MAPÚA INSTITUTE OF TECHNOLOGY

Department of Mathematics

VISION

The Mapua Institute of Technology shall be a global center of excellence in education by providing instructions that are current in content and state-of-the-art in delivery; by engaging in cutting-edge, high impact research; and by aggressively taking on present-day global concerns.

MISSION

The Mapua Institute of Technology disseminates, generates, preserves and applies knowledge in various fields of study.

The Institute, using the most effective and efficient means, provides its students with highly relevant professional and advanced education in preparation for and furtherance of global practice.

The Institute engages in research with high socio-economic impact and reports on the results of such inquiries.

The Institute brings to bear humanity's vast store of knowledge on the problems of industry and community in order to make the Philippines and the world a better place.

BASIC STUDIES EDUCATIONAL OBJECTIVES	MISSION			
	a	b	c	d
1. To provide students with a solid foundation in mathematics, physics, general chemistry and engineering drawing and to apply knowledge to engineering, architecture and other related disciplines.	✓	✓	✓	✓
2. To complement the technical training of the students with proficiency in oral, written, and graphics communication.	✓	✓	✓	✓
3. To instill in the students human values and cultural refinement through the humanities and social sciences.	✓	✓	✓	✓
4. To inculcate high ethical standards in the students through its integration in the learning activities.	✓	✓	✓	✓

COURSE SYLLABUS

1. Course Code: **MATH 13**

2. Course Title: **SOLID MENSURATION**

3. Pre-requisite: **MATH 12**

4. Co-requisite: **None**

5. Credit: **2 units**

6. Course Description: This course covers topics on mensuration of plane figures in space, and their applications. It also deals with determination of volumes and surface areas of solid figures such as prisms, cylinders, pyramids, cones, frustums, prismatoids, spheres and solids of revolution.

7. Student Outcomes and Relationship to Basic Studies Educational Objectives

Student Outcomes		Basic Studies Educational Objectives			
		1	2	3	4
(a)	an ability to apply knowledge of mathematics, science, and engineering	√	√		√
(b)	an ability to design and conduct experiments, as well as to analyze and interpret from data	√	√		
(c)	an ability to design a system, component, or process to meet desired needs	√	√		
(d)	an ability to function on multidisciplinary teams	√	√		√
(e)	an ability to identify, formulate, and solve engineering problems	√	√		√
(f)	an understanding of professional and ethical responsibility		√	√	√
(g)	an ability to communicate effectively		√		
(h)	the broad education necessary to understand the impact of engineering solutions in the global and societal context	√	√	√	√
(i)	a recognition of the need for, and an ability to engage in life-long learning	√	√	√	√
(j)	a knowledge of contemporary issues	√	√	√	√
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	√	√		√

8. CourseOutcomes (COs) and Relationship to Student Outcomes

Course Outcomes After completing the course, the student must be able to:	Student Outcomes*										
	a	b	c	D	e	F	g	h	i	j	K
1. Apply the basic concepts of mensuration of plane figures in solving geometric problems.	D		I		D		D	I	R	I	D
2. Solve problems involving solids for which the volume is equal to the area of the base times height (V = Bh) namely prism and cylinder, and solve problems involving solids for which the volume is equal to one-third of the product of area of base and height (V=1/3 Bh) namely cone and pyramid.	D		I	D	D		D	I	R	I	D
3. Solve problems involving solids for which the volume is equal to the product of the mean of the area of base and height (V = (mean B)h namely frustum, prismatoid and truncated solids, and solve problems involving spheres and other miscellaneous solids.	D		I	D	D		D	I	R	I	D

*** Level: I- Introduced, R- Reinforced, D- Demonstrated**

9. Course Coverage

Week	TOPICS	TLA	AT	COURSE OUTCOMES
1	**Mission and Vision of Mapua Institute of Technology** **Orientation and Introduction to the Course** Discussion on COs, TLAs, and ATs of the course Overview on student-centered learning and eclectic approaches to be used in the course			

