding of the background	10	-	-	-

	Software Development Life Cycle -Types of Models, advantages and disadvantages	30	-	-	-
	Requirement Engineering – Significance and Uses	15	-	-	-
	Software Design -Types and application	15	-	-	-
	Coding -Developing a code for the project	15	-	-	-
	Software Testing & Git Hub-Testing of the software	15	-	-	-
	Total Marks	100			
Data structures Using Python	Abstract Data Types	5	-	-	-
	Arrays	25	-	-	-
	Searching	15	-	-	-
	Linked Structures	20	-	-	-
	Stacks	10	-	-	-
	Queues	10	-	-	-
	Recursion	10	-	-	-
	Binary Trees	5	-	-	-
	Total Marks	100			
Database Design and development	Key Concepts in Databases and Database Development	5	-	-	-
	Enhancing Design 1	15	-	-	-
	Enhancing Design 2	15	-	-	-
	Data Retrieval 1	15	-	-	-
	Data Retrieval 2	10	-	-	-
	Physical Design 1	10	-	-	-
	Physical Design 2	10	-	-	-
	Physical Design 3	10	-	-	-
	Physical Design 4	10	-	-	-
	Total Marks	100			
Computer Networks	Introduction to Networks-Understanding of types	5	-	-	-
	Network Protocols and Standards-Understanding of Protocols and Standards	15	-	-	-
	Wireless Networking Standards-Understanding of Networks	15	-	-	-
	Network Topology and Architecture - Analyzing and Understanding	15	-	-	-
	Network Media and Connectors-Understanding of Types and uses	15	-	-	-
	Network Hardware-Identification and Understanding of hardware	10	-	-	-
	Wireless Network Hardware-Understanding of wireless networks	10	-	-	-
	Security Software-Uses and Types	05	-	-	-
	Firewalls-Types and Uses	05	-	-	-
	Network and Server Software-Understanding of the servers and Services	05	-	-	-
	Total Marks	100			

Employability Skills	Effective learning skills	20	-	-	5
	English skills-Writing Skills	20	-	-	5
	Communication skills-Effective Oral and Written Communication	35	-	-	15
	Total Marks	100			
SQL Server Lab	Creating Databases, Modify Databases, database, and files Viewing a Database	-	10	-	5
	Renaming a Database, Deleting Database, files groups	-	15	-	5
	Creating tables with different Data types, Altering the table	-	15	-	5
	Verification of Database Attributes (join, Queries, Mathematical Functions)	-	15	-	
	Checking Loop and Control Statements, Explicit Transaction	-	15	-	5
	Implementing Indexes with different types of indexes	-	10	-	-
	Total Marks	100			
Data Structure with Python Lab	Basics Python Programs, Checking Python Program Flow Control	-	10	-	5
	Verification of Functions, Modules and Packages Programs in Python	-	20	-	5
	Checking file Operations and Exception Handling	-	20	-	5
	Checking Regular Expressions	-	10	-	-
	Verification of Stacks, Queues, Recursion Programs	-	10	-	5
	Creating Program Binary Trees and search Trees	-	10	-	-
	Total Marks	100			
Computer networks Lab	Configuring Secure Passwords and SSH	-	10	-	5
	Configuring IPv4 and IPv6 Static Routers and VLANs	-	10	-	-
	Configuring Switch and Router	-	15	-	5
	Creating DHCP and DNS	-	15	-	5
	Verifying the Connection of Network Topology	-	10	-	-
	Configuring Secure Passwords and SSH	-	10	-	5
	Configuring IPv4 and IPv6 Static Routers and VLANs	-	10	-	-
	Total Marks	100			
OJT	On the Job Training in the relevant sector	-	75	-	25
	Total Marks	100			

Annexure 7: Assessment Strategy

1. ASSESSMENT STRATEGY

The Criteria for assessment is based on Modules, and. will be assigned marks proportional to its importance.

The assessment for the semester-based qualification is carried out by conducting Formative and Summative Assessments.

Regarding Theory – Sessional is based on Intermediate Tests, File / Assignments & Viva –voce: Semester end examination wherein for each Individual batch, A&E dept. at Corporate office, Bangalore creates unique question papers for theory part as well as practical – Theory comprises MCQ and descriptive questions drawn randomly from Question Bank.

Regarding the practical part, the experiments/ exercises are performed by the trainees during the LAB Hours and the trainees are allowed to record the learning of it which will be carried as their Record Marks & one Lab Test and semester end examination. Semester end examination is outcome-based experiments/ exercises of the course will be given to trainees to perform and based on the performance the mark will be awarded. The passing criteria is based on practical's performance, viva or oral exam, Test and final semester end examination.

Theory and practical Examinations are carried out by Examiners under the overall supervision of the Assessment and Evaluation Dept.

Evaluation of Theory and Practical examination is carried out by the Trained Assessors (NTTF faculty members) under the supervision of Shopfloor Manager / senior faculty in a fair manner as per the assessment criteria set by A&E dept. of NTTF.

The Tabulation and processing of results shall be carried out under EDUSQUARE campus Software.

Assessment comprises the following components:

- Job carried out in Labs / workshops
- Record book
- ONLINE Examination
- Answer sheet of assessment
- Viva-voce
- Semester end examination
- ON-THE-JOB training
- Tech Talk / Shop Talk
- Extracurricular and Co-curricular Activities
- Projects
- Attendance and punctuality

2. ASSESSORS

Evaluation of Theory & Practical examination is carried out by the Trained Assessors (NTTF faculty members) in a fair manner as per the assessment criteria set by A&E dept. of NTTF.

Assessors / Faculties are trained from time to time to upgrade their skills on various aspects such as conduct of assessments, teaching methodology etc.

3. ELIGIBILITY TO APPEAR FOR THE EXAM

- The candidates should have an attendance of a minimum 90% in a semester.
- The candidates should have secured minimum Sessional Marks in Theory & Practical

4. PASS CRITERIA

To pass the Qualification, every trainee should score a minimum of 40% in each Theory and 50% in each Practical and 60% in OJT / Projects.

5. RESULTS AND CERTIFICATION

The assessment results are backed by evidence collected by assessors. Successful trainees are awarded the Diploma certificate by NTTF Corporate Office.

6. ON THE JOB

1. The candidate must score 60% to successfully complete the OJT.
2. Tools of Assessment that will be used for assessing whether the candidate is having desired skills and etiquette of dealing with customer needs and requirements and perform Soft Skills effectively:
 - Videos/photos of Trainees during OJT
 - Suggestions / Kaizens from trainees
 - Rewards and appreciation to trainees as applicable
3. Assessment will ensure the following:
 - Effective engagement with the customers
 - Understand the working of various tools and equipment.

