

**NET 371**  
**WIRELESS COMMUNICATION NETWORKS**  
Spring Quarter, 2022  
Lewis Center - 1107  
Wednesday Evenings  
5:45 - 9:00

**1. REQUIRED TEXT AND READING:**

Cellular Networks: Design and Operation (A Real World Perspective), Paul Bedell, August 2014. ISBN: 978-1-4787-3208-2. All assignments and exams will include material straight from this book. Powerpoint decks related to each class section in the schedule below are posted and available on D2L.

**2. WEB ACCESS FOR CLASS DOCUMENTATION**

All students will log into the same system to access course materials. Both in-class and distance learning (DL) sections will log in at <http://D2L.depaul.edu>. Students will log in using their Campus Connect ID and password. Information that will be contained here includes assignments, course syllabus, and sometimes supplemental reading.

**3. INSTRUCTOR INFORMATION**

Instructor: Paul Bedell  
DePaul Phone: NA  
Cell Phone: 708-431-7568  
Office Hours: By appointment. Availability nights from 6:00 – 9:00 PM, except Tuesdays.  
E-Mail Addresses: [pbedell@depaul.edu](mailto:pbedell@depaul.edu); [bedell14@sbcglobal.net](mailto:bedell14@sbcglobal.net)

**4. COURSE OBJECTIVES**

- To obtain a comprehensive understanding of cellular / wireless system theory, design, management, and operations.
- The following material will be covered: RF technologies and operations, antenna technologies, cellular network infrastructure, wireless network operation and design, the backhaul network, intercarrier networking, DAS (Distributed Antenna Systems), 3G technologies, 4G / LTE technology, 5G technology, microwave radio systems, capacity management and propagation models, landline interconnection.

## 6. COURSE EVALUATION

40 % (4) Assignments (10% each). Two assignments are take-home quizzes, the other two assignments are Media Reviews.

**NOTE:** Assignments that are submitted after the designated due date will be subject to a **10 %** grading penalty. Assignments that are more than one calendar week late will not be accepted. The Instructor will post all grades on-line.

30 % Midterm Examination

30 % Final Exam

Curves: There is no curving applied to any grading in this course. In this course, your grade is earned.

## 7. GRADING SCALE:

|           |     |
|-----------|-----|
| 93 - 100: | A   |
| 90 - 92:  | A - |
| 87 - 89:  | B + |
| 83 - 86:  | B   |
| 80 - 82:  | B - |
| 77 - 79   | C + |
| 73 - 76   | C   |
| 70 - 72   | C - |
| 67 - 69   | D + |
| 60 - 66   | D   |

## 8. INCOMPLETES

Many incomplete grades are requested, and few are granted. An incomplete grade is given only for an exceptional reason for not completing the course. Any such reason must be fully documented before an incomplete grade can be given. An incomplete request must be approved by the Dean of the School of Computer Science, Telecommunications and Information Systems. In particular, an incomplete grade is not given for any of the following reasons:

- \* "The company won't pay for the course if I get a(n) \_\_\_\_.
- \* "My grade point average will suffer if I get an \_\_\_\_.
- \* It's past the drop date. I'll have to pay for the course if I withdraw now.

It is the student's responsibility to obtain the necessary forms and required signatures. If you are having difficulty with the class material, please discuss your situation with me immediately.

## 9. CELL PHONES AND TEXTING:

As a matter of courtesy to the other students and the Instructor: if you must keep your cell phone on, *please* turn the ringer off or place cell phone on vibrate mode. Also, texting during class is strongly discouraged due to its obvious distraction to the Instructor and other students.

