ELECTRICAL ENGINEERING DEPARTMENT
– ENGINEERING FACULTY
UNIVERSITY OF MATARAM

## MODULE HANDBOOK DESCRIPTION

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| Module designation | Telecommunication System Laboratory |
| Code | FBC3211 |
| Semester(s) in which the module is taught | 6/third year |
| Person responsible for the module | Djul Fikry Budiman., ST., MT. |
| Language | Indonesian |
| Relation to curriculum | Compulsory for Telecommunication Engineering |
| Teaching methods | Contextual Instruction (CI) |
| Workload (incl. contact hours, self-study hours) | Contact minutes every week, each week of the 16 weeks/semester : <br><br>● Practice : 1 x 50 minutes <br><br>● Data analysis : 1 x 60 minutes <br><br>● Writing report : 1 x 60 minutes. <br><br>Total study hours = 2 hours 50 minutes/week |
| Credit points | 1 (~ 1,6 ECTS) |
| Required and recommended prerequisites for joining the module | - Telecommunication System (FBC3102) |
| Module objectives/intended learning outcomes | 1. Students are able to analyze radio communication base on amplitude shift keying, Fourier equation of periodic waves (squares, sawtooth and triangles), oscillator , telemetry infrastructure and antenna for radio communication — PLO3 |
| | 2. Students are able to design radio station with ASK modulation, oscillator for radio communication, telemetry infra-structure and antenna based on instructions from the telecommunication system practicum module. — PLO4 |
| | 3. Students are able to compare modulator using ASK, oscillator with feedback and antennas equipment for radio communication with the experimental results and make conclusions then report the results. — PLO5 |

| Content | 1. Designing an ASK circuit using proteus |
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| | 2. Shows the dynamic characteristics of the ASK signal |
| | 3. Study and analyze the results of the ASK output |
| | 4. Knowing and understanding the Fourier equation of periodic waves (squares, sawtooth and triangles) |
| | 5. Create and display periodic waves in the MATLAB program using the Fourier equation. |
| | 6. Know and understand the appearance of periodic waves through the Fourier equation. |
| | 7. Understand the basic principle of the feedback oscillator. |
| | 8. Understand the form of a feedback oscillator circuit. |
| | 9. Test the feedback oscillator circuit. |
| | 10. Build a telemetry communication infrastructure using the Xbee RF module |
| | 11. Testing the client-server connection on Xbee communication |
| | 12. understand the working principle of antennas as part of a telecommunication system |
| | 13. perform antenna measurements using pocket VNA software |
| | 14. Antenna parameters, namely gain and radiation pattern. |
| Examination forms | 1. Pre-test |
| | 2. Practice skills |
| | 3. Practice report |
| | 4. Response |
| Study and examination requirements | The final grade in the module is composed of:<br>Pre-test and practice skills = 20%<br>Practice report and response = 80%<br>Students must have a final grade of 65% or higher to pass |
| Reading list | 1. Suhana and Shoji, S., 1981, Pengantar Teknik Telekomunikasi, Penerbit PT Pradnya Paramita. |
| | 2. Hayt, W.H., Buck, J.A., 2011, Engineering Electromagnetics, Eight Edition, McGraw-Hill Companies. |
| | 3. Schenk, TCW., Bultitude, R.J.C., Augustin, L.M., Van Poppel, R.H., and Brussaard, G., 2002, Analysis of Propagation Loss in Urban Microcells at 1.9 GHz and 5.8 GHz, Proc. URSI Commission F Open Symposium on Radiowave Propagation and Remote Sensing, Garmisch-Partenkirchen, Germany. |
| | 4. Shanmugam, K.S., 2013, Digital And Analog Communication System, Wiley. |
| | 5. Usman, U.K., 2010, Pengantar Ilmu Telekomunikasi, Penerbit Informatika Bandung. |