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| | **SEMESTER LEARNING PLAN**<br>**DEPARTMENT OF GEOMATICS ENGINEERING**<br>**FACULTY OF CIVIL, PLANNING, and GEO ENGINEERING** | | |
| **PROGRAM** | **UNDERGRADUATE** | | |
| **COURSE NAME** | **Tides and Water Level** | **CODE** | **RM184942** |
| **SEMESTER** | **Elected** | **CREDITS** | **3 (three)** |
| **LECTURERS** | **Khomsin, S.T., M.,T** | | |
| | **M. Rohmaneo Darminto., S.T., M.Sc** | | |

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| **COURSE MATERIALS** | 1 | Tidal definitions, concepts, theories and applications |
| | 2 | Tidal measurement method |
| | 3 | Doodson, Admiralty and Least Square methods |
| | 4 | Tidal characteristics |
| | 5 | Vertical Reference |
| | 6 | Tidal predictions |
| **EXPECTED LEARNING OUTCOMES THAT IMPOSED IN THE COURSE** | C | Able to design survey and mapping activities using the latest technology in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, and cadastral. |
| | D | Able to perform spatial data acquisition using modern measurement methods, geospatial data processing, using industry standard software, and making standard designs and analyzes in the fields of geodesy, surveying, hydrography, remote sensing, photogrammetry, and cadastral. |
| | E | Able to apply information & communication technology and the latest technological developments in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, geographic information systems, and cadastral. |
| **COURSE LEARNING OUTCOMES** | 1 | Students are able to understand the concepts, theories, and applications of tides |
| | 2 | Students are able to take tidal measurements with various methods |
| | 3 | Students are able to calculate the tidal components using the admiralty and least square methods |
| | 4 | Students are able to determine the characteristics of tides in a water location |
| | 5 | Students are able to calculate the vertical references used in mapping |
| | 6 | Students are able to predict future tides with harmonic functions |

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| **ABILITY CATEGORIES** | *Cognitive Prosecess* | *Analyse* |
| | *Knowledge Domain* | *Procedural* |
| | *Psychomotor* | *Conscious control* |
| | *Affective* | *Change of attitude* |

| Class | Lesson learning outcome | Criteria dan Assessment Indicator | Weight | Learning Materials | Learning Experience | Learning Methods | Estimated Time |
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| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1 - 2 | Students are able to understand the concepts and theories of tides | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 5 | Tidal theory; The tidal generator force | Lecture; Presentation; Discussion | Teacher centered learning<br>Student centered learning<br>Problem based learning | Class : 4 x 50'<br>Exercise : 2 x 50'<br>Assignment |

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| 3 | Students are able to understand the tidal application | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 5 | Tidal Applications in the Geomatics field; Tidal Applications in the Non Geomatics field | Lecture; Presentation; Discussion | Teacher centered learning<br>Student centered learning<br>Problem based learning | Class : 2 x 50'<br>Exercise : 1 x 50'<br>Assignment |
| 4 - 5 | Students are able to observe tides directly | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 10 | Tide Staff; Mechanic; Acoustic GPS; tide Radar | Lecture; Presentation; Discussion | Teacher centered learning<br>Student centered learning<br>Problem based learning | Class : 2 x 50'<br>Exercise : 1 x 50'<br>Assignment : 3 x 50' |
| 6 -7 | Students are able to understand the functions of tidal harmonics | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 10 | Tidal component; Tidal harmonic function; Tidal period; Tidal amplitude; Tidal phase | Lecture; Presentation; Discussion | Teacher centered learning<br>Student centered learning<br>Problem based learning | Class : 4 x 50'<br>Exercise : 2 x 50'<br>Assignment : 6x 50' |
| 8 | Mid semester Evaluation | | | | | | |
| 9 | Students are able to understand the characteristics of tides | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 10 | Tidal Characteristics; Formahzl number; Semidiurnal; Diurnal; Mix sc | Lecture; Presentation; Discussion | Teacher centered learning<br>Student centered learning<br>Problem based learning | Class : 2 x 50'<br>Exercise : 1 x 50'<br>Assignment |
| 10 - 11 | Students are able to calculate the tidal components using the Admiralty method | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 20 | Doodsoon Rules for the Admiralty; 15 and 29 Methods of Accuracy | Lecture; Presentation; Discussion | Teacher centered learning<br>Student centered learning<br>Problem based learning | Class : 4 x 50'<br>Exercise : 2 x 50'<br>Assignment |
| 12 - 13 | Students are able to calculate the tidal components using the Least Square method | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 20 | Least Square; Alignment Parameter; Accuracy | Lecture; Presentation; Discussion | Teacher centered learning<br>Student centered learning<br>Problem based learning | Class : 4 x 50'<br>Exercise : 2 x 50'<br>Assignment |
| 14 -15 | Students are able to calculate tidal predictions in the future | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 20 | Harmonic Function; Prediction; Accuracy of prediction | Lecture; Presentation; Discussion | Teacher centered learning<br>Student centered learning<br>Problem based learning | Class : 4 x 50'<br>Exercise : 2 x 50'<br>Assignment |
| 16 | Final semester evaluation | | | | | | |