IFT 372
Wireless Fundamentals

Spring 2025 Semester A (18047) Syllabus

Section 1: Course Overview

Instructor Information

Instructor: Betty J. Lauer
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Phone: NA
Office Hours: Tuesday 6:00 PM (AZ time) or by appointment
Office Location: Online via Zoom

Course Description

Foundational course in wireless networking includes systems-level coverage of advanced information communication technology (ICT) focusing on digital wireless communications systems used in today's ICT networks. Includes topical areas in noise, modulation techniques, signal path loss, basic antenna theory and other similar topics required to understand how a wireless network architecture is developed. Also introduces the characteristics of both Wi-Fi based systems and smart phone-based systems. Specific topics include: binary communications, QPSK, PCM, TDM, QAM, OFDM, OFDMA and the wireless environment. Lays the foundation for fully understanding how to create and develop a wireless network.

Prerequisite(s): IFT 266 or 394 (Networking Character and Protocols) with C or better OR Visiting University Student

Course Credit: 3

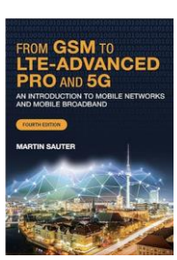
Class Meetings

This class is online.

Course Overview

IFT372 is an introductory course in wireless communication systems. The course spans 3G to 5G development of wireless systems and demonstrates how two disparate systems, Cellular and WiFi have matured into a single wireless network approach. The integration began with the introduction of smartphones and has grown to a ubiquitous communication network replacing the two separate architectures. The evolution of circuit-switched voice communications to packet-switched voice over IP (VoIP) is presented. In addition, other wireless systems are introduced. These include Wireless Local Area Networks (WLAN) and Bluetooth.

Textbook & Course Materials



From GSM to LTE-Advanced Pro and 5G, 4th edition
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Program Learning Outcomes

SO1: Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
SO2: Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
SO6: Use systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to accomplish user goals.

Course Learning Outcomes

CLO1: Describe the characteristics of 3rd Generation Wireless Systems.
CLO2: Demonstrate an understanding of Long Term Evolution (LTE) architecture that uses OFDM modulation.
CLO3: Demonstrate comprehension of Mobility Management functions in a wireless system.
CLO4: Compare and contrast the characteristics of VoLTE and VoWiFi information transfer.
CLO5: Describe the 5G core network architecture.
CLO6: Demonstrate an understanding of Wireless LAN Security
CLO7: Characterize the architecture of Bluetooth.

Course Access

Your ASU courses can be accessed by both my.asu.eduLinks to an external site. and https://asu.instructure.com/; bookmark both in the event that one site is down.

Computer Requirements

This is an online course. The subject matter requires a computer with internet access and a willingness by the student to install software that will be used to work on the class Lab Projects. NOTE: Smartphones, iPad/tablets, Chromebook, etc, will not be capable of completing the work in this course. M1-based Apple or M2-based Apple products are NOT x64 compatible. If looking for computers that would meet the requirements, check out https://ets.engineering.asu.edu/recommended-devices-for-students/ for some options.

Technical Support

- This course uses Canvas to deliver content. It can be accessed through MyASU at http://my.asu.edu.Links to an external site.or the Canvas home page at https://myasucourses.asu.edu.Links to an external site.
- To monitor the status of campus networks and services, visit System Health Portal at http://syshealth.asu.edu/.Links to an external site.
- To contact the help desk call toll-free at 1-855-278-5080.

Campus Resources

These resources can be used by on-campus and online students. There are many valuable resources on campus to help you achieve success both personally and academically. A few of these are listed here which are available on all campuses. You are able to interact with these services remotely:

- Free Software (Office 365) - https://myapps.asu.edu/Links to an external site.
- Writing centers – https://tutoring.asu.edu/writing-centers.Links to an external site.
- Tutoring, student success centers: https://tutoring.asu.edu/tutoring.Links to an external site.
- Counseling / consultation: https://eoss.asu.edu/counseling.Links to an external site.
- Career services: https://eoss.asu.edu/cs.

Section 2: Course Policies

How to Succeed in this Course

- Review contents of the syllabus to understand what to expect in this course.
- Read announcements.
- Read and respond to course email messages.
- Check your ASU email regularly.
- Read course materials.
- Complete assignments by the due dates specified.
- Communicate regularly with your instructor and peers.
- Create a study and/or assignment schedule to stay on track.
- Participate in all of the classroom sessions.
- Complete all pre-class preparation assignments and reading.

