Ahmedabad University

ISP | INDEPENDENT STUDY PERIOD

2024

Course Code	Course Name	Instructor	Fees
ISP076	Learn how to make an impactful documentary	Tanmay Shah	35000/-
ISP067	Clues 'The Truth Finder' Solving the Crime	Ritesh Shukla	35000/-
ISP116	BiodiverCity: Prototyping Fauna Habitat in Urban Areas	Priyanka Kanhare Patel	35000/-
ISP122	Paperwise Crafting Sustainability in Paper Pulp	Snehal Kashikar	35000/-
ISP131	Harnessing Solar Power to Address Real Life Problems	Tarun Rijwani	35000/-
ISP132	Biomimicry: Learning to Learn from Nature! 'Unlocking Nature's wisdom to create sustainable Innovations!	Prashant Dhawan	35000/-
ISP097	Ocean Explorers - Concerns and Solutions	Shefali Naik & Janki Teli	40000/- (Includes Travel expenses)

Creating Impactful Short Films

Tanmay Shah
Instructor

Founder and CEO at FridayFictionFilms. He holds the Limca Book of Records, India Book of Records, Asia Book of Records, and Golden Book of World Records, for making 52 short films in 52 weeks in 2015. His short documentary Pinch of Salt has won 17 international film festival awards and has been screened in more than 10 countries. He also has a short film, Woo, to his credit. FridayFictionFilms has served more than 100 clients under his direction.

Abstract

The course work will introduce students to basic film-making process. The three major building blocks of films- Pre-Production, Production and Post- Production will be taught. It will teach them to write conceptual and executable scripts and screenplays. The logic and techniques to write a gripping and engaging short film will be taught. It will also be an introduction to the following but not limited to film- production, shoot scheduling, shot divisions, art direction, light arrangement and sound recording. The basic cameras, light equipments and sound recorders will be demonstrated. The set design and art direction basics will be taught. It will teach them to do basic film editing. The entire course-work will be a 'Learning by Doing' exercise of each stages of film-making.

What is the grand challenge or real-life problems students will try to solve through the course?

The course is going to inculcate the values of social responsibilities and general awareness in students while learning to create films with meaning. A responsibility to be accountable for the communication a maker of the film is entitled to will result in learning a new way of doing effective visual communication.

Learning Outcome

They will learn to conceptualize and represent their ideas in a better way using visual communication techniques. They will learn to write for screen and films. They will learn to convert presentations into films or video.

Tangible Outcome

Short films will be made by students.

Clues 'The Truth Finder' Solving the Crime

ISP067

Abstract

Forensic Science is aimed at recognising evidence and navigating through it to solve intentionally or unintentionally executed crimes. This definition itself delineates the vital role of Forensic Science in the criminal investigation process. It is thus an amalgamation of theories and approaches drawn from various disciplines, and can help in detecting, identifying, and establishing evidence links with crime. In this course, students will learn how to recognise, detect, and identify the different types of evidence using various approaches and establish its link with the crime scene, suspect, or victim.

Ritesh Shukla
Instructor

Associate Professor, School of Arts and Sciences, Ahmedabad University. He holds a PhD in Toxicology. He is a trained fingerprint expert from the Directorate of Forensic Science, Forensic Science Laboratory, Gandhinagar, Gujarat. At Ahmedabad University, his research interest is focused on Forensic Biotechnology and Food Forensics. He has more than 50 research papers in various international peer-reviewed journals, 3 books, and 18 book chapters to his credit.

What is the grand challenge or real-life problems students will try to solve through the course?

This course will inculcate awareness among the students about the significance of Forensic Science and its role in an investigation process. It will help students enhance their personal and public safety and protect themselves from malicious intentions/actions and threats. It will also encourage students to explore their interests in the field of Forensics or Security Services.

Learning Outcome

Students will learn to identify and understand the clues using different scientific approaches and link them to the crime, suspect, or victim. They will learn to develop an investigative and innovative mind by creating a mock crime scene investigation process. They will also learn about the important role of Forensic Science in security as well as the judiciary system.

Tangible Outcome

Digitised Poster/Model of a crime investigation procedure; Model of Fingerprint Analysis.

BiodiverCity: Prototyping Faunal Habitat in Urban Areas

Biodiversity within urban environments allows individuals to engage with natural elements and foster a sense of respect toward the natural world. Through classroom interactive sessions, field excursions, and hands-on activities, students will understand the abundant biodiversity found in urban settings and the valuable functions that natural ecosystems can provide inside cities. Upon completing this course, students will construct a tangible model of an urban fauna habitat and implement it in their educational institutions or other urban settings.

