

Dr. Ambedkar Institute of technology, Bengaluru-56  
Department of Civil Engineering

The enclosed documents are verified & approved.



**Prof & Head**

Dr. S. Vijaya

Department of Civil engineering

**Professor and Head**

Department of civil Engineering

Dr. Ambedkar Institute of Technology

Bangalore - 560 056

NAAC CO-ORDINATORS:

MARY BHAGYA ANITHI, Asst Professor 

Dr. K. Hemant Kumar, Asst Professor 

[\(https://swayam.gov.in/\)](https://swayam.gov.in/) [\(https://swayam.gov.in/nc\\_details/NPTEL\)](https://swayam.gov.in/nc_details/NPTEL)[About Swayam \(https://swayam.gov.in/about\)](https://swayam.gov.in/about) | [All Courses](#) | [SIGN-IN / REGISTER](#) ()[Courses \(https://swayam.gov.in/explorer\)](https://swayam.gov.in/explorer) >

## Introduction to Engineering Seismology

By Prof. Anbazhagan P | IISc Bangalore

**Learners enrolled: 898**

### Introduction to Engineering Seismology



Introduction to Engineering Seismology is general course for anyone interested to know about earthquake. Initial part of study discusses about different seismic hazard, global seismicity and risk. Further gives theory behind earthquake, plate tectonics and seismic courses and fault. Theory of wave propagation and different types of earthquakes can also discuss in the course. Course also covers quantification of earthquake size: Concept of Intensity and Magnitude; different earthquake scales. Seismic instruments, earthquake data and interpretation of seismic data. Source mechanism and simple source model differ predictive equations in seismology and Seismic hazard estimation with examples. Taking this course will help to understand earthquake hazard and know seismic optional of the region and better way of estimating the future seismic hazard.

**INTENDED AUDIENCE :** Civil Engineering, Geology, Engineering Science, GeoPhysics, Earthquake Engineering**PREREQUISITES :** XII Stand**INDUSTRIES SUPPORT :** Any Company involved on seismic related studies

## Summary

Course Status :

Ongoing



Course Type :

Elective  
(<https://swayam.gov.in/>)([https://swayam.gov.in/nc\\_details/NPTEL](https://swayam.gov.in/nc_details/NPTEL))

Duration :

12 weeks

Start Date :

About Swayam (<https://swayam.gov.in/about>) | All Courses | SIGN-IN / REGISTER ()

End Date :

14 Oct 2022

Exam Date :

30 Oct 2022 IST

Enrollment Ends :

08 Aug 2022

Category :

◦ Civil Engineering

Credit Points :

3

Level :

Undergraduate/Postgraduate

**This is an AICTE approved FDP course**([/#facebook](#))([/#twitter](#))([/#email](#))([/#linkedin](#))([/#whatsapp](#))

([https://www.addtoany.com/share?url=https%3A%2F%2Fonlinecourses.nptel.ac.in%2Fnoc22\\_ce64%2Fpreview&title=Introduction%20to%20Engineering%20Seismology%20-%20Course](https://www.addtoany.com/share?url=https%3A%2F%2Fonlinecourses.nptel.ac.in%2Fnoc22_ce64%2Fpreview&title=Introduction%20to%20Engineering%20Seismology%20-%20Course))

## Course layout

**Week 1:** Introduction to earthquake hazards- Global seismicity and Seismic risk, History of Engineering Seismology and Earthquake types

**Week 2:** Elastic Rebound Theory; Earthquake sources; Plate tectonics, and Plate Boundaries: Continental Drift

**Week 3:** Theory of Wave Propagation Seismic wave propagation, Types of seismic waves, Wave characteristics and Shadow zones

**Week 4:** Concept of Earthquake Measurement, Seismic Intensity and Magnitudes Scales, Past earthquake Energy and Comparable Explosive tests

**Week 5:** Earthquake Instruments, Sensors and Data Loggers, Mechanical and Digital sensors; Seismic Station

**Week 6:** Interpretation of Seismic Records: Identification of made events and natural earthquake; Time and frequency domain characteristic of ground motion

**Week 7:** Regional Seismicity, Earthquakes in India and Most important Global Earthquakes; Concept of Seismic Zonation and Methodology for Seismic microzonation

**Week 8:** Predictive Models in Earthquake Engineering- Attenuation Relation; Intensity, Duration and Ground Motion Predictive Relations

**Week 9:** Earthquake Catalog preparation, Source Map preparation; Homogenization and Declustering of earthquake data and preparation of Seismotectonic maps

