Meeting Times

Mondays 5:30 pm to 9:30 pm (Live)

https://webster-edu.zoom.us/j/93966952850

Monday - Sunday 12:00 am to 11:59 pm (Learning Management System)

The student will be provided with lecture presentations, discussions, assignments, and evaluations on a weekly basis. The student will manage their time to complete the required coursework on a weekly basis.


Contact Information

Dr. Louis Fletcher, louisfletcher00@webster.edu, (719) 322-7510

Description

Students examine the technical aspects of satellite communication systems, including an extensive evaluation of space and ground segments. Topics include space communications design and performance analysis, design trade-offs, antenna design and performance, link equation, attenuation, modulation, jamming and anti-jamming techniques, encoding and decoding, access, error detection and correction, frequency hopping, and other access schemes. This course presents an in-depth analysis of current and future trends in satellite communication systems development and technologies such as Direct Broadcast and Global Cellular support.

Requisites

None

Outcomes

The student will:

- Develop a strong working knowledge of the space communication environment.
- Be able to handle a multitude of different tasks, such as, requirement planning, performance analysis, tradeoff studies, requirements formulation (resources, schedule, cost and performance consideration) and system's administration.
- Be able to apply the fundamentals of communication theory and practices, and have a working insight into the use of basic communication components, protocols, and methods employed in the space industry.
- Be able to manage the complexities of space communication assets (Space, Ground and User Segments).
- Be capable of explaining and applying their knowledge of the advantages and disadvantages of implementing different space communication technologies to meet a variety of space mission requirements.
- Be able to demonstrate their knowledge of different levels of performance for space communications systems that can be varied by using a wide range of control parameters
- Be able to explain and apply different mathematical formulas to calculate various performance requirements.
- Demonstrate their ability to understand, synthesize and apply the knowledge gained in this course through oral discussions and written examinations.

Required Textbook

Please Select a Textbook
Evaluation

Evaluation Area Points

Participation in Discussions and Knowledge Checks 50% (Discussions 40%, Knowledge Checks 10%)

Presentation 20%

Research Paper 30% (Paper 25%, Abstract 5%)

Total 100%

The following grade point structure is used to compute the letter grades for the final course grade.

<table>
<thead>
<tr>
<th>Grade Points Earned</th>
<th>Equivalent Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>94-100</td>
<td>A  Superior Graduate Work</td>
</tr>
<tr>
<td>90-93</td>
<td>A-  Superior Graduate Work</td>
</tr>
<tr>
<td>87-89</td>
<td>B+ Satisfactory Graduate Work</td>
</tr>
<tr>
<td>83-86</td>
<td>B  Satisfactory Graduate Work</td>
</tr>
<tr>
<td>80-82</td>
<td>B- Satisfactory Graduate Work</td>
</tr>
<tr>
<td>70-79</td>
<td>C  Work that is barely adequate as graduate-level performance</td>
</tr>
<tr>
<td>Below 70</td>
<td>F  Work that is unsatisfactory</td>
</tr>
<tr>
<td>I</td>
<td>I  Incomplete work</td>
</tr>
<tr>
<td>ZF</td>
<td>ZF  An &quot;I&quot; that is not completed within one year of the end of the course is automatically converted to a &quot;ZF&quot;. A &quot;ZF&quot; is treated the same as an F or NC for all cases involving GPA, academic warning, probation, and dismissal.</td>
</tr>
<tr>
<td>W</td>
<td>W  Withdrawn from the course</td>
</tr>
</tbody>
</table>

Schedule

Week 1

Introductions
Grading / Standards / Student Expectations
Introduction Satellite Communications
Orbital Mechanics & Launchers
Research Paper Overview

Reading

Chapters 1 & 2

Week 2
Satellites
Satellite Link Design

Reading
Chapters 3 & 4

Week 3
Digital Transmission & Error Control
Modulation & Multiple Access
Research Paper Abstract Due

Reading
Chapters 5 & 6

Week 4
Propagation Effects & Their Impact on Satellite-Earth Links
Low Throughput Systems & Small Satellites

Reading
Chapters 7 & 8

Week 5
Reading
NGSO Satellite Systems
Mid-term Knowledge Check
Chapter 9

Week 6
Direct Broadcast Satellite Television & Radio
Chapter 10

Week 7
Satellite Internet
Research Papers due

Reading
Chapter 11

Week 8
Satellite Navigation & The Global Positioning System
Individual Research Presentations

Reading
Chapter 12

Week 9
Final Knowledge Check
Course Critiques

Reading
Course Policies

Availability of Instructor

The professor is available by appointment. Students are encouraged to use e-mail as the primary means of interacting with the professor. Please use your Webster University email account with the course number and "Webster" included in the subject line. If any student needs to contact the professor for an immediate situation/emergency, a phone number is provided on page one of the syllabus. If the professor is unavailable when the student's call is placed, the student should leave a voice message with his/her name, phone number, and the best time to return their call. The professor will make contact as soon as possible.

