

# NPTEL DOMAIN CERTIFICATION



<https://nptel.ac.in/noc/Domain/>



<https://nptel.ac.in/noc/Domain/>

Want to **Specialize**  
in an area of Study?

Complete an **NPTEL Domain**



**58 Domains**  
across 14 Disciplines

## DISCIPLINES

1. Aerospace Engineering, 2. Agriculture Engineering, 3. Biotechnology and Bioscience / Bioengineering
4. Chemical Engineering, 5. Civil Engineering, 6. Computer Science
7. Electrical Engineering, 8. Management, 9. Mechanical Engineering
10. Metallurgical & Materials Engineering
11. Faculty Development, 12. Humanities, 13. Mathematics 14. Sports Science

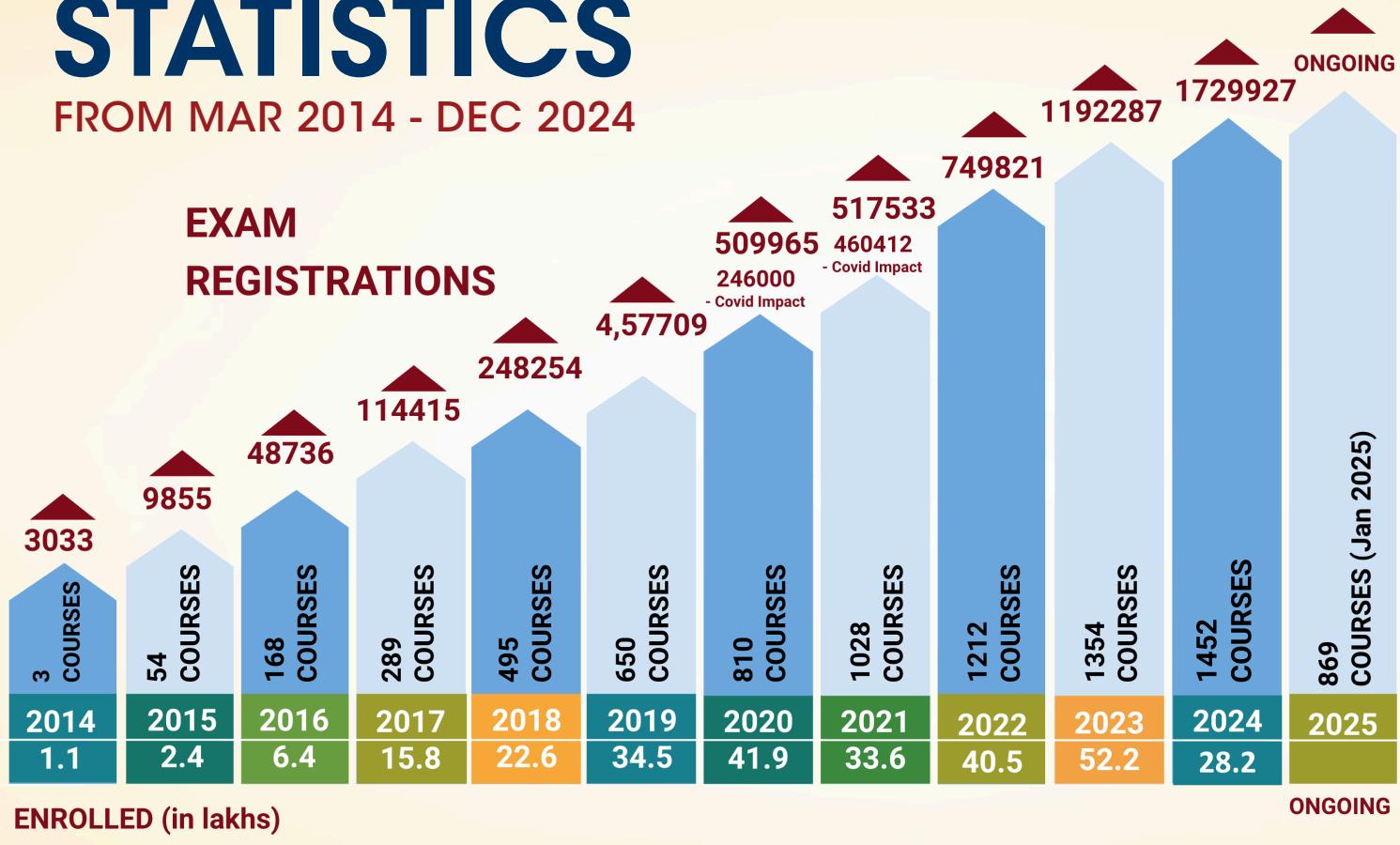
## About NPTEL

The National Programme on Technology Enhanced Learning (NPTEL) is a project funded by the Ministry of Human Resources Development, Govt. of India and carried out by seven IITs (Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras, and Roorkee) along with IISc, Bangalore. Since 2014 NPTEL has been focusing on offering online courses for certification, with a unique, in person - at center, proctored final exam currently conducted in 160+ cities across India, that lends strong credibility to this process.

# STATISTICS

FROM MAR 2014 - DEC 2024

## EXAM REGISTRATIONS



## Engaging with Indian Authorities

UGC and AICTE have approved that colleges can take these MOOC courses for credit in their Gazette notification of August 2016. These courses are being used by students to avail internship opportunities and prepare for the GATE exam too. About 15-20% of the total exam certified participants are faculty members from various colleges and hence these programmes are helping in faculty development and improvement. The advanced courses are recognized by AICTE as FDP.

