

**RENCANA PEMBELAJARAN SEMESTER
PROGRAM STUDI SARJANA TERAPAN TEKNIK TELEKOMUNIKASI
DEPARTEMEN TEKNIK ELEKTRO**



Kode	VE200019	Mata Kuliah	Mobile Communication
Bobot SKS	2	Semester	3
Kelompok MK	MK Pilihan	Jam/minggu	3
Tim Pengampu MK	I Gede Puja Astawa/ Amang Sudarsono		
Capaian Pembelajaran	<p>Mahasiswa diharapkan dapat:</p> <ol style="list-style-type: none"> 1. Memahami sistem komunikasi bergerak 2. Memahami standard system komunkasi bergerak 3. Frekuensi re-use dan konsep seluler 4. Memahami performansi untuk pemakaian coding dan un-coding. 		
Pokok Bahasan	<p>Topik-topik meliputi pembelajaran secara detil dan komprehensif dari komunikasi lanjut adalah sebagai berikut :</p> <ol style="list-style-type: none"> 1. Standar dan sistem komunikasi nirkabel 2. Mobile radio propagation 3. Propagation modeling 4. Co – channel interference 5. Spektral dari sinyal termodulasi dan power 6. Digital signaling pada flat channel 7. Antenna diversity 8. Equalisation dan interference cancellation 9. Error control coding 10. TDMA celluler 11. CDMA celluler 12. Pengukuran link quality 13. Channel assignment 		
Referensi	<ol style="list-style-type: none"> 1. Principles of Mobile Communication Second Edition, Gordon L. Stüber Georgia Institute of Technology Atlanta, Georgia USA, KLUWER ACADEMIC PUBLISHERS NEW YORK, BOSTON, DORDRECHT, LONDON, MOSCOW 2. Digital Communications: Fundamentals and Applications (2nd Edition) 2nd Edition, BERNARD SKLAR h, Publisher: Prentice Hall; 2 edition (January 21, 2001) 3. Channel Coding: Theory, Algorithms, and Applications: Academic Press Library in Mobile and Wireless Communications 1st Edition by David Declercq (Editor), Marc Fosserier (Editor), Ezio Biglieri (Editor), Academic Press; 1 edition (July 10, 2014) 4. Wireless Communications 1st Edition by Andrea Goldsmith Cambridge University Press; 1 edition (August 8, 2005) 5. Digital Communications, 5th Edition 5th Edition by John Proakis (Author), Masoud Salehi (Author), McGraw-Hill Education; 5th edition (November 6, 2007) 6. Modern Digital and Analog Communication Systems (The Oxford Series in Electrical and Computer Engineering) 4th Edition by B. P. Lathi (Author), 		

Noid: RF-DTEL-PSTE-4.05.Rev.01[031]

	Zhi Ding (Author) Publisher: Oxford University Press; 4 edition (January 23, 2009) 7. Principles of Digital Communication 1st Edition by Robert G. Gallager (Author) Publisher: Cambridge University Press; 1 edition (March 24, 2008)						
MK Prasyarat	1. Matematika 4 2. Sistem Komunikasi 3. Sinyal dan Sistem 4. Komunikasi Lanjut 5. Teknik Koding						
Media Pembelajaran	Software: Hardware: PC/Laptop, LCD Projector, Papan Tulis						
Asesmen (%)	UTS (30 %), UAS (40 %), Tugas (20 %), Sikap (10 %)						
Mgg Ke-	Sub Capaian Pembelajaran MK (Kemampuan Akhir Yang Direncanakan)	Bahan Kajian (Materi Pembelajaran)	Bentuk Pembelajaran	Waktu Belajar (menit)	Kriteria Asesmen (Indikator)	Bentuk Asesmen	Bobot
(1,2)	Mahasiswa mampu mereview standard dan system nirkabel	<ul style="list-style-type: none"> o Pengantar system komunikasi digital o Sistem komunikasi seluler generasi pertama o Sistem komunikasi seluler kedua o Sistem komunikasi seluler ketiga 	Kuliah Pengantar & Brainstorming, Diskusi	TM: 200 menit Tgs: 200 menit BM: 240 menit	<ul style="list-style-type: none"> o System komunikasi seluler kedua meliputi GSM/DCS1800/PCS1900, IS-54/136 AND IS-95, PDC o CORDLESS TELEPHONE SYSTEMS o Sistem komunikasi seluler ketiga meliputi Terminal and personal mobility, Expanded range of services, Supplementary services, Unified, seamless, infrastructure, Integration of mobile and wire-line networks, Service transparency, Spectral efficiency, o FREQUENCY REUSE AND THE CELLULAR CONCEPT o MOBILE RADIO PROPAGATION ENVIRONMENT o CO-CHANNEL INTERFERENCE AND NOISE 	Tugas, penyelesaian soal/studi kasus di kelas	5%

