

NIELIT Ropar

Deemed to be University

Diploma in Computer Science
Engineering
Academic Year 2024-25



National Institute of Electronics and Information Technology

(An Autonomous Scientific Society of Ministry of Electronics and Information Technology,
Government of India)

Main Campus, Birla Farms, Bada Phull, Rupnagar (Ropar), Punjab -140001

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About the Program

A Diploma in Computer Science Engineering at NIELIT University is an academic program that provides students with foundational knowledge and practical skills in various aspects of computer science and engineering. The program delves into the intricacies of managing and analyzing vast datasets, providing students with a comprehensive understanding of the field. This program, designed by industry experts and academic leaders, covers fundamental areas such as mathematical foundations, advanced data structures, and diverse electives including advanced algorithms and soft computing.

The curriculum not only focuses on theoretical foundations but also emphasizes hands-on experience through laboratory sessions. In these laboratories, students work on real-world scenarios, honing their skills in applying advanced data structures, implementing algorithms, and delving into core areas like machine learning and data visualization. The program offers a balanced blend of theoretical knowledge and practical application, ensuring that graduates are not only well-versed in the principles of data engineering but also adept at solving complex problems in the dynamic and evolving landscape of data science.

This innovative program is enriched with elective courses, allowing students to tailor their learning experience based on their interests and career goals. Courses such as Data Science, Distributed Systems, and Cloud Computing provide students with specialized knowledge, enabling them to explore diverse aspects of data engineering. The emphasis on a mini project further allows students to synthesize their skills in a real-world context, fostering a deep understanding of how data engineering principles translate into practical solutions.

Program Educational Objectives (PEOs)

PEO1: Graduates leverage foundational and advanced concepts in data engineering to excel in diverse professional roles, fostering innovation and critical problem-solving.

PEO2: Graduates demonstrate proficiency in advanced data engineering techniques, algorithms, and tools, addressing industry challenges and contributing to research and development.

PEO3: Graduates exhibit effective communication, teamwork, and ethical values, positioning them as responsible leaders and collaborators in the data engineering domain.

PEO4: Graduates who continue their formal education will achieve a higher degree or other specific skill based advance certification.

Program Outcomes (POs):

PO1: Graduates apply mathematical foundations and data engineering principles to solve complex computing challenges independently and collaboratively.

PO2: Graduates design, analyze, and implement advanced data structures, algorithms, and computational solutions, showcasing competence in data engineering.

PO3: Graduates critically evaluate and select appropriate data engineering methodologies and tools, demonstrating adaptability to evolving technologies and industry trends.

PO4: Graduates proficiently analyze and interpret data, employ machine learning techniques, and contribute to advancements in data preparation, analysis, and storage technologies..

PO5: Graduates exhibit expertise in data warehousing, data mining, and data security, ensuring efficient management, retrieval, and protection of large-scale data sets.

Course Curriculum

FIRST YEAR

SEMESTER-I

S. No.	Course Code	Subject	Periods			Credit
			L	T	P	
1.	BS101	MATHEMATICS-I	2	1	0	3
2.	BS103	APPLIED PHYSICS-I	2	1	0	3
3.	BS105	APPLIED CHEMISTRY	2	1	0	3
4.	HS101	COMMUNICATION SKILLS IN ENGLISH	2	0	0	2
5.	ES101	ENGINEERING GRAPHICS	0	0	3	1.5
6.	ES103	ENGINEERING WORKSHOP PRACTICE	0	0	3	1.5
7.	BS107	APPLIED PHYSICS-I LAB	0	0	2	1
8.	BS109	APPLIED CHEMISTRY LAB	0	0	2	1
9.	HS103	SPORTS AND YOGA	0	0	2	1
10.	HS105	COMMUNICATION SKILLS IN ENGLISH LAB	0	0	2	1
TOTAL CREDITS			8	3	14	18

FIRST YEAR

SEMESTER-II

S. No.	Course Code	Subject	Periods			Credit
			L	T	P	
1.	BS102	MATHEMATICS-II	3	1	0	4
2.	BS104	APPLIED PHYSICS-II	2	0	0	3
3.	ES102	INTRODUCTION TO IT SYSTEMS	2	0	0	2
4.	ES104	FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING	2	1	0	3
5.	ES106	ENGINEERING MECHANICS	2	1	0	3
6.	BS106	APPLIED PHYSICS-II LAB	0	0	2	1
7.	ES108	INTRODUCTION TO IT SYSTEMS LAB	0	0	4	2
8.	ES110	FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING LAB	0	0	2	1

