

**Guidelines for**  
**“Grant of Provisional Accreditation”**  
**to the Institutes**  
**for the conduct of**  
**NIELIT O /A / B/ C Level of Courses**

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## **I INTRODUCTION**

The DOEACC Scheme is the outcome of a National Working Group set up by the All India Council for Technical Education (AICTE) which is the statutory body in the field of technical education. Under the Scheme, computer training institutes/ organisations in the non - formal sector, subject to meeting well-defined norms and criteria, are granted accreditation for conducting specified levels of courses. These courses are, 'O' a Foundation Level course, 'A' an Advanced Diploma Level course, 'B' a MCA Level course and 'C' a M.Tech Level course in computer science.

Students can acquire any of these qualifications, if they undergo the particular Level of the accredited course in the institutions accredited for conducting the relevant course and pass the examinations conducted by the NIELIT. Working professionals can also appear in these examinations directly provided they possess the prescribed relevant experience for that particular Level. In either of the above cases, the candidates should have the requisite educational qualifications as indicated in the eligibility criteria given on the website at [www.nielit.gov.in](http://www.nielit.gov.in).

### **ACCREDITATION PARAMETERS UNDER AICTE**

Accreditation is a mechanism evolved in the United States. In India, the term 'Accreditation' was referred to for the first time in the National Policy on Education, 1986. Subsequently, the AICTE set up a National Board of Accreditation (NBA) for initiating the process of accreditation in the formal higher education sector of technical discipline. The basic objectives of accreditation are :-

- To assist all the stake holders in technical education to identify those institutions and their specific programmes which meet the norms and standards prescribed by AICTE.
- To provide guidelines to technical institution for the improvement of existing programmes and also for the development of new programmes; and
- To simulate the process of continual improvement in technical education system in the country.

The AICTE criteria for accreditation can be divided into the following major Categories:-

- Academic parameters, like faculty, laboratory, learning process, R&D, Library, industry interaction. Support services like hostel, furniture, building, canteen, transport and medical facilities.
- Accreditation is granted by AICTE based on specified weightages for each parameter. Institutes governed under the accreditation procedure are all in the formal sector. Accordingly, the institutes are expected to admit only specific number of students and also follow specified programmes with regard to conduct of courses.

## **ACCREDITATION – CONCEPT UNDER NIELIT**

The objective of the DOEACC Scheme is to develop quality manpower through non-formal sector in the field of IT, which consists of computer institutes mostly in the private sector. These institutes conduct computer courses, mostly, on part-time basis depending on many factors. It is also not possible for them to be governed by admission on fixed number of students, as the number would vary depending on places (metros/small towns) location of the industry etc. The imparting of training for NIELIT courses is open to organizations in the non-formal sector, including autonomous bodies as long as they meet the requisite criteria and obligations. Each level & location is treated as a separate entity.

Under the Accreditation norms, Institution is critically appraised by NIELIT Screening Committee to verify that the institute meets the Norms and Standards prescribed by the NIELIT under its Accreditation Scheme. Thus, Accreditation accorded by NIELIT ensures that the Institute conducting proposed course has the sufficient infrastructure, faculty, facilities etc., as per the Accreditation criteria to be able to deliver quality IT education & training. Accreditation is accorded for a course at an institute at a specified location and does not cover any other locations/Franchisees/Branches under any circumstances.

### **Scope of grant of Accreditation to institutes**

Granting accreditation to institutes for conduct of training, registration of the candidates to NIELIT and fielding candidates for the examination of NIELIT O/A/B/C level of courses is the process that ensures the quality delivery of the courses to the candidates by the institutes. Such institutions however, would be required to be analysed periodically on certain parameters to ensure that the objectives are being met. This periodical review is an assurance that the institute meets established quality standards. However, the institutes that did not meet the criteria for renewal of permission will be withdrawn.

