Study Programme : PhD in Ecology

Degree level: Doctoral degree

Course Title: Ground water and drinking water microbiology

Professor: Petar Knezevic

Required/Elective Course: Elective

Number of ECTS: 15

Prerequisites:

Course Objective:

The aim is to obtain knowledge about types and importance some groups of microorganisms from the aspect of their role in biogeochemical cycles and oxido-reduccion processes in natural environments, as well as their importance for health. The aim of the course is also familiarization with legislative in field of ground and drinking waters.

Course Outcome:

The course will provide knowledge about basic biological characteristics of ground waters as potential water supplies, types and quality of drinking water, methods for detection of some groups of microorganisms in these environments, current methods and analysis and legislative (WHO regulation and EU directions).

Course Content:

Theoretical part

Importance of ground waters as natural resource and problems of high-quality water supplying. Specificities of ground water ecosystem. Abundance and distribution of bacteria in ground waters, growth and multiplication. Biodegradation of anthropogenic contaminants in system of ground waters. Natural organic matters and impact on drinking water quality. Fe and Mn in ground waters and problems of specifical well bounty. Importance and control of Fe bacteria in water distribution system. Application of commercial BART tests in monitoring of microbiological quality of ground waters. Application of activated carbons in technology for preparation of drinking water. Legislative and protection.

Importance and function of some groups of microorganisms (viruses, bacteria, protozoa, algae, fungi) in drinking waters. Metabolical diversity and biological importance of total and viable bacterial count, adaptation to low nutritive environments. Pathogenicity of microorganisms, apathogenic bacteria and opportunistic pathogens. Methods for detection of some groups of microorganisms, contemporary methods and techniques. Application and efficacy of disinfection procedures. Biofilms and regrowth in water supplying systems. Scanning electron microscopy. Legislative.

Practical part

Reading List:

- Francis H. Chapelle (2000): Ground-water Microbiology and Geochemistry. John Wiley & Sons Inc
- Burlage R.S., Atlas R., Stahl D., Geesey G., Sayler G. (2000): Techniques in Microbial Ecology. Oxford University Press, New York
- Cullimore D.R. and McCann A.E. (1978): The Identification, Cultivation and Control of Iron Bacteria in Ground Water. Aquatic microbiology, Editors Skinner&Shewan, Academic Press
- Cullimore R. (2000): Microbiology of Well Biofouling. Lewis Publishers, USA
- Dalmacija B., Ivančev-Tumbas I. (2002): Prirodne organske materije u vod. Univerzitet u Novom Sadu,PMF, Departman za hemiju
- Škunca-Milovanović S., Feliks R., Đurović B. (1990): Voda za piće. Standardne metode za ispitivanje higijenske ispravnosti. Savezni zavod za zdravstvenu zaštitu, NIP „Privredni pregled“, Beograd.
- Petrović O., Radnović D., Gajin S., Matavulj M. , Svirčev Z. (2001): Mikroorganizmi u vodi za piće, uticaj dezinfekcije, zakonska regulativa. Ed. Dalmacija B. “Kontrola kvaliteta voda”, Prirodno-matematički fakultet,
- Institut za hemiju, Novi Sad, pp.439- 451.
- Petrović O., Gajin S., Knežević P. (2005): Mikrobiološki aspekti primene i efikasnost dezinfekcije vode za piće. U knj. “Dezinfekcija vode” ed B. Dalmacija et al., PMF, Departman za hemiju, Novi Sad, str.88-104.

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

Methods of instruction: ПП презентације, консултације, презентација семинарских радова
PP presentations, consultations, presentations of seminar papers

Assessment (maximum number of points 100)

Requirements

Seminar papers: 40 **Oral exam: 60**

Remark: