

Genetic Engineering

Calendar: 5th semester

Contact Hours: T: 30,0; TP: 15,0; OT: 7,5

Intended learning outcomes of the curricular unit:

1.Understand the fundamentals of genetic engineering. 2.Understanding the potential of biotechnology of plants, animals and microorganisms in genetic engineering. 3.Knowledge about common methodologies in genetic engineering. 4.Apply tools of recombinant DNA and cloning in bacteria.

Syllabus:

1.Biotechnology and Genetic Engineering. 2.Recombinant DNA technology. 2.1.Enzymes. 2.2.Recombinant DNA molecules. 2.3.PCR technique. 2.4.Methods for automatic sequencing. 2.5.DNA libraries. 2.6.Applications. 3.Gene expression systems. 3.1.Host models. 3.2.Vectors.3.3.Gene cloning. 3.4.Applications. 4.Transgenic models.4.1.Animals and plants. 4.2.Knocking out gene function. 4.3.Applications. 5.Gene and protein technology. 5.1.Vectors. 5.2.Sites for gene therapy. 6.Reproductive technologies. 6.1.Fertilization and cryopreservation techniques. 6.2.Gamete transfer.

Demonstration of the syllabus coherence with the curricular unit's intended learning outcomes.

The syllabus are coherent with the outcomes expected for the course, since includes a set of topics essential to the learning expected in the area of genetic engineering. Considering the huge potential of biotechnology in XXI century, according to specialized references, it is important that students acquire deep theoretical knowledge but also the ability to apply those contents to develop laboratory skills.

Teaching methodologies (including evaluation):

In the theoretical classes a participatory-expository teaching methodology will be employed, as well as the debate within the group of students. In the laboratory classes students will be asked to perform experiments, in order to complement and consolidate the knowledge acquired in theoretical content, of which they will have to write a report. Those classes will also have a period for discussion of the experiment with the students at the end.

Each component, theoretical and practical, accounts for 50% of the total classification. Laboratory assessment includes reports from each experience, and for the theoretical part students will perform two moments of evaluation, one individual and another in group for an oral presentation

Demonstration of the teaching methodologies coherence with the curricular unit's intended learning outcomes.

The expository-participatory methodology, adopted in the theoretical classes is well adapted to the presentation of the several themes discussed during this curricular unit considering its character innovative. Besides that, it allows the contribution of the students to the discussed topics. Practical classes allow an experimental approach to genetic engineering methodology worldwide known.

The evaluation methods demand that the students use the knowledge acquired during this curricular unit in an integrated perspective. The individual assessment enables student to the monitorization of its knowledge.