Apart from this, institute may have an option to exit from the system that is; they can also apply for voluntary withdrawal, if they did not wish to continue as an accredited institute of NIELIT for the conduct of its O/A/B/C level of courses. However, institutes applying for voluntary withdrawal would be required to clear all the dues outstanding against it.

## Accreditation Parameters

The accreditation parameters of the NIELIT programme are tuned to give weightage on the following:-

- Institute must be registered;
- The institute should have conducted IT/Computer related courses for at least six months preceding the date of application.
- must have own premises, if hired, on a long term lease;
- the library should have a good selection of books and subscribe to periodicals of standard quality;
- faculty should be made up of both teaching and support faculty and must meet the numbers and qualifications/ experience as specified for the concerned Level of course;
- should have the necessary hardware as well as software to conduct training as per syllabus of the concerned level of NIELIT course.
- Hands on Training should form at least one-half of the allocated time;
- all software should be licensed as understood in terms of intellectual Property Rights; Open Source software are also allowed.
- Financial status of the organization should be sound
- Industry support should involve interaction with the industry.
- There is no restriction with regard to number of levels & sequence/order of levels (viz. O, A, B, C) for which an institute can seek accreditation. In case, the institute is granted accreditation for higher level of courses (B or A level) and if interested, for lower level accreditation (A or O level), then the Screening visit at the institute will be waived off, if the institute applies within 6 months from the grant of higher level accreditation. However, the procedure for applying for grant of accreditation will be same. However, if the institute is accredited for lower level of courses and applies for higher level, there is no change in the procedure.

## GUIDELINES FOR ACCREDITATION

1. **Accreditation Fees:** Institutes seeking accreditation will have to apply online for provisional accreditation in the first instance by registering the institute in the web portal [www.onlineaccr.nielit.gov.in](http://www.onlineaccr.nielit.gov.in). After registering, the institute has to login and apply for accreditation. The fees for provisional Accreditation for each of O/A/B/C level are given on the online portal and is also mentioned below. Besides, a refundable "Security Deposit" of Rs. 10,000/- has also to be submitted along with the provisional accreditation fee, online. The **Security Deposit** shall be refunded without any interest after the withdrawal of accreditation / Rejection of application for Provisional Accreditation, if the institute applies for the same within 6 months from the date of withdrawal / date of Rejection. However, outstanding amount against institute, if any, shall be deducted from the Security Deposit. Also, if there is any complaint by the institute against the Screening Committee / Monitoring Committee which visited the institute, if the complaint is found to be wrong then the expenses incurred for the visit of the inspection committee to that institute will be deducted from the Security deposit.

### ACCREDITATION FEES FOR O/A/B/C LEVEL

LEVEL	FEE FOR PROVISIONAL ACCREDITATION FOR A PERIOD OF 5 YEARS	FEE FOR CONTINUATION / EXTENSION OF ACCREDITATION WITH FULL STATUS (If the Performance criteria is met) FOR A PERIOD OF 3 YEARS	FEE FOR CONTINUATION / EXTENSION OF ACCREDITATION WITH PROVISIONAL STATUS WITH PENALTY (if the Performance criteria is not met) for a period of 3 years	FEE FOR CONTINUATION / EXTENSION OF ACCREDITATION WITH PROVISIONAL STATUS for a period of 3 years	RECONVENING FEES (Rs.)		
					DEFERRED	CHANGE OF ADDRESS / FRANCHISEE DROP	CHANGE OF MANAGEMENT / NAME OF INSTITUTE
'O'	50,000/- +GST + 10,000/- (Security Deposit)	30,000/- + GST	33,000/- + GST	NOT APPLICABLE	10,000/- + GST	20,000/- + GST	5,000/- + GST
'A'							
'B'		NOT APPLICABLE	NOT APPLICABLE	30,000/- + GST			
'C'							

#### NOTE -

GST will be charged as per applicable Rates.

