COMPLEX DISEASES

**Degree:** Grau en Enginyeria Biomèdica  
**Type:** optional, 3rd trimester, 4 ECTS  
**Teaching staff:** Theory lectures: Ricard Solé, Sergi Valverde, Josep Sardanyés, Lucas Carey. Seminars: Raúl Montañez, Nuria Conde, Oriol Vall, Javier Macia

1. **General objectives**

This course will provide the students with a number of general tools and theoretical background to approach the problem of disease under a network perspective, the levels of complexity that need to be considered while studying a given pathology and different ways of approaching it, from the clinics to imaging and theoretical/computational modelling. The course should provide also a number of case studies and open problems that facilitate students to see the potential problems that remain open. When possible, students should have the opportunity of collaborating in some ongoing research projects.

2. **Contents**

   **Theory lectures:**


Seminars:

- Synthetic organs and the space of organ design (Ricard Solé)
- Complex networks in rare diseases (Raul Montañez)
- Synthetic biology approaches to cancer (Nuria Conde)
- Darwinian medicine (Oriol Vall)
- Synthetic biology approaches to diabetes (Javier Macia)

3. Evaluation

The final grade of the course will depend on performance in a final exam (60%) and in the preparation of a research project (40%).