

# Wireless Ad Hoc Networks

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## Course Information

Hung-Yun Hsieh  
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# Registration Information

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## ■ Course information

- Title: Wireless Ad Hoc Networks (無線隨意網路)
- Code number: 942 U0290 (第一類加選方式)
- Time: Tuesday 2:20pm ~ 5:20pm
- Place: Room 146, EE-II Building

## ■ Instructor

- Prof. Hung-Yun Hsieh <hyhsieh@cc.ee.ntu.edu.tw>
- Office: Room 546, EE-II Building
- Office hours: By appointment
- Phone: 02-33663666

# Course Scope

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- Wireless ad hoc networks
  - A particular type of wireless networks that do not need any infrastructure support to operate
  - ☞ Wireless multi-hop networks based on peer-to-peer communication
  - ☞ Wireless last-hop networks relying on direct communication with access points (or base stations)
  - Found applications in many areas
    - Wireless mesh network (WMN)
    - Wireless sensor network (WSN)
    - Mobile ad hoc network (MANET)
    - Vehicular ad hoc network (VANET)
    - Wireless personal/body area network (WPAN/WBAN)
    - ...

# Course Objective

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## ■ Objective

- The goal is to introduce students to fundamental disciplines and network protocol designs for multi-hop wireless networks
- ☞ Orthogonal to wireless access networks (e.g. cellular network, WLAN, and WMAN)
  - Familiarity with wireless access network technologies is helpful but not required

## ■ Prerequisites

- Introduction to computer networks, or
- Computer communication networks

# Syllabus

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- Selected topics on wireless multi-hop networking
  - Wireless link model
  - Mobility model
  - Network simulation
  - Medium access control protocol
  - Routing protocol
  - Transport protocol
  - Cross-layer optimization
  - ...

# Course Materials

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- No textbooks
  - Selected chapters from several books in wireless ad hoc networking
  - Selected articles from IEEE/ACM journals, magazines, and conference proceedings
  - ☞ An active research area in wireless networking
  
- Course materials
  - Fundamental disciplines
    - Lecture
  - State-of-the-art technologies
    - Topic presentation

# Not Just Theories

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- Network simulation
  - A valuable pedagogy for courses in networking
  - An in-depth understanding of the concept, design, operation, and performance of networks and protocols
- NS-2
  - *The* network simulator to use for research in networking
  - Supported by a large community (DARPA, NSF, LBL, ICIR, PARC, Berkeley, USC/ISI, CMU, Sun, ...)
  - Open source that runs on Windows and Linux/MacOS
  - ☞ Use of NS-2 is an integral part of this course
    - Homework assignments and term projects
    - Background in NS-2 is not a must

# Grading

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- Midterm exam (30%)
  - Essays, multiple choices, and/or gap fills
  - In class, closed notes
- Topic presentation (10%)
  - Group presentation, or
  - Paper review
- Homework assignments (40%)
  - Hands-on exercises
  - Essays
- Term project (20%)
  - Proposal, presentation, and final report

# Course Administration

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## ■ Teamwork

- Two students in a group
- Homework assignments and student presentations: per group
- ☞ Term project: it is possible for collaboration of at most 2 groups

## ■ Submission

- Homework
- Presentation slides
- Project proposal, presentation slides, and final report
- ☞ All submissions must be in English

# Course Web Page

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- Course portal  
<http://cc.ee.ntu.edu.tw/~hyhsieh/teaching/adhoc09s>
- Announcement
  - Exam and grades
- Syllabus and course materials
  - Lecture slides
  - Reading and supplementary papers
- Homework assignments
- All submissions
- 👉 No cheating
  - Plagiarism and hacking