# Domain Certification

- ▶ Register for domain-specific NPTEL courses
- ▶ No separate registration; no separate fees



## Possible Paths for students

| Path - 1 |            |
|----------|------------|
| Sem 1    |            |
| Sem 2    | 1 Core     |
| Sem 3    | 1 Core     |
| Sem 4    | 1 Core     |
| Sem 5    | 1 Core     |
| Sem 6    | 1 Elective |
| Sem 7    | 1 Elective |
| Sem 8    | 1 Elective |

| Path - 2 |                     |
|----------|---------------------|
| Sem 1    |                     |
| Sem 2    | 1 Core              |
| Sem 3    | 1 Core              |
| Sem 4    | 1 Core              |
| Sem 5    | 1 Core + 1 Elective |
| Sem 6    | 2 Elective          |
| Sem 7    |                     |
| Sem 8    |                     |

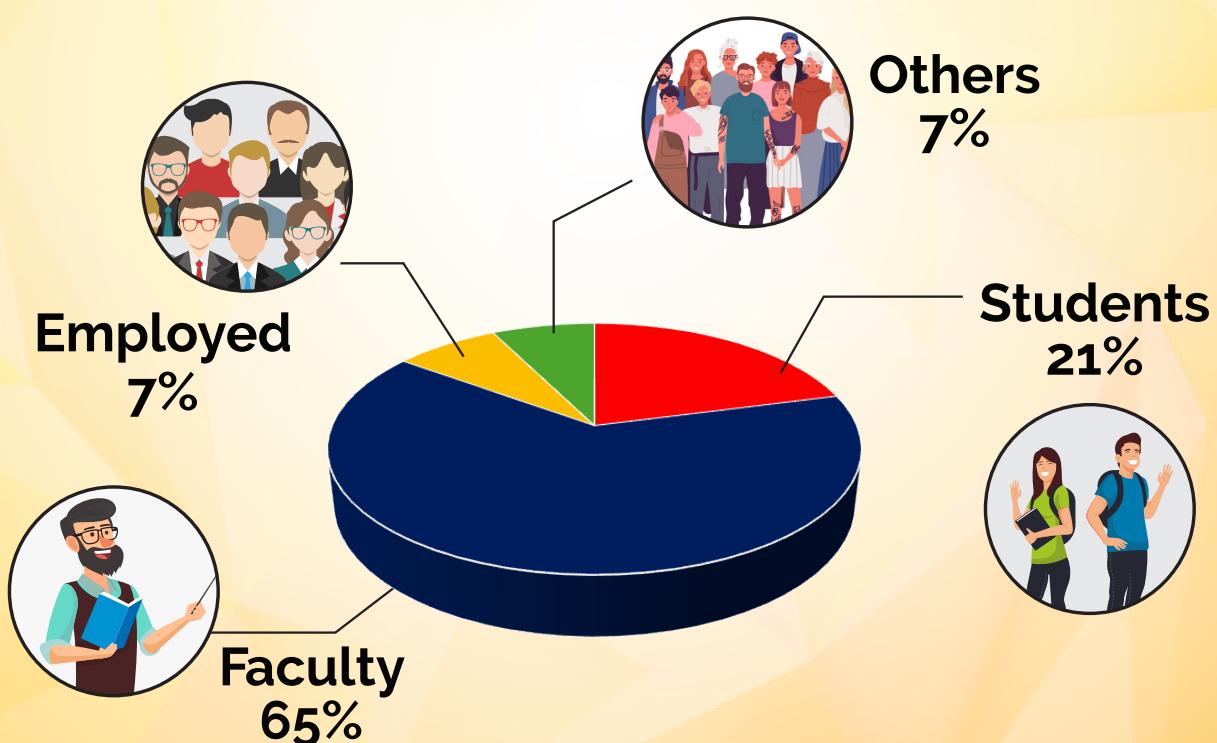
| Path - 3 |             |
|----------|-------------|
| Sem 1    |             |
| Sem 2    |             |
| Sem 3    | 2 Core      |
| Sem 4    | 2 Core      |
| Sem 5    | 3 Electives |
| Sem 6    |             |
| Sem 7    |             |
| Sem 8    |             |

Based on the capability of the student, they can space out the completion of the courses of a domain and ensure they do so before the placement season or before they appear for competitive exams.



# LEARNERS WHO HAVE **COMPLETED** DOMAIN COURSES

| Discipline                                    | Students | Faculty | Employed | Others |
|---|----------|---------|----------|--------|
| Aerospace Engineering                         | 12       | 4       | 3        | 1      |
| Biotechnology and Bioscience / Bioengineering | 33       | 34      | 1        | 6      |
| Chemical Engineering                          | 7        | 13      | 0        | 2      |
| Civil Engineering                             | 3        | 23      | 11       | 4      |
| Computer Science                              | 142      | 322     | 33       | 44     |
| Electrical Engineering                        | 18       | 89      | 6        | 5      |
| Faculty                                       | 2        | 195     | 3        | 6      |
| Management                                    | 28       | 105     | 22       | 18     |
| Mechanical Engineering                        | 24       | 66      | 8        | 2      |
| Metallurgical & Materials Engineering         | 3        | 23      | 5        | 2      |
| Mathematics                                   | 2        | 3       | 0        | 0      |
| Humanities and Social Science                 | 8        | 20      | 1        | 7      |
| Sports Science                                | 0        | 0       | 0        | 0      |





# NPTEL DOMAIN CERTIFICATE

## 💡 What

- This is a Micro Certification where a learner can obtain expertise in an area by completing a group of related courses.
- 

## 🎯 Why

- Gain expertise in a specific area
  - Demonstrates motivation and dedication
  - Can prepare for competitive exams like GATE, NET etc by doing the Minors defined in various disciplines.
- 

## ❓ How

- Complete all core and the selected electives in a domain within a period of 3 years
- Get Average score  $\geq 60$  across courses with minimum of  $\geq 55$  in each course
- Complete the minimum number of weeks of study specified

# Index

## Aerospace Engineering

|                  |    |
|------------------|----|
| Flight Mechanics | 10 |
|------------------|----|

## Agriculture Engineering

|                                      |    |
|--------------------------------------|----|
| Food Process Engineering             | 12 |
| Integrated Soil and Water Management | 13 |