SECOND YEAR**SEMESTER-III**

S. No.	Course Code	Subject	Periods			Credit
			L	T	P	
1.	COPC201	COMPUTER PROGRAMMING	2	0	0	2
2.	COPC203	SCRIPTING LANGUAGES (PYTHON, PERL, ETC. – ANYONE)	2	0	0	2
3.	COPC205	DATA STRUCTURES	2	0	0	2
4.	COPC207	COMPUTER SYSTEM ORGANISATION	3	1	0	4
5.	COPC209	ALGORITHMS	3	1	0	4
6.	SI201	SUMMER INTERNSHIP-1				2
7.	COPC211	COMPUTER PROGRAMMING LAB	0	0	4	2
8.	COPC213	SCRIPTING LANGUAGES LAB	0	0	4	2
9.	COPC215	DATA STRUCTURES LAB	0	0	2	1
Total			12	2	10	21

SECOND YEAR**SEMESTER-IV**

S. No.	Course Code	Subject	Periods			Credit
			L	T	P	
1.	COPC202	OPERATING SYSTEMS	2	0	0	2
2.	COPC204	INTRODUCTION TO DBMS	2	0	0	2
3.	COPC206	COMPUTER NETWORKS	2	0	0	2
4.	COPC208	SSAD/ SOFTWARE ENGINEERING	3	0	0	3
5.	COPC210	WEB TECHNOLOGIES	2	0	0	2
6.	**OE202	OPEN ELECTIVE - I				4
7.	PROJ202	MINOR PROJECT	0	0	4	2
8.	COPC212	OPERATING SYSTEMS LAB	0	0	2	1
9.	COPC214	INTRODUCTION TO DBMS LAB	0	0	2	1
10.	COPC216	COMPUTER NETWORKS LAB	0	0	2	1
11.	COPC218	WEB TECHNOLOGIES LAB	0	0	2	1
12.	AU202	ESSENCE OF INDIAN KNOWLEDGE AND TRADITION	2	0	0	0
Total			13	0	12	21

THIRD YEAR**SEMESTER-5**

S. No.	Course Code	Subject	Periods			Credit
			L	T	P	
1.	COPC301	INTRODUCTION TO e-GOVERNANCE	2	1	0	3
2.	COPC303	IoT	2	1	0	3
3.	COPE###	PROGRAM ELECTIVE-I				4
4.	COPE###	PROGRAM ELECTIVE-II				4
5.	**OE301	OPEN ELECTIVE - II	3	0	0	3
6.	SI301	SUMMER INTERNSHIP-2				3
7.	PR302	MAJOR PROJECT	0	0	2	
Total			7	2	2	20

THIRD YEAR**SEMESTER-6**

S. No.	Course Code	Subject	Periods			Credit
			L	T	P	
1.	COPE###	PROGRAM ELECTIVE-III				4
2.	COPE###	PROGRAM ELECTIVE-IV				4
3.	HS302	ENTERPRENEURSHIPS & START-UPS	3	1	0	4
4.	**OE###	OPEN ELECTIVE - III	3	0	0	3
5.	AU302	INDIAN CONSTITUTION	2	0	0	0
6.	PR302	MAJOR PROJECT	0	0	6	4
7.	SE302	SEMINAR	1	0	0	1
Total			9	1	6	20

ELECTIVE COURSES

S.No	Course Code	Course Name	L	T	P	C
1.	COPE301/COPE302	MOBILE COMPUTING	3	0	2	4
2.	COPE303/COPE304	MULTIMEDIA TECHNOLOGIES	3	0	2	4
3.	COPE305	FUNDAMENTALS OF AI	3	0	2	4
4.	COPE307/COPE308	ADVANCE COMPUTER NETWORKS	3	0	2	4
5.	COPE309/COPE310	INFORMATION SECURITY	3	0	2	4
6.	COPE311/COPE312	NETWORK FORENSICS	3	0	2	4
7.	COPE313/COPE314	DATA SCIENCE: DATA WAREHOUSING & DATA MINING	3	1	0	4
8.	COPE315/COPE316	FOSS (FREE AND OPEN SOURCE SOFTWARE)	3	0	2	4
9.	COPE317/COPE318	SOFTWARE TESTING	3	0	2	4

AUDIT COURSES

S.No	Course Code	Course Name	L	T	P	C
1.	AU102	ENVIRONMENTAL SCIENCE	3	0	0	3
2.	AU202	ESSENCE OF INDIAN KNOWLEDGE AND TRADITION	3	0	0	3
3.	AU302	INDIAN CONSTITUTION	3	0	0	3