Course Attendance

Students are expected to participate in each weekly session. In the case of unavoidable absence, the student must contact the instructor prior to the week. The student is subject to the appropriate academic penalty for incomplete or unacceptable makeup work, or for excessive or unexcused absences. Generally, a student who misses more than a one week course period (per course) without a documented military or medical excuse and advanced permission from the instructor should withdraw from the class.

Institutional Policies

Academic Policies

Academic policies provide students with important rights and responsibilities. Students are expected to familiarize themselves with all academic policies that apply to them. Academic policies for undergraduate students can be found in the Undergraduate Studies Catalog; graduate students should review the Graduate Studies Catalog.

Undergraduate Studies Catalog

The Undergraduate Studies Catalog contains academic policies that apply to all undergraduate students. The academic policies and information section of the catalog contains important information related to attendance, conduct, academic honesty, grades, and more. If you are an undergraduate student, please review the catalog each academic year. The current Undergraduate Studies Catalog is at:

http://www.webster.edu/catalog/current/undergraduate-catalog/

Graduate Studies Catalog

The Graduate Studies Catalog contains academic policies that apply to all graduate students. The academic policies section of the catalog contains important information related to conduct, academic honesty, grades, and more. If you are a graduate student, please review the catalog each academic year. The current Graduate Studies Catalog is at:

http://www.webster.edu/catalog/current/graduate-catalog/

Grading

The Grades section of the academic catalog outlines the various grading systems courses may use, including the information about the final grade reported for this class.

Undergraduate

http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html#grading

Graduate

http://www.webster.edu/catalog/current/graduate-catalog/academic-policies.html#grades

Incomplete

There are important policies that govern grades of Incomplete (I), including the circumstances under which Incomplete grades are granted, deadlines for completion, and consequences should the remaining course work not be completed. It is the responsibility of a student who requests an Incomplete to ensure that he/she understands and follows the policies.

Grade Appeals

Instructors are responsible for assigning grades, and student should discuss grade issues with the instructor. Policies and procedures for appealing grades are available in the appropriate catalog.
Academic Honesty Policy

Webster University is committed to academic excellence. As part of our Statement of Ethics, we strive to preserve academic honor and integrity by repudiating all forms of academic and intellectual dishonesty, including cheating, plagiarism and all other forms of academic dishonesty. Academic dishonesty is unacceptable and is subject to a disciplinary response. Students are encouraged to talk to instructors about any questions they may have regarding how to properly credit others’ work, including paraphrasing, quoting, and citation formatting. The University reserves the right to utilize electronic databases, such as Turnitin.com, to assist faculty and students with their academic work.

The University’s Academic Honesty Policy is published in academic catalogs:

- Undergraduate
  [http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html](http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html)

- Graduate
  [http://www.webster.edu/catalog/current/graduate-catalog/academic-policies.html](http://www.webster.edu/catalog/current/graduate-catalog/academic-policies.html)

As a part of the University commitment to academic excellence, the Academic Resource Center provides student resources to become better acquainted with academic honesty and the tools to prevent plagiarism in its many forms:

[http://www.webster.edu/arc/plagiarism_prevention/](http://www.webster.edu/arc/plagiarism_prevention/)

Statement of Ethics

Webster University strives to be a center of academic excellence. The University makes every effort to ensure the following:

- The opportunity for students to learn and inquire freely
- The protection of intellectual freedom and the rights of professors to teach
- The advancement of knowledge through scholarly pursuits and relevant dialogue

To review Webster University’s statement of ethics, see the Undergraduate Studies Catalog and the Graduate and Studies Catalog:

- Undergraduate
  [http://www.webster.edu/catalog/current/undergraduate-catalog/overview.html#ethics](http://www.webster.edu/catalog/current/undergraduate-catalog/overview.html#ethics)

- Graduate
  [http://www.webster.edu/catalog/current/graduate-catalog/ethics.html](http://www.webster.edu/catalog/current/graduate-catalog/ethics.html)

Contact Hours for this Course

It is essential that all classes meet for the full instructional time as scheduled. A class cannot be shortened in length. If a class session is cancelled for any reason, the content must be covered at another time.

Important Academic Resources

Academic Accommodations

Webster University makes every effort to accommodate individuals with academic/learning, health, physical and psychological disabilities. To obtain accommodations, students must identify themselves and provide documentation from a qualified professional or agency to the appropriate campus designee or the Academic ADA Coordinator at the main campus. The Academic ADA Coordinator may be reached at 314-246-7700 or disability@webster.edu.

