Indian Institute of Technology, Kanpur

Proposal for a New Course

1. Course No: SPA***A 628M

2. Course Title: *Introduction to Planetary Remote Sensing from Space Missions*

3. Lectures per week: *L=2, Tutorial: T=0, Laboratory: P=3*, Additional hours: (0-2) =0 (A), Credits (3*L+2*T+1*P+A) = 5

Duration of Course: *Half Semester*

4. Proposing Department: *Space, Planetary and Astronomical Sciences and Engineering*

5. Proposing Instructor: *DPGC Convener, SPASE*

6. Other Instructors who may teach this course:

7. Course Description

(A) Objectives: The course.

(B) Contents:

1. Planetary surface properties and Radiation Interactions [5 lectures]

The character of planetary surfaces, differentiated and undifferentiated planetary bodies, solar system processes and interactions. Planetary regolith, megaregolith.

2. Optical Image interpretation of planetary surfaces [3 lectures]

Elements of image interpretation, concept of spatial resolution, viewing geometry, Application in identifying active surface processes (viz. wind, water, ice)

3. UV-Vis-NIR Multi-Spectral and Hyperspectral Remote Sensing of planetary surfaces [5 lectures]

Spectrometer basics, Concept of Radiance, Reflectance, spectral resolution, basic spectral classification techniques (spectral parameters), and representation of spectral data (RGB composites), Application in mineral and elemental mapping

4. Topographic Data Analysis [4 lectures]

Laser ranging basics, Image-based Topographic analysis, Topographic data and products (topographic profile, digital elevation model), 2D interpolation techniques.

5. Radar Remote Sensing [3 lectures]

Radar remote sensing basics, Dielectric properties of materials, Monostatic and Bistatic modes, Circular polarization ratio (CPR), Application to compositional and textural mapping.

(C) Pre-requisites, if any: *Course on introductory geology, remote sensing or with the permission of the instructor.*

(D) Short summary for including in the Courses of Study Booklet:

This course would provide an overview of various types of remote sensing of planetary bodies carried out by space missions through time using various techniques. The student will be introduced to the analysis of remote sensing datasets from missions.

7. Recommended Books:

R. P. Gupta / Remote Sensing Geology / Third Edition (2018) / Springer Verlag Publisher / ISBN-10 : 3662558742, ISBN-13 : 978-3662558744 / 428 pages
Thomas Lillesand, Ralph W. Kiefer, Jonathan Chipman/ Remote Sensing and Image Interpretation/ 7th Edition (2015)/ ISBN: 978-1-118-34328-9 / 736 pages
Bruce A Campbell / Radar Remote Sensing of Planetary Surfaces /2002/ Cambridge University Press / 9780521583084, 052158308X / 331 pages

8. Any other remarks:

Dated: Proposer:

Dated: DUGC/DPGC Convener:

The course is approved/not approved

Chairman, SUGC/SPGC

Dated:

SSA

SCOM
28/8/24

INDIAN INSTITUTE OF TECHNOLOGY KANPUR
POSTGRADUATE OFFICE

No. A(P)/IITK/course approval/
August 27, 2024

The Convener, DPGC
Departments of SPASE
IIT Kanpur

I am directed to communicate the concurrence of the SPGC (2023-24) in its 11th meeting held on 01/08/2024 for the approval of new PG course proposal. After detailed discussion the following courses were approved.

Course No	Title	Credits	Instructor	SPGC Decision
SPA627M	Introduction to fluid mechanics in space	3-0-0-0-(5)	Dr. Kartick Sarkar Dr. Ishan Sharma	Approved
SPA628M	Introduction to Planetary Remote Sensing from Space Missions	3-0-0-0-(5)	DPGC Convener, SPASE	Approved
SPA629M	Introduction to Geology: Measuring the Heartbeat of a Planetary Body	3-0-0-0-(5)	DPGC Convener, SPASE	Approved

Assistant Registrar
Academic Affairs

CC: OARS (DOAA Office) For necessary action

MINUTES

FOR THE 11th MEETING OF THE SENATE POSTGRADUATE COMMITTEE (2023-24) TO BE HELD ON August 1, 2024 (Thursday) AT 03:00 P.M.

Over Zoom (online)

Members present:

Prof(s): P M Mohite (AE), Vishal Agarwal (CHE), Chinmoy Kolay (CE), Abheejeet Mohapatra (EE), T H Syed (ES), Sukumar Vellakkal in place of Vasudha Jain (ECO), Feroz Hassn (HSS), Amit Shukla (DoMS), Malay Das in place of Santanu De (ME),Sudhanshu S Singh (MSE), Sudhansu Shekhar in place of Subhajit Dutta (MATH), Sharvari Nadkarni (SPASE), Laltu Chandra (SEE), Sagar Chakrabarty (PHY) (SPASE)

Members Absent: Prof(s), Suresh Kumar (BSBE), Ark Verma (CGS), Ashis Kumar Patra (CHM), J Ramkumar (DES), Shilpi Gupta(PSE), Piyush Rai (CSE), Sri Sivakumar (MSP), Pankaj Wahi (NET)

Student representative:

Shivam Nigam (19112264), Harsha Prasad (21106270), Nachiket (18102278)

Item requiring SPGC Approval:

a) Conversion from MSR/MTech to PhD Program:

S.No	Roll No	Name	Dept	Prog	Supervisor and DPGC Recommendation	SPGC Recommendation /Decision
01-	231180016	Sivani Biswal	BSBE	MTech	Recommended	Recommended
02-	231230006	Mo Zaid	ES	MTech	Recommended	Recommended

*Students has completed course and CPI requirement as per clause 4.6 of PG Manual

b) New course approval:-

ourse No	Title	Credits	Instructor	SPGC Recommendation /Decision
SPA627M	Introduction to fluid mechanics in space	3-0-0-0-(5)	Dr. Kartick Sarkar Dr. Ishan Sharma	Approved
SPA628M	Introduction to Planetary Remote Sensing from Space Missions	3-0-0-0-(5)	DPGC Convener, SPASE	Approved
SPA629M	Introduction to Geology: Measuring the Heartbeat of a Planetary Body	3-0-0-0-(5)	DPGC Convener, SPASE	Approved

Items requiring SPGC recommendation for Senate considerations:

a) Conversion of Programme Full Time to Part Time

S.No	Roll No	Name	Dept	Prog	Supervisor and DPGC Recommendation	SPGC Recommendation /Decision
1	19101268	Shiv Kumar	AE	PhD	Recommended	Recommended
2	21104030	Gedala Sai Praveen	EE	MTech	Recommended	Recommended

b) Termination (under clause 8.6)

S.No	Name	Roll No	Dept.	Prog.
01	Harshita Gupta	22127266	ECO	PhD

Sr.No. 1 Three times comprehensive exam failed.

Abheejeet Mohapatra 1/8/24