

Tsuyama College		Year	2021	Course Title	Geometry
Course Information					
Course Code	0157		Course Category	Specialized / Elective	
Class Format	Lecture		Credits	Academic Credit: 2	
Department	Department of Integrated Science and Technology Electrical and Electronic Systems Program		Student Grade	5th	
Term	Year-round		Classes per Week	1	
Textbook and/or Teaching Materials	Textbooks : Osami Yamamoto, "Well-understood topology" (Morikita Publishing)				
Instructor	YOKOTANI Masaaki				
Course Objectives					
Learning purposes : Learn geometry, especially topology.					
Course Objectives : 1. To understand topology, sets, and Euler's theorem. 2. To understand metric and topological spaces, continuity, closed surfaces, and groups.					
Rubric					
	Excellent	Good	Acceptable	Not acceptable	
Achievement 1	Fully understands the concepts of Topology, Sets, and Euler's theorem.	Understands the concepts of Topology, Sets, and Euler's theorem.	Understands the basic concepts of Topology, Sets, and Euler's theorem.	Insufficient understanding of Topologies, Sets, and Euler's theorem.	
Achievement 2	Fully understands the concept of Metric Space and Topological Space, Continuity, closed surface, and group.	Understands the concept of Metric Spaces and Topological Spaces, Continuity, closed surfaces, and groups.	Understands the basic concepts of Metric and Topological Spaces, Continuity, closed surfaces, and groups.	Insufficient understanding of Metric and Topological Spaces, Continuity, closed surfaces, and groups.	
Assigned Department Objectives					
Teaching Method					
Outline	<p>General or Specialized : Specialized</p> <p>Field of learning : Mathematics / Physics</p> <p>Foundational academic disciplines : Algebra, Geometry and Related fields / Geometry Related</p> <p>Relationship with Educational Objectives : This class is equivalent to "(3) Acquire deep foundational knowledge of the major subject area".</p> <p>Relationship with JABEE programs : The main goals of learning / education in this class are "(A), A-1".</p> <p>Course outline : The rudimentary part of topology is an area that can be understood without any prior knowledge of mathematics. There are many parts of this field that lead to results by logical manipulation using the definitions, and learning this field is good training for thinking logically through appropriate mathematical thinking. Looking at the beautiful mathematical world and understanding its structure indirectly helps us to understand many mathematical phenomena around us.</p>				
Style	<p>Course method : Classes will be centered on board writing, but at the same time, as much exercise time as possible will be provided so that students can understand the content of the lecture more deeply and acquire the ability to solve problems on their own.</p> <p>Grade evaluation method : Evaluate the total of two regular exams (60% evaluated equally) and other exams, exercises, reports, and lesson approaches (40%). Depending on the grades, etc., a re-examination may be conducted (report submission is required). The retest will be evaluated in the same way as the main test, with an upper limit of 80 points.</p>				
Notice	<p>Precautions on the enrollment : Students must take this class (no more than one-third of the required number of class hours missed) in order to complete the 5th year course.</p> <p>Course advice : It is important to make sure to prepare and review, and to understand the lecture contents more deeply by solving the exercises on your own.</p> <p>Foundational subjects : Fundamental Mathematics (1st year), Fundamental Mathematics Practice (1st), Differential and Integral I (2nd), Fundamental Linear Algebra (2nd), Integrated Science and Technology Practice (2nd), Differential and Integral II (3rd), Basic Calculus (3rd), Mathematics for General Education (3rd), Integrated Mathematics Practice (3rd), Applied Mathematics I (4th), Applied Mathematics II (4th), Set Theory and General Topology (4th)</p> <p>Related subjects : Mathematics in general</p> <p>Attendance advice : It is important to understand the content of the lecture well and solve the problem by yourself. I want you to value finding a solution on your own. If you are late a lot, you may be treated as absent after giving a warning.</p>				
Characteristics of Class / Division in Learning					
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class	
<input type="checkbox"/> Instructor Professionally Experienced					
Elective must complete subjects					
Course Plan					
			Theme	Goals	
1st Semester	1st Quarter	1st	Guidance, What is topology?	Understand the expansion and contraction of figures and the extraction of features of figures.	

2nd Semester		2nd	The set and the world that spreads from it Learning content outside class hours: Report assignment (1) "The set and the world that spreads from it"	Understand what a set is.	
		3rd	The set and the world that spreads from it Learning content outside class hours: Report assignment (1) "The set and the world that spreads from it"	Understand relationships, mappings and transformations.	
		4th	Euler's theorem Learning content outside class hours: Report assignment (2) "Euler's theorem"	Understand the relationship between points, sides, and faces of plane figures and solid figures.	
		5th	Euler's theorem Learning content outside class hours: Report assignment (2) "Euler's theorem"	Examine the type of regular polyhedron.	
		6th	Metric space and topological space Learning content outside class hours: Report assignment (3) "Metric space and topological space"	Understand the neighborhoods and general topological spaces in Euclidean space and Euclidean space.	
		7th	1st semester mid-term exam		
		8th	Return and commentary of exam answers		
		2nd Quarter	9th	What does it mean to change smoothly-continuity- Learning content outside class hours: Report assignment (4) "What does it mean to change smoothly-continuity-"	Understand the "continuity" of functions.
	10th		What does it mean to change smoothly-continuity- Learning content outside class hours: Report assignment (4) "What does it mean to change smoothly-continuity-"	Understanding the "continuity", discontinuous mapping, and homeomorphism of topological to topological maps	
	11th		Thinking with a development view-the world of closed surfaces- Learning content outside of class hours: Report assignment (5) "Thinking with a development view-a world of closed surfaces-"	Understand the development of cubes and "glue".	
	12th		Thinking with a development view-the world of closed surfaces- Learning content outside of class hours: Report assignment (5) "Thinking with a development view-a world of closed surfaces-"	Understand the projective plane and its properties.	
	13th		Consider the algebraic structure of a group Learning content outside class hours: Report assignment (6) "Thinking about the algebraic structure of groups"	Understand the definition of groups and examples.	
	14th		Consider the algebraic structure of a group Learning content outside class hours: Report assignment (6) "Thinking about the algebraic structure of groups"	Understand the generator of groups, the fundamental theorem on homomorphism with normal subgroups, and the commutative group with commutators.	
	15th		(1st semester final exam)		
	16th		Return and commentary of exam answers		
	3rd Quarter	1st			
		2nd			
		3rd			
		4th			
		5th			
		6th			
		7th			
		8th			
		4th Quarter	9th		
			10th		
			11th		
			12th		
	13th				
14th					
15th					
16th					
Evaluation Method and Weight (%)					

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	60	0	0	0	0	40	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	60	0	0	0	0	40	100
Cross Area Proficiency	0	0	0	0	0	0	0