Priyanka Kanhare Patel
Instructor

Academician and practising Architect and Landscape Architect. She is working as a Visiting Faculty at Navrachana University, Vadodara, and CEPT University, Ahmedabad. She completed her Bachelor of Architecture in 2013, followed by Master of Landscape Architecture in 2015 at CEPT University, Ahmedabad. She is currently pursuing her PhD in Landscape Architecture at the School of Planning and Architecture, New Delhi. Her research interest lies in reading and documenting ecological and cultural manifestations along natural systems (rivers). She also conducts workshops on ways to *Represent and Document Intangible Cultural Heritage of People and Places.*

What is the grand challenge or real-life problems students will try to solve through the course?
Since humans have become permanent occupants of urban green spaces, there has been a pressing need to provide appropriate habitats for species residing in urban environments. As a result of excessive infrastructure-related endeavours, many species are experiencing habitat loss which leads to their confinement inside fragmented areas. In this course, students will design captivating structures and installations that will enhance the habitat for various fauna species and help integrate them into the urban green areas of Ahmedabad.

Learning Outcome
Students will learn to communicate natural patterns and processes through graphical representations of biodiversity such as maps, story boards, and other visual narratives. They will transform the two-dimensional drawings of their ideas into physical three-dimensional models and installations. They can also suggest ideas for the future to increase the biodiversity quotient.

Tangible Outcome
Physical prototype-models for a chosen fauna species and its installations either in the institute or gardens, parks, ponds, and riverside, among other locations. Display of documentation such as maps, storyboards, photographs, videos, and basic sketches in different mediums.

ISP122

Paperwise Crafting Sustainability in Paper Pulp

Abstract
Paper manufacturing has a significant environmental impact, particularly in terms of deforestation. Only 20 per cent of waste paper in India is collected, while the rest ends up in landfills. To address this issue, the course proposes solutions that eliminate the use of wood in the production of paper products with the use of alternative materials like denims, sugarcane, and grass, among other things. The course focuses on finding innovative methods of making handmade paper with unconventional waste materials. Additionally, the course seeks to foster innovation by investigating alternative materials for paper production in three dimensions, with the aim of expanding the conventional boundaries of paper. Students will also learn about the ancient art of paper making, its historical significance, and its relevance in the development of arts.

Snehal Kashikar
Instructor

Ceramic artist in Ahmedabad. She is currently working as a principal artist for the handmade ceramics initiative, Mogra. She practises from her studio and also works as an instructor in various reputed institutes in the city. She received her Diploma in Textile Design in 2002 from the Department of Textile Engineering, VJTI, Mumbai. After receiving a Diploma in Ceramics and Pottery in 2007 from LS Raheja Institute, Mumbai, she began her creative journey in clay. Her key interest areas are explorations in hand-built techniques, form appreciation, and glaze and surface development in the earthenware ceramics range.

What is the grand challenge or real life problems students will try to solve through the course?
Grand challenge- providing solutions for paper waste in society project deliverables.

Learning Outcome
Upon completion of the course students will be able to:
- Understand aesthetics, history, science, and sustainability of recycled paper materials.
- Apply, practise, and develop basic hand skills required for the successful creation of hand-made paper and blocks in paper pulp.
- Demonstrate proficiency to creatively construct two- and three-dimensional paper forms.

Tangible Outcome
- Handmade paper samples from recycled denim, jute, sugarcane waste, pineapple waste, corn waste, banana fibre paper, lemon straw grass, neem leaves, coir, and cotton fabric wastes.
- Pin up presentation of process

ISP131

Harnessing Solar Power to Address Real Life Problems

Abstract
As the world increasingly shifts towards sustainable energy, this theme aligns with global priorities and offers students an opportunity to contribute to meaningful solutions. Students will explore a range of solar technologies, including photovoltaic (PV) systems, solar thermal energy, concentrated solar power (CSP), and hybrid solar setups. They will learn about key concepts such as energy conversion efficiency, storage solutions (like batteries and thermal storage), and smart grid integration. The course will delve into the practical aspects of solar technology, including the design of solar panels, the optimisation of solar trackers, and the implementation of solar inverters.
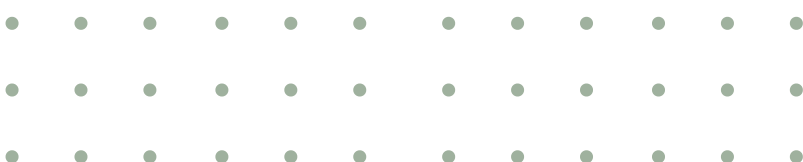
Tarun Rijwani