- Complete all post-class follow-up assignments and reading.
    - Access ASU Online Student Resources.

Submitting Assignments

All assignments (Discussions, Homeworks, Lab Projects, Quizzes/Exams, unless otherwise announced, MUST be submitted to the designated area of Canvas. Do not submit an assignment via email.

Late or Missed Assignments

Assignments are due at 11:59 PM Mountain Standard Time on the date listed for each module. Students who need alternative deadlines for personal reasons should communicate with the instructor as early as possible.

Accommodations will be made for religious observances provided that students notify the instructor at the beginning of the semester concerning those dates. Students who expect to miss class due to officially university-sanctioned activities and active duty military duties should inform the instructor early in the semester or as soon as possible. Alternative arrangements will generally be made for any examinations and other graded in-class work affected by such absences. The preceding policies are based on ACD 304–04, "Accommodation for Religious Practices;" ACD 304–02, "Missed Classes Due to University-Sanctioned Activities;" and "Missed Class Due to Military Line-of-Duty Activities," and SSM 201–18, "Accommodating Active Duty Military."

Drop and Add Dates/Withdrawals

This course adheres to a compressed schedule and may be part of a sequenced program, therefore, there is a limited timeline to drop or add the course. Consult with your advisor and notify your instructor to add or drop this course. If you are considering a withdrawal, review the following ASU policies: Withdrawal from Classes, Medical/Compassionate Withdrawal, and a Grade of Incomplete.

Grade Appeals

Grade disputes must first be addressed by discussing the situation with the instructor. If the dispute is not resolved with the instructor, the student may appeal to the department chair per the University Policy for Student Appeal Procedures on Grades.

Course Evaluation

Students are expected to complete the course evaluation. The feedback provides valuable information to the instructor and the college and is used to improve student learning. Students are notified when the online evaluation form is available.

Email and Internet

ASU email is an official means of communication among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly. All instructor correspondence will be sent to your ASU email account.

Course Time Commitment

This three-credit course requires approximately 135 hours of work. Please expect to spend around 18 hours each week preparing for and actively participating in this course.

Technical Support

- This course uses Canvas to deliver content. It can be accessed through MyASU at http://my.asu.edu or the Canvas home page at https://myasucourses.asu.edu
- To monitor the status of campus networks and services, visit the System Health Portal at http://syshealth.asu.edu/
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Section 3: Class Overview

Grading Scheme

Your grade will be determined based on the following grading schema:

Graded Item	***Points***
Discussion Questions/Posts Points	140
Assignments	210
Project	100
Quizzes	160
Midterm Exam	60
Final Exam	100
Total Points	770

Assignment Descriptions

- Canvas has a Course Summary that displays all the assignments and due dates.
- It is recommended that you use the Calendar in Canvas.

Discussion Questions/Posts

- You are required to respond during the specified time period.
- Discussion Question is closed after the due date.
- Required to follow the Discussion Question Substantive Post Instructions (Welcome Module).
- Discussion Question are not eligible for late or missing submission**.**

Assignments

- Assignments are to reflect your analysis and answers to the questions asked. Synthesize what you read into your own words.

Project

- Project will provide an opportunity for students to engage with the content using a real-world example.

Exams & Quizzes

- Exam & Quizzes are open book and administered online through Canvas.
- Exams & Quizzes are not eligible for late or missing submission

Grading Scale:

Grades reflect your performance on assignments and adherence to deadlines. Grades on assignments will be graded after the due date. Grade will be determined based on the following grading scale:

Grade	**A+**	**A**	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**D**	**E**
% Upper Limit	100%	< 98%	< 93%	< 90%	< 88%	< 83%	< 80%	< 78%	< 70%	< 60%
% Lower Limit	98%	93%	90%	88%	83%	80%	78%	70%	60%	

Week	*Topic*
0 **(01-13 to 01-17)**	Graded Activities: • M0: Discussion – Introduce Yourself • M0: Syllabus Quiz • Prepare for Semester: Software and Final Project
1 **(01-13 to 01-21)**	Graded Activities: • M1: Discussion • M1: Assignment • M1: Quiz
2 **(01-20 to 01-28)**	Graded Activities: • M2: Discussion • M2: Assignment • M2: Quiz
3 **(01-27 to 02-04)**	Graded Activities: • M3: Discussion • M3: Assignment • M3: Quiz
4 **(02-03 to 02-11)**	Graded Activities: • M4: Discussion • M4: Assignment • M4: Quiz • M4: Midterm Exam
5 **(02-10 to 02-18)**	Graded Activities: • M5: Discussion • M5: Assignment • M5: Quiz
6 **(02-17 to 02-22)**	Graded Activities: • M6: Discussion • M6: Assignment • M6: Quiz
7 **(02-21 to 03-04)**	Graded Activities: • M7: Discussion • M7: Assignment • M7: Quiz • M8: Final Exam

