



## UNIVERSITI TEKNOLOGI MARA

### SCE550: METHODS OF TEACHING SCIENCE

<b>Course Name (English)</b>	METHODS OF TEACHING SCIENCE <b>APPROVED</b>
<b>Course Code</b>	SCE550
<b>MQF Credit</b>	3
<b>Course Description</b>	This course enables students to appreciate and put into practice the various theories relevant to the teaching and learning of science as evidenced from recent science education literature. Students are encouraged to translate the theories discussed into their teaching practices wherever and whenever appropriate. KSSM science content is used as a mean of providing a context for acquiring, developing, and practising the innovative science-classroom instructional skills created. In short, students will be aspired to be an effective science facilitator in the cognitive, the affective, and the practical domains of science.
<b>Transferable Skills</b>	Team Work, Personal Development
<b>Teaching Methodologies</b>	Lectures, Microteaching, Discussion, Presentation
<b>CLO</b>	CLO1 Explain various teaching approaches and strategies in the teaching of science. CLO2 Organize innovative and creative science lesson(s) based on varying teaching approaches in the teaching of science CLO3 Prepare teaching aids that will enhance students' creativity in the teaching of science.
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Lecture 1</b> 1.1) Science Learning and Teaching Theories: 1.2) • Theories of learning and teaching of Science 1.3) • The importance of learning and teaching Science 1.4) • Effective presentations in Science classrooms	
<b>2. Lecture 2</b> 2.1) Lesson Planning (Approaches and techniques in teaching Science) 2.2) • Approaches and techniques for meaningful Science learning 2.3) • Planning effective Science lessons 2.4) • 21st-century teaching skills	
<b>3. Lecture 3 &amp; Lecture 4</b> 3.1) Micro Teaching Skills in Science 3.2) • Set induction 3.3) • Explaining 3.4) • Demonstrating 3.5) • Questioning 3.6) • Stimulus variations 3.7) 3.8) Scientific Skills 3.9) • Science Process Skills (SPS) 3.10) • Manipulative Skills (MS)	
<b>4. Seminar Presentation (SP) &amp; Video Teaching Project (VTP)</b> 4.1) SP : 21st Century Science Classroom 4.2) VTP : Task (15 minutes for each student)	

<p><b>5. Seminar Presentation (SP) &amp; Video Teaching Project (VTP)</b>  5.1) SP : Gamification in Science Learning  5.2) VTP : Task (15 minutes for each student)</p>
<p><b>6. Seminar Presentation (SP) &amp; Video Teaching Project (VTP)</b>  6.1) SP : Inquiry-Based Learning in the Science Classroom  6.2) VTP : Task (15 minutes for each student)</p>
<p><b>7. Seminar Presentation (SP) &amp; Video Teaching Project (VTP)</b>  7.1) SP : Problem Based Learning in the Science Classroom  7.2) VTP : Task (15 minutes for each student)</p>
<p><b>8. Seminar Presentation (SP) &amp; Video Teaching Project (VTP)</b>  8.1) SP : Teaching Science using 'Field Work/Field Trip &amp; Project'  8.2) VTP : Task (15 minutes for each student)</p>
<p><b>9. Seminar Presentation (SP) &amp; Video Teaching Project (VTP)</b>  9.1) SP : Entertainment Approach in Science Learning  9.2) VTP : Task (15 minutes for each student)</p>
<p><b>10. Seminar Presentation (SP) &amp; Video Teaching Project (VTP)</b>  10.1) SP : Teaching Science using 'Experiment &amp; Laboratory Skills'  10.2) VTP : Task (15 minutes for each student)</p>
<p><b>11. Microteaching</b>  11.1) Demonstration of appropriate method/approach  11.2) Use suitable teaching materials  11.3) Development of a comprehensive lesson plan with suitable</p>
<p><b>12. SCIENCE EXHIBITION: TEACHING AID(S)</b>  12.1) Construction of Innovative product(s) or Science Teaching Material(s)  12.2) Ex: Games, model, software, etc.</p>

Assessment Breakdown	%
Continuous Assessment	100.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Group Project	Students need to work in a group and prepare teaching aids that could enhance students' creativity in the teaching of science	30%	CLO3
	Individual Project	Students are required to come out with video teaching project (VTP) around 15 minutes. Students need to record their teaching on specific Science (Physics/Chemistry/Biology) topics by using any available tools or software on Web 2.0 and presented in class. Students must creatively develop this technology-based teaching	20%	CLO2
	Individual Project	Students are given the freedom to demonstrate their teaching around 30 minutes by using the appropriate methods/approaches that they have learned in this course. The students need to use suitable and creative teaching aids and the development of a comprehensive lesson plan with suitable evaluation.	30%	CLO2
	Presentation	Students are required to work in a group. Each group will be given ONE scientific topic from various methods of teaching science as highlighted in the scheme of work (SOW).	20%	CLO1

Reading List	Recommended Text	<ul style="list-style-type: none"> <li>Bennett, J. 2014, <i>On Teaching Science: Principles and Strategies That Every Educator Should Know</i>, New York: Oxford University Press</li> <li>Janet Eberhardt, T. J. 2016, <i>Problem-Based Learning in the Life Science Classroom</i>, NSTA Press Book</li> </ul>
	Reference Book Resources	<ul style="list-style-type: none"> <li>De Silva, Eugene 2014, <i>Cases on Research-Based Teaching Methods in Science Education</i>, IGI Global</li> <li>Mansoor Niaz, Mayra Rivas 2016, <i>Students' Understanding of Research Methodology in the Context of Dynamics of Scientific Progress</i>, Springer</li> <li>Aaron J. Sickel, Stephen B. Witzig 2017, <i>Designing and Teaching the Secondary Science Methods Course: An International Perspective.</i>, Springer</li> <li>Kieran Keohane (2014) 2014, <i>Imaginative Methodologies in the Social Sciences: Creativity, Poetics and Rhetoric in Social Research</i>, Ashgate Publishing, Ltd.,</li> <li>Koch, J. 2010, <i>Science stories: Science methods for elementary and middle school teachers.</i>, CA: Wadsworth Cengage Learning.</li> <li>Sunita Joshi and Sharma, A. 2008, <i>Micro Teaching: A practical approach.</i>, Delhi: Authors Press.</li> <li>Osborne, R., Freyberg, P. 1989, <i>Learning in Science</i>, Ed., , Heinemann.</li> </ul>
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	