**Week 10:** Seismic Hazard Parameters: a and b values, Recurrence relations and Maximum magnitude: Region Specific Approach for estimation Parameters and Selection of predictive equations

**Week 11:** Seismic Hazard Analysis: Deterministic and Probabilistic Methods; Rupture based approach

**Week 12:** Seismic Hazard Analysis Case studies and Worked examples

## Books and references

- Earthquake Geotechnical Engineering, Steven L. Kramer
- Earthquake Hazard Analysis: Issues and Insights, Leon Reiter



## Instructor bio



(<https://swayam.gov.in/>)



([https://swayam.gov.in/nc\\_details/NPTEL](https://swayam.gov.in/nc_details/NPTEL))

About Swayam (<https://swayam.gov.in/about>) | All Courses | SIGN-IN / REGISTER ()



**Prof. Anbazhagan P**

IISc Bangalore

I started my research on Engineering Seismology during my B.E project, continued all my research in the same area up to my PhD. After Joining at IISc, I offered new Course on Engineering Seismology, where basic about earthquakes and application research are being taught to students. I do research on several section of engineering seismology and published more than 75 papers, which I also included in my teaching course.

## Course certificate

The course is free to enroll and learn from. But if you want a certificate, you have to register and write the proctored exam conducted by us in person at any of the designated exam centres.

The exam is optional for a fee of Rs 1000/- (Rupees one thousand only).

Date and Time of Exams: **30 October 2022** Morning session 9am to 12 noon; Afternoon Session 2pm to 5pm.

Registration url: Announcements will be made when the registration form is open for registrations.

The online registration form has to be filled and the certification exam fee needs to be paid. More details will be made available when the exam registration form is published. If there are any changes, it will be mentioned then.

Please check the form for more details on the cities where the exams will be held, the conditions you agree to when you fill the form etc.

### CRITERIA TO GET A CERTIFICATE

Average assignment score = 25% of average of best 8 assignments out of the total 12 assignments given in the course.

Exam score = 75% of the proctored certification exam score out of 100

Final score = Average assignment score + Exam score

**YOU WILL BE ELIGIBLE FOR A CERTIFICATE ONLY IF AVERAGE ASSIGNMENT SCORE  $\geq 10/25$  AND EXAM SCORE  $\geq 30/75$ . If one of the 2 criteria is not met, you will not get the certificate even if the Final score  $\geq 40/100$ .**

Certificate will have your name, photograph and the score in the final exam with the breakup. It will have the logos of NPTEL and IISc Bangalore. It will be e-verifiable at [nptel.ac.in/noc](http://nptel.ac.in/noc) (<http://nptel.ac.in/noc>).

Only the e-certificate will be made available. Hard copies will not be dispatched.

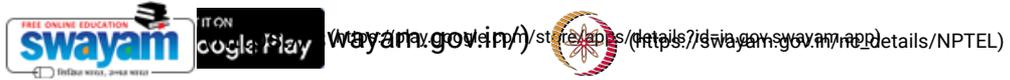
Once again, thanks for your interest in our online courses and certification. Happy learning.

- NPTEL team



DOWNLOAD APP





About Swayam (<https://swayam.gov.in/about>) | Courses | SIGN-IN / REGISTER ()

FOLLOW US

-  (<https://www.facebook.com/swayammoocs/>)
-  (<https://www.instagram.com/swayammhrd/>)
-  (<https://twitter.com/SWAYAMMHRD>)

Privacy Policy ([https://swayam.gov.in/privacy\\_policy](https://swayam.gov.in/privacy_policy)) | Terms of Use ([https://swayam.gov.in/terms\\_of\\_use](https://swayam.gov.in/terms_of_use)) | Honor Code ([https://swayam.gov.in/honor\\_code](https://swayam.gov.in/honor_code))

SWAYAM Helpline / Support ()

© 2022 SWAYAM. All rights reserved.

