



Subject code: HODNM24	Subject name: Research in natural sciences education		
Study cycle: III	Year: I	Semester: II	ECTS credits: 10
Status: Optional		Contact hours: 60 Lectures: 30 Exercises/seminar: 30	
Assigned professors and assistants:	Teachers and associates selected in the field to which the subject belongs.		
Prerequisites:	/		
Subject objectives:	Developing capacities for searching, analyzing and synthesizing scientific literature in the field of research in natural sciences education; Developing skills for organizing and planning research in science education; Developing the ability to design and manage a research project; Developing the ability for oral and written communication about research results within the scientific community; Developing the ability to work in interdisciplinary team; Quality care.		
Teaching units:	<ol style="list-style-type: none"> 1. Search of scientific literature in the field of research in science education (e.g. Web of Science); 2. Review of research topics in science education – case studies; 3. Descriptive, relational and experimental research – traditional research design in science education; 4. Action research as a bridge between qualitative and quantitative research – New research approach to understanding the learning process; 5. Research tools in science education (pre-test, post-test, interviews, structured interviews, questionnaires, etc.); 6. Observation as a research tool; 7. Conducting pilot research; 8. Statistical data analysis, hypothesis testing; 9. Mapping the results of qualitative research; 10. Designing a research project in the field of science education; 11. Presenting research results to the scientific community - writing articles/reports. 		
Learning outcomes:	•		
Teaching methods:	Multimedia presentation and discussion (lectures); individual work – research project and presentation of results (research seminar/project).		



<p>Knowledge testing methods with grading structure¹:</p>	<p>Knowledge test - criterion:</p> <table border="0"> <thead> <tr> <th></th> <th style="text-align: right;"><i>Points</i></th> </tr> </thead> <tbody> <tr> <td>Attendance</td> <td style="text-align: right;">10</td> </tr> <tr> <td>Research project</td> <td style="text-align: right;">50</td> </tr> <tr> <td>Final exam</td> <td style="text-align: right;">40</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>TOTAL</td> <td style="text-align: right;">100</td> </tr> </tbody> </table> <p>Assessment:</p> <table border="0"> <thead> <tr> <th><i>Grade</i></th> <th><i>ECTS grade</i></th> <th><i>Points scale</i></th> </tr> </thead> <tbody> <tr> <td>10</td> <td>(A) excellent</td> <td>95 - 100</td> </tr> <tr> <td>9</td> <td>(B) very good</td> <td>85 - 94</td> </tr> <tr> <td>8</td> <td>(C) good</td> <td>75 - 84</td> </tr> <tr> <td>7</td> <td>(D) satisfactory</td> <td>66 - 74</td> </tr> <tr> <td>6</td> <td>(E) sufficient</td> <td>55 - 64</td> </tr> <tr> <td>5</td> <td>(F, FX) insufficient</td> <td>55</td> </tr> </tbody> </table>		<i>Points</i>	Attendance	10	Research project	50	Final exam	40	<hr/>		TOTAL	100	<i>Grade</i>	<i>ECTS grade</i>	<i>Points scale</i>	10	(A) excellent	95 - 100	9	(B) very good	85 - 94	8	(C) good	75 - 84	7	(D) satisfactory	66 - 74	6	(E) sufficient	55 - 64	5	(F, FX) insufficient	55
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<p>Literature²:</p>	<p>Mandatory:</p> <ol style="list-style-type: none"> Bandiera, M. et. al. (1999). Research in Science Education in Europe. Kluwer Academic Publishers, Dordrecht. Behrendt, H. et. al. (2001). Research in Science Education - Past, Present, and Future. Kluwer Academic Publishers, Dordrecht. Cross K.P. & Steadman, M.H. (1996). Classroom Research: Implementing the Scholarship of Teaching. Jossey-Bass Publishers, San Francisco. Gabel, D. L. (1994). Handbook of Research on Science Teaching and Learning. Macmillan, New York Kalmbach Phillips, D. & Carr, K. (2006). Becoming a Teacher through Action Research: Process, Context, and Self-study. Routledge, Taylor & Francis Group, New York, London. <p>Recommended:</p> <ol style="list-style-type: none"> Tilbury, D. & Williams, M. (1997). Teaching and learning geography. Routledge, Taylor & Francis Group, New York, London. Vukadinovič, N. & Dolničar, D. (2004). Writing Professional English - A Practical Handbook with Self-study Materials for Scientific and Technical Writers. CD ROM. Faculty of Natural Sciences and Engineering, 																																	

¹ The structure of points and point criteria for each subject is determined by the Council of the organizational unit before the beginning of the academic year in which the subject is taught in accordance with Article 64, paragraph 6 of the Law on Higher Education of Sarajevo Canton

² The Senate of the higher education institution as an institution or a council of the organizational unit of the higher education institution as a public institution determines mandatory and recommended textbooks and manuals, as well as other recommended literature on the basis of which exams are prepared by a special act which is required to be published on its website before the beginning of the academic year in accordance with Article 56, paragraph 3 of the Law on Higher Education of the Sarajevo Canton.



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Form SP2

Page 3 of 3

Ljubljana.