7. SYSTEM OF GRADING

An alphabetical letter grade will be assigned for each subject based on the total marks scored in the sessional and end semester examination.

Equivalent Grade Points are used: A = 9.5, B = 8.5, C = 7.5, D = 6.5, E = 5.5, F = 0 (FAIL), I = Incomplete (MP/AB/SP) Supplementary cleared = E

The student will be issued Semester Grade Report calculating SGPA / CGPA as follows:

$$\text{Semester Grade Point Average (SGPA)} = \frac{\sum (\text{No. of Credits} \times \text{Grade Point})}{\sum (\text{No. of Credits for the Program})}$$

$$\text{Cumulative Grade Point Average (CGPA)} = \frac{\sum (\text{SGPA} \times \text{total Credits of each semester})}{\text{Total credits Acquired}}$$

Awarding of class:**a) Awarding of class for semester:**

SGPA	Classification
8.5 and above	First class with distinction
7.5 to 8.4	First class
6.0 to 7.4	Second class
5.5 to 5.9	Pass class

b) Awarding of class for Programme:

First class with Distinction	Should have scored CGPA 8.5 and above and should have cleared all Semesters in the first attempt.
First class	Should have scored CGPA 7.5 to 8.4
Second class	Should have scored CGPA 6.0 to 7.4
Pass class	5.5 to 5.9

8. ASSESSMENT TOOLS

All assessment and evaluation activities are carried out under EDUSQUARE campus software which includes Formative assessment and Summative assessment.

- EDUSQUARE : NTTF ERP/CRM used for academic purpose EDUSQUARE erp.nttftrg.com used as SaaS (software as a service) mode
- Digital Valuation System: Digital Valuation system is an innovative software solution which automates manual evaluation and help institutions to minimize the time, effort and human errors in the entire valuation process.
- Remote proctoring which includes AI based Auto Proctoring, Student authentication and Multi secure Exam browser as and when the need arises.

List of ICT Tools:

Desktop and laptops

Interactive White Board

CCTV Camera

Pen Drive

Video Conferencing

Biometric

Edusquare: NTTF ERP/CRM used for academic purpose Edusquare erp.nttftg.com used as SaaS (Software as a Service) mode

Networking: Includes Wireless access Points, Switches, Routers, Controllers across all NTTF

AWS Cloud: AWS Cloud computing platform to host NTTF website www.nttftg.com and used as backup storage.

Firewall: Network security device protecting our network by filtering traffic and blocking outsiders.

Microsoft (O365/M-365) – Email/office (Word, Excel, PPT, One Drive for all staff/students are provided using Microsoft O365 MDM (BYOD) policies implemented through M365 used as SaaS

Annexure 8: Model Curriculum

Semester - 1		Module Name: Communication English CP09101T	Module Code:
Sl. No.	Module Details	Theory Hours 60	
1	Parts of Speech	20h	
2	Verb Tenses	8h	
3	Language and Skill Development Exercises	15h	
4	Writing Skills	4h	
5	Sentences	4h	
6	Language Skill Development	9h	
Semester -1		Module Name: Applied Mathematics-1	Module Code: CP09102T
Sl. No.	Module Details	Theory Hours 60	
1	Fundamentals of Mathematics	6h	
2	Matrices and Determinants	11h	
3	Complex Numbers	9h	
4	Trigonometry	14h	
5	Differential Calculus	12h	
6	Statistics	8h	
Semester -1		Module Name: Applied Science	Module Code: CP09103T
Sl. No.	Module Details	Theory Hours 40	
1	Physical World	2h	
2	Force, Motion and Energy	6h	
3	Composition and Resolution of Forces	3h	
4	Friction	3h	
5	Equilibrium of Forces	5h	
6	Centre of Gravity and Moment of Inertia	5h	
7	Properties of Solids and Fluids	4h	
8	Heat	4h	
9	Industrial Chemistry	4h	
10	Renewable Energy	4h	
Semester - 1		Module Name: Algorithm Problem Solving Techniques and Flowchart	Module Code: CP09104T
Sl. No.	Module Details	Theory Hours 100	
1	Introduction to Algorithm	10h	
2	Method for Developing an Algorithm	30h	
3	Pseudocode (or Program Design Language)	10h	
4	Problem Solving - Introducing Computational Thinking	30h	
5	Programming using C	20h	

Semester - 1		Module Name: Basics of Electrical and Electronics	Module Code: CP09105T
Sl. No.	Module Details		Theory Hours 40
1	Atomic Structure and Introduction to electron current		5h
2	Resistors and Kirchhoff's law		4h
3	Capacitors		3h
4	Fundamentals of AC		2h
5	Basic Semiconductor and P.N. junction Theory		5h
6	Semiconductor Diodes, Zener Diodes and LED		6h
7	Number Systems		6h
8	Digital Fundamentals		9h
Semester - 1		Module Name: Computing System	Module Code: CP09106T
Sl. No.	Module Details		Theory Hours 20
1	Introduction to Computer Systems		2h
2	Environments, Functions of components		2h
3	Hardware		2h
4	Peripherals and System Building		2h
5	Software, Installation and Configuration		2h
6	Alternative Operating Systems		1h
7	System Testing		3h
8	Software Maintenance		2h
9	Hardware Maintenance		2h
10	File Management		2h
Semester - 1		Module Name: Basic Electrical and Electronics Lab	Module Code: CP09106P
Sl. No.	Module Details		Practical Hours 60
1	Familiarization of Tool Kit		3h
2	Soldering Practice		3h
3	Familiarization of CRO		3h
4	Familiarization of Function Generator, Digital Multimeter		3h
5	Color coding of the resistor		3h
6	Verification of Ohm's law, KVL and KCL		3h
7	Study of diode data sheet and V.I Characteristics of diodes		3h
8	Study of Zener data sheet and V.I Characteristics of Zener diodes		3h
9	Rectifiers-Half-wave and center-tapped full-wave rectifier		3h
10	Bridge Rectifier with Capacitor filter		3h
11	Familiarization of Logic Inverter, OR gate (TTL)		3h
12	Familiarization of AND, NAND Gate (TTL)		3h