Penalty @ 10% of continuation of accreditation fee

**NOTE:** In addition to the Accreditation Fee the institute has to deposit a '**SECURITY DEPOSIT**' of Rs. **10,000/-** (Refundable) at the time of applying for the Provisional Accreditation. The Security Deposit shall be refunded without any interest after the withdrawal of accreditation / Rejection of application for Provisional Accreditation, if the institute applies for the same within 6 months from the date of withdrawal / date of Rejection. However, outstanding amount against institute, if any, shall be deducted from the Security Deposit. Also, if there is any complaint by the institute against the Screening Committee / Monitoring Committee which visited the institute, if the complaint is found to be wrong then the expenses incurred for the visit of the inspection committee to that institute will be deducted from the Security deposit.

\* Fee is Subject to change and will be at the discretion of NIELIT.

\*\* Fee once paid for Provisional Accreditation / Extension of Accreditation Period with Provisional status/ Extension of Accreditation Period with Full Status/ Revisit on account of Deferred Case or changes as mentioned above are not refundable under any condition.

**VAF** Variable Accreditation Fee for each level @ Rs. 6,000/- for every additional 25 candidates or part thereof fielded in every examination for the first time. For the first 25 candidates, institutes need not pay any Variable Accreditation fees. **The fee has to be paid at the time of submission of the examination application forms.**

2. **Processing of Application:** There will be partial online scrutiny of the application by validation checks, as per the norms of accreditation, at the time of submission of the online application. Minimum criteria for submission of the application are mandatory and the institutes who do not meet the minimum criteria will not be able to submit the online application. The application will be on **self certification basis** by the authorised signatory of the institute. Following documents (self attested by the authorized signatory) has to be uploaded by the institute along with the online application:

- a) Documents with regard to registration and the legal status of the institute (registration certificate, bye-laws, rules and regulations, memorandum, board resolutions etc.)
- b) Documents with regard to premises (lease agreement / ownership deed)
- c) Corporate structure / details of the institute (list of proprietor / partners / directors /Trustee, etc.)
- d) Documents with regard to franchise / license terms (Franchisee ship / Licensee ship agreement, NOC from licensor / franchisor), if applicable.
- e) PAN Card of the Institute
- f) List of books and magazines available at the institute
- g) Photograph, pay slips, educational and computer qualifications certificates and Unique Identification document of the faculty
- h) Signature of the authorized signatory of the institute
- i) An affidavit on the Rs.100/ Non-Judicial paper Duly Attested by Notary Public, signed by authorized signatory of the institute that the information /documents provided by the institute w.r.t. legal status/address/infrastructure/faculty/financial status etc. for accreditation are true and correct and that it conceals nothing and that no part is false.
- j) Photographs and video with time and date stamp and longitude, latitude of the institute premises.

3. **THE MINIMUM LAID OUT CRITERIA FOR ACCREDITATION:**

- a) **Legal Status:** The institute should be registered under the categories:
  - **PROPRIETORSHIP CONCERN :** An institute with legal status "Proprietorship" can be registered under the following:
    - (i) Registration/ Certificate from any Government authority as given for the Industrial / Business units such as Shop & Establishment Act.
    - (ii) Registration with Registrar / Sub-Registrar.
    - (iii) Registration with Sales Tax / Service Tax or any other tax authority.

**Documents required for establishing the necessary links of the ownership of the proprietorship concern.**

- 1) Any one of the registration certificate as mentioned above. (In case document does not show the name of the proprietor, then an additional document which shows the name of the proprietor is required (such as certificate from the bank)).
  - 2) The institute has to upload the authority letter from proprietor indicating the details of the authorized person with the authority / powers given to him
- **PARTNERSHIP:** An institute with legal status Partnership firm has to submit the following:

