



**MODULE HANDBOOK DESCRIPTION**

Module designation	Microwave Communication	
Code	FBC0003	
Semester(s) in which the module is taught	7 / fourth year	
Person responsible for the module	Abdullah Zainuddin, ST., MT.	
Language	Indonesian	
Relation to curriculum	Elective course for Telecommunication System	
Teaching methods	Lectures, small group discussion, case base method.	
Workload (incl. contact hours, self-study hours)	Contact minutes every week, each week of the 16 weeks/semester: <ul style="list-style-type: none"> <li>• Lectures: 2 x 50 minutes</li> <li>• Exercises and Assignments: 2 x 60 minutes</li> <li>• Private study: 2 x 60 minutes.</li> </ul> total study hours = 5 hours 40 minutes/week	
Credit points	2 SKS (~ 3.2 ECTS)	
Required and recommended prerequisites for joining the module	-	
Module objectives/intended learning outcomes	1. Students are able to select and apply actual modelling, calculating, and testing methods to Quantitatively analyse the performance of Microwave Communication	PLO3
	2. Students are able to design Microwave communication system to achieve performance objectives	PLO4
	3. Students are able to recognise the need for, and have the ability to engage in independent, lifelong learning.	PLO9

Content	<ol style="list-style-type: none"> <li>1. Review of radio frequency spectrum, propagation mechanism in each frequency band, frequency band application.</li> <li>2. Propagation of radio waves in free space, attenuation of free space, electric field strength in the receiver.</li> <li>3. The propagation of radio waves in the LF and MF spectrum.</li> <li>4. The propagation of radio waves in the HF spectrum.</li> <li>5. Refraction of radio waves by atmospheric layers, ducting, effective earth radius, path profile.</li> <li>6. Reflection of radio waves by the earth's surface (or other objects), total electric field strength, power at the receiver.</li> <li>7. Diffraction: Fresnel zone, fresnel radius, diffraction attenuation, multi obstacle diffraction.</li> <li>8. Rain attenuation: terrestrial link, satellite link.</li> <li>9. Link budget.</li> </ol>
Examination forms	<ul style="list-style-type: none"> <li>- Assignment</li> <li>- Written case study</li> <li>- Midterm and final test</li> </ul>
Study and examination requirements	<p>The final grade in the module is composed of:</p> <ol style="list-style-type: none"> <li>a. Assignment : 10 %</li> <li>b. Case I assessment: 15%</li> <li>c. Case II assessment: 15%</li> <li>d. Midterm assessment: 30%</li> <li>e. Final assessment: 30%</li> </ol> <p>Students must have a final grade of 65% or higher to pass</p>
Reading list	<ol style="list-style-type: none"> <li>1. J. D. Parsons, Mobile radio propagation channel, John Wiley &amp; Sons, 2000.</li> <li>2. S. Saunders, Antennas and Propagation for Wireless Communication Systems: 2nd Edition, 2007</li> <li>3. R. L. Freeman, Radio System Design for Telecommunications (1 – 100 GHz), John Wiley and Sons, 1987.</li> <li>4. K. Siwiak, Radio wave Propagation and Antennas for Personal Communications, Artech House, 1995.</li> </ol>