13	Familiarization of NOR, EXOR Gates (TTL)	3h
14	Universal Property of NAND, NOR Gates (TTL)	3h
15	Verification of Half adder circuit	3h
16	Verification of Full adder circuit	3h
17	Simplification of given Boolean equation using Karnaugh Map(2 Variables)	6h
18	Simplification of given Boolean equation using Karnaugh Map(3 Variables)	6h
Semester - 1 Module Name: Web Programming Lab Module Code: CP09108P		
Sl. No.	Module Details	Practical Hours 60
1	Create a HTML document using the following tags <html>, <head>,<title>,<body>	4h
2	Create a HTML document which contains the following properties: Headings, paragraphs and breaks, divisions and centering quotations, preformatted text, inserted and deleted text, character entities, comments, block level elements-block quote tag, text -level elements, font tags.	2h
3	Create a HTML document for creating lists-ordered list, unordered list and definition list.	2h
4	Create a HTML document to implement nested list	2h
5	Create 6 HTML pages, make one as main and make other 5 as subpages. Create links in main page to link to all subpages and create link in all subpages for moving throughout the pages and to come back to main page	4h
6	Create an html document containing images by using tag.	2h
7	Create an HTML document to implement Image map.	2h
8	Create a HTML document and give different colors for text, set background color, background image.	2h
9	Create an HTML document to create the following tables (Table with caption, Headings, Row span, Col span, Cellpadding, Cells pacing, add background color, background image in a table, Border properties)	4h
10	Create an HTML document and divide the page into frames use vertical frame and horizontal frame, include pages in all the frames,give links in the page and open the link in the frame, use target	2h
11	Create an HTML document to implement inline frame	2h
12	Create an HTML document and attach audio, video, animation, PDFformat using <embed>	2h
13	Create an HTML document add a form in that and add form elements such as, field set, legend, labels, text box, text area, radio button, check box, drop down list, select menu, file uploads, submit button, reset button	4h
14	Create a HTML document to adding style to a document (use different selectors)	4h
15	create a HTML document for adding style to a document. a) Inline style sheet b) Embedded style sheet c) External style sheet d) Import e) Link	2h
16	Create a HTML document to include CSS background properties.	2h

17	Create a HTML document to include CSS Text properties	2h
18	Create a HTML document to include CSS list properties	2h
19	Create a HTML document to include CSS fancy Table	2h
20	Create a HTML document to include CSS Box Model	2h
21	Create a HTML document to include CSS Border properties	2h
22	Create a HTML document to include CSS Outline	2h
23	Create a HTML document to include CSS Positioning properties	2h
24	Create a HTML document to implement CSS pseudo-class. Add different colors to a hyperlink, add other style to hyperlinks	2h
25	Create a HTML document to implement CSS pseudo-element. Make the first letter and first line special.	2h

Semester - 1		Module Name: Office Solutions Development Lab	Module Code: CP09109P
Sl. No.	Module Details	Practical Hours 60	
1	Application Software and Business Processes	4h	
1.1	Define Application Software	1h	
1.2	Application Software Brands	1h	
1.3	Range of Application software	1h	
1.4	Other Types of Application Software	1h	
2	An Introduction to End-User Software Development	3h	
2.1	Improvements to Application Software Functions	1h	
2.2	Improvements to Business Processes	1h	
2.3	Software Display Design Elements	1h	
3	An Introduction to the Advanced Features and Functions of the Microsoft Office Suite	4h	
3.1	Advanced Features and Functions and Business Processes	1h	
3.2	Date and Time Functions in Excel	2h	
3.3	Evaluating Interface Design		
3.4	Data Entry and Validation		
3.5	Evaluation of Elements of the Microsoft Office Interface	1h	
4	Advanced Features and Functions of Microsoft Access, Excel and Word	10h	
4.1	Word, Excel, Access – Detail	2h	
4.2	Access, Excel and Word features and functions	2h	
4.3	Table Creation	1h	
4.4	Excel LOOKUP function	1h	
4.5	Excel conditional formatting	1h	
4.6	Pivot Table	1h	
4.7	Mail merge stages of development	1h	

4.8	Mail Merge	1h
5	An Introduction to VBA and Macros	12h
5.1	Macro, VBA	3h
5.2	Issues of macros and security	2h
5.3	Visual Basic Editor to create macros	2h
5.4	Record Macros	3h
5.5	Inserting Rows into a Spreadsheet	2h
6	Using Macros in Microsoft Word	7h
6.1	Microsoft Word	3h
6.2	Formatting	2h
6.3	Macro – word	2h
7	Using Macros in Microsoft Access	8h
7.1	Macro – Access	3h
7.2	Print records using a macro	1h
7.3	Run a query using a macro	1h
7.4	Input data using a macro	3h
8	Using Macros in Microsoft Excel – Part 1	4h
8.1	Macro – Excel	2h
8.2	Data validation using a macro	1h
8.3	Interactive user forms	1h
9	Using Macros in Microsoft Excel – Part 2	3h
9.1	Print data using a macro	1h
9.2	Absolute cell references	1h
9.3	Relative cell references	1h
10	Testing Software Development	5h
10.1	Testing	2h
10.2	Test Plan	2h
10.3	Check list	1h

Semester - 1		Module Name: C Programming Lab	Module Code: CP09110P
Sl. No.	Module Details		Practical Hours 40
1	Write a program in C language to declare and initialize variables using different data types.		2h
2	Write a program in C language to perform arithmetic operation		1h
3	Write a program in C language to calculate the area of the circle. Formula for calculating area is where r is the radius and is a constant.		1h
4	Write a program in C language to find whether an input number is even or odd.		1h

5	Write a program in C language to find whether an input number is positive, negative or zero	1h
6	Write a program in C language to find the greatest among three input numbers.	1h
7	Write a program in C language to check whether an entered alphabet is vowel, consonant or digit.	1h
8	Write a program in C language to interchange the values of two numeric variables i. With using third variable ii. Without using a third variable.	2h
9	Write a program in C language to print counting numbers from 1 to 100 using 'for loop'.	2h
10	Write a program in C language to print all odd numbers less than 100 using 'while loop'.	2h
11	Write a program in C language to print all even numbers less than 100 using 'while loop'.	2h
12	Write a program to print all the ASCII values and their equivalent characters using a while loop.	2h
13	Write a program in C language to find the sum of digits of an input number less than 99999.	2h
14	Write a program in C language to find the sum of first and last digit of any input number less than 999999.	2h
15	Write a program in C language to reverse any input number less than 99999	2h
16	Write a program in C to generate Fibonacci series 0, 1, 1, 2, 3, 5, 8... < 1000.	2h
17	Write a program in C language to find factorial of given number	2h
18	Write a program in C language to display the output as given below using proper loops 1 2 3 4 2 3 4 3 4 4	1h
19	Write a program in C language to check whether entered number is armstrong or not	2h
20	Write a program in C language to find whether an input number is prime or composite.	2h
21	Write a program in C language to display a menu as given below and execute arithmetic operations. Use switch case. Menu Addition 1 Subtraction 2 Multiplication.....3 Division..... 4 Modulo Division .. 5 Enter your choice. (0/1/2/3/4)	2h
22	Write a program to demonstrate one dimensional array	1h
23	Write a program to print sum of the elements in one dimensional array	1h
24	Write a program to demonstrate two dimensional array	2h
25	Write a program to print transpose of a matrix	1h