## Biotechnology and Bioscience / Bioengineering

|                       |       |
|-----------------------|-------|
| Bioprocesses          | 15    |
| Bioengineering        | 16-17 |
| Biosciences           | 18-19 |
| Computational Biology | 20-21 |

## Chemical Engineering

|                                    |    |
|------------------------------------|----|
| Minor 1                            | 23 |
| Computational Chemical Engineering | 24 |
| Energy and Environment             | 25 |
| Minor 2                            | 26 |
| Minor 3                            | 27 |
| Polymers and Colloidal Materials   | 28 |

## Civil Engineering

|                                   |       |
|-----------------------------------|-------|
| Construction Materials Technology | 30    |
| Structural Analysis               | 31    |
| Structural Design                 | 32    |
| Environment                       | 33-34 |

## Computer Science Engineering

|                          |       |
|--------------------------|-------|
| Artificial Intelligence  | 36    |
| Data Science             | 37-38 |
| Programming              | 39    |
| Foundations of Computing | 40    |
| Systems                  | 41    |
| Cyber Security           | 42    |

## Electrical Engineering

|                                     |       |
|-------------------------------------|-------|
| VLSI design                         | 44-45 |
| Communication and Signal Processing | 46-47 |
| Power Systems and Power Electronics | 48-49 |
| Control and Instrumentation         | 50-51 |
| Photonics                           | 52-53 |

## Faculty Development

|                              |       |
|------------------------------|-------|
| Faculty Domain - Fundamental | 55    |
| Faculty Domain - Advanced    | 56-57 |

## Management

|  |       |
|--|-------|
| Marketing                                | 59    |
| Operations                               | 60-61 |
| Minor                                    | 62    |
| Patents and Intellectual Property Rights | 63    |
| Economics                                | 64    |
| Managerial Economics                     | 65-66 |
| Economics And Finance                    | 67    |
| Human Resource Management                | 68    |

## Mechanical Engineering

|  |       |
|--|-------|
| Computational Engineering              | 70    |
| Computational Thermo Fluids            | 71    |
| Advanced Mechanics                     | 72-73 |
| Propulsion                             | 74    |
| Energy Systems                         | 75    |
| Manufacturing Processes and Technology | 76-77 |
| Product Design                         | 78-79 |
| Advanced Dynamics and Vibration        | 80    |
| Computational Mechanics                | 81    |
| Robotics                               | 82-83 |

# Index

## ***Metallurgical & Materials Engineering***

|                            |       |
|----------------------------|-------|
| Materials Joining          | 85    |
| Electronic Materials       | 86    |
| Materials Characterization | 87    |
| Minor in Metallurgy        | 88-89 |
| Minor in Materials Science | 90    |

## ***Mathematics***

|                            |    |
|----------------------------|----|
| Foundations of Mathematics | 95 |
| Algebra                    | 96 |

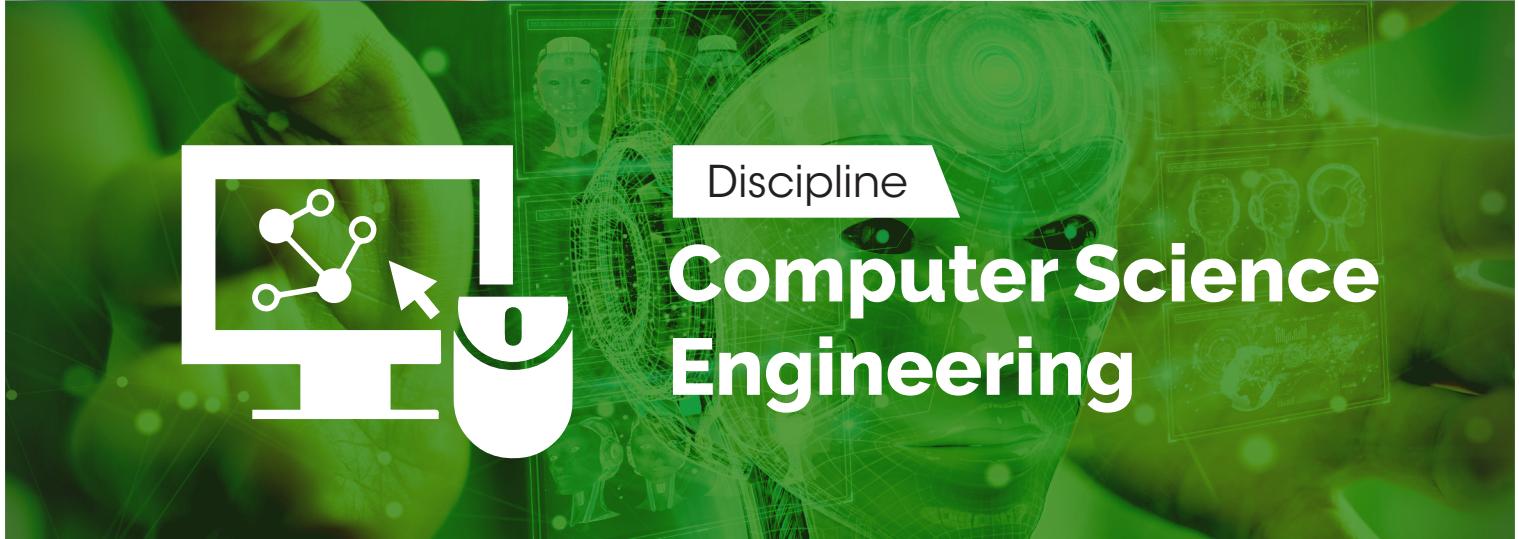
## ***Humanities and Social Science***

|                 |    |
|-----------------|----|
| English Studies | 92 |
| Psychology      | 93 |

## ***Sports Science***

|                |    |
|----------------|----|
| Sports Science | 98 |
|----------------|----|





