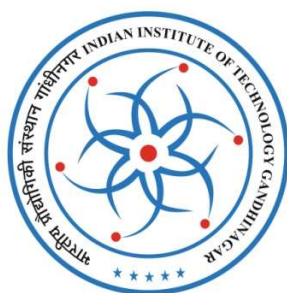
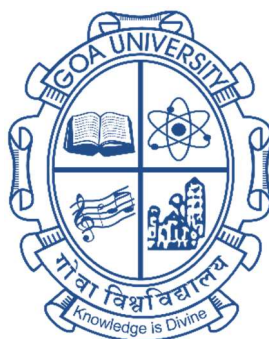


A training session report on
**Operation of Atomic Absorption
Spectrophotometer, Total Organic Carbon
Analyser, Acoustic Doppler Current Profiler and
Epifluorescence Microscope**
Under STUTI program funded by DST



In association with
Indian Institute of Technology, Gandhinagar
(Project Management Unit)



Coordinated by

Dr. Maheshwar R. Nasnodkar

School of Earth, Ocean and Atmospheric Sciences (SEOAS)

Goa University, Goa

23rd to 29th August 2022

Acknowledgement

The School of Earth, Ocean and Atmospheric Sciences (SEOAS), Goa University, convey gratitude for the encouragement and support received from multiple sources during the execution of the 7-Days STUTI training workshop. First and foremost, we express sincere gratitude towards the Department of Science and Technology (DST), India and Indian Institute of Technology (IIT), Gandhinagar, for giving us an opportunity to host the STUTI training workshop. We are thankful to **Prof (HAG) H. B. Menon** (Honorable Vice Chancellor of Goa University), **Prof. V.S. Nadkarni** (Registrar of Goa University), and **Prof. C. U. Rivonker** (Dean of SEOAS and the Convener for STUTI workshop), for their necessary support and encouragement for conducting the STUTI training workshop. The workshop was conducted on the ‘Operation of Atomic Absorption Spectrophotometry (AAS), Total Organic Carbon (TOC) Analyser, Acoustic Doppler Current Profiler (ADCP) and Epifluorescence Microscope’. These instruments were funded under DST-FIST program (Sanction No.: SR/FST/LSI-571/2013 Dated November, 2013). The workshop was co-ordinated by **Dr. Maheshwar R. Nasnodkar**. The SEOAS acknowledge the contributions of all the resource persons/speakers of the STUTI training workshop in the implementation and the execution of the program, namely, **Dr. Aftab A. S. Can**, **Dr. Maheshwar R. Nasnodkar**, **Dr. Sheryl O. Fernandes**, **Dr. Priya M. D’Costa**, **Dr. Sangeeta M. Naik**, **Dr. Smita N. Naik** (Assistant Professors, SEOAS, Goa University) and **Dr. Arjun Adhikari** (Research Associate, SEOAS, Goa University). Also, we acknowledge all the supporting staff of the SEOAS office for their valuable contributions without which the training workshop could not have been possible.

Dr. Maheshwar R. Nasnodkar
Coordinator

Summary

The aim of the 7-Days STUTI training workshop was to provide an insight into and hands-on experience in the functioning of Atomic Absorption Spectrophotometer (AAS), Total Organic Carbon (TOC) analyzer, Acoustic Doppler Current Profiler (ADCP) and Epifluorescence Microscope facility among research scholars, faculty, scientists and industry professionals. The workshop was conducted at the School of Earth, Ocean and Atmospheric Sciences, Goa University from 23rd to 29th August, 2022 and involved theory and practical sessions on AAS, TOC analyzer, ADCP and Epifluorescence Microscope. The 7-Days training workshop was funded by the Department of Science & Technology (DST), India under the STUTI (Synergistic Training Program Utilizing the Scientific and Technological Infrastructure) program. The participants were introduced to the basic concepts and fundamentals of instruments, and were provided hands-on opportunity to operate instruments in laboratory as well as on the field. Moreover, the analysis of the participant's samples was also carried out. The focus of this workshop was to have *“a balance between theory and practical training on the equipment. Emphasis is on hands-on use of equipment for demonstration/characterization by each participant and analysis of participant's samples”*.

Introduction

School of Earth, Ocean and Atmospheric Sciences, Goa University conducted 7-Days long training workshop on the hands-on usage of instruments viz., AAS, TOC analyzer, ADCP and Epifluorescence Microscope procured through DST-FIST scheme. The workshop involved the participation of Ph.D. Fellows, Assistant Professors and Scientist (**Annex-1**). The following activities were conducted during the workshop from 23rd to 29th August 2022 (**Annex-2 and 3**). This report provides a quick overview of both the lecture and technical sessions.