Semester - 1

Module Name: Employability Skills

Module Code: CP09111T

Sl. No.	Module Details	Theory Hours 30
1	Introduction to Employability skills	10h
2	Behavior skills	10h
3	Constitutional Values and Citizenship	10h
Semester - 2		
Module Name: Python Programming		Module Code: CP09206T
Sl. No.	Module Details	Theory Hours 60
1	Introduction to Python	4h
2	Python Data types and Operators	10h
3	Python Program Flow Control	6h
4	Python Functions, Modules and Packages	4h
5	Python Input, Output and File operations	6h
6	Exception Handling	4h
7	Python Object Oriented Programming-Oops	5h
8	CGI Programming	6h
9	Databases	6h
10	Sending Email	1h
11	GUI programming	5h
12	Web Scraping	1h
13	Working with PDF and Word Documents	2h
Semester - 2		
Module Name: Applied Mathematics - II		Module Code: CP09207T
Sl. No.	Module Details	Theory Hours 40
1	Analytical Geometry	6h
2	Integral Calculus	6h
3	Correlation and Regression	6h
4	Probability and Distribution	14h
5	Data Science	8h
Semester - 2		
Module Name: Software Engineering		Module Code: CP09208T
Sl. No.	Module Details	Theory Hours 60
1	Software Engineering Overview	5h
2	Software Development Life Cycle	15h
3	Requirement Engineering	8h
4	Software Design	6h
5	Coding	6h
6	Software Testing	6h
7	Software Measurement and metrics	4h

8	Introduction about DeVops and Git	10h
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Semester - 2		Module Name: Data Structures using Python	Module Code: CP09209T
Sl. No.	Module Details	Theory Hours 80	
1	Abstract Data Types	5h	
2	Arrays	20h	
3	Searching	10h	
4	Linked Structures	6h	
5	Stacks	9h	
6	Queues	8h	
7	Recursion	9h	
8	Binary Trees	13h	
Semester - 2		Module Name: Database Design and Development	Module Code: CP09210T
Sl. No.	Module Details	Theory Hours 60	
1	Key Concepts in Databases and Database Development	3h	
2	Enhancing Design 1	5h	
3	Enhancing Design 2	4h	
4	Data Retrieval 1	4h	
5	Data Retrieval 2	6h	
6	Physical Design 1	4h	
7	Physical Design 2	4h	
8	Physical Design 3	4h	
9	Physical Design 4	6h	
10	Distributed Databases	10h	
11	Data Warehouses	6h	
12	Summary	4h	
Semester - 2		Module Name: Computer Networks	Module Code: CP09211T
Sl. No.	Module Details	Theory Hours 40	
1	Introduction to Networks	4h	
2	Network Protocols and Standards	4h	
3	Wireless Networking Standards	4h	
4	Network Topology and Architecture	4h	
5	Network Media and Connectors	4h	
6	Network Hardware	4h	
7	Wireless Network Hardware	3h	
8	Security Software	3h	
9	Firewalls	2h	

10	Network and Server Software	3h
11	Voice over IP and Video Conferencing	3h
12	Virtual Private Networks	2h
Semester - 2		
Module Name: SQL Server Lab		Module Code: CP09212P
Sl. No.	Module Details	Practical Hours 60
1	Demo on Creating Databases	2h
2	Demo on Modify Databases	
3	Demo on database and files Viewing a Database	
4	Demo on Renaming a Database	1h
5	Demo on Deleting Database	
6	Demo on database and files	1h
7	Demo on database and files groups	1h
8	Creating tables with different Data types	2h
9	Demo on altering the table	
10	Creating tables with User Defined Data Types	
11	Dropping User Defined Data Types	1h
12	Demo on Data Manipulation Language with different types inserting values	1h
13	Demo on Data Manipulation Language with different types updating values	1h
14	Demo on Data Manipulation Language with different types deleting rows	1h
15	Demo on Truncating a Table	1h
16	Demo on Deleting a Table	1h
17	Writing a Basic select statement	1h
18	Writing a Basic select statement using where clause	1h
19	Write a query to perform Arithmetic operations	3h
20	Write a query to perform Relational operators	
21	Write a query to perform Logical operators	3h
22	Write a query to perform Special operators	
23	Generate query using TOP and DISTINCT keywords	2h
24	Generate query to perform ORDER BY clause	
25	Generate query to perform GROUP BY and HAVING Clauses	
26	Generate query using String functions	3h
27	Generate query using Date functions	
28	Generate query using Mathematical Functions	3h
29	Generate query using Aggregate functions	
30	Creating tables with different types of Constraints	2h
31	Perform demo on Nested sub queries	2h
32	Perform demo on Correlated Sub queries	3h

