



IIT ROORKEE

ADVANCED CERTIFICATE PROGRAM IN FULL STACK SOFTWARE DEVELOPMENT

10 Months | Online Live Classes
+ Recorded Lectures

THE FUTURE OF SOFTWARE ENGINEERING



30 LAKH JOBS TO BE ADDED BY 2025

The Indian IT/ITeS Industry added 1.4 lakh jobs in 2020 and will continue to add around 30 lakh jobs by 2025.

Source: NASSCOM

TOP 10 EMERGING JOBS IN INDIA

Full Stack Developers, Back End Developers, and JavaScript Developers are listed in the Top 10 Emerging Jobs by LinkedIn India.

Source: LinkedIn Emerging Jobs 2020

HIGHLY REWARDING CAREERS

Average starting salary for Full Stack Developers starts at 6-9 LPA and increases based on experience.

Source: Cutshort.IO Salary Insights

#1 RANKED - FULL STACK DEVELOPER

Full Stack Developers are the most in-demand Software Developers followed by Back End Developers and Front End developers.

Source: Hackerrank Developer Skills Report, 2020

PROGRAM INTRODUCTION



The increasing adoption of digital products has enabled the penetration of web & software technologies. With a wider range of platforms - Desktop, Web, Mobile, AR/VR, etc., the scope for software development is only going to increase. With development costs dropping, many non-tech companies are becoming tech-savvy which would lead to a future where every company will be a tech company on some level. The Indian IT/ITeS industry has shown phenomenal growth in the last decade contributing to the Digital India initiative and is poised to grow up to USD 350 million by 2025, creating 30 lakh+ jobs in the process, according to NASSCOM.

The software industry initially focused on hiring & training super specialised personnel such as Front End Developers, Back End Developers, Database Engineers, Testers,

Site Reliability Engineers etc. who worked on specific aspects of the software development life cycle (SDLC). The emergence of multiple frameworks, tools, and libraries has encouraged companies to hire Full Stack Developers who can handle end-to-end development of software applications in addition to testing, building, and deploying applications on the cloud.

While we have around 6 lakh engineering students who graduate every year, NASSCOM reveals that only around 25% of these graduates are employable by IT/ITeS companies. This puts India in a unique talent paradox. We have a multitude of engineering graduates but a limited pool of qualified engineers in computer science and programming, resulting in companies struggling to meet their talent supply needs.

To address this digital skill gap and build the next generation of Full Stack Software Developers, EICT IIT Roorkee in collaboration with Great Learning has launched the **Advanced Certificate Program in Full Stack Software**

Development. This program is focused on building essential software development skills among learners to make them productive and reliable Software Developers to open new opportunities for them.

Learners build their expertise by solving real-world problems which will require planning, design, coding, code reviews, and testing with periodic and constant support from faculty and industry experts via live sessions and webinars. Participants will also receive extensive career support and placement assistance from Great Learning to crack their next dream job in tech.

SPECIALIZATION

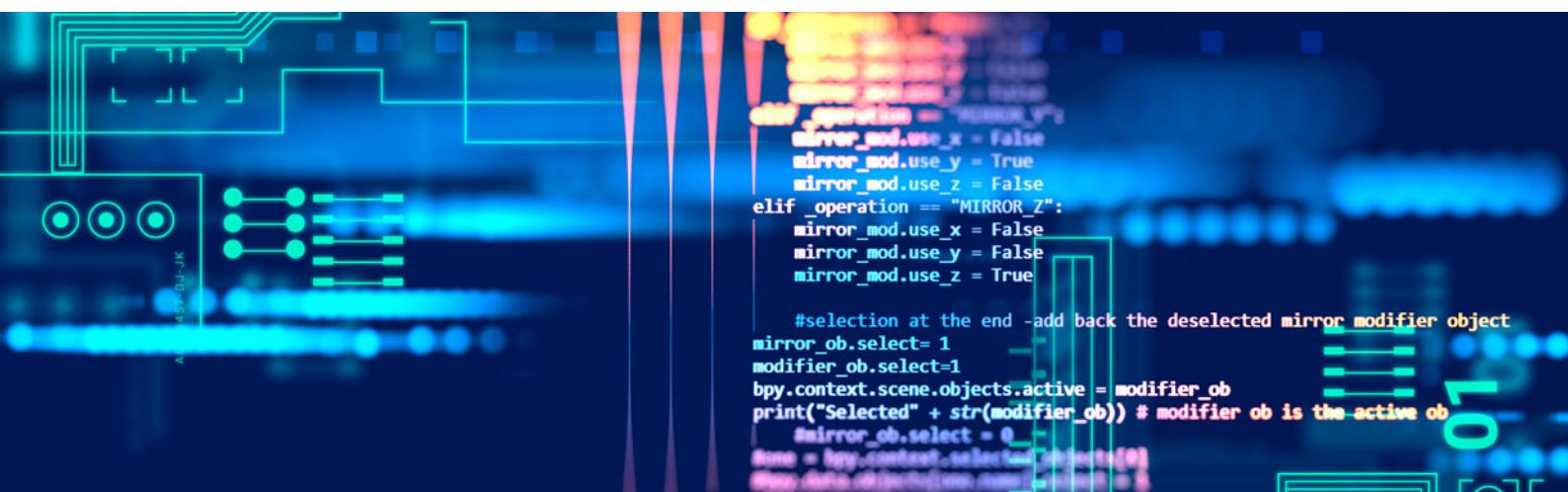
Learners have the opportunity to specialize in one of the two emerging technologies below to augment their skill set and target multiple job roles.