- Lecture Session

Dr. Maheshwar R. Nasnodkar (SEOAS, Goa University) provided detailed information on the functions and funding schemes of DST, which aims at educating and encouraging scientific/industrial R&D projects in India. He also gave a brief talk on the fundamentals of AAS, sample preparation techniques, demonstration of sample analysis using the AAS, hands-on experience to digest marine sediment samples for the metal analysis through AAS and the analysis of participant's samples. **Dr. Sangeeta M. Naik** and **Dr. Smita N. Naik** (SEOAS, Goa University) both gave lectures on the fundamentals TOC analyzer. **Dr. Aftab A. S. Can** and **Dr. Arjun Adhikari** (SEOAS, Goa University) gave an introduction on the Acoustic Doppler Current Profiler (ADCP) to all the participants.

- Technical Session

On the day **One**, all the participants were taken to various instrumentation facilities of the SEOAS department. On the day **Two and Three**, **Dr. Sangeeta M. Naik** and **Dr. Smita N. Naik** (SEOAS, Goa University) conducted hands-on session on the working principle of TOC analyzer with its demonstration of sample analysis using TOC and in addition demonstrating the experiment using participants samples. **Dr. Aftab A. S. Can** and **Dr. Arjun Adhikari** (SEOAS, Goa University) introduced the ADCP to participants. On the day four and five, **Dr. Aftab A. S. Can** and **Dr. Arjun Adhikari** (SEOAS, Goa University) engaged the session on the programming, familiarization of ADCP and demonstrated the operation of ADCP onboard a research fishing vessel during the field work. The session consist of hands on session for the analysis of data generated through the field work and the applications of ADCP data in Physical Oceanography. On the day **Six and Seven**, hands-on sessions held on providing an overview of Epifluorescence Microscope, its applications in environmental sample analysis, demonstration and analysis of water samples were conducted by **Dr. Sheryl O. Fernandes** and **Dr. Priya M. D'Costa** (SEOAS, Goa University). Also, 7-Days workshop participation certificates were awarded to all the participants during the valedictory function.

- Types of Samples Tested

During the technical session, all of the participants expressed an interest in learning from the workshop and characterized about 10 no. of samples were tested on TOC analyzer, ADCP, Epifluorescence Microscope.

Outcome of the workshop

Total 32 participants registered for the workshop. It comprised of 66 % male and 34% female participants from 26 various institutions across the country (**Figure-1**). The participants consisted of 01 Scientist, 07 Assistant Professors and 18 research scholars. There were 07 participants from Goa and 19 participants from universities/institutions/industries outside Goa. The goal of the workshop was to bring together participants from diversified disciplines and raise awareness of the advanced facilities procured through DST-FIST scheme at SEOAS, Goa University. The participants actively involved in each of the theory and practical sessions. The expert gave suggestions for possible solutions and invited participants to future collaborations with SEOAS and other schools at Goa University. Finally, the feedback (**Annex-4**) from the participant was gathered in the evaluation of the workshop. The participants were found to be satisfied with the overall conduct of the sessions on AAS, TOC, ADCP and Epifluorescence Microscope.





Figure 1: Participants registered for the training program from 16 different institutes.

Annex 1: Brochure for the program.

**Department of Science & Technology
(DST)**
funded
Training workshop under
STUTI
(Synergistic Training Program Utilizing
the Scientific and Technological
Infrastructure)

7 Days Workshop on

**Operation of
Atomic Absorption
Spectrophotometer, Total Organic
Carbon Analyser, Acoustic Doppler
Current Profiler and Epifluorescence
Microscope**

23rd to 29th August 2022

SEOAS, Goa University



Registration & Contact Details

Interested participants must register and only selected candidates would be invited for the workshop.

Local travel, boarding and lodging for the selected candidates will be covered by School of Earth, Ocean and Atmospheric Sciences (SEOAS), Goa University.

Interested participants should register using the following link: [LINK HERE](#)

Registration deadline: 04th August 2022

Shortlisted candidates will be intimated by email, latest by 10th August 2022.

Eligibility criteria:

- Minimum qualification: Post Graduate (Science) or B. Tech.
- Faculty/Scientists/Post-Doc Fellows/Ph. D. Fellows/Industry persons who are actively involved in R&D

Please note: Not more than 3 people from one Institute.

For more information, contact:

Co-ordinator: Dr. Maheshwar R. Nasnodkar

E-mail: maheshwar@unigoa.ac.in

Contact: (M) +91-9765848560

(O) +91-8669609315

Acknowledgements



Speakers



Dr. Aftab A. S. Can
Assistant Professor,
SEOAS, Goa
University.
Expertise: Air-Sea
interactions, Indian
Summer Monsoon
and ocean
circulation.