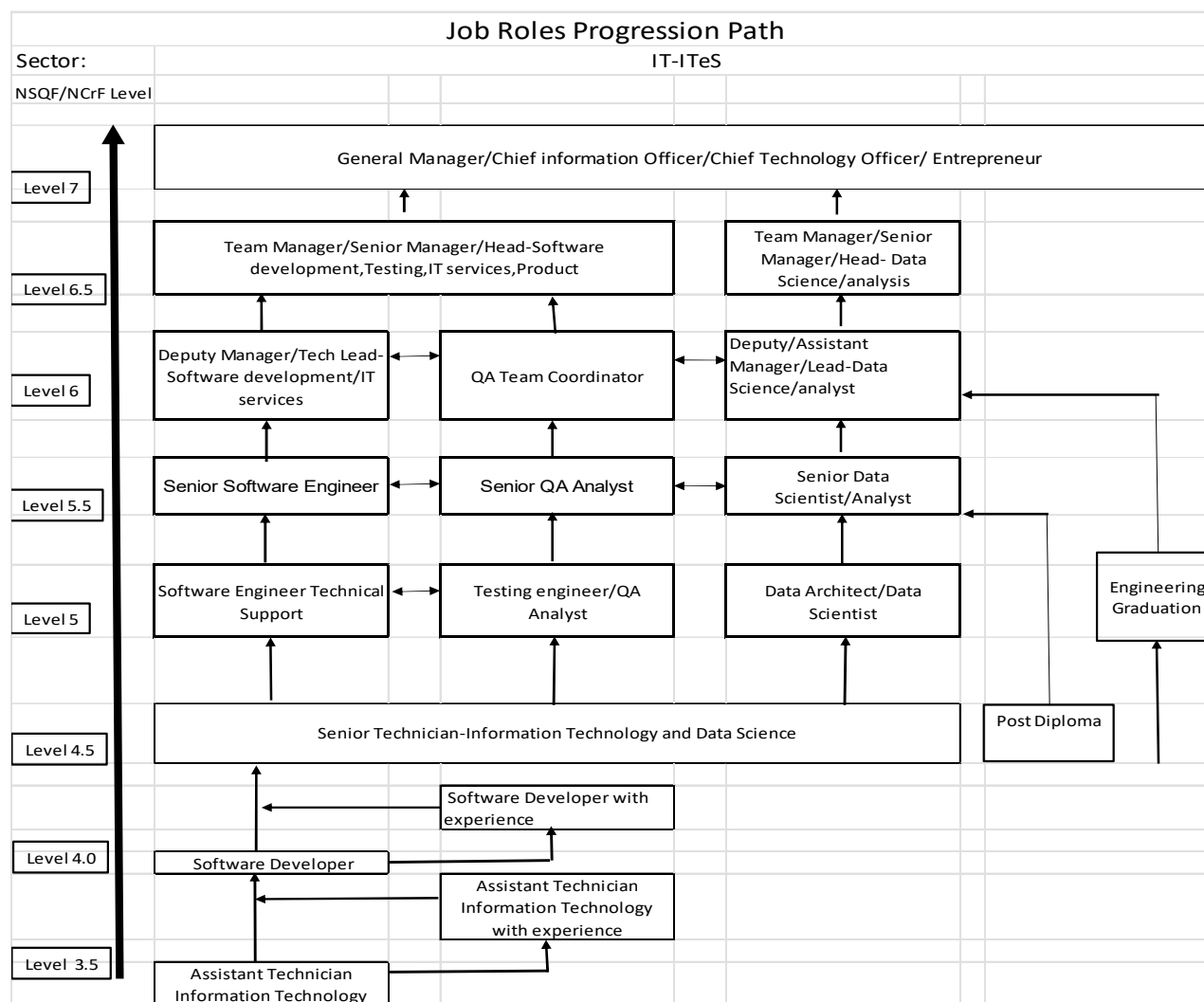
33	Perform demo on sub queries with Operators	
34	Generate a query to create an identity column	1h
35	Perform demo on Cross Join	4h
36	Perform demo Natural Join	
37	Perform demo Equi Join	
38	Perform demo on inner Join	
39	Perform demo on outer Join	2h
40	Write a query to creating Views	
41	Write a query to retrieve Results from Views	
42	How to Alter Views	3h
43	Write a query to Dropping Views	
44	Write a query to Renaming Views	
45	Write a query to Manipulating Data through Views	
46	Write a query to Implementing Indexes with different types of indexes	
47	Creating Triggers	2h
48	Write programs to declare different types of variables with different data types	1h
49	Write program to Printing Messages	1h
50	Write program to Implementing Stored Procedures	2h
51	Write program on Types of Stored Procedures	
52	Write program on Types of Parameters	2h
53	Demo on Altering a Stored Procedure	
54	Demo on how to Viewing a Stored Procedure	
55	Demo on Deleting a Stored Procedure	
56	Write a program to Create a function	2h
57	Demo on IF statement	1h
58	Demo on WHILE loop	1h
59	Demo on exception handling	2h
60	Demo on Explicit Transaction	
61	Demo on Implicit Transactions	
Semester - 2		Module Name: Data structures with Python Lab
		Module Code: CP09213P
Sl. No.	Module Details	Practical Hours 60
1.0	Introduction to Python	6h
1.1	Write a python program to find the square Root	
1.2	Write a python program to calculate the Area of a Triangle	
1.3	Write a python program to swap Two Variables	
2.0	Python Program Flow Control	3h
2.1	Write a python program to check if a number is positive, negative or zero	

2.2	Write a python program to check prime number	
3.0	Python Functions, Modules and Packages	
3.1	Write a python program to find numbers divisible by another number by using functions	6h
3.2	Write a python program to display powers of 2 using anonymous function	
3.3	Write a python program to find Factors of Number by importing module	
3.4	Write a python program to demonstrate calculator using package	
4.0	Python Input, Output and File operations	
4.1	Write a python program to read from one file and copy to another file	3h
4.2	Write a python program to rename and delete the file	
5.0	Exception Handling	
5.1	Write a python program to perform zero division error	2h
6.0	Python Object Oriented Programming – Oops	
6.1	Write a python program to demonstrate on creating a class, creating instance objects and accessing attributes	6h
6.2	Write a python program to demonstrate Inheritance	
6.3	Write a python program to demonstrate Overriding	
6.4	Write a python program to demonstrate Overloading	
7.0	Regular Expressions	
7.1	Write a Python program to check that a string contains only a certain set of characters (a-z, A-Z and 0-9)	2h
8.0	CGI Programming	
8.1	Write a CGI program to pass values using HTML form and submit button by GET and POST Method	2h
9.0	Using the ADT	
9.1	Extracts a collection of birth dates from the user and determines	2h
10.0	Arrays	
10.1	Fill a 1-D array with random values, then print them, one per line	4h
10.2	Implementation of the Array2D ADT using an array of arrays	
10.3	Implementation of the Matrix ADT using a 2-D array	
11.0	Searching	
11.1	Implementation of the linear search on a sorted sequence	5h
11.2	Searching for the smallest value in an unsorted sequence	
11.3	Implementation of the binary search algorithm	
11.4	Implementation of the bubble sort algorithm	
11.5	Implementation of the selection sort algorithm	
12.0	Linked Structures	
12.1	Implements the Bag ADT using a singly linked list	4h
13.0	Stacks	
13.1	Implementation of the Stack ADT using a Python list	3h
14.0	Queues	3h