- (i) Registered Partnership Deed
- (ii) Registration Certificate from Registrar of firms with the documents showing the names of the partners.
- (iii) The institute has to upload the authority letter from partners indicating the details of the authorized person with the authority / powers given to him
- **SOCIETY / NGO** : An institute with legal status "Society" has to submit the following documents
  - (i) Certificate from the Registrar of Society
  - (ii) Rules and Regulations / Memorandum
  - (iii) Resolution to nominate the authorised person (as per the terms of the Rules & Regulations/Bye Laws/Memorandum specifically mentioning that the authorized person has been authorized to deal with NIELIT including applying for accreditation).
- **TRUST**: An institute with legal status "Trust" has to submit the following documents
  - (i) Trust Deed
  - (ii) Certificate of Registration of Trust
  - (iii) Resolution to nominate the authorised person (as per the terms of the Trust Deed / Settlement Deed specifically mentioning that the authorised person has been authorised to deal with NIELIT including applying for accreditation)
- **COMPANY**: An institute with legal status "Company" has to submit the following documents:
  - (i) Certificate of Incorporation
  - (ii) Memorandum of Association
  - (iii) Board Resolution specifically authorizing the authorized person to deal with NIELIT including applying for accreditation.
- The owner or the person appointed by the management can be described as Owner/ Authorised Person from the Management, such as in the case of a company a Director having authority from the Board or in the case of a Society a person so defined under the Rules / Bye Laws / Memorandum with a resolution as per the Rules/ Bye Laws/ Memorandum. If the management wants to change any such Authorised Person, it should be intimated to NIELIT in accordance with their rules, if any.
- That the Owner/ Authorised person from the Management is the person who is working in the capacity and signing in the capacity as the owner or the Management and all the declarations as required by the NIELIT at the time of the accrediting or any other important documents or applications are required to be signed by him.
- On the other hand, there can be another person who is not the owner but is running the day to day business of the institute since the owner or the management may or may not be in a position to do day to day business of the institute. The person be called the authorized employee of the institute to deal with NIELIT. His signatures and other particulars like his position should be taken from the institute. This person can be changed at any time since he is only an employee but whenever this person is

changed, NIELIT should be communicated with the signatures and other particulars of this person.

- b) The institute should be in computer education and training field for at least **last six months**.
- c) **Premises:** The institute must have own premises, if hired, the lease should be at least for a minimum period of eleven months for each of O/A Levels, three years for 'B' Level & two years for 'C' Level with a reasonable assurance of continuity;
- d) **Space:** Minimum carpet area should be more than 90 sq. meters (if the institute is already accredited for one level, additional 30 sq.mtr. area is required) to cater to at least one classroom to seat 25 students, one laboratory for hands on training, a library, reception area (min. 4 sq.mtr.) and clean and hygienic washrooms preferably separate for boys and girls.
- e) **Software:** The institute should comply with the norms on software as laid down in the Annexure II. All the Softwares must be licensed; **Open source software is also accepted.**
- f) **Faculty:** The institute should comply with the norms on faculty as laid down in the Annexure I. Faculty must consist of at least 2 competent faculty and one support faculty (Minimum 3 faculty should be there). Faculty should have been with the institution for not less than three months; Should possess qualifications and experience referred at Annexure I.
- g) **Hardware:** The number of computers required is either 8 PCs or one Server plus 7 terminals with as far as latest configuration to support all the Student Terminals. **Thin Clients (N Computing devices) / Client Server Architecture are also accepted.** The ratio of Number of students for each terminal or PC should be 2:1. Hands on time should be given to students; Availability of teaching aids like overhead projectors, video projection, audio visuals etc at the institute.
- h) **Library:** Library to have a good selection of relevant books and should subscribe to standard periodicals; should have reference facilities; as evident from the List of Library Books, Registers for issue of books and usage of library by students.
- i) Fee charged should be reasonable, justifiable and commensurate with infrastructure and facilities offered
- j) At least 50% of the enrolment of students in the computer course shall be on the basis of merit, with a specified percentage for SC/ST candidates as per norms prescribed by the Government from time to time;
- k) Sustainability of the institution financially, technically, infrastructure-wise and growth-wise.
- l) Student administration should be of high order
- m) The institute should plan periodic interactions with the industry for the placement of the candidates
- n) Feedback forms should be filled by the students at the end of each module. The institute must also plan a comprehensive record keeping of admission, registration, aptitude test, selection norms, candidates selected, attendance, internal evaluation, Project work etc.