OPEN ELECTIVES

S.No	Course Code	Course Name	L	T	P	C
1.	OE102	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	3	0	0	3
2.	OE107	ARTIFICIAL INTELLIGENCE	3	0	0	3
3.	OE106	MECHATRONICS	3	0	0	3
4.	OE105	INTERNET OF THINGS	3	0	0	3
5.	OE104	RENEWABLE ENERGY TECHNOLOGIES	3	0	0	3
6.	OE103	SOFT COMPUTING TECHNIQUES	3	0	0	3
7.	OE101	ECONOMIC POLICIES IN INDIA	3	0	0	3

State Of Art Labs

<p>A well established IoT Lab to explore the many applications of sensors and "smart" objects. It is equipped with Arduino, Raspberry Pi and NodeMCU ESP 8266 in addition to wi-fi, BLE, shields and other connectivity modules. Lot many sensors in the lab to explore myriad of applications. The campus is equipped with 24x7 wired and wireless internet connectivity.</p>	
	<p>NIELIT Ropar Cyber Security lab intends to educate, make aware and enhance the posture of Cyber Security of individuals about their exposure to technology. The laboratory provides a whole gamut of courses from Cyber Security Awareness to Ethical Hacking and Penetration Testing and above all post-graduation in Cyber Forensics.</p>
<p>The Artificial Intelligence Lab is state of the art lab with all high- end machines and AI development kits. The lab is designed to give students hands-on experience in everyday Artificial Intelligence Applications like Predictive Analysis, Image Detection and Analysis, Natural Language Processing tools and applications.</p>	
	<p>WEB Application /MEAN Development Lab which provides a conducive space for developers to build modern, scalable and efficient websites and web applications. In this lab, developers typically design, develop, test, and deploy web applications, focusing on the entire stack from the back-end database to the server-side application framework and the front-end user interface.</p>
<p>Embedded System and VLSI Lab work in providing in-depth knowledge and skills to enhance the learning paradigm of students and comprehensive skills to understand about the Electronics fundamentals, SoC Design and Verification methodologies and industry practices followed by VLSI Design Companies across the world.</p>	

Job Roles

Upon completion of the diploma, graduates can pursue entry-level positions in software development, system administration, technical support, or continue their education with further studies like a bachelor's degree in computer science or related fields. Graduates of Diploma in Computer Science Engineering program are well-positioned for a variety of exciting career paths, including:

- Programmer/ Software Developer
- Web Designer/ Full Stack Developer
- System Analyst
- Data Scientist / Data Analyst
- Graphic Designer
- Cyber Security Specialists
- Database Administrator
- Network Administrator
- Academia as Lecturers/ Asst Professor/ Professor
- And many more

Employment Opportunities

- Facebook
- Tata Consultancy
- Cisco
- Apple
- Flipcart
- Paytm
- Yahoo
- Microsoft
- Google
- Adobe

Eligibility and Fee Details

Duration	3 Years	
No of Seats	60	
Eligibility	Xth standard/Secondary School Certificate (SSC) examination passed from a recognized Board with main subjects Physics, Chemistry and Mathematics with minimum percentage 55%. (50% for SC/ST candidates)	
Fee	Tuition Fee	Rs 37500/- per Semester
	Caution Fee Deposit	Rs 3750/- per semester
	Total	Rs 41250/-

Facilities & Amenities


Hostel Facilities

NIELIT Ropar provides in-campus hostel accommodation for both boys and girls separately with a total capacity of 160 seats in each hostel with modern amenities. The hostels are secured by round-the-clock security guards at the entry gates.

Other Facilities

- NKN Connectivity
- 24x 7 Wi-Fi Campus
- IEEE Online Access
- Shodh Ganga Access
- ACM Online Access

How to Reach

	Please scan the code to get the location details of NIELIT UNIVERSITY
Location Address:	NIELIT University Birla Farms, Bada Phull Rupnagar: 144001
By Auto / Taxi from Ropar Bus Stand	https://maps.app.goo.gl/eEcEqsxMyetwy5AA6
By Auto /Taxi from Ropar Railway station	https://maps.app.goo.gl/sf5pjKz3eiLWYRqi8
By Airport	The nearest Airport is Shaheed Bhagat Singh International Airport which is situated at 55 kms away from the NIELIT Ropar Campus. One can reach the venue by hiring a taxi from the airport https://maps.app.goo.gl/53SosBhBckNDXmdH8

Important Dates

To be added later on