

# EE401: Advanced Communication Theory

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Topics & Course Information

# Topics

- ➊ **Introduction**
- ➋ **Principles of M-ary Decision & Detection Theory**
- ➌ **Principles of Diversity Theory**
- ➍ **Multi-Antenna Wireless Communications:**
  - ➊ **An Introductory Overview**
  - ➋ **SIMO,MISO,MIMO**
  - ➌ **Array Receivers for SIMO and MIMO**
    - ★ Detection Problem
    - ★ Estimation Problem
    - ★ Reception Problem
  - ➍ **Massive Systems (maMI and maSI)**
  - ➎ **mm-Wave Communications**
  - ➏ **Spatiotemporal Wireless Communications**
  - ➐ **5G**

# Useful Connections

- Professor Manikas:  
<http://skynet.ee.imperial.ac.uk/manikas.html>
- Lecture Notes:  
<http://skynet.ee.imperial.ac.uk/notes/notes.html>
- Following course on Twitter:  
[@amanikas](#)
- Blackboard:  
<https://bb.imperial.ac.uk>
- Panopto (video recordings of the Lectures):  
<https://imperial.cloud.panopto.eu>  
directory: [EE4-01 17-18](#)

# Coursework


- The coursework is **compulsory** and is a software based assignment (various system designs) using MATLAB.
- **Important Notes:**
  - 1 **Past Examination Papers** are **not** available for this course.
  - 2 More than 10 representative **problems** and their solutions are available to support the topic "Decision and Detection Theory".
  - 3 More than 30 **MCQ** support the topics "Diversity" and "Multiple-Antenna Wireless Comms".


# Course Academic Weeks & Deadlines

- Table-2 shows the Autumn Term academic weeks (A1-A11) and the deadlines of the various parts of the coursework

Table-2			
Academic Weeks - Autumn Term			Comments
Week-A1	2 Oct. 2017	8 Oct. 2017	
Week-A2	9 Oct. 2017	15 Oct. 2017	
Week-A3	16 Oct. 2017	22 Oct. 2017	
Week-A4	23 Oct. 2017	29 Oct. 2017	
Week-A5	30 Oct. 2017	5 Nov. 2017	Test-1 Deadline: Friday at 5:30pm
Week-A6	6 Nov. 2017	12 Nov. 2017	
Week-A7	13 Nov. 2017	19 Nov. 2017	Test-2 Deadline: Friday at 5:30pm
Week-A8	20 Nov. 2017	26 Nov. 2017	
Week-A9	27 Nov. 2017	3 Dec. 2017	Test-3 Deadline: Friday at 5:30pm
Week-A10	4 Dec. 2017	10 Dec. 2017	Lectures have moved to other weeks
Week-A11	11 Dec. 2017	17 Dec. 2017	Formal Coursework Deadline: Friday at 5:30pm

# Books and Other References

 D. Tse, P. Viswanath,  
"Fundamentals of Wireless Communication",  
Cambridge University Press, 2005.

 A. Manikas,  
"Differential Geometry in Array Processing",  
Imperial College Press, 2004.

 A. Manikas,  
"Interference Cancellation Techniques Experiment",  
<http://skynet.ee.ic.ac.uk/am1.zip>