- o) It is mandatory for every institute authorized to conduct NIELIT accredited course (s) to contribute in the Awareness creation programme, depending upon the number of candidates fielded in for the first time by institutes at each level in every examination. The rate of contribution shall be @ Rs. 2,000/- per 25 candidates or part thereof. The contribution has to be paid at the time of submission of the examination application forms.

Number of Candidates	Contribution (Amount in Rs.)
0-25	2,000/-
25-50	4,000/-
51-75	6,000/-
76-100	8,000/- and so on

### **PROCEDURE FOR ACCREDITATION OF THE O/A/B/C LEVEL COURSES**

- a) Provisional accreditation to conduct a course will be granted at the first instance.
- b) The application received along with the uploaded documents will be screened for completeness and additional information may be asked for, if necessary, from the institute vide online deficiency letter / email. **The total time period given to the institute for compliance of the shortcomings is 180 days (from the date of receiving of the initial application on the NIELIT web portal).** Incomplete forms and inability to supply additional information may lead to rejection of the application.
- c) Institute will be granted accreditation for NIELIT O level course on the basis of self-certification with respect to availability of the infrastructure as per norms and approval of competent authority. However random monitoring visits will be conducted at the institutes for O level course.
- d) For NIELIT A/B/C Level course, on completion of the documents, the institute will be issued a letter online / by email, informing that their documentation is over and the screening committee will visit their institute any day within minimum one month from the date of intimation of completion of documents.
- e) The Screening Committee will check that all criteria laid down above are fulfilled. The committee will examine all of the following:
- Compliance of all norms set out above.
  - Actual competence of the teaching staff, over and above the paper qualifications submitted;
  - Progress of students;
  - Teaching methodologies;
  - Management attitudes, plans, approach etc.
  - Past results;
  - Student feedback on usefulness teaching standards, criticisms, praise etc;
  - Placement of trainees;

- f) Institutes fulfilling the criteria laid down above, for the respective Level, as reflected by the report of the Screening Committee will be granted provisional accreditation for 5 years for A/B/C Level. A letter of provisional accreditation will be issued to the institute along with the unique Accreditation number (generated after the completion of the documents) to serve as the documentary proof of the same.
- g) In case when the Screening Committee visits the institute and the institute shows its non-preparedness, it will be considered that the institute is not interested & hence treated as a DEFERRED case.
- h) Also, If the Screening Committee is convinced of the potential of the institution, but feels that there are flaws which need rectification and which may be rectified within six months, may recommend deferment of accreditation. Deferment does not result in forfeiture of the initial fees of accreditation.
- i) In case of deferment of accreditation, institute is informed about deferment of application by letter, the institute may confirm to the NIELIT within a period of six months from the date of issue of deferment letter that the deficiencies pointed out have been rectified and remit the fee of Rs. 10,000/- + GST (as applicable) online. The institute will be revisited by the Screening Committee and based on their report; the NIELIT will take appropriate action. In case of non-compliance or non-receipt of a reply, a notice of rejection / letter of rejection (as applicable), is issued to the institute by NIELIT.
- j) Rejection of accreditation which results in forfeiture of the initial fees of accreditation may be recommended if it is felt that in the interest of the students, it will not be advisable to grant accreditation or even to defer accreditation due to the failure on the part of the institute to meet the criteria. Such institute whose request for accreditation is rejected by the **NIELIT**, will not be revisited till three months elapse and the institute apply afresh thereafter with the prescribed fees.

