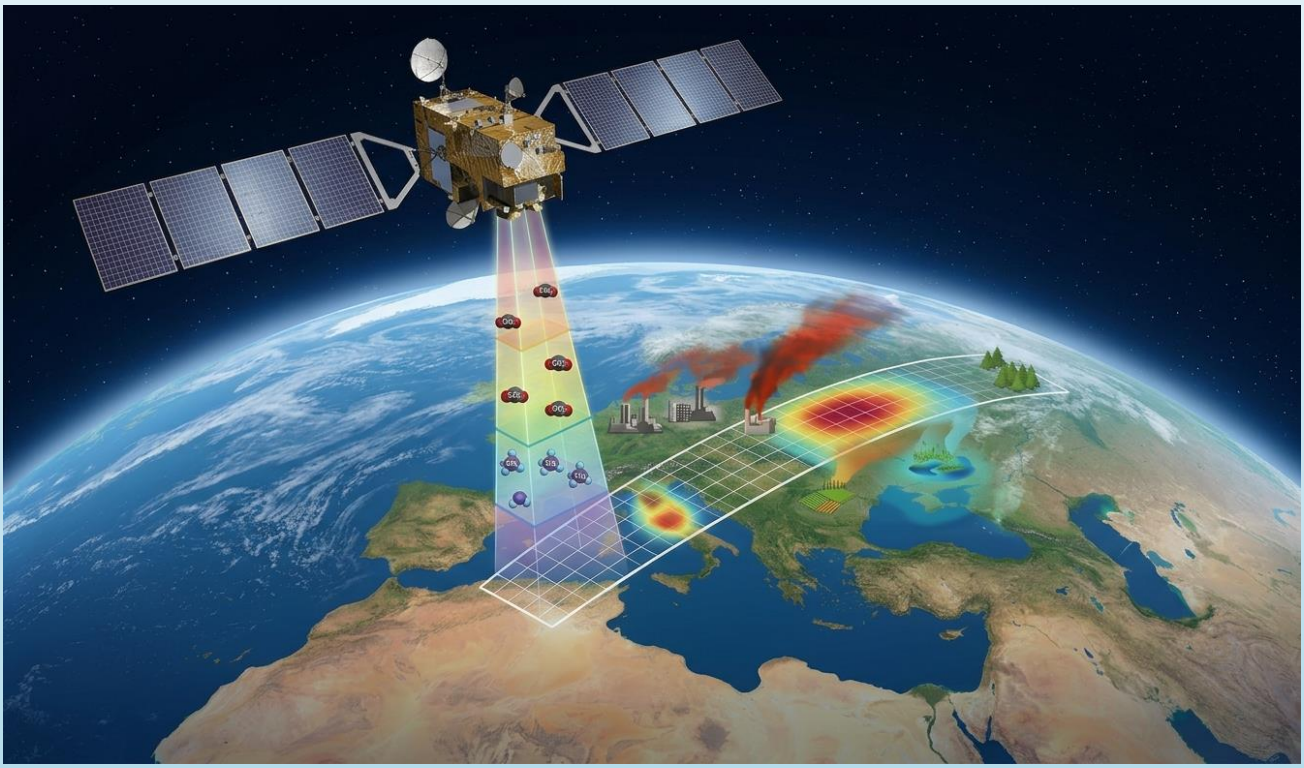
CSSTEAP Short Course
on
Satellite Based Monitoring of Carbon Dioxide and Methane
(Online Mode)
14-25 September, 2026



Last date for receipt of application
31 July 2026

Organised by

Centre for Space Science and Technology Education
in Asia and the Pacific (CSSTEAP)
(Affiliated to the United Nations)
www.cssteapun.org

Conducted by

Space Applications Centre (SAC)
Indian Space Research Organization
(ISRO)
Ahmedabad, India
www.sac.gov.in

Background

Because of excessive emission of greenhouse gases (GHGs), our globe is warming and climate is changing, leading to adverse impact on the environment. Carbon dioxide (CO_2) and methane (CH_4) are two major GHGs which are enhancing at alarming rates due to anthropogenic (man-made) activities and they are responsible for nearly 90% of total warming of 1.1 °C since pre-industrial era. Ground-based measurements could be accurate and precise but it is not possible to carry out measurements at each and every place of the earth. Thus, satellite observations are of paramount importance to monitor how GHGs are changing over the time. There are several satellites in the orbit measuring CO_2 and CH_4, for example, GOSAT, OCO-2/3, TROPOMI/Sentinel-5P, etc. These observations help to track point sources, identify hot-spots, assess long-term changes and improve our understanding of sources, sinks and associated processes. In addition, satellite observations are also useful for validation of global and regional models, improve emission inventories, and data assimilations. By integrating satellite-based monitoring with ground-based measurements, scientists and governments can develop the more effective strategies to mitigate the climate change.