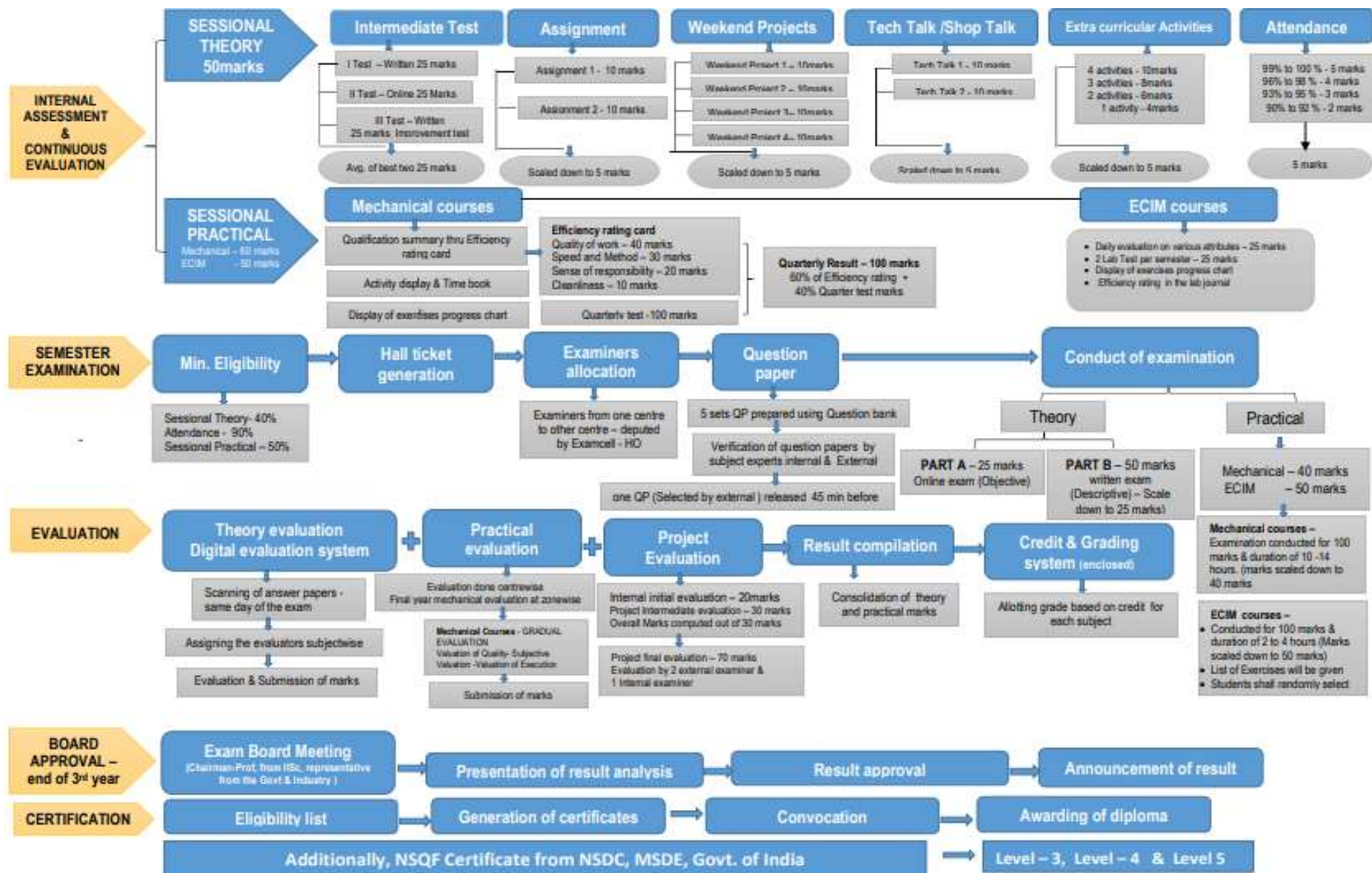
14.1	Implementation of the Queue ADT using a Python list	
15.0	Recursion	3h
15.1	The factorial recursive function	
15.2	The Fibonacci recursive function	
16.0	Binary Trees	3h
16.1	The storage class for creating binary tree nodes	
16.2	Preorder traversal on a binary tree	
17.0	Search Trees	3h
17.1	Searching for a target key in a binary search tree	
17.2	Find the element with the minimum key value in a binary search tree	
Semester - 2Module Name: Computer Networks LabModule Code: CP09214P		
Sl. No.	Module Details	Practical Hours 50
1	Configuring Secure Passwords and SSH	4h
2	Configuring IPv4 and IPv6 Interfaces	4h
3	Configuring IPv6 Addressing	4h
4	Configuring IPv4 Static and Default Routes	4h
5	Configuring IPv6 Static and Default Routes	4h
6	Troubleshooting Static Routes	3h
7	Configuring Switch Port Security	3h
8	Configuring VLANs	3h
9	Configuring Initial Switch Settings	3h
10	Configure Initial Router Settings	3h
11	Identify MAC and IP Addresses	3h
12	Examine the ARP Table	3h
13	Web and Email	3h
14	DHCP and DNS Servers	3h
15	FTP Servers	3h
Semester - 2Module Name: Employability SkillsModule Code: CP09215T		
Sl. No.	Module Details	Theory Hours 30
1	Effective learning skills	10h
2	English skills-Writing Skills	10h
3	Communication skills-Effective Oral & Written Communication	10h
Semester – 2Module Name: OJTModule Code: CP09216P		
Sl. No.	Module Details	Practical Hours 90
1	On the Job Training in the relevant sector	90h
	Total Hours	90h

Annexure 9: Career Progression

Sector: IT - ITeS



Annexure 10: Assessment SOP



Annexure 11: Occupational Map**Sector Name : Computer and Information Technology - IT - ITeS**