**Annexure-II****Level-wise Module-wise list of Software****O Level:**

<b>Paper Code/ Module Code</b>	<b>Paper Name/ Module Name</b>	<b>Software Required</b>
<b>M1-R5</b>	Information Technology Tools and Network Basics	Any relevant word processing / spreadsheet/Presentation like Libre Office 6.0, Linux/Ubuntu 16 or higher,
<b>M2-R5</b>	Web Designing & Publishing	Any standard web browser and publishing tools
<b>M3-R5</b>	Programming and Problem Solving through Python	Python
<b>M4-R5</b>	Internet of Things and its Applications	Arduino IDE, any open source tool
	Antivirus	Any Standard Antivirus software

**A Level:**

<b>Paper Code/ Module Code</b>	<b>Paper Name/ Module Name</b>	<b>Software Required</b>
<b>A1-R5.1</b>	Information Technology tools and Network Basics	Any relevant word processing / spreadsheet/Presentation like Libre Office 6.0, Linux/Ubuntu 16 or higher,
<b>A2-R5.1</b>	Web Designing & Publishing	Any standard web browser and publishing tools
<b>A3-R5.1</b>	Programming and Problem Solving through Python	Python
<b>A4-R5.1</b>	Internet of Things and its Applications	Arduino IDE, any open source tool
<b>A5-R5.1</b>	Data Structure Through Object Oriented Programming Language	Python, C, C++
<b>A6-R5.1</b>	Computer Organization and Operating System	Linux
<b>A7-R5.1</b>	Database Technologies	MariaDB, MySQL
<b>A8-R5.1</b>	Systems Analysis, Design and Testing	
<b>A9.1-R5</b> <b>A10.1-R5:</b>	<b>*Specialized Area: Data Analytics</b> Big Data Analytics using Hadoop Data Science using Python	HDFS, HIVE, Java, HBASE, PIG, JSQL, Linux/Ubuntu, RHIVE
<b>A9.2-R5</b> <b>A10.2-R5</b>	<b>*Specialized Area: Web Application Development</b> Web Application using PHP Full Stack Web Application using MVC	Apache, PHP, MySQL, NetBeans, CakePHP

<b>A9.3-R5</b>	<b>*Specialized Area: Information Security</b> Network Management	CentOS/ Ubuntu, Oracle VirtualBox, Crypto tools, Snort, Squid Proxy Server Nessus, Network Mincer, Kali Linux
<b>A10.3-R5</b>	Information Security Management	
<b>A9.4-R5</b>	<b>*Specialized Area: Internet of Things</b> Internet of Things (IoT):A Practical Approach	Arduino IDE, Linux, Apache server NOOBS, Raspbian or any Linux distribution for Raspberry Pi
<b>A10.4-R5</b>	Internet of Things (IoT) using Raspberry Pi	
<b>A9.5-R5</b>	<b>*Specialized Area: Artificial Intelligence</b> Artificial Intelligence Concepts and R Programming	R, Python, Anaconda,
<b>A10.5-R5</b>	Machine Learning Using Python	
	Antivirus	Any Standard Antivirus software