(2,3)	Mahasiswa mampu menjelaskan propagation modeling	<ul style="list-style-type: none"> ○ FREQUENCY-NON-SELECTIVE (FLAT) multipath fading ○ Spektrum dan korelasi sinyal yang diterima ○ Distribusi phase dan envelope terima ○ Level crossing rates dan fade duration ○ Korelasi spatial ○ Frekuensi selektif fading ○ Klasifikasi channel 	Kuliah, Brainstorming, Diskusi	TM: 200 menit Tgs: 200 menit BM: 240 menit	<ul style="list-style-type: none"> ○ Doppler power spectrum ○ Rayleigh fading ○ Rician fading ○ Nakagami fading ○ Envelope Phase ○ Spektral dan korelasi square-envelope ○ Rate dari envelope level crossing ○ Fungsi korelasi sinyal statistic ○ Uncorrelated scattering (US) ○ Wide sense stationary uncorrelated scattering (WSSUS) 	Tugas, penyelesaian soal/studi kasus di kelas	15%
(4,5)	Mahasiswa mampu menjelaskan Co – channel interference	<ul style="list-style-type: none"> ○ Multiple Log-normal interferer ○ Probability of outage ○ Multiple rician/rayleigh interferers ○ Multiple log-normal nakagami interferer ○ multiple log-normal rician/rayleigh interferer 	Kuliah, Brainstorming, Diskusi, maju di depan kelas	TM: 200 menit Tgs: 200 menit BM: 240 menit	<ul style="list-style-type: none"> ○ Mengerti, mengidentifikasi dan menyelesaikan metode fenton-wilkinson, metode schwartz and yeh, metode farleys ○ Statistik identity interferer ○ Single interferer ○ Multiple interferer ○ 	Tugas, penyelesaian soal/studi kasus di kelas	15%
(6)	Mahasiswa mampu menjelaskan Spektral dari sinyal termodulasi dan power	<ul style="list-style-type: none"> ○ Representasi dari sinyal bandpass termodulasi ○ Nyquist pulsa shaping ○ QAM ○ PSK ○ Modulasi orthogonal dan variants ○ OFDM ○ CPM ○ Partial response CPM 	Kuliah, Brainstorming, Diskusi	TM: 100 menit Tgs: 100 menit BM: 120 menit	<ul style="list-style-type: none"> ○ Representasi dari vector space ○ prosedur GRAM-SCHMIDT ○ Energi sinyal dan korelasi ○ Raised cosine and root raised cosine pulse shaping ○ Konstelasi sinyal QAm, PAM ○ OQPK ○ Pi/4 DQPSK ○ Modulasi orthogonal FSK ○ Modulasi resolusi modulasi ○ FFT ○ Full response CPM ○ MSK ○ GMSK 	Tugas, penyelesaian soal/studi kasus di kelas	5%
(7,8)	Mahasiswa mampu menjelaskan Digital signaling pada flat channel	<ul style="list-style-type: none"> ○ Representasi ruang vektor sinyal termodulasi ○ Deteksi sinyal yang diketahui pada noise white gaussian ○ Probability of error ○ Error Probability of PSK ○ Error probability of M-QAM ○ Error probability of 	Kuliah, Brainstorming, Diskusi	TM: 200 menit Tgs: 200 menit BM: 240 menit	<ul style="list-style-type: none"> ○ Mengerti, mengidentifikasi dan menyelesaikan Terminal connectivity, Automatic repeat request, Channel model, Code rate ○ Pairwise error probability ○ Upper bounds on Probability ○ Lower bounds on Probability ○ Bit versus symbol error probabilities ○ Error probability of quaternary PSK 	Tugas, penyelesaian soal/studi kasus di kelas	10%

		<ul style="list-style-type: none"> ○ orthogonal signal ○ Error probability of OFDM ○ Diffrenetial detection ○ Non coherent detection 			(QPSK) <ul style="list-style-type: none"> ○ Error probability of M-PSK 		
(9)	Ujian Tengah Semester (UTS)						
(10,11)	Mahasiswa mampu menjelaskan antenna diversity	<ul style="list-style-type: none"> ○ Diversity combining ○ Selective combining ○ Maximal ratio combining ○ Equal gain combining ○ Switch combining ○ Differential detection ○ Transmitter diversity 	Kuliah, Brainstorming, Diskusi	TM: 200 menit Tgs: 200 menit BM: 240 menit	Mengerti, mengidentifikasi dan menyelesaikan space time transmitter diversity	Tugas, penyelesaian soal/studi kasus di kelas	10%
(12,13)	Mahasiswa mampu menjelaskan Equalisation dan interference cancellation	<ul style="list-style-type: none"> ○ Symbol by symbol equalizer ○ Modelling ISI channel ○ Optimum receiver ○ 	Kuliah, Brainstorming, Diskusi	TM: 200 menit Tgs: 200 menit BM: 240 menit	<ul style="list-style-type: none"> ○ Mengerti, mengidentifikasi dan menyelesaikan ZF,LS, LMS ○ Sequence estimation ○ Co-channel interference ○ Representasi vector sinyal yang diterima ○ Model kanal diskrit ○ Diversity berbasis waktu ○ T/2 space receiver 	Penilaian tugas, penyelesaian soal/studi kasus di kelas	15%
(14)	Mahasiswa mampu menjelaskan Error control coding	<ul style="list-style-type: none"> ○ Channel symbol error probbailty dari hamming codes dan BCH codes 	Kuliah, Brainstorming, Diskusi	TM: 100 menit Tgs: 100 menit BM: 120 menit	<ul style="list-style-type: none"> ○ Mengerti, mengidentifikasi dan menyelesaikan : hamming codes, bch codes meliputi generator primitive bch code 	Tugas, penyelesaian soal/studi kasus di kelas	10%
(15,16)	Mahasiswa mampu menjelaskan TDMA celluler	<ul style="list-style-type: none"> ○ Sektor sel ○ Conventional cell splitting ○ Cluster plan ○ Arsitektur dari Macrodiversity 		TM: 200 menit Tgs: 200 menit BM: 240 menit	Mengerti, mengidentifikasi dan menyelesaikan : <ul style="list-style-type: none"> ○ sel sektor dengan antena wide-beam directional ○ sektor dengan antena switched beam ○ teknik trunkpool ○ kinerja seluler ○ reverse channel ○ forward channel ○ reuse portioning ○ cell splitting 		15%
(17)	UAS (Ujian Akhir Semester)						
Keterangan: TM : Tatap Muka Tgs : Tugas BM : Belajar Mandiri							