Dr. Priya M. D'Costa
Assistant Professor
SEOAS, Goa
University.
Expertise: Marine
Microbiology,
interactions
between bacteria
and phytoplankton,
diatom diversity and
biofilms.



**Dr. Maheshwar R.
Nasnodkar**
Assistant Professor,
SEOAS, Goa
University.
Expertise: Marine
Chemistry and
Estuarine
Geochemistry.



**Dr. Sangeeta M.
Naik**
Assistant Professor,
SEOAS, Goa
University.
Expertise: Marine
Biogeochemistry
and Marine Ecology.



**Dr. Sheryl O.
Fernandes**
Assistant Professor,
SEOAS, Goa
University.
Expertise: Marine
Microbial Ecology
and Marine
Biogeochemistry.



Dr. Arjun Adhikari
Research Associate,
SEOAS, Goa
University.
Expertise: Coastal
oceanography,
measuring and
investigating
turbulence in
estuarine and
coastal waters and
remote sensing.



Dr. Smita N. Naik
Assistant Professor,
SEOAS, Goa
University.
Expertise:
Paleoceanography,
paleoclimate
reconstruction,
isotope
geochemistry and
climate variability.

**Annex 2: List of participants registered and their attendance for the Application of XRD
Technique in Materials Science and Engineering workshop.**

Sr. No.	Candidate Name	Gender	Educational Qualification	Email address	University/Institute
1	Shweta Moye	Female	M.Sc Zoology, MH-SET	shwetamoye96@gmail.com	School of Biological Sciences & Biotechnology, Goa University
2	Ankit A. Sinha	Male	M.Sc Zoology	ankitsinha907@gmail.com	
3	Rajeshkumar Hyam	Male	Ph.D. Physics	rajesh.hyam@unigoa.ac.in	School of Physical & Applied Sciences, Goa University
4	Anita Parsekar	Female	M.Sc Marine Microbiology	parsekaranita345@gmail.com	St. Xavier's College, Mapusa - Goa
5	Sinchan Hait	Male	M.Tech	sinchan.hait1@gmail.com	Amity University Mumbai, Maharashtra
6	Abigail Fernandes	Female	M.Sc	abigailfernandes13@gmail.com	
7	Amruta Ravi Balekundri	Female	M.Pharmacy	amrutaabc11@gmail.com	KLE College of Pharmacy Belagavi, Karnataka
8	Eknath Damu Ahire	Male	M.S. Pharm	eknatha_iop@bkc.met.edu	MET's, Institute of Pharmacy, Nashik, Maharashtra
9	Dr. Thena T.	Female	Ph.D.	thenadoss@ncpor.res.in	National Centre for Polar and Ocean Reseach, Vasco da Gama, Goa
10	Dr. Shafik Shabbirsab Shaikh	Male	Ph.D.	77shafik@gmail.com	Shivaji Mahavidyalaya Renapur, Latur, Maharashtra
11	K. S. Balu	Male	M.Sc. Applied Microbiology	ks.balumicro@gmail.com	K. S. Rangasamy College of Technology, Tamil Nadu
12	Harikrishnan K.	Male	M.Tech	kodungallurharikrishnan@gmail.com	Central University of Gujarat
13	Nilesh Gajanan Bajad	Male	M.Pharm Pharmaceutical Chemistry	nileshgajananbajad.rs.phe21@iitbhu.ac.in	Indian Institute of Technology, BHU, Varanasi, Uttar Pradesh
14	Nidhi Chaubey	Female	M.Tech	nidhichaubey.rs.mst19@iitbhu.ac.in	
15	Pranav Ragavendra S.	Male	M.Pharm	pranavragavendra007@gmail.com	PSG College of Pharmacy, Coimbatore, Tamil Nadu
16	Dr. Sandip P. Vyas	Male	Ph.D.	vyasspraghav0763@gmail.com	The HNSB. Ltd. Science College, Himatnagar, Gujarat
17	Kesar Singh	Male	M.Sc.	kesarsingh84@gmail.com	Dr. Harisingh Gour Central University, Sagar, Madhya Pradesh
18	Jayant Kumar Sahoo	Male	M.Phil Geology	jayantks1998@gmail.com	CSIR-IMMT, Bhubaneswar, Odisha
19	Sriram D.	Male	M.Sc.	javissriram2@gmail.com	Bharathiar University, Coimbatore, Tamil Nadu
20	Radheshyam	Male	M.Pharm	radheshyammpfarm@gmail.com	H.N.B. Garhwal (a central) University, Utrakhhand
21	Mahesh M. Mayekar	Male	M.Sc. Geology	mahesh.mayekar@unigoa.ac.in	School of Earth, Ocean & Atmospheric Sciences, Goa University, Goa
22	Swati	Female	M.Tech Biotechnology	jaast414@gmail.com	Guru Jambheshwar University of Science and Technology, Hisar, Haryana
23	Kanupriya	Female	Ph.D.	kanu.priya@sharda.ac.in	Sharda University, Greater Noida, Uttar Pradesh
24	Dr. Dhara Nishit Zaveri	Female	Ph.D.	djgandhi21@gmail.com	The MaharajaSayajirao University of Vadodara, Gujarat
25	Himanshu Jain	Male	M.Sc.	himanshu.microbiology@kuk.ac.in	Kurukshetra University, Haryana
26	Bimalkumar Rajeshbhai Patel	Male	M.Sc.	bimal.patel1998@gmail.com	Gujarat University, Gujarat
27	Apurva Sunilkumar Prajapati	Male	M.Sc. Organic Chemistry	apurva481999@gmail.com	
28	Bhargav Devliya	Male	M.Sc. Organic Chemistry	badevliya112@gmail.com	
29	Divy Mohan Arora	Female	Ph.D.	divymohananarora@gmail.com	Guru Jambheshwar University of Science and Technology, Hisar, Haryana
30	Dr. Prajesh Volvoiker	Male	Ph.D.	prajesh.volvoikar07@unigoa.ac.in	School of Chemical Science, Goa University
31	Namrata Kumari	Female	M.Sc.	chem.namrata@unigoa.ac.in	
32	Rakeshpal Bhagat	Male	M.Sc. Microbiology	rpal9244@gmail.com	Gujarat Biotechnology Research Centre, Gandhinagar, Gujarat

