prbb intervals
Continuing Professional Development Programme
Space for Reflective Learning

PRBB Intervals Course Proposal

Course Title:
Unlocking innovation in science through biodesign

Proposed date(s)
June 29th & July 3rd

Course Language: *English*

Course Leader(s) and a very brief summary of relevant qualifications and experience (no more than 2 lines for each trainer)
Carlos Silveira is a biodesigner and futurist focused on biohybrid technologies for emergent problems, pursuing a Master's in Design for Emergent Futures. He's a Teaching Assistant at How to Grow Almost Anything at MIT Media Lab, Project Head for the Bioart Community at iGEM, and acts as a speaker and educator bridging scientific and creative fields.
linktr.ee/carlossilveira.design

Rationale for course (why is this course of interest for the PRBB staff?):
Considering the diverse field of research at PRBB, and in light of recent developments in the biotechnology field, this proposal aims to encourage innovative solutions that are non-obvious, driven by interdisciplinarity and collaboration to address emerging problems, communicate new ideas, and foster disruption.
The idea aims to introduce PRBB participants to the realm of biodesign and how the intersection of scientific and creative disciplines is building communities around the world to drive innovation and change in the industry through startups, research, and design methodologies integrating biological processes, materials, and logics on different scales.

Course aim – general
This course aims to break mindsets from normal procedures and protocols in the lab by bringing biodesign methodologies as an approach to develop biotechnological solutions with a framework to help applicants conceptually rethink their lab skills to envision new research directions and develop new products for the market within their professional fields.
Participants will idealize solutions and reflect on how to imply a collaborative mindset, analyzing what's been done in the past and proposed in the present to forecast change by hybridizing different technologies, engineering fields, tools, and systems already invented.

Specific learning outcomes - What new i) knowledge, ii) skills & iii) attitudes will participants take away from the course?

1. ***Knowledge:*** Futures Thinking, Biodesign/Bioart and business innovation.

2. ***Skills:*** Critical thinking, interdisciplinary management, design-driven approach.
3. ***Attitudes:*** Collaboration, disruptive thinking, and entrepreneurial spirit.

Course contents (outline of topics to be covered)

- Biodesign Methodologies
- Arts, Creativity, and Technology
- Business Innovation & Market Adoption
- Futures Thinking and Forecasting
- Bioethics Analysis

Training methods

A sequence of expository lectures will drive the class to situate participants in the gaps between creative and scientific fields, bridging them through a biodesign methodology that will sequentially create suitable proposals for market, social, and cultural adoption. (Exp: A biosensor applied to an ink to produce tattoos sensitive to specific diseases)
During the first day, the classes will be followed by specific tasks to guide the development and speculation of a biohybrid technology solution to a problem given by the tutor in the course. (Exp: How to identify diseases by communicating them to patients before more severe symptoms.)
On the second day, all groups will pitch and present their projects to be bioethically evaluated by their peers, allowing others to question the real implications of their solutions from different perspectives. (Exp: If tattoos could change color to identify a certain type of cancer, would people be comfortable communicating that to others?)

Target group in PRBB (Senior scientists, postdocs, predocs, management/admin staff, all residents)

All PRBB Scientific and Non-Scientific Staff.

Number of participants (maximum)

12

Total course hours (Please specify: direct training with instructor present and required self-study)

Note: only the direct training hours will be included in the post-course certificate.

Number of hours of class time: 8 hours (direct training with instructor present)
Number of hours of self-study: 1-2 hours
Total number of course hours: 10 hours

Distribution of course (hours/days)

First day - Arts, Creativity and Technology + Futures Thinking and Forecasting + Biodesign Philosophy + Project Briefing and Brainstorm ***/ 4 hours***

Second day - Business Innovation & Market Adoption + Project Assistance + Project Pitching and Bioethics Revision ***/ 4 hours***

Pre-course preparation and self-study expected between sessions (what preparation should participants do before the course and/or in between sessions – reading, online study, prepare ideas, etc.)

Before starting the classes, participants should watch a simple TEDx video with Neri Oxman, explaining the possible disruptive possibilities of applying biotechnology to non-usual areas in the field, such as fashion, architecture, and so on. https://www.youtube.com/watch?v=CVa_IZVzUoc
It's required for all people to watch the video and write a paragraph (280 characters) to be presented on the first day of class, responding to the following question: ***How can we be more creative through biology?***

Material participants need to bring (laptops, etc.)

Laptops, notebooks, pencils, and Post-its.

What to expect:

Identify emergent problems
Ideate solutions through a biodesign methodology
Apply science into business innovation by design
Pitch and projects presentation skills

What not to expect:

Scientific driven techniques or processes for lab procedures or protocols

Web Materials:

iGEM Arts Gallery - *https://community.igem.org/projects/igem-arts-gallery*
Biodesign Challenge - *https://www.biodesignchallenge.org/*
Ani Liu - *https://ani-liu.com/*
Eduardo Kac - *https://www.ekac.org/*
How to Grow Almost Anything - *https://howtogrowalmostanything.notion.site/2025-How-to-Grow-Almost-Anything-113387c9c1e9807095d1cf98e24fa476*
Oxman - *https://oxman.com/*
Ancient Futures - *https://www.instagram.com/ancient__futures/*
Next Nature - *https://nextnature.org/en*