## Part A: Communication Theory and Systems

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|---|---|
| 1. Communication theory | 40. Space-time codes |
| 2. Digital modulations and demodulations | 41. MIMO techniques |
| 3. Coding theory | 42. Multi-user/multi-points transmission |
| 4. Channel codes | 43. Interference alignment |
| 5. Turbo codes | 44. OFDM |
| 6. LDPC codes | 45. CDMA |
| 7. Polar codes | 46. Spread spectrum technologies |
| 8. Information theory | 47. Multiple access |
| 9. Cryptography | 48. Power control |
| 10. Physical-layer security | 49. Cognitive radios |
| 11. Radio propagation | 50. Software defined radios |
| 12. Channel modeling and characterization | 51. Intelligent/smart radios |
| 13. Antennas | 52. Cooperative communications |
| 14. Antenna systems | 53. Relay systems |
| 15. Radio frequency | 54. Spectrum sensing |
| 16. RF front-end circuitries and modules | 55. Mobile communications |
| 17. Up/down frequency converters | 56. Wireless communications |
| 18. Radio frequency synthesizers/oscillators | 57. Broadcasting |
| 19. Carrier frequency analogue modulations/demodulations | 58. Power line communications |
| 20. Intermediate frequency | 59. Satellite communications |
| 21. Micro-/Millimeter-wave circuits and systems | 60. Spectrum resource management |
| 22. Wireless power transfer | 61. Interference analysis |
| 23. EMI/EMC & SI/PI | 62. Optical communications |
| 24. Analogue-to-digital/digital-to-analogue converters | 63. Cellular systems |
| 25. Signal sampling | 64. Interference management |
| 26. Communication components and materials | 65. Physical-layer network coding |
| 27. Speech and acoustic signal processing | 66. UWB communication systems |
| 28. Image signal processing | 67. Collaborative signal processing |
| 29. Image and video coding | 68. Space communication |
| 30. Visual analysis and content management | 69. Data storage for information and communications |
| 31. 3D rendering and processing | 70. Wireless multimedia communications |
| 32. Signal processing for communications | 71. Embedded systems for information and communications |
| 33. Signal processing theory | 72. Sub-systems for communications |
| 34. Detection and estimation | 73. Computational intelligence |
| 35. Iterative processing | 74. Nature/bio-inspired communication technologies |
| 36. Synchronization | 75. Green communications |
| 37. Equalization | 76. Bio communications |
| 38. Beamforming | 77. Medical/bio signal processing |
| 39. Smart antennas | |

## Part B: Networks and Services

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|---|---|
| 1. Ad hoc mobile networks | 44. Nano(scale) networks |
| 2. Addressing and location management | 45. Network applications and services |
| 3. Bio/nature-inspired networking | 46. Network architectures |
| 4. Body area networks | 47. Network coding |
| 5. Broadband access technologies | 48. Network control |
| 6. Capacity planning | 49. Network economics |
| 7. Cellular and broadband wireless networks | 50. Network management |
| 8. Cloud computing and data center | 51. Network science |
| 9. Cognitive networks | 52. Network security, vulnerability, and defenses |
| 10. Communication reliability | 53. Network simulation and emulation |
| 11. Congestion control | 54. Network software |
| 12. Content-based network service | 55. Network virtualization |
| 13. Content-centric networks | 56. Optical networks |
| 14. Content distribution network (CDN) | 57. Peer-to-peer networks |
| 15. Cross-layer design and optimization | 58. Personal area networks |
| 16. Cyber-physical systems and networking | 59. Performance evaluation |
| 17. Delay/disruption tolerant networks | 60. Power control and management |
| 18. Device-to-device communications | 61. Power line networking |
| 19. Distributed networks | 62. Pricing, billing, and business model |
| 20. Dynamic spectrum management | 63. Quality of service/Quality of experience |
| 21. Embedded systems | 64. Resource allocation and management |
| 22. Future Internet | 65. RFID networks and protocols |
| 23. Green networks | 66. Routing and switching |
| 24. Grid and cloud computing | 67. Scheduling and buffer management |
| 25. Heterogeneous networks | 68. Self-organizing networks |
| 26. Home area networks | 69. Sensor networks |
| 27. Implementation and experimental testbeds | 70. Smart grid networks |
| 28. Information security | 71. Service overlays |
| 29. Internet of things (IoT) | 72. Service platforms |
| 30. Local area networks | 73. Social computing and networks |
| 31. Location and context aware services | 74. Software-defined networking |
| 32. Machine-to-Machine networking | 75. Software for communications |
| 33. Media streaming | 76. Standardization activities |
| 34. Medium access control | 77. Topology characterization and inference |
| 35. Middleware support for networking | 78. Traffic measurement and analysis |
| 36. Mobile ad-hoc networks | 79. Traffic engineering and control |
| 37. Mobile cloud computing | 80. Underwater networks |
| 38. Mobile computing | 81. Ubiquitous/pervasive computing |
| 39. Mobility models and management | 82. Vehicular networks |
| 40. Multicast, broadcast and anycast | 83. Virtual and overlay networks |
| 41. Multimedia protocols and networks | 84. Web services and performance |
| 42. Multimedia services and applications | 85. Wireless local area networks |
| 43. Multi-hop wireless networks | 86. Wireless mesh networks and protocols |

| Part C: Convergence Technologies | |
|---|---|
| 1. ITS/Telematics | 25. IT for livestocks |
| 2. U-health [Smart care, smart living, u-health infrastructure, u-health applicatins] | 26. IT for forestry |
| 3. Ambient intelligence | 27. IT for aviations |
| 4. Ubiquitous applications | 28. Brain-IT convergence |
| 5.Convergence of securities | 29. Convergence software |
| 6. Policy for convergence | 30. Information security |
| 7. Context-awareness | 31. Green communications |
| 8. 3D Image convergence | 32. Military and tactical communications |
| 9. RFID/USN Convergence | 33. Multimedia entertainment |
| 10. Broadcasting and communications convergence | 34. Game |
| 11. Smart grid | 35. Mobile robots |
| 12. IT for defence | 36. Cloud computing services |
| 13. M2M convergence | 37. TV and multi-screen |
| 14. Energy-IT convergence | 38. Mobile apps. for smartphones |
| 15. Mechanics-IT convergence | 39. Hybrid apps. (Incl. HTML5) |
| 16. Marine-IT convergence | 40. Big data |
| 17. Illumination-IT convergence | 41. Smart services |
| 18. Medical and Bio-IT convergence | 42. Location-based services (LBS) |
| 19. Car and vehicular IT | 43. Smartphone applications |
| 20. IT for ships | 44. IT-Empowered systems and services |
| 21. IT for constructions | 45. Positioning and navigations applications |
| 22. IT for fabrics | 46. Smart home appliances |
| 23. IT for finances | 47. Profile-based services |
| 24. IT for agricultures | |