## Domains

1. Artificial Intelligence
2. Data Science
3. Programming
4. Foundations of Computing
5. Systems
6. Cyber Security



# Artificial Intelligence

(4 Core + 2 Elective) Minimum of 60 Weeks

The AI domain includes courses in artificial intelligence and machine learning. This set of courses introduce the learner to tools that would go into building intelligent agents, including the ability to solve problems, represent and reason about the agent's environment, learning from data, implementing neural networks, and being able to handle text and images.

| Core/<br>Elective | Course Name   | Duration | SME Name   | Institute                      | NPTEL ID  |
|-------------------|---|----------|--|--------------------------------|-----------|
| Core 1            | Artificial Intelligence : Search Methods For Problem solving    | 12 weeks | Prof. Deepak Khemani   | IIT Madras                     | 106106226 |
|                   | An Introduction to Artificial Intelligence                      | 12 weeks | Prof. Mausam   | IIT Delhi                      | 106102220 |
| Core 2            | Artificial Intelligence: Knowledge Representation and Reasoning | 12 weeks | Prof. Deepak Khemani   | IIT Madras                     | 106106140 |
| Core 3            | Programming, Data Structures and Algorithms in Python           | 8 weeks  | Prof. Madhavan Mukund  | Chennai Mathematical Institute | 106106145 |
|                   | Python for Data Science   | 4 weeks  | Prof. Ragunathan Rengasamy   | IIT Madras                     | 106106212 |
| Core 4            | Introduction to Machine Learning- IIT KGP                       | 8 weeks  | Prof. Sudeshna Sarkar  | IIT Kharagpur                  | 106105152 |
|                   | Introduction to Machine Learning                                | 12 weeks | Prof. Balaraman Ravindran  | IIT Madras                     | 106106139 |
| Elective 1        | Deep Learning   | 12 weeks | Prof. Sudarshan Iyengar  | IIT Ropar                      | 106106184 |
|                   | Deep Learning   | 12 weeks | Prof. Prabir Kumar Biswas  | IIT Kharagpur                  | 106105215 |
|                   | Deep Learning for Computer Vision                               | 12 weeks | Prof. Vineeth N Balasubramanian  | IIT Hyderabad                  | 106106224 |
| Elective 2        | Reinforcement Learning  | 12 weeks | Prof. Balaraman Ravindran  | IIT Madras                     | 106106143 |
| Elective 3        | AI:Constraint Satisfaction                                      | 8 weeks  | Prof. Deepak Khemani   | IIT Madras                     | 106106158 |
| Elective 4        | Computer Vision   | 12 weeks | Prof. Jayanta Mukhopadhyay   | IIT Kharagpur                  | 106105216 |
| Elective 5        | Natural Language Processing                                     | 12 weeks | Prof. Pawan Goyal  | IIT Kharagpur                  | 106105158 |
|                   | Applied Natural Language Processing                             | 12 weeks | Prof. Ramaseshan R   | Chennai Mathematical Institute | 106106211 |
| Elective 6        | Practical Machine Learning with Tensorflow                      | 8 weeks  | Prof. Ashish Tendulkar<br>Prof. Balaraman Ravindran                              | IIT Madras & Google            | 106106213 |
| Elective 7        | Affective Computing   | 12 weeks | Prof. Jainendra Shukla<br>Prof. Abhinav Dhall                                    | IIT Delhi                      | 106106244 |
| Elective 8        | Games and Information   | 12 weeks | Prof. Ankur A. Kulkarni  | IIT Bombay                     | 106101360 |
| Elective 9        | Responsible & Safe AI Systems                                   | 12 Weeks | Prof. Ponnurangam Kumaraguru<br>Prof. Balaraman Ravindran<br>Prof. Arun Rajkumar | IIT Hyderabad<br>IIT Madras    | 106106472 |
| Elective 10       | Algorithms in Computational Biology and Sequence Analysis       | 12 weeks | Prof. Chirag Jain  | IISc Bangalore                 | 106108571 |
| Elective 11       | Deep Learning for Natural Language Processing                   | 12 weeks | Prof. Pawan Goyal  | IIT Kharagpur                  | 106105572 |
| Elective 12       | Human Computer Interaction (In English)                         | 12 weeks | Prof. Rajiv Ratn Shah  | IIT Delhi                      | 106106575 |
| Elective 13       | Introduction to Large Language Models (LLMs)                    | 12 weeks | Prof. Tanmoy Chakraborty<br>Prof. Soumen Chakraborti                             | IIT Delhi                      | 106102576 |