CLOUD COMPUTING

- Foundations
- AWS Core & Advanced
- DevOps on AWS, etc.

PYTHON FOR DATA SCIENCE

- Exploratory Data Analysis
- Supervised Learning
- Unsupervised Learning, etc.



ABOUT IIT ROORKEE



Indian Institute of Technology - Roorkee is among the foremost institutes of national importance in higher technological education and in engineering, basic and applied research. The institute ranks amongst the best technological institutions in the world and has contributed to all sectors of technological development. It has also been considered a trend-setter in the area of education and research in the field of science, technology, and engineering.

ABOUT E&ICT ACADEMY



Electronics & ICT Academy IIT Roorkee (E&ICT IITR) is an initiative supported by MeitY, Govt of India. EICT IIT Roorkee delivers FDPs and certification courses in online as well as offline modes. Our courses lay emphasis on bridging the gap between industry demand and academic learning to provide a foundation to build your career in the ICT industry. All our courses have projects with real-life problems which impart industry insights. We have assimilated both academic & industry experts to formulate the most effective courses that help professionals, students and faculty upgrade their skills without disrupting their regular schedule.

ACHIEVEMENTS



In Engineering Category of NIRF Rankings 2022

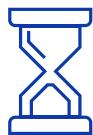


In Overall Category of NIRF Rankings 2022



Among the IITs in the '**Citations per Faculty**' parameter in QS World University Rankings, 2021

PROGRAM HIGHLIGHTS



10-MONTH
program with
300+
learning hours



LEARN FROM THE BEST

Live classes & recorded lectures with IIT Roorkee faculty and industry experts with dedicated program support



BUILD APPLICATIONS

Work on 10+ projects & assignments



CAREER ASSISTANCE FROM GREAT LEARNING

Get exclusive access to 2300+ top hiring companies

WHO IS THIS PROGRAM FOR?

- Students and early-career professionals who want to kickstart their software development career and gain specialisation in Cloud Computing and Python for Data Science as well as other emerging technologies.
- IT professionals working as System Analysts and Backend Developers who want to gain expertise in Full Stack Software Development.
- Professionals looking to transition to Software Development roles from non-development IT roles such as Testing, Support and Quality Analysis, or other non-technical roles.



PROGRAM OUTCOMES

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM, YOU WILL:

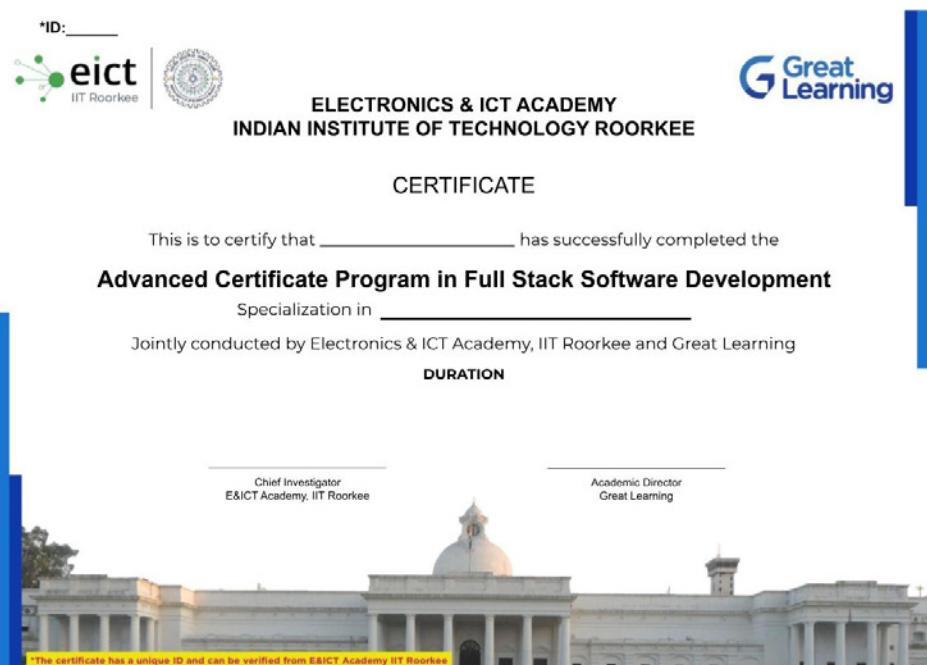
- Become proficient in building end-to-end web applications handling all the areas of the tech-stack
- Become ready to kickstart your tech career in top IT companies
- Become an ideal candidate for early-career tech roles such as Full Stack Developer, Back End Developer, Front End developer, Software Engineer, Software Developer, etc.
- Based on the specialization chosen, you can also target emerging tech job roles as mentioned below.

CLOUD COMPUTING: AWS Cloud Engineer, Cloud Devops Engineer, Cloud Developer, etc.

PYTHON FOR DATA SCIENCE:
Data Analyst, Business Analyst, Data Scientist, etc.

CERTIFICATE

Upon successful completion of this program, you will receive a Certificate of Completion from E&ICT Academy, IIT Roorkee.



CURRICULUM*

*The curriculum is subject to change based on industry trends and inputs from IIT Roorkee faculty.



COURSE - PREWORK

INTRODUCTION TO PROGRAMMING

- a. Program Structure & Basic Principles
- b. Programming Constructs - Loops, Functions, Arrays, Etc.
- c. An Introduction to Version Control, Git, Command-line Scripting
- d. Basic HTML, CSS

COURSE - BACK END SOFTWARE DEVELOPMENT

OBJECT-ORIENTED PROGRAMMING

- Object-Oriented Paradigms of Java Programming (Classes, Objects etc.)
- Object-Oriented Design
- Exception Handling, Collections, Concurrency, etc.

DATA STRUCTURES

- Linear Data Structures (Arrays, Strings, Stacks, Queues, Linked Lists, etc.)
- Binary Trees and Binary Search Trees, Tree traversals



ALGORITHMS

- Basic Algorithms: Recursion, Searching and Sorting Algorithms, Greedy Algorithms
- Analysis of Algorithms and Evaluating the right algorithm for a problem
- **Self Study** : Advanced algorithms – Graphs, Dynamic Programming, Hashing Algorithms

DATABASE DESIGN & SYSTEMS

- Processing, Storing & Organizing Data: Data Models,
- Tables, Views, SQL Queries - Simple & Complex
- Database Schemas, Normalization, Keys, Indexes
- JDBC
- Introduction to NoSQL databases

SERVER-SIDE DEVELOPMENT & FRAMEWORKS

- Spring MVC Architecture
- Backend Development Using Springboot Framework
- ORM & Hibernate
- REST APIs

COURSE - FRONT END SOFTWARE DEVELOPMENT

FRONT-END DEVELOPMENT - HTML & CSS

- HTML & CSS Interaction, CSS : Styling, Selectors, Box Model, Border, Margin, Padding, etc

FRONT-END DEVELOPMENT - JAVASCRIPT

- JavaScript Fundamentals, Hoisting, Callbacks, Promises, Asynchronous JavaScript, DOM Manipulation, JSON, AJAX Calls, Communication with Server, Event Listeners, Local and Session Storage etc.
- Advanced JavaScript -ES6, Let & Const, Arrow Functions, Array Destructuring, Async/Await, Babel, Webpack, etc

JAVASCRIPT FRAMEWORKS - REACT

- React Introduction, React Router, Components and Single Page Applications
- React Forms, Flow Architecture
- Redux & Client-Server Communication, etc