As per NCrf		As per NCO-2015	Sub-Sector 1/IT Services, BPM, Software products, Engineering Services	
NCrf Level (1-8)	Level Descriptors	NCO-15 - Family (First 4 digits code/s for the given level cross cutting the OM Sub-Sectors/ Occupations)	Occupation 1/ Software Developer, Testing, IT Services	Occupation 2/ Data Science/management
Level 8	1. Professional Theoretical Knowledge: Mastery of knowledge / Innovation driven/ Comprehensive knowledge 2. Professional and Technical Skills/ Expertise: Most advanced Technical and Managerial skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Significant authority, transformational leadership, Social intelligence 4. Broad Learning Outcomes: Lead large transformational projects 5. Responsibility: Business Vision Chairperson/ Board Member / CMD			
Level 7	1. Professional Theoretical Knowledge: Advanced knowledge with critical understanding of emerging developments 2. Professional and Technical Skills/ Expertise: Highly specialized skills, transdisciplinary skills, leadership skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Cross cultural competency, transformational leadership 4. Broad Learning Outcomes: Apply acquired advanced technical skills, technical appraisal and reviews 5. Responsibility: Business Management (like GM/ CEO / CXO, etc.)	1330	General Manager /Chief Information officer/Chief Technology Officer/Entrepreneur	General Manager /Chief Information officer/Chief Technology Officer/Entrepreneur

Level 6.5	1. Professional Theoretical Knowledge: Advanced multidisciplinary and specialized knowledge 2. Professional and Technical Skills/ Expertise: Advanced Technical and Managerial Skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Leadership, effective resource management 4. Broad Learning Outcomes: Judgement in complex problems 5. Responsibility: Vertical/ Business unit management – Manager or Senior Manager	2356 2512 2514	Team Manager/Senior Manager/Head-Software development, Testing, IT services, Product Electives: Software Development, Full stack development, Information system management, Firmware development Options: IT services, BPM, Software Product, Engineering services	Manager/Senior Manager/Head-Data Science/analysis Electives: Data Analysis, Artificial Intelligence, Machine Learning Options: IT services, BPM, Software Product, Engineering services
Level 6	1. Professional Theoretical Knowledge: Multidisciplinary and specialized knowledge 2. Professional and Technical Skills/ Expertise: Range of skills along with specialized domain skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Entrepreneurial mindset, self-management 4. Broad Learning Outcomes: Judgement / decision making – specialized 5. Responsibility: Team leader – Junior technical supervisor, Technical supervisor or junior/ deputy manager	2512 2514 2519	Deputy Manager/Tech Lead-Software development, IT services/QA Team Coordinator Electives: Software Development, Full stack development, Information system management, Firmware development Options: IT services, BPM, Software Product, Engineering services	Deputy/Assistant Manager/Lead-Data Science/analyst Electives: Data Analysis, Artificial Intelligence, Machine Learning Options: IT services, BPM, Software Product, Engineering services
Level 5.5	1. Professional Theoretical Knowledge: Specialized knowledge 2. Professional and Technical Skills/ Expertise: Specialized skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Team readiness, self-entrepreneurship readiness 4. Broad Learning Outcomes: Specialized/ complex jobs/tasks 5. Responsibility: Self and team responsibility – Sr. Technician or Master Technician	2512 2514 2519	Senior Software Engineer/Senior QA Analyst Electives: Software Development, Full stack development, Information system management, Firmware development Options: IT services, BPM, Software Product, Engineering services	Senior Data Scientist/Analyst Electives: Data Analysis, Artificial Intelligence, Machine Learning Options: IT services, BPM, Software Product, Engineering services
Level 5		2512 2519	Software Engineer/Testing Engineer Technical Support/QA Analyst/Computer Programmer	Data Architect/Data Scientist Electives: Data Analysis, Artificial Intelligence, Machine Learning

			Electives: Software Development, Full stack development, Information system management, Firmware development Options: IT services, BPM, Software Product, Engineering services	Options: IT services, BPM, Software Product, Engineering services
Level 4.5	1. Professional Theoretical Knowledge: Range of knowledge 2. Professional and Technical Skills/ Expertise: Range of technical skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Team readiness & Entrepreneurial readiness 4. Broad Learning Outcomes: Carry out Range of tasks and may provide range of solutions 5. Responsibility: Accountable/ responsible - Sr. Technician & Technician	3514 2512	Senior technician-Information Technology and Data Science Electives: Software Development, Full stack development, Information system management, Firmware development Options: IT services, BPM, Software Product, Engineering services	
Level 4.0	1. Professional Theoretical Knowledge: Range of knowledge 2. Professional and Technical Skills/ Expertise: Range of technical skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Follows instructions. Team member 4. Broad Learning Outcomes: Carry out Range of tasks under minimum supervision 5. Responsibility: Technician	2512	Software Developer	
Level 3.5	1. Professional Theoretical Knowledge: Range of knowledge 2. Professional and Technical Skills/ Expertise: Installation skills 3. Employment Readiness & Entrepreneurship Skills & Mind-set: Follows instructions. Team member 4. Broad Learning Outcomes: Carry out Range of tasks under minimum supervision 5. Responsibility: Jr. Technician & Technician	3512 3514	Assistant Technician Information Technology	

Annexure 12: Key Learning Outcome

SL. NO.	SUBJECT NAME	KNOWLEDGE AND UNDERSTANDING	TECHNICAL & PROFESSIONAL SKILLS	APPLICATION OF KNOWLEDGE AND SKILLS
FIRST YEAR				
1	English (CP09101T) Ability to communicate effectively	Understand, comprehend grammar. Formation of simple sentences.	Communicate with peers. Writing skills - Internal and Organizational correspondence. Technical writing. Public Speaking.	Write Business Letters Reports as necessary in Profession. Interact, Communicate during Interviews, debates, and Group Discussion for Career Development. Develop Presentation Skills.
2	Mathematics -1 (CP09102T) Mathematics -2 (CP09207T) Ability to solve various mathematical problems	Basic Algebra. Linear and Quadratic equations. Understanding Analytical geometry, Correlation and regressions, sequences and series. Laplace Transform	Use of Trigonometry, Matrices and determinants, differential, and Integral calculus for solving Technical and Engineering problems. Apply Statistical Methods for Computation.	Apply Statistics in Interpreting Data. Graphical representation of Data. Use appropriate units and measurements during interactions and discussions in the work area. Determine Percentage, Proportions and Ratios in day to day life.
3	Applied Science (CP09103T) Understanding various physical quantities, Conservation, and transfer of different forms of energy.	Interpret Different systems of Units and convert from one unit to another. Industrial Chemistry.	Describe Physical Law governing Translatory and Rotational Motions. Evaluating Work, Power, and Energy.	Application of Physical laws, Fluid Dynamics, concepts of Heat, and measurement, in the work area. Various energy sources, conversion, and conservation of energy. Renewable energy sources.