# Data Science

**(3 Core + 3 Elective) Minimum of 60 Weeks**

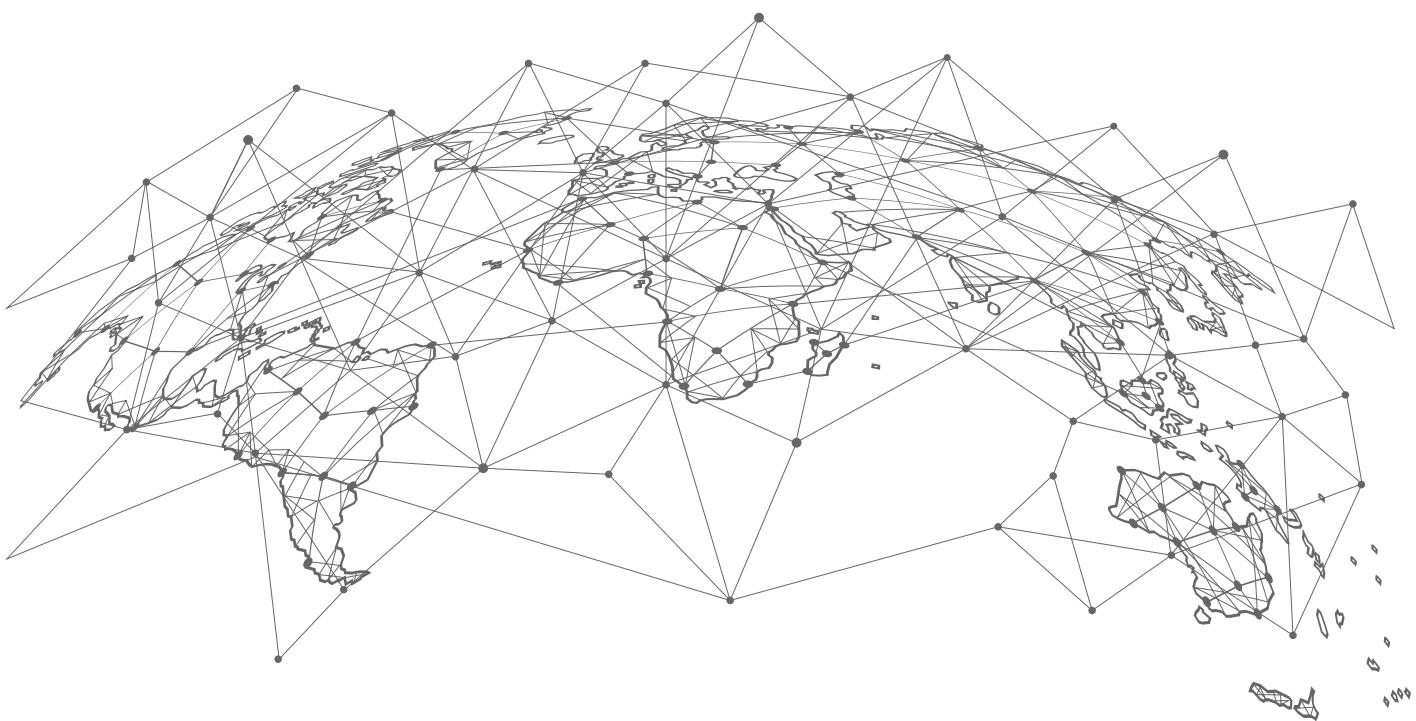
The Data Science domain includes courses that contribute to implementing programs that can handle and make sense of large amounts of data. The focus is on machine learning techniques to help make sense of data, often dealing with text and images, but there is also possible exposure to symbolic artificial intelligence methods.

| Core/<br>Elective | Course Name   | Duration | SME Name   | Institute                      | NPTEL ID  |
|-------------------|---|----------|--|--------------------------------|-----------|
| Core 1            | Python for Data Science   | 4 weeks  | Prof. Ragunathan Rengasamy                             | IIT Madras                     | 106106212 |
|                   | Programming, Data Structures and Algorithms in Python           | 8 weeks  | Prof. Madhavan Mukund                                  | Chennai Mathematical Institute | 106106145 |
| Core 2            | Introduction to Data Analytics                                  | 8 weeks  | Prof. Nandan Sudarsanam<br>Prof. Balaraman Ravindran   | IIT Madras                     | 110106072 |
|                   | Data Science for Engineers                                      | 8 weeks  | Prof. Ragunathan Rengasamy<br>Prof. Shankar Narasimhan | IIT Madras                     | 106106179 |
|                   | Data Analytics with Python                                      | 12 weeks | Prof. A. Ramesh  | IIT Roorkee                    | 106107220 |
| Core 3            | Introduction to Machine Learning - IIT KGP                      | 8 weeks  | Prof. Sudeshna Sarkar                                  | IIT Kharagpur                  | 106105152 |
|                   | Introduction to Machine Learning                                | 12 weeks | Prof. Balaraman Ravindran                              | IIT Madras                     | 106106139 |
| Elective 1        | Deep Learning   | 12 weeks | Prof. Sudarshan Iyengar                                | IIT Ropar                      | 106106184 |
|                   | Deep Learning   | 12 weeks | Prof. Prabir Kumar Biswas                              | IIT Kharagpur                  | 106105215 |
|                   | Deep Learning for Computer Vision                               | 12 weeks | Prof. Vineeth N Balasubramanian                        | IIT Hyderabad                  | 106106224 |
| Elective 2        | Reinforcement Learning  | 12 weeks | Prof. Balaraman Ravindran                              | IIT Madras                     | 106106143 |
| Elective 3        | Artificial Intelligence : Search Methods For Problem Solving    | 12 weeks | Prof. Deepak Khemani                                   | IIT Madras                     | 106106226 |
|                   | An Introduction to Artificial Intelligence                      | 12 weeks | Prof. Mausam   | IIT Delhi                      | 106102220 |
| Elective 4        | Artificial Intelligence: Knowledge Representation and Reasoning | 12 weeks | Prof. Deepak Khemani                                   | IIT Madras                     | 106106140 |
| Elective 5        | Computer Vision   | 12 weeks | Prof. Jayanta Mukhopadhyay                             | IIT Kharagpur                  | 106105216 |
| Elective 6        | Natural Language Processing                                     | 12 weeks | Prof. Pawan Goyal                                      | IIT Kharagpur                  | 106105158 |
|                   | Applied Natural Language Processing                             | 12 weeks | Prof. Ramaseshan R                                     | Chennai Mathematical Institute | 106106211 |
| Elective 7        | Practical Machine Learning with Tensorflow                      | 8 weeks  | Prof. Ashish Tendulkar<br>Prof. Balaraman Ravindran    | IIT Madras & Google            | 106106213 |
| Elective 8        | Learning Analytics Tools  | 12 weeks | Prof. Ramkumar Rajendran                               | IIT Bombay                     | 106101224 |
| Elective 9        | Probability for Computer Science                                | 8 Weeks  | Prof. Nitin Saxena                                     | IIT Kanpur                     | 106104233 |
| Elective 10       | Linear Programming and its Applications to Computer Science     | 8 weeks  | Prof. Rajat Mittal                                     | IIT Kanpur                     | 106104356 |
| Elective 11       | Games and Information   | 12 weeks | Prof. Ankur A. Kulkarni                                | IIT Bombay                     | 106101360 |
| Elective 12       | Business Intelligence & Analytics                               | 12 weeks | Prof. Saji K Mathew                                    | IIT Madras                     | 106106361 |
| Elective 13       | Advanced R Programming for Data Analytics in Business           | 12 Weeks | Prof. Abhinava Tripathi                                | IIT Kanpur                     | 110104513 |

