Study Programme : PhD in Biology

Degree level: Doctoral degree

Course Title: BIOCHEMICAL METHODS IN MICROBIOLOGY

Professor: Dragan Radnović

Required/Elective Course: Elective Course

Number of ECTS: 15

Prerequisites:

Course Objective is to update knowledge in research methodology of microbial metabolism and functional structure linking these findings with current and potential biotechnological application of microorganisms

Course Outcome:. After successfully completed the pre-examination and examination commitments student should be able to: (i) understand the basic principles of common biochemical methods used in microbiological laboratory with special reference to the methods for the doctoral thesis which the candidate is applied (ii) to independently use these methods in scientific work

Course Content:

Theoretical part Lectures, consultations and seminars would be organized through thematic modules. Biochemical properties of microorganisms are very diverse, and methods for their identification and characterization are very important. Students would be introduced and trained for testing microorganisms for different biochemical properties. It would be used methods for screening and studying taxonomy of microorganisms. Students will be introduced with laboratory techniques for rapid screening of properties of microbes that are important for their application. The course would be primarily involved examining the following properties: detection of pigments in cyanobacteria (spectrophotometric method), determination of enzyme activity on solid media - lipolytic, proteolytic, celulolytic and saharolytic activity, determination of enzymatic activity of microorganisms using fluorogenic and hromogenic substrates, the determination of other biochemical properties of specific for specific groups of microorganisms.

Reading List:

1. Madigan M.T. and Martinko J.M. BROCK – Biology of Microorganisms. Pearson, Prentice Hall, 11th edition, 2006.
2. Petrović, O., Gajin, S., Matavulj, M., Radnović, D., Sviřčev, Z. (1998): manual for microbiological analysis of water.. Institute of biology, Faculty of Science, University of Novi Sad. (In Serbian).
3. Knežević-Vukčević, J., Simić D. (1997)Mothods in microbiology. Faculty of biology. University of Belgrade.ISBN86-7078-008-9
4. Škrinjar, M. (2001): Manual of food microbiology. Faculty of Technology. University of Novi Sad.

Additional reading (in English):

5. Harley, J., Prescott, L. (2001): Laboratory Exercises In Microbiology. McGraw-Hill College. ISBN 10: 0072333456
6. Gerhardt P. and Murray R.G.E.: Manual of methods for general bacteriology: By Philipp Gerhardt and R.G.E. Murray, editors American Society for Microbiology, Washington 1981.
7. Paterson, R.R.M., Bridge, P.D. (1994): Biochemical techniques for filamentous fungi. IMI Technical Handbooks, No. 1. CAB International, Surrey, UK.
8. Burlage, R.S., Atlas, R., Stahl, D., Geesey, G., Sayler, G. (1998): Techniques in Microbial Ecology. Ed. Burlage R. Oxford University Press. ISBN – 0-19-509223-6.

Total hours:				
Lectures: 5	Practicals	Other:	Student research work: 5	

Methods of instruction: Classes are held under the system of consultation defined by the units. Student in consultation with the teacher and supervisor selects topics for seminar papers from two respective area of microbiological methods with the obligation to search the Internet and/or standard library documentation, based on which to analyze comparability of results obtained using the above methods..

Assessment (maximum number of points 100) During the semester students will work through the seminar, which will be especially valued and enter into the stock assessment, be able to achieve up to 60 points with 30 of the oral exam and 10 the experimental work (maximum points = 100)

Requirements

Remark: