



SPECTROSCOPIC TECHNIQUES FOR PHARMACEUTICAL AND BIOPHARMACEUTICAL INDUSTRIES

PROF. SHASHANK DEEP

Department of Chemistry

IIT Delhi

PRE-REQUISITES : BSc Chemistry

INTENDED AUDIENCE : Any interested Learners

COURSE OUTLINE :

A variety of Spectroscopic techniques will be discussed along with their application in chemical, Pharmaceutical and Bio-pharmaceutical Industries.

ABOUT INSTRUCTOR :

Prof. Shashank Deep is a professor in Department of Chemistry, Indian Institute of Technology Delhi. Dr. Deep obtained his Ph.D. degree from Indian Institute of Technology Delhi. He then moved to Prof. Hinck laboratory at Department of Biochemistry, University of Texas health science center at San Antonio, Texas, USA on a post-doctoral assignment. His second postdoctoral work was with Prof. Erik Zuiderweg at Department of Biophysics, University of Michigan, Ann Arbor, MI, USA where he used NMR to study the protein-protein interaction, protein dynamics and protein structure. He joined the department as an assistant professor in 2005. Dr. Deep is a member of American Chemical society, Protein Society, and Indian Biophysical Society. He is joint secretary of Protein Society (India). Prof. Shashank has taught almost all topics of physical chemistry i.e. thermodynamics, spectroscopy, kinetics and biophysical chemistry to PG students. He is involved in web course development of courses at various levels and for various courses (IIT PAL, UGC-EDUSAT, NPTEL and e-PATHSHALA). He has delivered lectures for teachers training, workshops and conferences

COURSE PLAN :

Week 1 :Summary of spectroscopic techniques, electromagnetic radiation and its interaction with matter

Week 2 :Schrodinger Equation, Postulates of quantum mechanics, resolution, signal to noise ratio.

Week 3 :Rotational/ Rotational Raman and their application and Vibrational Spectroscopy

Week 4 :Application of Vibrational spectroscopy, Vibrational, Rotational-Vibration, Raman spectroscopy/Rotational-Raman/Vibrational-Raman

Week 5 :Atomic Spectroscopy

Week 6 :Flame photometry, AAS, ICP and its application, Molecular spectroscopy

Week 7 :Electronic spectroscopy, UV-Vis Spectroscopy and its application

Week 8 :Application of UV-Visible spectroscopy, Fluorescence spectroscopy

Week 9 :Fluorescence spectroscopy, Time resolved Spectroscopy

Week 10 :Microscopy

Week 11 :Mass spectroscopy, NMR spectroscopy

Week 12 :Application of FTIR, NMR and Mass in Pharmaceutical and Biopharmaceutical Industry

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: NPTEL19CY29S31232094

To
ANUSUYA M
2/69-1, KAPPALANKARAI
KINATHUKADAVU TALUK
COMBATORE
TAMIL NADU
642120
PH. NO :9487470426

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.



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This certificate is awarded to
ANUSUYA M
for successfully completing the course

**Spectroscopic Techniques for Pharmaceutical and
Biopharmaceutical Industries**

with a consolidated score of **47** %

Online Assignments	17.06/25	Proctored Exam	30/75
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Devendra Jalihal
Prof. Devendra Jalihal
Chairman
Centre for Continuing Education, IITM

Total number of candidates certified in this course: 108

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



Indian Institute of Technology Madras



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No. of weeks of NPTEL Courses

4	1/2 FDP of one week
8	Full FDP of one week
12	1 1/2 FDP

Duration of NPTEL course: 12 Weeks

No. of weeks of NPTEL Courses

4	1/2 FDP of one week
8	Full FDP of one week
12	1 1/2 FDP



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

(Jul-Oct 2019)

Prof. Dileep N. Maikhede
Prof. Dileep N. Maikhede
Advisory (Research, Institute & Faculty Development)
All India Council for Technical Education

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The candidate has studied the above course through MOOCs mode, has submitted online assignments and passed proctored exams.
This certificate is therefore acceptable for promotions under CAS as per AICTE notifications dated 24th July 2018, similar to other refresher / orientation courses.
F.No: AICTE / RFD / FDP through MOOCs / 2017-18