	INSTITUT TEKNOLOGI SEPULUH NOPEMBER FACULTY OF CIVIL PLANNING AND GEO ENGINEERING GEOPHYSICAL ENGINEERING DEPARTMENT UNDERGRADUATE PROGRAM (S1)	
Course	**Course Name**	**Seismology**
	Course Code	**CF234312**
	Credit	**3 (Three)**
	Semester	**3 (Three)**
COURSE DESCRIPTION		
This course studies aboutphenomena related to earthquake vibrations and able to explain the concept of earthquake wave propagation		
PROGRAM LEARNING OUTCOMES (PLO)		
PLO-4	Able to explain the principles of mathematics, natural science, geology, information technology and engineering principles into geophysical engineering procedures, processes, systems or methodologies	
COURSE LEARNING OUTCOMES (CLO)		
CLO-1	Students understand phenomena related to earthquake vibrations and are able to explain the concept of earthquake wave propagation	
SUB COURSE LEARNING OUTCOMES (SUB CLO)		
Sub CLO-1	Able to understandA brief history of seismology	
Sub CLO-2	Able to understandstress and strain	
Sub CLO-3	Able to understandseismic wave equation	
Sub CLO-4	Able to understandRay theory: travel time	
Sub CLO-5	Able to understandinversion of travel time data	
Sub CLO-6	Able to understandray theory: amplitude and phase	
Sub CLO-7	Able to understandreflection seismology	
Sub CLO-8	Capable of understandingsurface waves	
Sub CLO-9	Able to understandearthquakes and source theory	
Sub CLO-10	Able to understandearthquake prediction	
Sub CLO-11	Able to understandinstruments, noise and anisotropy	
Sub CLO-12	Able to understand the application of seismology	
STUDY MATERIALS		
A brief history of seismology, stress and strain, seismic wave equations, ray theory: travel time, inversion of travel time data, ray theory: amplitude and phase, reflection seismology, surface waves, earthquake and source theory, earthquake prediction, instruments, noise and anisotropy.		
PRECONDITION		
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REFERENCES		

1. Shearer, P. M., 2009, Introduction to Seismology, Cambridge University Press, Cambridge, UK
2. Zobin, V. M., 2012, Introduction to Volcanic Seismology, Elsevier, London, UK.
3. Jens Havskov, Gerardo Alguacil (auth.)-Instrumentation in Earthquake Seismology-Springer International Publishing (2016)
4. Barbara Romanowicz, Adam Dziewonski-Seismology and Structure of the Earth_ Treatise on Geophysics-Elsevier (2009)
5. Agustin Udías-Principles of Seismology-Cambridge University Press (2000).