Instructor

Tech enthusiast with a background in mechanical engineering, who has spent the last six years working in the 3D printing industry. He currently serves as the CEO of Rudrabots Pvt. Ltd., which manufactures indigenously developed 3D Printers for use in engineering and medicine. Some of the innovations he has created to improve the effectiveness and cost-effectiveness of 3D printing include the Multi Material FDM System, Modified Core-XY Mechanism, and FDM-based Metal Additive Manufacturing (FAM). He has also worked on many Do-It-Yourself (DIY) projects such as robotic arms, aerial robotics, and CNC automation, among others, and as a hobby, he continues to look for new opportunities to innovatively use various products.

What is the grand challenge or real-life problems students will try to solve through the course?

The central theme of the "Innovating for Impact" course will be a grand challenge focused on Harnessing Solar Power to Address Real-Life Problems.

Methodology

Students will work in teams through the following distinct phases of project development:

- **Problem Identification and Research:** Students will conduct an in-depth analysis of a specific real-world problem that can be addressed using solar energy.
- **Ideation and Design:** Teams will brainstorm and select a project idea, followed by creation of a detailed technical design, taking into account factors like energy efficiency, system durability, and cost-effectiveness.
- **Prototyping and Testing:** Using tools like Arduino, sensors, and 3D printing, students will build prototypes, conduct performance testing, and iterate on their designs based on feedback and data.
- **Final Presentation and Real-World Application:** The course will culminate in a final presentation where teams will showcase their projects. They will also explore opportunities for scaling up their solutions, while assessing the feasibility of deploying them in real-world scenarios.

Academic Concepts

Students will learn about key concepts such as energy conversion efficiency, storage solutions (like batteries and thermal storage), and smart grid integration. The course will delve into the practical aspects of solar technology, including the design of solar panels, the optimisation of solar trackers, and the implementation of solar inverters.

Learning Outcome
By the end of the course, the participants would have developed a solid understanding of solar energy technologies and gained practical experience in applying them to create impactful solutions.

Tangible Outcome
Solar powered projects like an Air Purifier, Irrigation system, Water Desalination Unit, Solar Cooker, Lake Cleaner Unit, and Solar Tree.

ISP132

Biomimicry: Learning to Learn from Nature! Unlocking Nature's wisdom to create sustainable Innovations!

Abstract
This year, the course will focus on the following three organisms :

- **Spider** – Spider web and Spider silk is a model for creating strong, lightweight materials.
- **Bees** – The hexagonal honeycomb structure is strong and efficient, inspiring structural designs in architecture and engineering for lightweight but strong materials.
- **Termites** – Termite mounds maintain stable internal temperatures through a clever ventilation system. This has inspired energy-efficient building designs that use natural airflow for cooling.

Prashant Dhawan

Instructor

Co-founder of "Biomimicry India Network" and "Biomimicry India", a company which designs and delivers learning experiences, undertakes consultancy and research in the field of biomimicry. He is the first person from India to obtain an M.S. degree in Biomimicry (2015) from the Arizona State University, and a Biomimicry Professional Certification (Biomimicry 3.8 Institute, USA). He also holds a degree in Architecture from SPA Delhi, and an MBA from ISB Hyderabad. With over 27 years of work experience (including 8 years of designing and delivering learning experiences in Biomimicry), he has had the opportunity to work with IDEO and also in the corporate sector. He is also a TEDx speaker having delivered two TEDx talks on Biomimicry.

What is the grand challenge or real-life problems students will try to solve through the course?
Design challenge: What can we learn from Nature about eliminating/reducing waste and increasing sufficiency/abundance?

- Exploring and coming up with nature-inspired solutions.
- Creating a model/prototype of the idea.

Methodology

The course would follow the following modes of teaching:

- Lectures and presentation sessions interwoven with games, movies, and activities to understand biomimicry concepts;
- Field trips and outdoor exercises to observe, identify, and reconnect with various patterns in nature;
- In class discussions and student presentations (peer learning);
- Multidisciplinary explorations (crossing disciplinary boundaries – building bridges, especially with biology);
- Individual as well as group-based assignments (short design explorations and one long design project);
- Learning games and exercises (to help students understand the biomimicry concepts);
- Library/web research and readings; and
- Introduction and training on using biological databases.

Academic Concepts

The course aims to inform participants about the following theoretical concept areas:

• Operating conditions of planet earth (theory);

• Life's unifying patterns (theory);

• Integrating Biology into Design (theory, tools and methodology); and

• Exploring and understanding 'How and why there's no waste in nature?' and then applying the Biomimicry approach to come up with solutions.