COURSE - SPECIALIZATION IN CLOUD COMPUTING

LINUX ESSENTIALS

- Linux OS
- File Structure
- Command Line Ops
- Linux Distros & Usage
- Basic Shell Scripting

PYTHON ESSENTIALS

- Language Basics
- Python Scripting
- Using AWS Python SDK

CLOUD FOUNDATIONS

- Service Models
- Deployment Models
- Virtual Machines vs Containers
- Why Cloud
- Traditional vs Cloud Infra
- Cloud Platforms

CONTAINERS

- Container Basics
- System Containers (LXD)
- Application Containers (Docker)
- Container Orchestration & Management

AWS CORE

- AWS Organization & IAM
- Compute
- Storage
- Network

AWS ADVANCED

- Database Services (RDS, DynamoDB)
- PaaS - Elastic BeanStalk
- CaaS - Elastic Container Service
- Monitoring & Logging - AWS CloudWatch, CloudTrail
- Notifications - SNS, SES
- Billing & Account Management

DEVOPS ON AWS

- Continuous Integration and Continuous Deployment
- Deployment Pipeline(e.g. AWS CodePipeline, CodeCommit, CodeBuild, CodeDeploy)
- Plan, Build, Deploy and Monitor (CloudFormation)
- Infrastructure as Code (Terraform, CloudFormation)



COURSE - SPECIALIZATION IN PYTHON FOR DATA SCIENCE

PYTHON FOR DATA SCIENCE

- Numpy
- Pandas
- Matplotlib

SQL PROGRAMMING

- Introduction to DBMS
- Subqueries and Joins
- Functions, Operations, Grouping & Filtering, etc.

EXPLORATORY DATA ANALYSIS

- Data Cleaning
- Data Preprocessing
- Feature Engineering

SUPERVISED LEARNING

- Predictive Modelling- Linear Regression

- Predictive modelling- Logistic Regression
- Popular supervised ML Algorithms
- Naive Bayes
- K-Nearest Neighbor
- Decision Tree

UNSUPERVISED LEARNING

- Introduction to Clustering
- K Means Clustering
- Silhouette coefficient for K means
- Visual Analysis of clustering

APPLICATIONS (SELF PACED OPTIONAL CONTENT)

- Time Series
- Text Mining

TOOLS COVERED



AND MORE



FACULTY AND MENTORS

Learn from India's leading academicians in the field of Software Engineering and several experienced industry practitioners from top organisations. Below is an indicative sample of faculty and mentors you might interact with during the course of the program.



Prof. R. Balasubramanian

CSE Department, IIT Roorkee

Prof. Balasubramanian Raman is a Professor in the Department of Computer Science and Engineering at IIT Roorkee since 2004. His research focus is in the areas of Computer Vision, Graphics and Image Processing, etc.



Prof. Partha Pratim Roy

CSE Department, IIT Roorkee

Prof. Partha Pratim Roy is an Associate Professor in the Department of Computer Science and Engineering at IIT Roorkee since 2014. His research focus is in the areas of Computer Vision, Machine Learning and Deep Learning, etc.



Prof. Sanjeev Manhas

ECE Department, IIT Roorkee

Prof. Sanjeev Manhas is a Professor in the Department of Electronics and Communications Engineering at IIT Roorkee since 2008. His research interests are the areas of Nanoscale Devices and Circuits, Semiconductor Memories, ML and In-memory Computing, IoT, and Sensors.

FACULTY AND MENTORS



Prof. Abhinanda Sarkar
Academic Director, Great Learning

Dr. Abhinanda Sarkar has a degree in B.Stat. and M.Stat. from the Indian Statistical Institute (ISI) and a Ph.D. in Statistics from Stanford University. He is currently adjunct or visiting faculty at Stanford, ISI Delhi, IIM-B and IISc. After working in the research teams at MIT and IBM, he spent a decade at General Electric in Bangalore. At Great Learning, Dr. Sarkar is the Academic Director where he ensures academic rigour and quality for all programs offered by through Great Learning.



Nirmallya Mukherjee
Academic Director, Cloud Computing

With over two and half decades of cross domain experience in IT and ITeS across both services and products, Nirmallya Mukherjee has served as Chief Architect at Dell, Principal Architect at Infosys and Technical Architect at Ciber Inc, an HTC Global Services company. He lends his expertise to various multinationals like Cisco, Walmart Labs, Amadeus, Mercedes Benz, ANZ, Societe Generale etc. through his consulting, development and training.