## 10. ACADEMIC INTEGRITY:

Violations of academic integrity, particularly plagiarism, are not tolerated. Plagiarism is defined by the university as:

*“..a major form of academic dishonesty involving the presentation of the work of another as one's own. Plagiarism includes but is not limited to the following:*

- a. The direct copying of any source, such as written and verbal material, computer files, audio disks, video programs or musical scores, whether published or unpublished, in whole or part, without proper acknowledgement that it is someone else's.*
- b. Copying of any source in whole or part with only minor changes in wording or syntax, even with acknowledgement.*
- c. Submitting as one's own work a report, examination paper, computer file, lab report or other assignment that has been prepared by someone else. This includes research papers purchased from any other person or agency.*
- d. The paraphrasing of another's work or ideas without proper acknowledgement.*

*Plagiarism, like other forms of academic dishonesty, is always a serious matter. If an instructor finds that a student has plagiarized, the appropriate penalty is at the instructor's discretion. Actions taken by the instructor do not preclude the college or the university from taking further punitive action including dismissal from the university” (DePaul Student Handbook).*

University policies on academic integrity will be strictly adhered to. Consult the DePaul University Student Handbook (<http://condor.depaul.edu/~handbook/> or <http://condor.depaul.edu/~handbook/code17.html>) for further details.

## 11. PREREQUISITE

The prerequisite for this course is either **NET 261** or **IT 263**. It is assumed that students have completed one of these courses prior to registering for NET 371.

## 12. REGISTRATION

You must be registered for any class you attend at DePaul University. If your name is not on the preprinted roster, you must submit proof of registration to your instructor

within the first two weeks of the quarter. Proof of registration is one of the following documents:

- \* The pink copy of your registration form
- \* The yellow copy of your “add” form
- \* An official confirmation

### 13. WITHDRAWAL POLICY

Standard DePaul Withdrawal policies apply to this course. Policy can be found on Campus Connection; at the Registrar’s Office or at DePaul CDM.

### 14. APPROXIMATE CLASS SCHEDULE

*The topics listed below, per class session, reflect accompanying chapters in the required course text. It’s expected that students will have read the related chapters either before or after each applicable lecture.*

#### Week One

- The Early Years
- The Cell Base Station
- Wireless Operations Design

Date  
**March 30<sup>th</sup>, 2022**

#### Week Two

- Radio Frequency (RF) Technologies and Operations
- Antennas, RF Power and Sectorization

**April 6<sup>th</sup>, 2022**

#### Week Three

- **Assignment #1 Available**
- Antennas, RF Power and Sectorization (Continued)
- Base Station Elements and RF Signal Flow (New and Improved)

**April 13<sup>th</sup>, 2022**

#### Week Four

- **Assignment #1 Due**
- **Media Review # 1 Available (due: 5/11)**
- 3G Technologies
- 4G LTE Technology
- 4.5 G Technology (“LTE + / LTE Advanced”)

**April 20<sup>th</sup>, 2022**

#### Week Five

- **MID-TERM EXAM**
- **No Class Session After Exam**

**April 27<sup>th</sup>, 2022**

Week Six

**May 4<sup>th</sup>, 2022**

- 5G Technology
- Microwave Radio Systems
- The Backhaul Network

Week Seven

**May 11<sup>th</sup>, 2022**

- **Media Review # 1 Due (Hardware)**
- The Backhaul Network (Continued)
- The MTSO, Core Network and Network Operations Center (NOC)

Week Eight

**May 18<sup>th</sup>, 2022**

- Towers
- Capacity Management, Propagation Models and Drive Testing
- **Assignment #2 Available**
- **Media Review # 2 Available (due: June 1<sup>st</sup>)**

Week Nine

**May 25<sup>th</sup>, 2022**

- \* Interconnection to the Landline PSTN
- Roaming and Inter-carrier Networking
- **Assignment #2 Due**

Week Ten

**June 1<sup>st</sup>, 2022**

- **Media Review # 2 Due (Services or Technology)**
- Guest Speaker: Ric Biederwolf, Vertical Bridge (Digital Colony Group) – Site and Tower Construction

Week Eleven

**June 8<sup>th</sup>, 2022**

- **FINAL Exam**
- No Class Session