About CSSTEAP and SAC

CSSTEAP was established in India in November 1995 with its headquarters at Dehradun and over the past 30 years, the center has emerged as a Centre of Excellence in capacity building in the field of space science and technology applications. For more information, visit www.cssteapun.org. The Space Applications Centre (SAC), located in Ahmedabad, India, is one of the major centres of the Indian Space Research Organization (ISRO). This centre is engaged in the research and development of applications of Space Technology in the field of Communications, Remote Sensing, Meteorology, Planetary science and Satellite Navigation.

It has major contributions in the recent Chandrayaan-3 mission, that demonstrated soft landing on moon. The other achievements of the centre include development of communication, navigation and meteorological payloads and designing various applications. SAC provides its infrastructure to conduct training courses to the students of CSSTEAP and will be the host centre for this course. For more information on SAC, visit www.sac.gov.in.

Objective of the course

This course provides a comprehensive understanding of major greenhouse gases, CO_2 and CH_4 using satellite remote sensing. It covers various topics: Greenhouse gases, climate change impacts, basics of remote sensing and retrievals, satellite data processing, variabilities (spatial and temporal) of satellite observed CO_2 and CH_4, and associated processes.

Faculty and Medium of Instruction

The core faculty is drawn from SAC and premier institutes of India. Some faculty from reputed institute outside India might be brought in, depending upon their availability. They have rich experience in the field. The medium of instruction shall be in English. Participants having competence in spoken and written English language will be given preference.

Course Content

1. Introduction to satellite remote sensing

- Overview of satellite remote sensing, its need and importance
- Basics of satellite retrievals

2. GHGs, its impact on climate and satellite retrieval technique

- Overview of major GHGs (CO_2 and CH_4), their sources, sinks and, impacts of climate change
- Retrieval techniques for satellite-based GHG measurements

3. Satellites in orbit monitoring GHGs

- Overview of major satellite sensors (GOSAT, OCO-2/3, TROPOMI, PRISMA, EMIT, GOSAT-GW, etc.) being used for GHG studies and glimpse of India's upcoming mission G20 (in GHG context)

4. Analysis of satellite data

- Satellite observations of CO_2 and CH_4; and their variations

5. Estimation of CO_2 and CH_4 emission from large point sources

- Familiarisation with online tools providing emission of CO_2 and CH_4
- Estimation of emission from plume (point source)

6. Practical Sessions using Python*

- Demonstration/Hands-on analysis of satellite datasets (CO_2 and CH_4); and interpretation

*** Note: Participants are expected to be familiar with python programming**

Number of seats: **50-100**

(Nominations from Governing Board Members / Respective Embassies/ Organizations / Academic Institutions is compulsory)

Eligibility and Selection Procedure

- The course is aimed at users, decision-makers, researchers, and professionals working in the field of air quality monitoring.
- 5 years of experience in the relevant field (Desirable)
- Limited seats are available for this course, which will be filled with participants from different Asia-Pacific countries
- Government employees and professionals working in the field of air pollution and related fields would be given priority
- Candidate should have proficiency in the English Language as the course will be conducted in English.
- The selection of candidates will be carried out by a designated selection committee.

How to Apply

- Eligible candidates can apply online through the CSSTEAP website.

https://admissions.cssteapun.org

- Applicants are requested to send the application forwarded by the Head of their respective Institute/ Organization for consideration.
- Incomplete applications will not be considered for selection

Announcement of Course: 05 June 2026

Last date for receipt of application:

July 31, 2026

Mode of Course: **Online**

- **Two classes per day will be held in a preferred time which will be decided based on the major participating countries.**

Contact Details

Dr Sasmita Chaurasia,
Course Director
CSSTEAP (SATMET)

E-mail: cssteapsatmet@sac.isro.gov.in

Phone: +91 -79-26916068