If you have already identified as a student with a documented disability and are entitled to classroom or testing accommodations, please inform the instructor of the accommodations you will require for this class at the beginning of the course.

Academic Resource Center

Additional support and resources may be accessed through the Academic Resource Center (ARC). Support and resources include academic counseling, accommodations, assistive technology, peer tutoring, plagiarism prevention, testing center services, and writing coaching. Visit [www.webster.edu/arc](http://www.webster.edu/arc) or Loretto Hall 40 on the main campus for more information.

Student Success Portal
Webster University's Student Success Portal, powered by Starfish, is a communications tool to connect students with faculty members and campus support services. It allows faculty and staff members to communicate with you regarding academic achievements as well as areas where support may be helpful. You may use the portal to contact faculty and staff members for assistance and to arrange meetings. Activity in the portal will be communicated to your Webster University email account. The Student Success Portal is available via your course home page in WorldClassRoom or via Connections. Learn more about the Student Success Portal at http://www.webster.edu/success/students.html.

**University Library**

Webster University Library is dedicated to supporting the research needs and intellectual pursuits of students throughout the University's worldwide network. Resources include print and electronic books, journal articles, online databases, DVDs and streaming video, CDs and streaming music, datasets, and other specialized information. Services include providing materials at no cost and research help for basic questions to in-depth exploration of resources. The gateway to all of these resources and services is http://library.webster.edu. For support navigating the library's resources, see http://libanswers.webster.edu/ for the many ways to contact library staff.

**Drops and Withdrawals**

Drop and withdrawal policies dictate processes for students who wish to unenroll from a course. Students must take proactive steps to unenroll; informing the instructor is not sufficient, nor is failing to attend. In the early days of the term or semester, students may DROP a course with no notation on their student record. After the DROP deadline, students may WITHDRAW from a course; in the case of a WITHDRAW, a grade of W appears on the student record. After the WITHDRAW deadline, students may not unenroll from a course.

Policies and a calendar of deadlines for DROP and WITHDRAW are at:

- Graduate [http://www.webster.edu/catalog/current/graduate-catalog/enrollment.html](http://www.webster.edu/catalog/current/graduate-catalog/enrollment.html)

**Student Handbook and Other Important Policies**

Student handbook and other non-academic policies may apply to you and may impact your experience in this class. Such policies include the student code of conduct, privacy, technology and communications, and more. Please review the handbook each year and be aware of policies that apply to you. The handbook is available at:


**Sexual Assault, Harassment, and Other Sexual Offenses**

Webster University makes every effort to educate the community to prevent sexual assault, harassment, and other sexual offenses from occurring, and is committed to providing support to those affected when this behavior does occur. To access information and resources or to review the Policy on Sexual Assault, Harassment, and Other Sexual Offenses, visit:

- [http://www.webster.edu/sexual-misconduct/](http://www.webster.edu/sexual-misconduct/)

**Research on Human Subjects**

The Webster University Institutional Review Committee (IRB) is responsible for the review of all research on human subjects. The IRB process applies to all Webster University faculty, staff, and students and must be completed prior to any contact with human subjects. For more information on the IRB, visit:
Course Evaluations

At the end of this course, you will have the opportunity to provide feedback about your experience. Your input is extremely valuable to the university, your instructor, and the department that offers this course. Please provide your honest and thoughtful evaluation, as it helps the university to provide the best experience possible for all of its students.

Important Technology Information

Connections Accounts

Webster University provides all students, faculty, and staff with a University email account through Connections. Students are expected to activate their Connections account and regularly check incoming University email. Students may choose to have their University email forwarded to an alternate email address. Connections account holders can call the Help Desk (314-246-5995 or toll free at 1-866-435-7270) for assistance with this setup. Instructions are also provided on the Information Technology website at:

http://www.webster.edu/technology/service-desk/

WorldClassRoom

WorldClassRoom is Webster's Learning Content Management System (LMS). Your instructor may use WorldClassRoom to deliver important information, to hold class activities, to communicate grades and feedback, and more. WorldClassRoom is available using your Connections ID at:

https://worldclassroom.webster.edu/

Webster Alerts

Webster Alerts is the University's preferred emergency mass notification service, available free to current students, faculty and staff at all US campuses. By registering a valid cell phone number and email address, you will receive urgent campus text, voice mail and email communications. Valuable information concerning a range of incidents affecting you - from weather-related campus closures, class delays and cancellations, to more serious or life-threatening events - are immediately and simultaneously delivered through multiple communication channels. To register for Webster Alerts, visit:

http://www.webster.edu/technology/services/webster-alerts/

Campus Information