HANDONG UNITWIN FELLOWSHIP

SYLLABUS

Lecturer's Information	
Name	Tingneyuc Sekac
University	Papau New Guinea University of Technology

Course Information			
Course Name	Geo-informatics In Earth Science, Tectonic Hazard and Infrastructure Management	Prerequisite Course	Natural Resources and Disaster Management
Course Date	2023-07-25 ~ 2023-10-28	Course Language	English
Keyword	Earth Science, Geoinformatics, Hazards, Disaster Management, Meteorology, Geology, Tectonic, Remote Sensing, Infrastructure Management		

Course Description (100 ~200 words)	Geo-informatics in Earth Science, Tectonic Hazard and Infrastructure Management is seen as one of the important field in the research and development sector and plays a vital role in the field of Remote Sensing, GIS, Agricultural Monitoring, Disaster Management, Resource planning and monitoring and other streams related to science, engineering and technology. Geo-informatics itself is a multidisciplinary subject that combines various aspects of science including physics, chemistry, biology, etc. into one unit and makes use of technology and science to address and solve real world issues under concept of spatial information technology and geo- visualization. It helps establish a connection among people, locations. The course emphasizes a hands-on learning environment, with in-depth insights into theoretical and conceptual underpinnings Earth Science, Tectonic Hazard and Infrastructure Management. The course will empower student to explore deeply into understanding of Earth Science and its related branches and Infrastructure management in due respect to or during disaster. The course will empower student to explore deeply into utilization of Geo-spatial tool to analyze process, investigate and produce information and maps to better understanding of geological and meteorological processes, the tectonic hazard processes including management of infrastructures in their practical area of interest.
Course Goals and Objectives (Approximately 100 words)	1. Explain the principles of Geo-informatics in Earth Science especially, geological and meteorological, Tectonic Hazard and Infrastructure management. 2. Examining different sources of extracting or retrieving Earth Science data, Tectonic hazard data, Geological and meteorological data including infrastructure data and then to integrate them in Geospatial environment. 3. Understanding the stages of processing of geological and meteorological data through utilizing geospatial tools . 4. Understanding the processes of analysing and monitoring earthquake and Liquefaction possibilities. 5. Explaining the benefits of Geospatial technology for management and monitoring of existing and developing infrastructure relating to occurring Geo-hazards and or tectonic hazards.
Textbook	**(The format : Title, Author/Editor, Publisher, Year of Publication)** 1. GIS Technology and Applications in Environmental and Earth Sciences, 1st Edition,Tian, B., CRC Press Tylor & Francis Group, 2019. ISBN : 9780367889593. 2. GIS for critical Infrastructure Protection, 1st edition Austin, R.F., DiSera, D.P., & Brooks, T.J., CRC Press, Tylor and Francis Group, 2020. ISBN: 9780367868598. 3. Introduction to Earth Science, 15th Edition, Neser, Laura, Blacksburg: Virginia Tech Department of Geosciences, 2023, IPrint: ISBN 978-1-957213-36-1
References	1. Departmental Practical Modules. 2. ERDAS IMAGINE Tour Guides (2001), Atlanta, Georgia, USA 3. Handouts and data provided through Google Classroom.
Course Requirements and Grades	The course is design to learn and understand the Geo-Hazards, Meteorological Hazard and Geo-informatics concept that one can use to implement in the discipline of Geo-Hazards, and disaster management in terms of planning and decisions making to safeguard the general population body and infrastructure. The course is also the added value to many disciplines to assist them in data gathering and preparation into executing certain projects. Mode of Assessments: Test, Quiz and Assignment carries 50% Exam Carries other 50% Total = 100%

Weekly Schedule		
Week	Main Topics	Keywords
1	Geo-Informatics and Earth Science and System	GIS, Remote Sensing, Branch of Earth Science, Environmental Science, Ecosystem
2	Introduction to Tectonic Structure and Hazards	Tectonic Plates, Plate boundaries, Hazards, Plate Motion
3	Introduction to Geological Hazards	Geology, Hazards, Tsunami, Earthquake, Landslide
4	The Science of Earthquake	Earthquake, Triggering Mechanism, Seismic Waves, Site-Soil, Geology, PGA, PGV
5	Science of Liquefaction and Site Soil-Geology	Liquefaction, Consolidation Statues, Shaking Intensity, Rock types
6	Weather and Climate - Meteorology	Atmosphere, Greenhouse Gas, Solar Radiation, El-Nino, La-Nina, Rainfall, Temperature, Humidity, Source of Disaster
7	Science of Landslide	Geological Factors, Triggering Mechanism, Types of Landslide, Slope Stability
8	Science of Volcanic	Eruption Mechanism, Lava, Lahar, Pyroclastic flow, Volcanic Hazard,
9	Science of Flood	Triggering Mechanism, Type of flooding, Source of Flooding, Flood Hazards.
10	Science of Drought	Drought Mechanism, Type of drought, Source of Drought, Drought Hazard, Drought Impact
11	Hazard and Disaster Mitigation and Management Practices	Geo-Informatics, Remote Sensing, GIS, Risk Assessment, Micro-Zonation, Hazard Reduction, Vulnerability Reduction, Land Use Planning
12	Infrastructure Management and Planning	Resilience, Geo-Informatics, Remote Sensing, Infrastructure type, Economic Viability, Planning, Monitoring, Sustainability
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