Initiative by : Ministry of Education (Govt of India)





# MAINTENANCE AND REPAIR OF CONCRETE STRUCTURES

**PROF. RADHAKRISHNA G. PILLAI**

Department of Civil Engineering  
IIT Madras

**TYPE OF COURSE** : Rerun | Elective | UG/PG

**COURSE DURATION** : 12 weeks (24 Jan' 22 - 15 Apr' 22)

**EXAM DATE** : 23 Apr 2022

**PRE-REQUISITES** : Completed 3rd year of a Bachelor program in civil engineering

**INTENDED AUDIENCE** : Undergraduate Students, Graduate students, research scholars, practicing engineers, repair experts, and scientists, working in the areas of concrete science and technology

**INDUSTRIES APPLICABLE TO** : Govt. agencies and public/private companies involved in the design, construction, and maintenance of concrete structures: • Govt agencies: National Highway Authority (NHAI), Central Public Works Department (CPWD) and PWD/Housing departments of various states • Chemical manufacturers: BASF, SIKA corporation, Euclid chemicals, and other chemical admixture companies • Cement companies: ACC Ltd., Ambuja cement, JSW cement Ltd, JK Cement Ltd, Penna Cement Industries Ltd, Ultratech cement Ltd.

## **COURSE OUTLINE :**

This course will help students learn how to identify various deterioration mechanisms or damage mechanisms in concrete structures (say, deterioration of metallic reinforcement and cementitious materials). The course will discuss the scientific aspects and its use while practicing repair works at site. Use of various non-destructive, partially-destructive tools to assess the condition of the structure will be discussed. Also, tips on selecting measurable parameters that are useful in deciding the further repair and maintenance practices will be provided.

## **ABOUT INSTRUCTOR :**

Prof. Radhakrishna G. Pillai is an Associate professor at the Department of Civil Engineering at the Indian Institute of Technology Madras, Chennai, India, where he is working since 2010. He earned his M.S. and Ph.D. in Civil Engineering from Texas A and M University (TAMU), College Station, Texas, USA. He has co-authored more than 70 publications in the areas of structural and materials performance, concrete technology, and corrosion mechanisms and service life estimation in concrete structures. In addition, he is a lead investigator for various research projects funded by public and private agencies involving corrosion, condition assessment and restoration of concrete structures.

## **COURSE PLAN :**

**Week 1:** Introduction, significance of corrosion, and corrosion mechanisms

**Week 2:** Embedded metal corrosion

**Week 3:** Deterioration of cementitious systems – Sulphate and Acid attack

**Week 4:** Deterioration of cementitious systems – Alkali Silica Reaction (ASR), Shrinkage, and others

**Week 5:** Concrete assessment using non-destructive tests (NDT)

**Week 6:** Concrete assessment and load effects

**Week 7:** Surface repair – Condition assessment

**Week 8:** Surface repair – Analysis, strategy, and design

**Week 9:** Surface repair – Material requirement, surface preparation, placement of repair material

**Week 10:** Strengthening and stabilization – Introduction and beam shear capacity strengthening

**Week 11:** Strengthening and stabilization – Column strengthening

**Week 12:** Strengthening and stabilization – Flexural strengthening

Dr. Ambedkar Institute of technology, Bengaluru-56  
Department of Civil Engineering

The enclosed documents are verified & approved.



**Prof & Head**

Dr. S. Vijaya

Department of Civil engineering

**Professor and Head**

Department of civil Engineering

Dr. Ambedkar Institute of Technology

Bangalore - 560 056

NAAC CO-ORDINATORS:

MARY BHAGYA ANITHI, Asst Professor 

Dr. K. Hemanth Kumar, Asst Professor 

This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE13S23234476

To  
AISHWARYA MANJUNATHA  
NO 396 4TH CROSS 43RD MAIN IDEAL HOMES  
PHASE 1 RAJARAJESHWARI NAGAR BANGALORE  
BANGALORE  
KARNATAKA - 560098  
PH. NO :9663244936



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to  
**AISHWARYA MANJUNATHA**  
for successfully completing the course

## Maintenance and Repair of Concrete Structures

with a consolidated score of **47** %

Online Assignments	17.06/25	Proctored Exam	30/75
--------------------	----------	----------------	-------

Total number of candidates certified in this course: **545**

*Devendra Jalihal*

**Prof. Devendra Jalihal**  
Chairman  
Centre for Continuing Education, IITM

Jan-Apr 2021  
(12 week course)

*Andrew Thangaraj*

**Prof. Andrew Thangaraj**  
NPTEL, Coordinator  
IIT Madras



Indian Institute of Technology Madras



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S43221912

To  
AKASH GOWDA R  
AKASH GOWDA .R, #14,15TH MAIN 8THCROSS  
JC.NAGAR ,KURUBHARAHALLI  
BANGALORE URBAN DISTRICT  
KARNATAKA - 560086  
PH. NO :9535497677



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

**No. of credits recommended by NPTEL:3**

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**AKASH GOWDA R**

for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **55** %

Online Assignments	14.85/25	Proctored Exam	39.75/75
--------------------	----------	----------------	----------

Total number of candidates certified in this course: **156**

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE13S23234467

To  
D K KARUNASHREE  
NO 5 ASHIRVAAD OUTHOUSE 13TH MAIN  
M C LAYOUT VIJAYANAGAR  
BANGALORE  
KARNATAKA - 560040  
PH. NO :8095619806



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.