# Data Science

**(3 Core + 3 Elective) Minimum of 60 Weeks**

| Core/<br>Elective | Course Name   | Duration | SME Name   | Institute      | NPTEL ID  |
|-------------------|---|----------|--|----------------|-----------|
| Elective 14       | Algorithms in Computational Biology and Sequence Analysis | 12 Weeks | Prof. Chirag Jain                                    | IISc Bangalore | 106108571 |
| Elective 15       | Deep Learning for Natural Language Processing             | 12 weeks | Prof. Pawan Goyal                                    | IIT Kharagpur  | 106105572 |
| Elective 16       | Introduction to Large Language Models (LLMs)              | 12 Weeks | Prof. Tanmoy Chakraborty<br>Prof. Soumen Chakraborti | IIT Delhi      | 106102576 |



# Programming

**(4 Core + 2 Elective) Minimum of 60 Weeks**

The Programming domain lays emphasis on the tools needed to implement application software systems. Starting with programming fundamentals one moves on to databases, and then there options to study cloud computing, internet of things, machine learning and data science.

| Core/<br>Elective | Course Name   | Duration | SME Name   | Institute   | NPTEL ID  |
|-------------------|---|----------|--|---|-----------|
| Core 1            | Programming, Data Structures and Algorithms in Python           | 8 weeks  | Prof. Madhavan Mukund  | Chennai Mathematical Institute                                | 106106145 |
|                   | Data Structure and Algorithms using Java                        | 12 Weeks | Prof. Debasis Samanta  | IIT Kharagpur   | 106105225 |
| Core 2            | Programming in C++  | 8 weeks  | Prof. Partha Pratim Das  | IIT Kharagpur   | 106105151 |
|                   | Programming in Modern C++                                       | 12 weeks | Prof. Partha Pratim Das  | IIT Kharagpur   | 106105234 |
|                   | An Introduction to Programming through C++                      | 12 weeks | Prof. Abhiram G Ranade   | IIT Bombay  | 106101208 |
| Core 3            | Programming in Java   | 12 weeks | Prof. Debasis Samanta  | IIT Kharagpur   | 106105191 |
|                   | Object Oriented System Development using UML, Java and Patterns | 12 weeks | Prof. Rajib Mall   | IIT Kharagpur   | 106105224 |
|                   | Fundamentals of Object Oriented Programming                     | 12 Weeks | Prof. Balasubramanian Raman  | IIT Roorkee   | 106107574 |
| Core 4            | Database Management System                                      | 8 weeks  | Prof. Partha Pratim Das<br>Prof. Samiran Chattopadhyay             | IIT Kharagpur   | 106105175 |
|                   | Introduction to Database Systems                                | 12 weeks | Prof. Sreenivasa Kumar   | IIT Madras  | 106106220 |
| Elective 1        | Data Science for Engineers                                      | 8 weeks  | Prof. Ragunathan Rengasamy,<br>Prof. Shankar Narasimhan            | IIT Madras  | 106106179 |
| Elective 2        | Cloud Computing   | 12 weeks | Prof. Soumya Kanti Ghosh   | IIT Kharagpur   | 106105167 |
| Elective 3        | Introduction to Internet of Things                              | 12 weeks | Prof. Sudip Misra  | IIT Kharagpur   | 106105166 |
| Elective 4        | Introduction to Machine Learning - IIT KGP                      | 8 weeks  | Prof. Sudeshna Sarkar  | IIT Kharagpur   | 106105152 |
|                   | Introduction to Machine Learning                                | 12 weeks | Prof. Balaraman Ravindran  | IIT Madras  | 106106139 |
| Elective 5        | Modern Application Development                                  | 12 weeks | Prof. Aamod Sane<br>Prof. Abhijat Vichare<br>Prof. Madhavan Mukund | Persistent Computing Systems & Chennai Mathematical Institute | 106106222 |
| Elective 6        | Human Computer Interaction (In English)                         | 12 Weeks | Prof. Rajiv Ratn Shah  | IIT Delhi   | 106106575 |
| Elective 7        | Large Applications Practicum                                    | 4 Weeks  | Prof. Varun Dutt   | IIT Mandi   | 106106579 |



# Foundations of Computing

**(4 Core + 2 Elective) Minimum of 60 Weeks**

The Foundations domain looks at the theoretical foundations of computing. Starting with the mathematics related to computing, one moves on to the study of algorithms and their associated complexity. One has options to further study graphs formally, parallel algorithms, logic and computational geometry.