**\* For modules 9 and 10, student will have to select one specialized group out of five groups.**

**Each specialized group consists of two modules.**

**Both the modules within selected specialized group are mandatory to qualify 'A' Level (IT)**

### **B Level :**

<b>Module Code</b>	<b>Paper Name/ Module Name</b>	<b>Software Required</b>
B0.1-R5	Basic Mathematics	Ubuntu/Windows 10 Operating, Python and R-Studio, Open Office
B1.1-R5	Management Fundamentals & Information Systems	Project Libre
B1.2-R5	Discrete Structures	Ubuntu/Windows 10 Operating, Python and R-Studio, Open Office
B1.3-R5	Software Engineering	1.All drawing-MS Visio or LibreOffice Draw or Diagrams.net or Google Drawings or similar, 2.Configuration Management tools: 'Subversion' or CVS (Concurrent Versions System), 3. Testing tools: Selenium or Jira or similar
B1.4-R5	Operating Systems	1. Windows Server (Evaluation Version) 2. Linux OS / Ubuntu 3. Open Source Virtualization Software 4. C/C++ for simulation of algorithms
B1.5-R5	Data Communications and Computer Networks	1. Windows 10 or CentOS/Ubuntu 2. Wireshark Network Protocol Analyzer 3, Python 3.x
B-PR-1-R5	Practical Based on B1.1-R5 to B1.5-R5	Already Covered in Modules
B2.1-R5	Computer based Statistical & Numerical Methods	Ubuntu/Windows 10 Operating, Python and R-Studio, Open Office
B2.2-R5	Professional & Business Communication	Already Covered in Modules
B2.3-R5	Advance Database Technologies	MariaDB/MongoDB/ DB2/Oracle/SQLor similar tools

B2.4-R5	Computer Graphics & Multimedia	<ol style="list-style-type: none"> <li>1) FotoMorph (Freeware)</li> <li>2) Midi Editor (Freeware)</li> <li>3) Audacity (Freeware)</li> <li>4) Photo&amp; Video Editor (Bundled free with Windows 10 &amp; 11)</li> <li>5) Opentoonz (Freeware)</li> <li>6) Adobe Photoshop (Licensed)</li> </ol>
B2.5-R5	Cloud Computing and IoT	Open source embedded C/C++ IDE as per hardware Python
B-PR-2-R5	Practical Based on B2.1-R5 to B2.5-R5	Already Covered in Modules
B3.1-R5	SOFTWARE PROJECT MANAGEMENT	<ol style="list-style-type: none"> <li>1.All drawing-MS Visio or LibreOffice Draw or Diagrams.net or Google Drawings or similar,</li> <li>2.Configuration Management tools: 'Subversion' or CVS (Concurrent Versions System) or similar</li> <li>3.Testing tools: Selenium or Jira or similar</li> </ol>
B3.2-R5	Artificial Intelligence and Machine Learning	Jupyter Notebook, Python IDLE, MySQL
B3.3-R5	Web Technologies	Java development kit (JDK) , MySQL, Hibernate , spring framework and IDE like NetBeans / Eclipse
B3.E1-R5	Digital Marketing	Ubuntu/Windows 10 Operating System, Internet browser, Social Media accessibility
B3.E2-R5	System Modelling & Computer Simulation	SIMUL8. Business process modelling and simulation tool, MATLAB/Simulink, Programming and numeric computing platform, NS-3 an open-source network simulator. TensorFlow may be a free and open-source software library for machine learning
B3.E3-R5	Distributed and Parallel Computing	OPENMP API
B3.E4-R5	Data Warehouse and Data Mining	<ol style="list-style-type: none"> <li>1. ETL tools: Apache Kafka/ PostgreSQL/SQL server/ Oracle/ RapidMiner or similar</li> <li>2. Mining tools: R/Weka/SAS/Apache Mahout/Orange/Tableau or any Mining tools</li> </ol>
B3.E5-R5	Software Testing and Quality Assurance	<ol style="list-style-type: none"> <li>1.All drawing-MS Visio or LibreOffice Draw or Diagrams.net or Google Drawings or similar,</li> <li>2.Configuration Management tools: 'Subversion' or CVS (Concurrent Versions System),</li> <li>3.Testing tools: Selenium or Jira or similar</li> </ol>
B3.E6-R5	Digital Image Processing	Recommended Software [AR/VR]-Adobe Flash/Max/3DS Max, JavaScript, Unity SDK, A-frame, Google Cardboard App
B3.E7-R5	Accounting& Financial Management	Financial Accounting using Tally, Vyapar Software, Open source ERP-OODO Business software
B3.E8-R5	Wireless & Mobile Communication	Matlab, Ns2/NS3/Glomosim, Contiki/Cooja or any suitable opensource Wireless Network / Wireless Sensor Network Simulator
B3.E9-R5	Block chain Technology	<ol style="list-style-type: none"> <li>1. Development Tools and libraries: Remix IDE, Ganache, Metamask, web3.js,</li> <li>2. Learning Front End Technologies required for the project (React, HTML, JS, etc)</li> </ol>

