

Study Programme: Phytomedicine		
Course Unit Title: Plant bacteriology		
Course Unit Code: 19.FTM019		
Name of Lecturer(s): full prof. Mila Grahovac		
Type and Level of Studies: Undergraduate academic study		
Course Status (compulsory/elective): Compulsory		
Semester (winter/summer): summer		
Language of instruction: english		
Mode of course unit delivery (face-to-face/distance learning): face-to-face		
Number of ECTS Allocated: 3		
Prerequisites: Passed General phytopathology		
Course Aims: Mastering basics of phytobacteriology with economically significant bacterial diseases of cultivated plants and control strategies.		
Learning Outcomes: Acquired knowledge presents the base for application and management of different plant protection measures, with an aim to reduce losses, environmental pollution and costs. The acquired knowledge is also the base for further scientific work.		
Syllabus:		
<i>Theory</i>		
General section: Economic significance. Development of phytobacteriology. Characteristics of phytopathogenic bacteria (morphological, cultural, biochemical-physiological, serological, genetic). Origin and specialisation. Classification. Pathogenesis (signal molecules, enzymes, toxins, polysaccharides). Effect of pathogenic bacteria on plants. Symptoms. Plant resistance (classic selection, genetic engineering). Plant protection measures (administrative, cultural, mechanical, physical, chemical, biological).		
Specific section: Occurrence, distribution, damage. Morphological characteristics, symptoms, epidemiology, control. Species identification (conventional and contemporary identification methods). <i>Pseudomonas syringae</i> pvs., and other fluorescent <i>Pseudomonas spp.</i> Nonfluorescent <i>Pseudomonas spp.</i> , <i>Xanthomonas spp.</i> , <i>Erwinia</i> , groups « <i>amylovora</i> » and « <i>cartovora</i> », <i>Agrobacterium spp.</i> , <i>Clavibacter</i> , and close genera. Phytoplasmas (basic characteristics of phytoplasmas, identification methods, economically the most important representatives).		
<i>Practice</i>		
Symptoms (overview of herbarized and conserved material). Isolation of phytopathogenic bacteria (MPA medium). Inoculation of plants (different methods). Morphological characteristics (Gram staining, bacterial size and spore formation). Cultural characteristics (development of bacteria on different nutrient media). Biochemical-physiological characteristics (catalase activity, oxidase activity, O/F test, decomposition of carbon compounds, reactions in milk, indole formation, hydrogen sulfide, nitrate reduction etc.). Serological methods (agglutination, ELISA). Basics of molecular identification methods. Use of identification keys.		
Required Reading:		
Janse, J.D. (2006): Phytobacteriology. Principles and Practice CABI.		
Balaž, F., Balaž, J., Tošić, M., Stojšin, V., Bagi, F. (2010): Fitopatologija – bolesti ratarskih i povrtarskih biljaka. Poljoprivredni fakultet, Novi Sad.		
Ivanović, M., Ivanović M. (2017): Bolesti voćaka i vinove loze. Univerzitet u Beogradu, Poljoprivredni fakultet.		
Arsenijević, M. (1997): Bakterioze biljaka. Univerzitet u Novom Sadu, Poljoprivredni fakultet, Novi Sad.		
Delibašić, G., Obradović, A., Tanović, B. (2018): Bolesti sadnog materijala povrtarskih biljaka. Univerzitet u Beogradu, Poljoprivredni fakultet.		
Weekly Contact Hours: 6	Lectures: 4	Practical work: 2

Teaching Methods:

Visual - didactic methods with the use of modern teaching aids and laboratory equipment. Practical classes - individual student work and demonstrative - illustrative methods.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	Final exam	points
Active class participation	10	written exam	20
Practical work		oral exam	50
Preliminary exam(s)	20	
Seminar(s)			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.