Section 4: University Policies

Syllabus Disclaimer

This syllabus is to be used as a guideline only. The information provided is a summary of topics to be covered in the class. Information contained in this document such as assignments, grading scales, due dates, office hours, required textbooks are subject to change. Students will be notified accordingly.

Classroom Behavior

Cell phones and pagers must be turned off during class to avoid causing distractions. The use of recording devices is not permitted during class. Any violent or threatening conduct by an ASU student in this class will be reported to the ASU Police Department and the Office of the Dean of Students. See SSM 104–02, "Handling Disruptive, Threatening, or Violent Individuals on Campus."

Academic Integrity & Copyright Laws

One of the core topics of this course is academic integrity. You will be discussing it further throughout the course. ASU expects and requires all its students to act with honesty and integrity, and respect the rights of others in carrying out all academic assignments. Fulton Schools of Engineering takes academic integrity VERY seriously. The Fulton Honor Code will be discussed during a future class.

Students in this class must adhere to ASU's academic integrity policy, which can be found at https://provost.asu.edu/academic-integrity/policy). Students are responsible for reviewing this policy and understanding each of the areas in which academic dishonesty can occur. In addition, all engineering students are expected to adhere to both the ASU Academic Integrity Honor Code and the Fulton Schools of Engineering Honor Code. All academic integrity violations will be reported to the Fulton Schools of Engineering Academic Integrity Office (AIO). The AIO maintains record of all violations and has access to academic integrity violations committed in all other ASU college/schools.

Course content, including lectures (Zoom recorded lectures are included), are copyrighted materials and students may not share outside the class, upload to online websites not approved by the instructor, sell, or distribute course content or notes taken during the conduct of the course (see ACD 304–06, "Commercial Note Taking Services" and ABOR Policy 5-308 F.14 for more information).
You must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement.

Plagiarism

Although ASU encourages collaboration between students, and faculty, in the sharing of ideas and experiences, individual work needs to represent the student's original thought and be distinguishably different from other students' work. Copying from other people's work in part or in whole will result in a ZERO grade for the whole work. Recurring plagiarism will result in obtaining an XE and reporting each student's misconduct.

No Generative AI Use Permitted

In this course, all assignments must be completed by the student. Artificial Intelligence (AI), including ChatGPT and other related tools used for creating of text, images, computer code, audio, or other media, are not permitted for use in any work in this class. Use of these generative AI tools will be considered a violation of the ASU Academic Integrity Policy, and students may be sanctioned for confirmed, non-allowable use in this course.

Threatening Behavior Policy

Students, faculty, staff, and other individuals do not have an unqualified right of access to university grounds, property, or services (see SSM 104-02). Interfering with the peaceful conduct of university related business or activities or remaining on campus grounds after a request to leave may be considered a crime. All incidents and allegations of violent or threatening conduct by an ASU student (whether on- or off-campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students.

Harassment and Sexual Discrimination

Arizona State University is committed to providing an environment free of discrimination, harassment, or retaliation for the entire university community, including all students, faculty members, staff employees, and guests. ASU expressly prohibits discrimination, harassment, and retaliation by employees, students, contractors, or agents of the university based on any protected status: race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqs.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling, is available if you wish discuss any concerns confidentially and privately.

Disability Resources

Any students who have special needs or need accommodations in this course are encouraged to communicate with me as soon as possible to make appropriate arrangements for these accommodations. The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. One element of this legislation requires that all qualified students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Disability Resource Center (DRC) at ASU Polytechnic located in Student Affairs Quad # 4 or call 480-727-1039 / TTY: 480-727-1009. Please note that students who may need accommodations must register with the ASU Disability Resource Center and provide documentation of that registration to the instructor. Eligibility and documentation policies online: http://www.asu.edu/studentaffairs/ed/drc/. See ACD 304-08 Classroom and Testing Accommodations for Students with Disabilities.