| Core/<br>Elective | Course Name  | Duration        | SME Name   | Institute                      | NPTEL ID  |
|-------------------|--|-----------------|--|--------------------------------|-----------|
| Core 1            | Discrete Mathematics                                     | 12 weeks        | Prof. Sourav Chakraborty                                       | Chennai Mathematical Institute | 111106086 |
|                   | Discrete Mathematics                                     | 12 weeks        | Prof. Sudarshan Iyengar  | IIT Ropar                      | 106106183 |
|                   | Discrete Mathematics                                     | 12 weeks        | Prof. Sajith Gopalan<br>Prof. Benny George K                   | IIT Guwahati                   | 106103205 |
|                   | Discrete Mathematics - IIITB                             | 12 weeks        | Prof. Ashish Choudhury   | IIIT Bangalore                 | 106108227 |
|                   | Discrete Mathematics for CS                              | 12 Weeks        | Prof. Nitin Saxena   | IIT Kanpur                     | 106104573 |
| Core 2            | Design and Analysis of Algorithms                        | 8 weeks         | Prof. Madhavan Mukund  | Chennai Mathematical Institute | 106106131 |
| Core 3            | Programming, Data Structures and Algorithms in Python    | 8 weeks         | Prof. Madhavan Mukund  | Chennai Mathematical Institute | 106106145 |
| Core 4            | Theory of Computation                                    | 8 weeks         | Prof. Raghunath Tewari   | IIT Kanpur                     | 106104148 |
| Core 5            | Introduction to Graph Algorithms                         | 8 Weeks         | Prof. C Pandu Rangan   | IISc Bangalore                 | 106108468 |
| Elective 1        | Randomized Algorithms                                    | 12 weeks        | Prof. Benny George K   | IIT Guwahati                   | 106103187 |
| Elective 2        | Parallel Algorithms                                      | 12 weeks        | Prof. Sajith Gopalan   | IIT Guwahati                   | 106103188 |
| Elective 3        | Modern Algebra   | 8 weeks         | Prof. Manindra Agrawal   | IIT Kanpur                     | 106104149 |
| Elective 4        | Graph Theory   | 8 weeks         | Prof. Soumen Maity   | IISER Pune                     | 111106102 |
| Elective 5        | Computational Geometry                                   | 12 weeks        | Prof. Amit Kumar   | IIT Delhi                      | 106102011 |
| Elective 6        | Arithmetic Circuit Complexity                            | 12 weeks        | Prof. Nitin Saxena   | IIT Kanpur                     | 106104221 |
| Elective 7        | Foundations of Cryptography                              | 12 weeks        | Prof. Ashish Choudhury   | IIIT Bangalore                 | 106106221 |
| Elective 8        | Computer Graphics  | 8 weeks         | Prof. Samit Bhattacharya                                       | IIT Guwahati                   | 106103224 |
| Elective 9        | Computational Complexity Theory                          | 12 weeks        | Prof. Raghunath Tewari   | IIT Kanpur                     | 106104227 |
|                   | Computational Complexity                                 | 12 Weeks        | Prof. Subrahmanyam Kalyanasundaram                             | IIT Hyderabad                  | 106106229 |
| Elective 10       | Mathematical Logic                                       | To Be Developed | -  | -                              | -         |
| Elective 11       | Secure Computation: Part I                               | 12 Weeks        | Prof. Ashish Choudhury   | IIIT Bangalore                 | 106108229 |
| Elective 12       | Parameterized Algorithms                                 | 12 Weeks        | Prof. Neeldhara Misra<br>Prof. Saket Saurabh                   | IIT Gandhinagar<br>IMSC        | 106106230 |
| Elective 13       | Probability for Computer Science                         | 8 Weeks         | Prof. Nitin Saxena   | IIT Kanpur                     | 106104233 |
| Elective 14       | Computational Arithmetic - Geometry for Algebraic Curves | 12 Weeks        | Prof. Nitin Saxena   | IIT Kanpur                     | 106104469 |
| Elective 15       | Approximation Algorithm                                  | 12 weeks        | Prof. Palash Dey   | IIT Kharagpur                  | 106105471 |
| Elective 16       | Linear Algebra Through Geometry                          | 12 Weeks        | Prof. M Krishna Kumar<br>Prof. Ashok Rao<br>Prof. Arulalan M R | IISc Bangalore and NITK        | 106108482 |



# Systems

**(4 Core + 2 Elective) Minimum of 60 Weeks**

The Systems domain is concerned with innerware, that makes the application software relate to the hardware. The core subjects are compilers, operating systems, databases and networks. There are opportunities to learn cryptography and security, internet of things, cloud computing, and multicore systems.

| Core/<br>Elective | Course Name   | Duration | SME Name   | Institute     | NPTEL ID  |
|-------------------|---|----------|--|---------------|-----------|
| Core 1            | Compiler Design   | 12 weeks | Prof. Santanu Chattopadhyay                            | IIT Kharagpur | 106105190 |
| Core 2            | Introduction to Operating Systems   | 8 weeks  | Prof. Chester Rebeiro                                  | IIT Madras    | 106106144 |
|                   | Operating System  | 12 weeks | Prof. Sorav Bansal                                     | IIT Delhi     | 106102132 |
|                   | Operating System Fundamentals   | 12 weeks | Prof. Santanu Chattopadhyay                            | IIT Kharagpur | 106105214 |
| Core 3            | Computer Networks and Internet Protocol   | 12 weeks | Prof. Soumya Kanti Ghosh<br>Prof. Sandip Chakraborty   | IIT Kharagpur | 106105183 |
| Core 4            | Introduction to Database Systems  | 12 weeks | Prof. Sreenivasa Kumar                                 | IIT Madras    | 106106220 |
| Elective 1        | Cloud Computing   | 12 weeks | Prof. Soumya Kanti Ghosh                               | IIT Kharagpur | 106105167 |
| Elective 2        | Information Security - 5 - Secure Systems Engineering                           | 8 weeks  | Prof. Chester Robeiro                                  | IIT Madras    | 106106199 |
| Elective 3        | Introduction to parallel programming with OpenMP and MPI                        | 8 weeks  | Prof. Yogish Sabharwal                                 | IIT Delhi     | 106102163 |
| Elective 4        | Introduction to Internet of Things  | 12 weeks | Prof. Sudip Misra                                      | IIT Kharagpur | 106105166 |
| Elective 5        | Multi-Core Computer Architecture-Storage and Interconnects                      | 8 weeks  | Prof. John Jose  | IIT Guwahati  | 106103183 |
| Elective 6        | Cryptography and Network Security   | 12 weeks | Prof. Sourav Mukhopadhyay                              | IIT Kharagpur | 106105162 |
| Elective 7        | Advanced Computer Architecture  | 8 weeks  | Prof. John Jose  | IIT Guwahati  | 106103206 |
|                   | Advanced Computer Architecture  | 12 Weeks | Prof. Smruti R. Sarangi                                | IIT Delhi     | 106102229 |
| Elective 8        | Ethical Hacking   | 12 weeks | Prof. Indranil Sengupta                                | IIT Kharagpur | 106105217 |
| Elective 9        | Introduction to Blockchain Technology and Applications                          | 8 weeks  | Prof. Sandeep Shukla                                   | IIT Kanpur    | 106104220 |
|                   | Blockchain Architecture Design and Use Cases                                    | 12 weeks | Prof. Sandip Chakraborty<br>Prof. Praveen Jayachandran | IIT Madras    | 106105184 |
| Elective 10       | GPU Architectures and Programming   | 12 weeks | Prof. Soumyajit Dey                                    | IIT Kharagpur | 106105220 |
| Elective 11       | C-Based VLSI Design   | 12 Weeks | Prof. Chandan Karfa                                    | IIT Guwahati  | 106103229 |
| Elective 12       | Real-Time Systems   | 12 Weeks | Prof. Rajib Mall<br>Prof. Durga Prasad Mohapatra       | IIT Kharagpur | 106105229 |
| Elective 13       | Introduction to Computer and Network Performance Analysis using Queuing Systems | 4 weeks  | Prof. Varsha Apte                                      | IIT Bombay    | 106101238 |
| Elective 14       | Foundation of Cloud IoT Edge ML   | 8 weeks  | Prof. Rajiv Misra                                      | IIT Patna     | 106104242 |
| Elective 15       | Design and Engineering of Computer Systems                                      | 8 weeks  | Prof. Mythili Vutukuru                                 | IIT Bombay    | 106101234 |
| Elective 16       | Practical Cyber Security for Cyber Security Practitioners                       | 12 Weeks | Prof. Sandeep K. Shukla                                | IIT Kanpur    | 106104467 |
| Elective 17       | Human Computer Interaction (In English)   | 12 Weeks | Prof. Rajiv Ratn Shah                                  | IIT Delhi     | 106106575 |