**C Level:**

<b>Paper Code/ Module Code</b>	<b>Paper Name/ Module Name</b>	<b>Software Required</b>
<b>CO-R4.B1</b>	Elements of Mathematical Sciences	MATLAB
<b>CO-R4.B2</b>	Operating System	Any OS
<b>CO-R4.B3</b>	Data Structure through JAVA	JAVA
<b>CO-R4.B4</b>	Computer System Architecture	TASM, TLINK
<b>C1-R4</b>	Advanced Computer Graphics	Adobe Suite or C compiler
<b>C2-R4</b>	Advanced Computer Networks	
<b>C3-R4</b>	Mathematical Methods for Computing	MATLAB
<b>C4-R4</b>	Advanced Algorithms	MATLAB
<b>C5-R4</b>	Data Warehousing and Data Mining	Weka
<b>Lab I</b>	Graphics and Visualization	Turbo C
<b>Lab II</b>	Data Network and Management	NS2
<b>C6-R4</b>	Multimedia Systems	Adobe Suite
<b>C7-R4</b>	Digital Image Processing and Computer Vision	MATLAB
<b>C8-R4</b>	Information Security	
<b>C9-R4</b>	Soft Computing	MATLAB
<b>C10-R4</b>	Software Systems	Rational ROSE
<b>Lab III</b>	Image Processing and Computer Vision + Multimedia Systems	MATLAB
<b>Lab IV</b>	Information Security + Soft Computing	JAVA
	<b>(Any two from the following to be chosen)</b>	
<b>CE1.1-R4</b>	Digital Signal Processing	MATLAB
<b>CE1.2-R4</b>	Machine Learning	-
<b>CE1.3-R4</b>	Cyber Forensic & Law	-
<b>CE1.4-R4</b>	Project Management	-
<b>CE1.5-R4</b>	Mobile Computing	Android

**FACULTY QUALIFICATION AND EXPERIENCE CRITERIA**

LEVEL	COMPETENT FACULTY		SUPPORTING FACULTY	
	QUALIFICATION	EXPERIENCE	QUALIFICATION	EXPERIENCE
'O'	At Least a Graduate with One Year Diploma or equivalent (Govt. recognized is desirable) in Computers or 'A' level	Minimum 2 year's experience is required	At least have a One Year Diploma in computers (Govt. Recognized is desirable)	Minimum one year's relevant experience.
'A'	At least a B.E./B.Tech (COMP. Sc) Or MCA Or MSc. (Comp. Sc.) Or DOEACC 'B' Level	Minimum 2 year's experience is required	At least have a Diploma in computers	Minimum one year's relevant experience.
'B'	At least a M.E./M.Tech (Preferably a Ph.D) Or DOEACC 'C' Level	Minimum 2 year's experience is required	At least have a B.Tech (Computer Science)/MCA Degree	Minimum one year's relevant experience.
'C'	At least a M.E./M.Tech (Preferably Ph.D) Or Equivalent in Computer Science	Minimum 2 year's experience is required	At least have a B.Tech (Computer Science)/MCA Degree	Minimum one year's relevant experience.

**Notes:**

- 1 The institute should have at least three faculties (Two competent and one support) and they should be with the institution for not less than three months.
- 2 Support faculty to assist in computer laboratory work, use of application packages and demonstrations.
- 3 Faculty with the higher than the minimum qualification specified for each level with one year experience will also be considered as an eligible competent faculty

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