Week	TOPICS	TLA	AT	COURSE OUTCOMES
	Mensuration of Plane Figures: - Regular Polygons	Lecture/Discussion		
2	Triangles and Quadrilaterals -parallelogram,rectangle,square,	Lecture/Discussion		
	Rhombus, trapezoid and trapezium	Lecture/Discussion		
3	Circles: definitions and theorems on Circles	Lecture/Discussion		**CO 1**
	- sector, segment, annulus and cyclic quadrilateral	Lecture/Discussion		
4	Star polygons, parabolic section, Elliptical section and composite Figures	Lecture/Discussion	Homework	
	LONG QUIZ 1			
5	Solid Mensuration : V=Bh Polyhedra, Similar figures, Volumes and Surface areas of platonic solids	Lecture/Discussion		
6	Prisms, Rectangular Parallelepiped and Cube	Lecture/Discussion		**CO 2**
	Cylinders	Collaborative Learning 1	Project 1 Problem-based approach	
7	Solid Mensuration: V=1/3 Bh Pyramids and Cones	Lecture/Discussion		
	LONG QUIZ 2			
8	Solid Mensuration : V=(Mean B)h Frustums of Cones and Pyramids	Lecture/Discussion		
	Truncated Prisms and Cylinders Prismatoids Cylindrical wedge	Collaborative Learning 2	Project 2-A Problem-based approach	
9	Sphere - Properties, Area of the Surface, and Volume - zone, Spherical sector, spherical cone	Lecture/Discussion		**CO 3**
	LONG QUIZ 3			
10	Ellipsoid, Paraboloid, Torus	Multiple Learning Approach	Project 2-B (Short film Documentary-Environmentally Related)	
	PappusGuldinus Theorem and Composite Solids	Lecture/Discussion		
11	**SUMMATIVE ASSESSMENT FINAL EXAMINATION**			**CO1, CO2, CO3**

10. Opportunities to Develop Lifelong Learning Skill

11. Contribution of Course to Meeting the Professional Component

Engineering Topics	:	0 %
General Education	:	0 %
Basic Sciences and Mathematics	:	100%

12. Textbook: Solid Mensuration – Understanding the 3D Space by Richard Earnhart

13. Course Evaluation

Student performance will be rated based on the following:

Assessment Tasks		Weight (%)	Minimum Average for Satisfactory Performance (%)
CO 1	Long Quiz 1	15.75	13.13
	RLA	3	
CO 2	Long Quiz 2	16.25	18.38
	Project 1	10	
CO 3	Long Quiz 3	15	21
	Project 2 (A & B)	15	
Summative Assessment: Final Examination		25	17.5
TOTAL		100	70

The final gradeswill correspond to the weighted average scores shown below:

Final Average	Final Grade
$96 \leq X < 100$	1.00
$93 \leq X < 96$	1.25
$90 \leq X < 93$	1.50
$86 \leq X < 90$	1.75
$83 \leq X < 86$	2.00
$80 \leq X < 83$	2.25
$76 \leq X < 80$	2.50
$73 \leq X < 76$	2.75
$70 \leq X < 73$	3.00
Below 70	5.00 (Fail)

13.1. Other Course Policies

a. Attendance
According to CHED policy, total number of absences by the students should not be more than 20% of the total number of meetings or 9 hrs for a three-unit-course. Students incurring more than 9 hours of unexcused absences automatically gets a failing grade regardless of class standing.

b. Submission of Assessment Tasks

c. Written Examination

d. Course Portfolio

e. Language of Instruction

Lectures, discussion, and documentation will be in English. Written and spoken work may receive a lower mark if it is, in the opinion of the instructor, deficient in English.

f. Honor, Dress and Grooming Codes
All of us have been instructed on the Dress and Grooming Codes of the Institute. We have all committed to obey and sustain these codes. It will be expected in this class that each of us will honor the commitments that we have made.
For this course the Honor Code is that there will be no plagiarizing on written work and no cheating on exams. Proper citation must be given to authors whose works were used in the process of developing instructional materials and learning in this course. If a student is caught cheating on an exam, he or she will be given zero mark for the exam. If a student is caught cheating twice, the student will be referred to the Prefect of Student Affairs and be given a failing grade.

g. Consultation Schedule
Consultation schedules with the Professor are posted outside the faculty room and in the Department's web-page (http://math.mapua.edu.ph). It is recommended that the student first set an appointment to confirm the instructor's availability.

14. Other References

14.1. Books
Plane and Solid Mensuration by Earnhart and Bejasa
Solid Mensuration by Kern and Bland

14.2 Websites
http://www.mathalino.com/reviewer/solid-mensuration/solid-mensuration
http://**groups.yahoo.com**/group/solidmensuration_**mapua**

15. Course Materials Made Available

Course schedules for lectures and quizzes
Samples of assignment/Problem sets of students
Samples of written examinations of students
End-of-course self-assessment

16. CommitteeMembers:

Course Cluster Chair: Richard T. Earnhart
CQI Cluster Chair: Joseph G. Santos
Members: Wyndell A. Almenor
Gilford B. Estores
Morris Martin M. Jaballas
Ma. Christina A. Valerio