

INTRODUCTION TO BIOMIMICRY

MULTIFACULTY

Multidisciplinary
IIT Madras

INTENDED AUDIENCE : All interested learners

INDUSTRY SUPPORT : All companies interested in research, innovation and entrepreneurship

COURSE OUTLINE :

Biomimicry is a practice that learns from and mimics the strategies found in nature to solve human challenges. Examples of biomimicry include everything from energy-producing solar cells that mimic tree leaves to antibacterial paints that emulate sharkskin to highly profitable businesses that improve their organizational structures based on redwood groves. Biomimicry is based on the principle that nature, with 3.8 billion years of wisdom, offers time-tested solutions to all our problems. We do not need to reinvent the strategies that are already here. We just need to learn how to adapt them.

ABOUT INSTRUCTOR :

Prof. Shiva Subramaniam is a life skills coach and consultant, specialising in innovation, entrepreneurship, and cross-cultural skills. In his career spanning over 3 decades, he has worked with a multitude of organizations, teams, and individuals, helping them with new ways of thinking, exploring connections, expanding their vision and realizing their potential. As a life skills coach for young engineering students, he is particularly interested in looking for connections between STEM skills and non-STEM skills and how one set of skills can enhance the other. Shiva is a biomimicry evangelist. He teaches biomimicry to young students with the intention of transforming them to become not just innovators but also sustainability champions. With his penchant to look for connections, he is exploring how coaching can be enhanced through biomimicry. He is a lawyer by training and was practicing at the High Court at Chennai. Prof. Sivakumar Srinivasan, fondly called Anbudan Siva, is a Professor of Applied Mechanics at IIT Madras specializing in the area of Active Material Structures and Systems. He holds a B.Tech (1985) and an M.S. (1987) both from IIT Madras and a Ph.D. degree (1993) from the Louisiana State University for his thesis in the area of plasticity. He has been with IIT Madras as a faculty since 1994. As Dean of Students at IIT Madras, he holds pride of place in creating and anchoring several new initiatives to enhance the emotional and professional growth of students. He established MITR - a network to provide students with emotional and counselling support. He is the midst of anything to do with the welfare of students. Prof. Satya Seshadri is an associate professor in the Department of Applied Mechanics at IIT Madras. He has a PhD from Texas A&M University in aerosol science. His research focus is on indigenous technology development and translation of technology from lab to market in the domains for energy recovery and industrial emission monitoring. He has 4 granted patents and 5 patent filings in these domains. He is also the coordinator for the energy committee of the Centre for Technology and Policy at IIT Madras and member of the energy committee at the South Indian Chamber of Commerce and Industry (SICCI). He is the faculty advisor for Centre for Innovation (CFI) and the Nirmaan pre-incubation center at IIT Madras. Prof. Mrinalini is the co-founder of the Biomimicry Compass that enables companies, educational institutions and other organizations use the practice of biomimicry to solve problems and innovate on products, processes and services. She has held many executive positions throughout her career in technology, product management, strategy, innovation and knowledge management, and has headed cross-disciplinary teams locally and globally. She graduated in engineering from BITS, Pilani and holds an MBA from INSEAD.

COURSE PLAN :

Week 1: Introduction

Week 2: UN Sustainable Development Goals

Week 3: Systems Thinking, Curiosity

Week 4: Creativity tools, Design thinking

Week 5: Biomimicry essentials

Week 6: From problem definition to solution

Week 7: From problem definition to solution

Week 8: Biomimicry and the future of innovation