Elite



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to  
**D K KARUNASHREE**  
for successfully completing the course



## Maintenance and Repair of Concrete Structures

with a consolidated score of **76** %

Online Assignments	18.56/25	Proctored Exam	57.62/75
--------------------	----------	----------------	----------

Total number of candidates certified in this course: 545

*Devendra Jalihal*

Prof. Devendra Jalihal  
Chairman  
Centre for Continuing Education, IITM

Jan-Apr 2021  
(12 week course)

*Prof. Andrew Thangaraj*

Prof. Andrew Thangaraj  
NPTEL, Coordinator  
IIT Madras



Indian Institute of Technology Madras



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S43222307

To  
G DEEPIKA  
#58, 4TH MAIN  
GANGANAGAR EXTENSION  
BANGALORE  
KARNATAKA - 560032  
PH. NO :7019175580



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.

Elite



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**G DEEPIKA**

for successfully completing the course



## Introduction to Engineering Seismology

with a consolidated score of **79** %

Online Assignments	17.5/25	Proctored Exam	61.5/75
--------------------	---------	----------------	---------

Total number of candidates certified in this course: 156

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S43222674

To  
HARSHITH M  
NO 5, 4TH CROSS, 1ST B MAIN  
SANJEEVINI NAGAR, MOODALAPALYA  
BANGALORE  
KARNATAKA - 560072  
PH. NO :9535754516



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**HARSHITH M**

for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **48** %

Online Assignments	16.1/25	Proctored Exam	31.5/75
--------------------	---------	----------------	---------

Total number of candidates certified in this course: 156

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S43220775

To  
IMRAN HUSSAIN SIKDAR  
#8, 7TH CROSS 10TH MAIN, SAMADHI ROAD  
NEAR HMR SCHOOL, JNANA JYOTHINAGAR  
BENGALURU  
KARNATAKA - 560056  
PH. NO :8660263252



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.

Elite



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**IMRAN HUSSAIN SIKDAR**

for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **66** %

Online Assignments	18.94/25	Proctored Exam	47.25/75
--------------------	----------	----------------	----------

Total number of candidates certified in this course: 156

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S43223283

To  
MAMATHA A V  
DOOR NO - 502  
ANCHECHOMANAHALLY  
KADUR  
KARNATAKA - 577548  
PH. NO :8971611836



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

**No. of credits recommended by NPTEL:3**

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**MAMATHA A V**

for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **50** %

Online Assignments	15.13/25	Proctored Exam	34.88/75
--------------------	----------	----------------	----------

Total number of candidates certified in this course: **156**

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S43222834

To  
MANOHAR L N  
#305/2, 6TH CROSS, SHESHADRINAGAR  
BAGALAGUNTE  
BENGALURU URBAN  
KARNATAKA - 560073  
PH. NO :8904303039



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**MANOHAR L N**

for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **50** %

Online Assignments	17.56/25	Proctored Exam	32.63/75
--------------------	----------	----------------	----------

Total number of candidates certified in this course: **156**

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S43222755

To  
MANOJ M GANGUR  
#702, 9TH MAIN, NAGARBHAVI 2ND STAGE  
KARNATAKA - 560072  
PH. NO :8792724963



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to  
**MANOJ M GANGUR**  
for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **41** %

Online Assignments	11/25	Proctored Exam	30/75
--------------------	-------	----------------	-------

Total number of candidates certified in this course: **156**

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below.

Roll No: NPTEL22CE12S23194468

To  
MANOJ M  
NO 109 5TH MAIN 1ST STAGE 2ND PHASE  
MANJUNATHNAGAR RAJAJINAGAR  
BENGALURU  
KARNATAKA - 560010  
PH. NO :919945594238



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.