Annex 3: Schedule date and activities during the workshop.

Schedule									
Day 1		Day 2		Day 3		Day 4			
						Batch I		Batch II	
0900	Registration	0930	Session 2A	0930	Session 3A	0700	to	0930	Session 4A
1015	Inaugural Session	1045	Tea Break	1045	Tea Break	1045		Tea Break	
1045	Tea Break	1100	Session 2B	1100	Session 3B	1100		Session 4B	
1100	Session 1A	1300	Lunch	1300	Lunch	1300		Lunch	
1200	User requirements of Participants	1400	Session 2C	1400	Session 3C	1400		Session 4C	
1300	Lunch	1515	Tea Break	1515	Tea Break	1515		Tea Break	
1400	Session 1B	1530	Session 2D	1530	Session 3D	1530		Session 4D	
1515	Tea Break	1730	Break for the Day	1730	Break for the Day	1730		Break for the Day	
1530	SEOASLab Visit								
1730	Break for the Day								
Day 5			Day 6			Day 7			
Batch II		Batch I							
0700	to	0930	Session 5A	0930	Session 6A	0930	Session 7A		
		1045	Tea Break	1045	Tea Break	1045	Tea Break		
		1100	Session 5B	1100	Session 6B	1100	Session 7B		
		1300	Lunch	1300	Lunch	1300	Lunch		
		1400	Session 5C	1400	Session 6C	1400	Feedback from Participants		
		1515	Tea Break	1515	Tea Break	1500	Valedictory Function		
		1530	Session 5D	1530	Session 6D				
		1730	Break for the Day	1730	Break for the Day				
2000	Networking Dinner								

Annex 4: Feedback summary

Sr. No.	Content	% Rating
1	Overall grading of the Programme with reference to relevance of course, module/content etc.	96% rated 8 and above 8 points
2	Overall grading of the facilities provided by the institute, i.e., Hostel, Mess, Class Rooms, Transport/infrastructure etc.	99% rated 8 and above 8 points
3	Overall grading of the faculty members conducting the training	98% rated 8 and above 8 points
4	How do you rate the overall training methodology	91% rated 8 and above 8 points
5	How far the field visit is relevant and related to your research study	97% rated 8 and above 8 points
6	Usefulness of this training in your current role	94% rated 8 and above 8 points
7	Usefulness of this training in future work/job you may handle	97% rated 8 and above 8 points
8	How far have you benefitted from interaction with the fellow participants of the training	95% rated 8 and above 8 points
9	How far the course material supplied relevant and related to the training curriculum	98% rated 8 and above 8 points
10	Overall grading of the process of training	98% rated 8 and above 8 points
11	Your recommendation to your peers/colleagues for the training Programme	100% rated 8 and above 8 points