4	Algorithm problem solving techniques and flowchart (CP09104T) Understanding methods, processes, and strategies used to identify, analyze and solve problems.	Able to design efficient algorithms and data structures to solve complex problems.	Able to recognize and avoid common pitfalls in algorithm design and implementation, such as over fitting, under fitting, and numerical instability.	Apply algorithm analysis skills to real-world problems in various domains, such as computer science, engineering, biology, economics, and social sciences and medical sciences.
5	Basics of Electrical and Electronics (CP09105T) Basics of Electrical and Electronics Lab(CP09106P) Understanding various electronic devices, components, laws and circuits.	Able to perform circuit design, simulation, and analysis, to solve complex problems related to electronics and electrical systems.	Develop skills in problem-solving, critical thinking, communication, project management, and leadership that are essential in many careers related to engineering, including electrical and electronics design, power systems, communication systems, and automation.	Design and develop DC power supply, Usage of transformers, Designing of Rectifiers, Analysing a voltage regulator.
6	Computing system (CP09106T) Ability to know about the combination of hardware and software components that work together to perform tasks and solve problems.	Understanding the basic concepts of computer hardware and software, including computer architecture, operating systems, and programming languages.	Able to design and implement basic computer programs using a high-level programming language.	Being able to work effectively in a team and communicate technical concepts to a non-technical audience.
7	Web Programming Lab (CP09108P) Ability to create web applications using programming languages and tools that are specifically designed for the web.	Learn about popular web frameworks and libraries such as React, Angular, Vue.js, and jQuery, which can help you build complex web applications more efficiently.	Able to create dynamic and interactive web pages that can respond to user input and data.	Able to do web hosting and deployment, which involves configuring web servers, managing domain names, and deploying web applications to the cloud with front end design.

8	Office Solution Development Lab (CP09109P) Ability to use computer systems and software to automate and streamline various office tasks and processes.	Understanding the basic concepts of office automation, such as document management, email, calendaring, and workflow automation	Able to integrate office automation solutions with other business processes and applications, such as customer relationship management, project management, and accounting.	Provide professional development opportunities for students, such as workshops, seminars, and guest lectures.
9	C – Programming Lab (CP09110P) Ability to Create C programs for simple Engineering applications	Knowledge on data types, operators and expressions, Decision making and looping in writing 'C' Program. Understand Array, function, external variables, and multiple source files. Pointers in the 'C' Program.	Implement data types using C program Perform Decision making Looping statements. Create Array, String and functions. Demonstrate Structure and pointer.	Develop software applications using C Program. Apply the standard library in developing C Program. Manage memory effectively by using pointers.
10	Python Programming (CP09206T) Understanding high-level, interpreted programming language that is known for its simplicity, readability, and versatility.	Learn about libraries and frameworks can help you solve complex problems quickly and efficiently.	Able to analyse and visualize data using tools such as Matplotlib, Seaborn, and Plotly.	Able to develop web applications using frameworks such as Flask and Django.
11	Software Engineering (CP09208T) Learn about requires collaboration, communication and teamwork among developers, project managers, stakeholders and customers.	Understanding of the software development life cycle (SDLC) and the different phases involved, such as planning, requirements analysis, design, implementation, testing, and maintenance.	Able to design software systems that are reliable, scalable, and maintainable, using design patterns, architectures, and modelling techniques.	Provide with skills to work collaboratively in a team environment, including communication, collaboration, and conflict resolution.

12	Data Structures using Python (CP09209T) Data Structures with Python lab (CP09213P) Understanding to store and manipulate data in different ways, depending on the specific needs of your program.	Gain proficiency in Python programming language and its built-in data structures, such as lists, tuples, sets, and dictionaries, as well as its control structures, functions, and modules.	Able to solve programming problems that involve data structures and algorithms, such as graph traversal, dynamic programming, and string manipulation.	Provides a solid foundation for solving a wide range of programming problems and building scalable and efficient software systems.
13	Data Base Design and Development (CP09210T) Ability to create a well-organized, efficient, and functional database system that stores, manages, and retrieves data.	Learn about fundamental database concepts such as data modelling, relational database design, normalization, and indexing.	Able to design and implement databases that meet the requirements of users and stakeholders, using data modelling techniques such as ER diagrams, UML diagrams, and data flow diagrams.	Able to build scalable and efficient software systems that require data storage and retrieval, such as web applications, e-commerce systems, and enterprise resource planning (ERP) systems.
14	Computer Networks (CP09211T) Computer Networks Lab (CP09214P) Ability to create, design networks and configure network devices with IP addressing	Learn about network components such as routers, switches, hubs, firewalls, and network interface cards (NICs), and how they are used to connect and manage network devices.	Able to troubleshoot network problems, such as connectivity issues, configuration errors, and network congestion, using tools such as ping, traceroute, and Wireshark.	Able to design and implement networks that meet the requirements of users and stakeholders, including LANs, WANs, and wireless networks.
15	SQL Server Lab(CP09212P) Understanding relational database management system that is widely used in enterprise environments.	Learn about SQL Server architecture, including database engine, security, data access, and data manipulation.	Able to design and implement databases that meet the requirements of users and stakeholders, using data modelling techniques such as ER diagrams, UML diagrams, and data flow diagrams.	Works with SQL Server integration with other technologies such as reporting services, analysis services, and integration services, and how they can be used to provide business intelligence and data integration solutions.

16	Employability Skills (CP09111T) Employability Skills (CP09215T) Ability to behave appropriately. Understand Constitutional Values/ role of citizen. Ability to communicate appropriately. Understand Diversity and Inclusion.	Knowledge and understanding of all Human relation Principles. Knowledge and understanding of the constitution of Indian state and the preamble of the constitution. Fundamental Duties of the citizen of India. Knowledge and understanding of types of communication. Good understanding about Diversity and Inclusion in the workplace.	Able to practice the HRP with peer groups to maintain healthy relationship. Practice the constitutional values in the society. Being ethical and moral in the society following all the fundamental duties in the society. Practice effective communication with the peers, superiors and subordinates with empathy and care. Practice a sense of belonging in the society leaving behind all differences due to race, ethnicity, gender, age, identity etc.	Follow all the skills in the work place and society to have peace and harmony with superiors and subordinates.
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Annexure: Acronym and Glossary**Acronym**

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
OJT	On the Job Training

Glossary

Term	Description
National Occupational Standards (NOS)	NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
Qualification	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
Qualification File	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
Sector	A grouping of professional activities on the basis of their main economic function, product, service or technology.
Long Term Training	Long-term skilling means any vocational training program undertaken for a year and above. https://ncvet.gov.in/sites/default/files/NCVET.pdf