# TELKOM UNIVERSITY SAP Jaringan Nirkabel

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| **Course Catalog Description** | : | Mata kuliah ini bertujuan unntuk memberikan penjelasan mengenai pengenalan konsep dasar sistem wireless broadband dengan sudut pandang lapis ke-2 keatas serta pencarian perkembangan teknologi terkait melalui review jurnal : standarisasi WIFI, WIMAX, dan LTE; fungsi transmisi dan protokol WIFI, WIMAX, dan LTE. |
| **Pre-Requisite Courses** | : | Pengenalan Teknik TelekomunikasiJaringan dan Teknik Penyambungan TelekomunikasiJaringan Komunikasi Data |
| **Textbook & Materials** | : | 1. David D, Coleman and David A, Westcott, "CWNA: Certified Wireless Network Administrator Official Study Guide",John Wiley & Sons , 2009 2. Andrews, Jeffrey G. and Ghosh, Arunabha, "Fundamentals of WiMAX: Understanding Broadband Wireless Networking"", Prentice Hall, 2007 3. Cox, Christopher, "An Introduction to LTE: LTE, LTE-Advanced, SAE, VoLTE and 4G Mobile Communications", John Wiley & Sons, 2012 |
| **Program Learning Outcome (Capaian Pembelajaran Program Studi)** | : | 1. Mempunyai kemampuan untuk menggunakan pengetahuan dasar matematika, sains, dan rekayasa kerekayasaan. 2. Mempunyai kemampuan untuk mengidentifikasi, memformulasi, dan menyelesaikan permasalahan rekayasa telekomunikasi dengan mempertimbangkan dampaknya pada konteks sosial dan global 3. Memahami tanggung jawab dan etika profesi, serta mampu berperan dalam kelompok kerja multi disiplin. 4. Memahami pentingnya dan memiliki kemampuan belajar mandiri serta mempunyai wawasan kewirausahaan 5. Mempunyai wawasan terhadap isu-isu mutakhir di bidang telekomunikasi |
| **Course Learning Outcomes (Capaian Pembelajaran MK)** | : | 1. Mampu mendeskripsikan konsep Mobile Broadband2. Mampu mendeskripsikan isu-isu terkini terkait Mobile Broadband3. Memiliki kemampuan untuk mengulas jurnal terkait Mobile Broadband4. Mampu mempresentasikan dan menjelaskan ulasan jurnal terkait Mobile Broadband |
| **Assessment Percentage** | : | UTS (30%) UAS (30%) Lainnya (40%)  |

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| **Outcome** | **Level** | **Proficiency assessed by** |
| Bertaqwa kepada Tuhan Yang Maha Esa dan mampu menunjukkan sikap religius | None |  |
| Mempunyai pengetahuan dan kemampuan untuk menggunakan ilmu dasar matematika, sains, dan rekayasa | Highly Rated | Presentasi (ppt atau tulisan), UTS, UAS |
| Mempunyai kemampuan merancang suatu sistem, komponen, atau proses untuk memenuhi kebutuhan yang diharapkan dalam batasan-batasan realistis termasuk pengiriman konten broadband melalui metoda rekayasa dibidang telekomunikasi | None |  |
| Mempunyai kemampuan merancang dan melaksanakan eksperimen, termasuk menganalisis dan menginterpretasikan data secara ilmiah menggunakan metoda ilmiah | None |  |
| Mempunyai kemampuan untuk mengidentifikasi, memformulasi, dan menyelesaikan permasalahan rekayasa telekomunikasi | Highly Rated | Presentasi (ppt atau tulisan), UTS, UAS |
| Mempunyai keterampilan dalam mengoperasikan perangkat keras, menggunakan aplikasi perangkat lunak dan kemampuan pemrograman yang berkaitan dengan teknologi informasi dan telekomunikasi | None |  |
| Mempunyai kemampuan untuk berkomunikasi secara efektif baik lisan maupun tulisan | None |  |
| Kemampuan merencanakan menyelesaikan dan mengevaluasi tugas di dalam batasan-batasan yang ada | None |  |
| Mampu menunjukkan sikap peran serta dalam kelompok kerja multi disiplin dan lintas budaya | Highly Rated | Presentasi (ppt atau tulisan), UTS, UAS |
| Mampu menunjukkan sikap bertanggung jawab yang sesuai dengan etika profesi | Highly Rated | Presentasi (ppt atau tulisan), UTS, UAS |
| Mampu memahami kebutuhan akan pembelajaran sepanjang hayat termasuk akses terhadap isu-isu mutakhir di bidang telekomunikasi dan wawasan kewirausahaan | Highly Rated | Presentasi (ppt atau tulisan), UTS, UAS |

**Typical Topics Covered on a Week by Week Basis**

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| **Week 1** | 1. Pengenalan Silabus, Aturan penilaian: Quis, Ujian, Tugas dllnya2. Overview Wireless Broadband.3. Wireless Broadband saat ini, kedepan dan tantangan4. LLC, MAC sub-layer5. CSMA, Persistance Method, CSMA/CD, energy level6. CSMA/CA, IFS, contention window7. Controlled Access, reservation, polling, token passing8. IEEE 802.11, BSS, ESS, IBSS, MBSS9. DCF, NAV, PCF, Frame Format.10. Addressing, Hidden Station Problem, Exposed Station Problem11. High Level Architecture IEEE 802.1612. Network Reference Model, ASN, CSN, Reference Points13. Struktur Slot dan Frame, Reference Network Architecture14. MAC layer, Convergence Sublayer, MAC PDU construction15. QoS, Scheduling Services, Network Entry and Initiation, Power Saving16. Mobility Management, RRM, Paging and Idle operation17. History of mobile telecommunication system, Motivation of LTE18. High Level Architecture of LTE, From LTE to LTE Advanced19. UE, E-UTRAN, EPC, Roaming Architecture, Network Areas, Protocols20. Bearer Management, Tunnelling, Spectrum Allocation21. MAC, Multiplexing and Demultiplexing, RLC, modes of operation, PDCP22. LTE-A Carrier Aggregation, Relay, Release 11 and beyond |
| **Week 2** | 1. Pengenalan Silabus, Aturan penilaian: Quis, Ujian, Tugas dllnya2. Overview Wireless Broadband.3. Wireless Broadband saat ini, kedepan dan tantangan4. LLC, MAC sub-layer5. CSMA, Persistance Method, CSMA/CD, energy level6. CSMA/CA, IFS, contention window7. Controlled Access, reservation, polling, token passing8. IEEE 802.11, BSS, ESS, IBSS, MBSS9. DCF, NAV, PCF, Frame Format.10. Addressing, Hidden Station Problem, Exposed Station Problem11. High Level Architecture IEEE 802.1612. Network Reference Model, ASN, CSN, Reference Points13. Struktur Slot dan Frame, Reference Network Architecture14. MAC layer, Convergence Sublayer, MAC PDU construction15. QoS, Scheduling Services, Network Entry and Initiation, Power Saving16. Mobility Management, RRM, Paging and Idle operation17. History of mobile telecommunication system, Motivation of LTE18. High Level Architecture of LTE, From LTE to LTE Advanced19. UE, E-UTRAN, EPC, Roaming Architecture, Network Areas, Protocols20. Bearer Management, Tunnelling, Spectrum Allocation21. MAC, Multiplexing and Demultiplexing, RLC, modes of operation, PDCP22. LTE-A Carrier Aggregation, Relay, Release 11 and beyond |
| **Week 3** | 1. Pengenalan Silabus, Aturan penilaian: Quis, Ujian, Tugas dllnya2. Overview Wireless Broadband.3. Wireless Broadband saat ini, kedepan dan tantangan4. LLC, MAC sub-layer5. CSMA, Persistance Method, CSMA/CD, energy level6. CSMA/CA, IFS, contention window7. Controlled Access, reservation, polling, token passing8. IEEE 802.11, BSS, ESS, IBSS, MBSS9. DCF, NAV, PCF, Frame Format.10. Addressing, Hidden Station Problem, Exposed Station Problem11. High Level Architecture IEEE 802.1612. Network Reference Model, ASN, CSN, Reference Points13. Struktur Slot dan Frame, Reference Network Architecture14. MAC layer, Convergence Sublayer, MAC PDU construction15. QoS, Scheduling Services, Network Entry and Initiation, Power Saving16. Mobility Management, RRM, Paging and Idle operation17. History of mobile telecommunication system, Motivation of LTE18. High Level Architecture of LTE, From LTE to LTE Advanced19. UE, E-UTRAN, EPC, Roaming Architecture, Network Areas, Protocols20. Bearer Management, Tunnelling, Spectrum Allocation21. MAC, Multiplexing and Demultiplexing, RLC, modes of operation, PDCP22. LTE-A Carrier Aggregation, Relay, Release 11 and beyond |
| **Week 4** | 1. Pengenalan Silabus, Aturan penilaian: Quis, Ujian, Tugas dllnya2. Overview Wireless Broadband.3. Wireless Broadband saat ini, kedepan dan tantangan4. LLC, MAC sub-layer5. CSMA, Persistance Method, CSMA/CD, energy level6. CSMA/CA, IFS, contention window7. Controlled Access, reservation, polling, token passing8. IEEE 802.11, BSS, ESS, IBSS, MBSS9. DCF, NAV, PCF, Frame Format.10. Addressing, Hidden Station Problem, Exposed Station Problem11. High Level Architecture IEEE 802.1612. Network Reference Model, ASN, CSN, Reference Points13. Struktur Slot dan Frame, Reference Network Architecture14. MAC layer, Convergence Sublayer, MAC PDU construction15. QoS, Scheduling Services, Network Entry and Initiation, Power Saving16. Mobility Management, RRM, Paging and Idle operation17. History of mobile telecommunication system, Motivation of LTE18. High Level Architecture of LTE, From LTE to LTE Advanced19. UE, E-UTRAN, EPC, Roaming Architecture, Network Areas, Protocols20. Bearer Management, Tunnelling, Spectrum Allocation21. MAC, Multiplexing and Demultiplexing, RLC, modes of operation, PDCP22. LTE-A Carrier Aggregation, Relay, Release 11 and beyond |
| **Week 5** | 1. Pengenalan Silabus, Aturan penilaian: Quis, Ujian, Tugas dllnya2. Overview Wireless Broadband.3. Wireless Broadband saat ini, kedepan dan tantangan4. LLC, MAC sub-layer5. CSMA, Persistance Method, CSMA/CD, energy level6. CSMA/CA, IFS, contention window7. Controlled Access, reservation, polling, token passing8. IEEE 802.11, BSS, ESS, IBSS, MBSS9. DCF, NAV, PCF, Frame Format.10. Addressing, Hidden Station Problem, Exposed Station Problem11. High Level Architecture IEEE 802.1612. Network Reference Model, ASN, CSN, Reference Points13. Struktur Slot dan Frame, Reference Network Architecture14. MAC layer, Convergence Sublayer, MAC PDU construction15. QoS, Scheduling Services, Network Entry and Initiation, Power Saving16. Mobility Management, RRM, Paging and Idle operation17. History of mobile telecommunication system, Motivation of LTE18. High Level Architecture of LTE, From LTE to LTE Advanced19. UE, E-UTRAN, EPC, Roaming Architecture, Network Areas, Protocols20. Bearer Management, Tunnelling, Spectrum Allocation21. MAC, Multiplexing and Demultiplexing, RLC, modes of operation, PDCP22. LTE-A Carrier Aggregation, Relay, Release 11 and beyond |
| **Week 6** | 1. Pengenalan Silabus, Aturan penilaian: Quis, Ujian, Tugas dllnya2. Overview Wireless Broadband.3. Wireless Broadband saat ini, kedepan dan tantangan4. LLC, MAC sub-layer5. CSMA, Persistance Method, CSMA/CD, energy level6. CSMA/CA, IFS, contention window7. Controlled Access, reservation, polling, token passing8. IEEE 802.11, BSS, ESS, IBSS, MBSS9. DCF, NAV, PCF, Frame Format.10. Addressing, Hidden Station Problem, Exposed Station Problem11. High Level Architecture IEEE 802.1612. Network Reference Model, ASN, CSN, Reference Points13. Struktur Slot dan Frame, Reference Network Architecture14. MAC layer, Convergence Sublayer, MAC PDU construction15. QoS, Scheduling Services, Network Entry and Initiation, Power Saving16. Mobility Management, RRM, Paging and Idle operation17. History of mobile telecommunication system, Motivation of LTE18. High Level Architecture of LTE, From LTE to LTE Advanced19. UE, E-UTRAN, EPC, Roaming Architecture, Network Areas, Protocols20. Bearer Management, Tunnelling, Spectrum Allocation21. MAC, Multiplexing and Demultiplexing, RLC, modes of operation, PDCP22. LTE-A Carrier Aggregation, Relay, Release 11 and beyond |
| **Week 7** | 1. Pengenalan Silabus, Aturan penilaian: Quis, Ujian, Tugas dllnya2. Overview Wireless Broadband.3. Wireless Broadband saat ini, kedepan dan tantangan4. LLC, MAC sub-layer5. CSMA, Persistance Method, CSMA/CD, energy level6. CSMA/CA, IFS, contention window7. Controlled Access, reservation, polling, token passing8. IEEE 802.11, BSS, ESS, IBSS, MBSS9. DCF, NAV, PCF, Frame Format.10. Addressing, Hidden Station Problem, Exposed Station Problem11. High Level Architecture IEEE 802.1612. Network Reference Model, ASN, CSN, Reference Points13. Struktur Slot dan Frame, Reference Network Architecture14. MAC layer, Convergence Sublayer, MAC PDU construction15. QoS, Scheduling Services, Network Entry and Initiation, Power Saving16. Mobility Management, RRM, Paging and Idle operation17. History of mobile telecommunication system, Motivation of LTE18. High Level Architecture of LTE, From LTE to LTE Advanced19. UE, E-UTRAN, EPC, Roaming Architecture, Network Areas, Protocols20. Bearer Management, Tunnelling, Spectrum Allocation21. MAC, Multiplexing and Demultiplexing, RLC, modes of operation, PDCP22. LTE-A Carrier Aggregation, Relay, Release 11 and beyond |
| **Week 8** | 1. Menentukan topik terkait WiFi, WiMAX, dan LTE2. Mengumpulkan Jurnal terkini tentang topik yang sudah dipilih3. Membuat resume review jurnal yang sudah ditentukan |
| **Week 9** | 1. Menentukan topik terkait WiFi, WiMAX, dan LTE2. Mengumpulkan Jurnal terkini tentang topik yang sudah dipilih3. Membuat resume review jurnal yang sudah ditentukan |
| **Week 10** | 1. Menentukan topik terkait WiFi, WiMAX, dan LTE2. Mengumpulkan Jurnal terkini tentang topik yang sudah dipilih3. Membuat resume review jurnal yang sudah ditentukan |
| **Week 11** | 1. Presentasi dan diskusi terkait resume dan review yang sudah dibuat tentang WiFi, WiMAX, dan LTE |
| **Week 12** | 1. Presentasi dan diskusi terkait resume dan review yang sudah dibuat tentang WiFi, WiMAX, dan LTE |
| **Week 13** | 1. Presentasi dan diskusi terkait resume dan review yang sudah dibuat tentang WiFi, WiMAX, dan LTE |
| **Week 14** | 1. Presentasi dan diskusi terkait resume dan review yang sudah dibuat tentang WiFi, WiMAX, dan LTE |

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| **Computer Usage** | : | Hardware: PC / Laptop |