DEPARTMENT OF GEOMATICS ENGINEERING
UNDERGRADUATE PROGRAM IN GEOMATICS ENGINEERING
COURSE SYLLABUS

COURSE	Name	Transformation System and Map Projection
	Code	RM184306
	Credits	4 (four)
	Semester	III (three)

COURSE DESCRIPTION

The Transformation System and Map Projection Lecture will discuss various reference systems used in geomatics. It will discuss also various map projection systems, especially those used in Indonesia. In this course, we will study in detail about the coordinate system, the coordinate reference frame and the different coordinate system parameters. Furthermore, concepts will be given regarding the transformation of 2-dimensional and 3-dimensional coordinates, methods and processes to solve problems related to those transformations. It will also discuss theories and methods of transformation between coordinate systems and between datum (datum shift).

EXPECTED LEARNING OUTCOME

A	Able to apply mathematics, science, and engineering in the fields of geodesy, surveying, hydrography, remote sensing, photogrammetry, geographic information systems, and cadastral to gain a thorough. understanding of the principles of engineering
C	Able to identify, formulate, analyze and solve problems in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, and cadastral.

COURSE LEARNING OUTCOME

1	Able to explain and distinguish various coordinate systems which used in the field of geodesy / geomatics
2	Able to explain the concepts of spherical and ellipsoid geometry and perform calculations on spherical and ellipsoid fields
3	Able to explain the concept of a geodetic reference / datum system
4	Able to explain and distinguish types of map projections
5	Able to reduce geodetic size (angle and distance) from the ellipsoid plane to the projection plane / flat plane
6	Able to perform geodetic calculations in the ellipsoid plane and the projection plane / flat plane
7	Able to explain the basic concepts of coordinate transformation and to distinguish various methods of coordinate transformation
8	Able to transform 2-dimensional and 3-dimensional coordinates in the field of geodesy / geomatics
9	Able to explain the concept of transformation between datums and perform calculations of datum transformations
10	Able to transform coordinates between zones in a specific projection coordinate system

COURSE MATERIALS

1	Introduction and Review of Geodesy
2	Coordinate System
3	Spherical and Ellipsoid Geometry
4	Geodetic Datum
5	Map Projection
6	Calculations in the Projection Field
7	Calculations in the Ellipsoid Field (Solving Geodetic Problems)
8	Coordinate Transformation (2D and 3D)
9	Datum Transformation (Datum Shift)
10	Coordinate Transformation between Projection Zones

PREREQUISITE

Cartography, Mathematics 2, Basic Terrestrial Mapping

REFERENCES

A.	Main References
1	Maling, D.H. 1992. Coordinate Systems and Map Projections, Pergamon Press.
2	Iliffe, J and R. Lott. 2000. Datums and Map Projections for Remote Sensing, GIS, and Surveying, CRC Press.
3	Davis, R.E. 1981, Surveying Theory and Practice, McGraw Hill, New York.
4	Vanicek P. and Krakiwsky E. J. 1986. Geodesy the Concepts. Elsevier, Amsterdam
B.	Additional References
1	E-learning Sistem Transformasi dan Proyeksi Peta (share.its.ac.id)