

Department of Mathematics  
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<b>Course</b>	<b>Course Name</b>	<b>: Mathematical Logic</b>
	<b>Course Code</b>	<b>: KM184102</b>
	<b>Credit</b>	<b>: 3</b>
	<b>Semester</b>	<b>: 1</b>

<b>Description of Course</b>	
<p>In this course students will learn about the basic terms of logic, Sentential Logic, truth table and tautology, Theory of Inference: argumentation, proof; Predicate logic: the use of quarters, inference involving quarters and Introduction to Set theory. In learning in the classroom students will be given understanding and explanation related to the material taught according to teaching materials. Besides, it is given tasks that lead to self-study and group work.</p>	
<b>Learning Outcome</b>	
PLO 1	[C2] Students are able to identify and explain foundations of mathematics that include pure, applied, and the basic of computing
PLO 3	[C4] Students are able to analyze simple and practical problems in at least one field of analysis, algebra, modeling, system optimizations and computing sciences
PLO 4	[C5] Students are able to work on a simple and clearly defined scientific task and explain the results, both written and verbally either on the area of pure mathematics or applied mathematics or computing sciences
<b>Course Learning Outcome</b>	

<ol style="list-style-type: none"> <li>1. Students are able to compile and compare logical true statements.</li> <li>2. Students are able to apply inference rules to prove the validity of an argument in propositional logic.</li> <li>3. Students are able to apply predicate logic inference rules to prove the validity of an argument involving universal or existential quarters.</li> <li>4. Students are able to apply the basic characteristics of set theory in proof of argumentation.</li> <li>5. Students are able to explain the relation of fundamental concepts of mathematical logic and with other branches of science.</li> </ol>
<b>Main Subject</b>
<p>In this course students will study the following subjects: Basic terms of logic; Sentential logic: a connecting sentence, a sense of necessary condition and sufficient conditions; truth and tautology tables; Theory of Inference: argumentation, proof; Predicate logic: the use of quarters, inferences involving quarters; Introduction to Set Theory: set operations, Venn diagrams, proofs using set properties.</p>
<b>Prerequisites</b>
<b>Reference</b>
<ol style="list-style-type: none"> <li>1. Yunus, M., “<i>Logika: Suatu Pengantar</i>”, Graha Ilmu, Yogyakarta, 2007</li> </ol>
<b>Supporting Reference</b>
<ol style="list-style-type: none"> <li>1. Copi, I.M., Symbolic Logic, 5<sup>th</sup> ed., Prentice Hall, Singapore, 1979</li> <li>2. Rubin, J.E., Mathematical Logic: Application and Theory, Holt, Rinehart, and Winston, New York, 1997</li> <li>3. Suppes, P., Introduction to Logic, Dover Publications, Inc., New York, 1999</li> <li>4. Suppes, P. and Hill, S., First Course in Mathematical Logic, Dover Publications, Inc., New York, 2002</li> <li>5. Waner, S. and Costenoble, S.R., Finite Mathematics, 2<sup>nd</sup> edition, Brooks/Cole Publishing Co., New York, 2001</li> </ol>