Prof. Mukesh Rao
Faculty, Great Learning

Prof. Mukesh Rao is an Adjunct Faculty at Great Learning for Big Data and Machine Learning. Mukesh has over 20 years of industry experience in Market Research, Project Management, and Data Science. Mukesh has conducted over 100 corporate trainings in the areas of Data Science, Big Data, etc.

GET THE **GREAT LEARNING** ADVANTAGE

Great Learning, a part of the BYJU'S group, is India's leading professional learning and higher education platform. When you choose this program, you also get access to Great Learning's extensive pool of industry experts and dedicated career assistance.

6.1 MILLION+ LEARNERS

5400+ INDUSTRY EXPERT MENTORS

170+ COUNTRIES

2300+ COMPANIES HIRE FROM US

BEST ED-TECH COMPANY OF THE YEAR*

*EdTech Review Awards 2020

*Indian Education Awards 2022

BEST ONLINE SKILLS PROVIDER*

*Education Innovation Awards 2022



E-PORTFOLIO

An e-portfolio is a snapshot of all the projects done and skills acquired during the program that is shareable across social media channels. This will help you showcase your expertise to potential recruiters.



GREAT LEARNING JOB BOARD

The program provides candidates access to the Great Learning Job Board. 2300+ organisations approach us with job opportunities that are shared through the Job Board with our candidates, with an average salary hike of 50%.



RESUME BUILDING AND INTERVIEW PREPARATION

We help you build your resume to highlight your skills and your previous professional experience. You'll also learn to crack interviews with our interview preparation sessions.



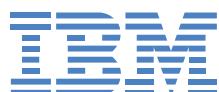
CAREER GUIDANCE

Get access to career mentoring from industry experts who've transitioned to roles in the industry. Benefit from their guidance on how to build a rewarding career.

COMPANIES THAT HIRE FROM US



McKinsey&Company



J.P.Morgan



+2300 MORE COMPANIES

ADMISSION PROCESS

STEP 1

Register your interest by filling in the online application form for the program.

STEP 2

Shortlisted candidates will be required to go through a screening interview with the Great Learning Program Admission Director's office.

STEP 3

Selected candidates will be provided with an offer of admission to the program. Candidates are required to pay the admission fee to secure their seat.

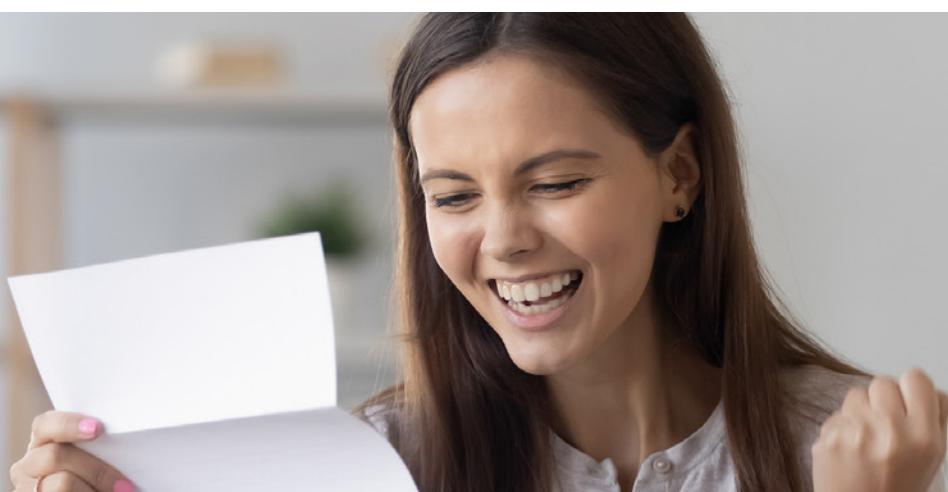
Eligibility

- Applicants should have 50% or above in Xth, XIIth.
- No programming experience is required.
- This program is suitable for both fresh graduates and professionals with experience.
- College students that are due to graduate within the next 12-18 months are also encouraged to apply.

FEES

₹ 2,00,000 + GST

Learning is now made easy with financing options at 0% interest rate, 0% processing fee and longer tenure of up to 60 months. EMIs for the program start at Rs. 4073. Please contact the admissions office for more details.



START LEARNING TODAY

ADVANCED CERTIFICATE PROGRAM IN FULL STACK SOFTWARE DEVELOPMENT



IIT ROORKEE

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