Learning Outcome

The course aims to inform participants and enable them to:

- Understand and be able to apply the Biomimicry approach in order to solve problems/innovate.
- Understand the concepts of nature's deep patterns/life's overarching principles and how these can inform the design of better and sustainable solutions
- Understand how to explore and learn from nature at various levels of product, process and systems.
- Learn and understand methods and tools to help in applying the Biomimicry approach in the problem solving/innovation process, especially in the fields of Design Engineering and Business.
- Reconnect with nature: learning to observe and take inspiration from nature (not 'about' nature but 'from' nature). Observe and understand nature by 'function'

Tangible Outcome
Final Physical Outcome:
- Physical prototype/model/models of the design solution/s
- A presentation (PPT) /video to explain and summarise the project

Ocean Explorers - Concerns and Solutions

Abstract
Our planet Earth is 70% water and 30% land. In fact, instead of planet "Earth", it should rather be called planet "Water". Of the 70% water cover on the Earth, more than 90% is actually marine water or salt water in oceans. Seas forming a complex web of ecosystems holistically known as "Marine Ecosystems". There is more life in these ecosystems than anywhere on the land, and a lot of it is unique, unexplored and unknown. The oceans are a significant source of oxygen for our planet and are instrumental in the storage of carbon dioxide. They are not only home to the animals but also innumerable plant species. This course is designed to give a glimpse of these exclusive and exceptional ecosystems, how they are important for the survival of mankind, threats to the ocean, problems related to marine ecology and their solutions.

Shefali Naik
Instructor

Assistant Professor at School of Engineering and Applied Science, Ahmedabad University. She is an author of the book Concepts of Database Management System. She has presented and published papers at national and international conferences and journals. She has a deep interest in wildlife and bird watching.

Janki Teli
Instructor

Naturalist working in the field of wildlife research, conservation, and education for the last 15 years. She has a passion for interacting with students and spreading the message of nature conservation.

What is the grand challenge or real-life problems students will try to solve through the course?

Challenge 1: Prevent Saltwater Intrusion into Agricultural Lands
- **Problem:** Over-extraction of groundwater and rising sea levels have led to saltwater intrusion in coastal agricultural areas, particularly in the Saurashtra and Kutch regions. This has reduced soil fertility and crop yields.
- **Potential Student Project:** Create water management strategies that focus on recharging groundwater and preventing saltwater intrusion. This could involve designing water retention structures, or planting salt-tolerant crops and vegetation. Students will experiment with various available seed options and will propose the most feasible solution.

Challenge 2: Protect Mangrove Forests from Depletion
- **Problem:** Despite efforts, the mangrove cover in certain areas of Gujarat has been depleting due to industrial expansion, coastal development, and habitat destruction. This loss increases vulnerability to storms and reduces biodiversity.
- **Potential Student Project:** Expand mangrove restoration efforts by visiting the coastal area near Vadodara, learn techniques of mangrove seed plantation, find methods to improve seedling survival rates, utilize GIS mapping to monitor mangrove health and identify areas for reforestation. Students will do hands-on during the field visit to find the feasible solution.

Methodology

- One of the most important methods of learning in this course is experiential and hands-on learning in the form of a field visit to the coastal area where students can explore, discover, and learn.
- The other method that will be employed is usage of hands-on activities, informative movies and documentaries, and group discussions.
- The students will learn the basics of GIS through hands-on GIS applications like Quantum GIS.

Academic Concepts
- Understanding one of the most important ecosystems of nature, the marine ecosystem.
- Understanding how our activities impact this important ecosystem.
- Learning to make GIS maps with hands-on activities.
- Identifying the issues and solving them.
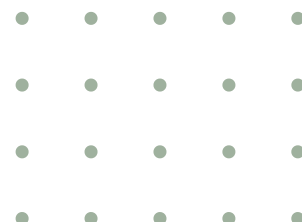
Learning Outcome

- Generate awareness, interest and passion for the conservation of oceans and seas among youth.
- Study human impact including urban habitations, industrial growth, ports and urban livelihood activities on coastal ecosystems.
- Gain an understanding of the local and global context of coastal/marine issues, the differences and similarities between cross-country approaches for addressing these issues.
- Encourage and develop skills among students in research, documentation, and monitoring of marine biodiversity.
- Basic understanding of map preparation using GIS mapping system.

Tangible Outcome

- Demonstration Models of Water Management Structures.
- GIS-based maps.
- Samples of proposed mangrove seeds/seedlings.
- Prototype to showcase the mangrove plantation and its effects.

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