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| | **SEMESTER LEARNING PLAN**<br>**DEPARTMENT OF GEOMATICS ENGINEERING**<br>**FACULTY OF CIVIL, PLANNING, and GEO ENGINEERING** | | | |
| **PROGRAM** | **UNDERGRADUATE** | | | |
| **COURSE NAME** | **Altimetry Satellite System** | | **CODE** | **RM184935** |
| **SEMESTER** | **Elective** | | **CREDITS** | **3 (three)** |
| **LECTURERS** | **Eko Yuli Handoko [coord]** | | | |
| | **Ira Mutiara Anjasmara, Putra Maulida** | | | |
| **COURSE MATERIALS** | 1 | Introduction of altimetry satellites. | | |
| | 2 | The basic principle of an altimeter. | | |
| | 3 | Corrections and biases in the altimetry data due to the atmosphere: troposphere (dry and wet components) and ionosphere, sea state bias and geophysical | | |
| | 4 | Mean sea surface model. | | |
| | 5 | Sea level anomaly (SLA) analysis: along-tracks and crossovers. | | |
| | 6 | Satellite altimetry applications in the fields of: geodesy & geophysics, oceanography, etc. | | |
| **EXPECTED LEARNING OUTCOMES THAT IMPOSED IN THE COURSE** | C | Able to identify, formulate, analyze and solve problems 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. | | |
| | F | Able to compile scientific reports and provide solutions based on leadership, creativity and communication skills as well as being responsible for the work done. | | |
| **COURSE LEARNING OUTCOMES** | 1 | Able to explain the basic concepts of satellite altimetry. | | |
| | 2 | Able to explain the basic theories and measurement methods to determine sea level using altimetry satellites. | | |
| | 3 | Able to do simple data processing to determine sea level using altimetry satellites. | | |
| | 4 | Able to explain sea level and its variations and their influence in global and regional sea phenomena. | | |
| | 5 | Able to think critically about the use of altimetry satellites for practical purposes in the fields of geodesy, geophysics, and marine based on their understar | | |
| | 6 | Able to express their ideas orally and in writing related to interpretation of altimetry satellite data. | | |
| **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 |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1-2 | Able to explain the basic principles of satellite geodesy | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 20 | The main objectives of the satellite geodesy | Lecture | Teacher-centered learning | 2 x 50' |
| | | | | Definitions in satellite geodesy | Presentation | Student-centered | 2 x 50' |
| | | | | | Discussion | Problem-based learning | 2 x 50' |

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| | | | | Review of physical and mathematical formulas in satellite geodesy | | | |
| 3-5 | Able to explain the basic principles of satellite altimetry | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 20 | The principle of radar altimeter | Lectures dan dicussion | Teacher-centered | 2 x 50' |
| | | | | Sea surface reflexivity | Exercise | Student-centered learning | 2 x 50' |
| | | | | Radar waveform | Assignment 1 | Problem-based learning | 2 x 50' |
| | | | | Meticulous orbit determination | | | |
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| | | | | Geophysical effects on sea surface topography | | | |
| | | | | Sea level nomaly | | | |
| 6-7 | Able to explain the concept of mean sea surface (MSS) | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 20 | The concept of geoid and ellipsoid | Lectures dan dicussion | Teacher-centered learning | 2 x 50' |
| | | | | *Sea surface topography* | Exercise | Student-centered | 2 x 50' |
| | | | | *mean sea surface* | Assignment 2 | Problem-based learning | 2 x 50' |
| 8 | | | | **Mid semester evaluation** | | | |
| 9-12 | Able to explain biases and error in altimetry measurements and be able to provide the corrections to measurements on altimetry satellite observation data | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 20 | Correction of troposphere to dry and wet components of geodynamic studies | Lectures dan dicussion | Teacher-centered learning | 2 x 50' |
| | | | | Ionosphere correction | Exercise | Student-centered learning | 2 x 50' |
| | | | | Sea state bias and dynamic atmospheric correction | Assignment 3 | Problem-based learning | 2 x 50' |
| | | | | Tide corrections | | | |
| 13-15 | Able to explain and apply satellite altimetry applications in the field of geodesy and the other related fields | Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude | 20 | Application in the fields of geodesy and geophysics | Lectures dan dicussion | Teacher-centered learning | 2 x 50' |
| | | | | Application in the marine field | Exercise | Student-centered learning | 2 x 50' |
| | | | | Application in the Climate field | Assignment 4 | Problem-based learning | 2 x 50' |
| | | | | Application in the field of hydrology | | | |
| 16 | | | | **Final semester evaluation** | | | |
| TOTAL | | | 100 | | | | |