# Cyber Security

**(2 Core + 4 Elective) Minimum of 50 Weeks**

The Cyber Security domain in NPTEL focuses on protecting digital systems, networks, and data from cyber threats and vulnerabilities. It offers a range of courses covering topics like cryptography, network security, ethical hacking, malware analysis, and cyber laws. Designed by experts from premier institutions like IITs and IISc, these courses provide both theoretical foundations and practical insights. Ideal for students and professionals, this domain equips learners with essential skills to address modern cybersecurity challenges and pursue careers in the growing field of information security.

| Core/<br>Elective | Course Name   | Duration        | SME Name   | Institute      | NPTEL ID  |
|-------------------|---|-----------------|--|----------------|-----------|
| Core 1            | Cryptography and Network Security                         | 12 Weeks        | Prof. Sourav Mukhopadhyay                            | IIT Kharagpur  | 106105162 |
|                   | Network Security  | To be developed |  |                |           |
| Core 2            | Introduction to Operating Systems                         | 8 Weeks         | Prof. Chester Rebeiro                                | IIT Madras     | 106106144 |
|                   | Operating Systems   | 12 Weeks        | Prof. Sorav Bansal                                   | IIT Delhi      | 106102132 |
|                   | Operating System Fundamentals                             | 12 Weeks        | Prof. Santanu Chattopadhyay                          | IIT Kharagpur  | 106105214 |
| Elective 1        | Computer Networks and Internet Protocol                   | 12 Weeks        | Prof. Soumya Kanti Ghosh<br>Prof. Sandip Chakraborty | IIT Kharagpur  | 106105183 |
| Elective 2        | Hardware Security   | 12 Weeks        | Prof. Debdeep Mukhopadhyay                           | IIT Kharagpur  | 106105194 |
| Elective 3        | Ethical Hacking   | 12 Weeks        | Prof. Indranil Sengupta                              | IIT Kharagpur  | 106105217 |
| Elective 4        | Privacy and Security in Online Social Media               | 12 Weeks        | Prof. Ponnurangam. K                                 | IIT Delhi      | 106106146 |
| Elective 5        | Information Security - 5 - Secure Systems Engineering     | 8 Weeks         | Prof. Chester Rebeiro                                | IIT Madras     | 106106199 |
| Elective 6        | Foundations of Cryptography                               | 12 Weeks        | Prof. Ashish Choudhury                               | IIIT Bangalore | 106106221 |
| Elective 7        | Secure Computation: Part I                                | 12 Weeks        | Prof. Ashish Choudhury                               | IIIT Bangalore | 106108229 |
| Elective 8        | Systems and Usable Security                               | 4 Weeks         | Prof. Neminath Hubballi                              | IIT Indore     | 106106234 |
| Elective 9        | Online Privacy  | 12 Weeks        | Prof. Ponnurangam Kumaraguru                         | IIIT Hyderabad | 106106235 |
| Elective 10       | Blockchain and its Applications                           | 12 weeks        | Prof. Sandip Chakraborty<br>Prof. Shamik Sural       | IIT Kharagpur  | 106105235 |
| Elective 11       | Secure Computation: Part II                               | 12 weeks        | Prof. Ashish Choudhury                               | IIIT Bangalore | 106108237 |
| Elective 12       | Quantum Algorithms and Cryptography                       | 12 weeks        | Prof. Shweta Agrawal                                 | IIT Madras     | 106106241 |
| Elective 13       | Cyber Security and Privacy                                | 12 weeks        | Prof. Saji K Mathew                                  | IIT Madras     | 106106248 |
| Elective 14       | Practical Cyber Security for Cyber Security Practitioners | 12 weeks        | Prof. Sandeep K. Shukla                              | IIT Kanpur     | 106104467 |



# NPTEL DOMAIN CERTIFICATION

👉 <https://nptel.ac.in/noc/Domain/>

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