Elite



# NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to

**MANOJ M**

for successfully completing the course



## Maintenance and Repair of Concrete Structures

with a consolidated score of **79** %

Online Assignments	24.6/25	Proctored Exam	54.75/75
--------------------	---------	----------------	----------

Total number of candidates certified in this course: **936**

*Devendra Jalihal*

**Prof. Devendra Jalihal**  
Chairman  
Centre for Continuing Education, IITM

Jan-Apr 2022  
(12 week course)

*Prof. Andrew Thangaraj*

**Prof. Andrew Thangaraj**  
NPTEL, Coordinator  
IIT Madras



Indian Institute of Technology Madras



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S33221146

To  
NIKHIL N  
#93 1ST MAIN ROAD ANNAPURNESHWARI NAGAR  
LANDMARK- VTU REGIONAL OFFICE  
BANGLORE  
KARNATAKA - 560091  
PH. NO :8861320787



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**NIKHIL N**

for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **54** %

Online Assignments	16.56/25	Proctored Exam	37.13/75
--------------------	----------	----------------	----------

Total number of candidates certified in this course: **156**

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below.

Roll No: NPTEL22CE12S13190448

To  
NISHANTH K  
11 2ND I CROSS 3RD BLOCK 3RD STAGE  
BASAVESWARNAGAR  
BANGALORE URBAN  
KARNATAKA - 560079  
PH. NO :9900313965



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.

Elite



# NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to

**NISHANTH K**

for successfully completing the course

## Maintenance and Repair of Concrete Structures

with a consolidated score of **68** %

Online Assignments	25/25	Proctored Exam	42.88/75
--------------------	-------	----------------	----------

Total number of candidates certified in this course: **936**

*Devendra Jalihal*

**Prof. Devendra Jalihal**  
Chairman  
Centre for Continuing Education, IITM

Jan-Apr 2022  
(12 week course)

*Andrew Thangaraj*

**Prof. Andrew Thangaraj**  
NPTEL, Coordinator  
IIT Madras



Indian Institute of Technology Madras



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S33220101

To  
OMKAR SHANKAR PATIL  
ATTIHAL  
KARNATAKA - 591254  
PH. NO :9113095191



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**OMKAR SHANKAR PATIL**

for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **58** %

Online Assignments	16.69/25	Proctored Exam	41.63/75
--------------------	----------	----------------	----------

Total number of candidates certified in this course: 156

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S33222931

To  
PARINEETHA M  
HULIGEREPURA MADDUR MANDYA DISTRICT  
KARNATAKA - 571428  
PH. NO :9986234869



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**PARINEETHA M**

for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **55** %

Online Assignments	16.6/25	Proctored Exam	38.25/75
--------------------	---------	----------------	----------

Total number of candidates certified in this course: **156**

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S33221521

To  
PRADEEP J  
NO. 11, 6TH CROSS, 4TH MAIN, SSA ROAD,  
HEBBAL, BENGALURU - 560024  
BENGALURU  
KARNATAKA - 560024  
PH. NO :7019849703



Score	Type of Certificate
$\geq 90$	Elite+Gold
75-89	Elite+Silver
$\geq 60$	Elite
40-59	Successfully Completed
$< 40$	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



Elite

# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**PRADEEP J**

for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **60** %

Online Assignments	17.44/25	Proctored Exam	42.62/75
--------------------	----------	----------------	----------

Total number of candidates certified in this course: 156

Prof. G. L. Sivakumar Babu  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

Prof. L. Umanand  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S33220336

To  
SANCHITHA C J  
#9 1ST D CROSS (NANASU NILAYA)  
NAGADEVANAHALLI BANGALORE  
BENGALURU  
KARNATAKA - 560056  
PH. NO :7022371289



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to  
**SANCHITHA C J**  
for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **54** %

Online Assignments	16.53/25	Proctored Exam	37.88/75
--------------------	----------	----------------	----------

Total number of candidates certified in this course: 156

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21CE71S43223165

To  
GAGANDEEP M  
ATTIGATTE V  
AJJAMPURA T  
AJJAMPURA  
KARNATAKA - 577145  
PH. NO :9972445092



Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.



# NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to

**GAGANDEEP M**

for successfully completing the course

## Introduction to Engineering Seismology

with a consolidated score of **45** %

Online Assignments	11.75/25	Proctored Exam	33/75
--------------------	----------	----------------	-------

Total number of candidates certified in this course: 156

**Prof. G. L. Sivakumar Babu**  
Chairman, Center for Continuing Education  
IISc Bangalore

Jul-Oct 2021  
(12 week course)

**Prof. L. Umanand**  
NPTEL Coordinator  
IISc Bangalore



Indian Institute of Science Bangalore

