COMPUTER NETWORKS CS 348 (Theory) and CS 315 (Lab)

Tamal Das
CSE, IIT Dharwad

TWO-STEP RITUAL

before every class

Mobiles/Tablets/Laptops/.. turned off

Class begins at pin-drop silence

WHAT WOULD **<u>YOU</u>** LIKE TO LEARN IN THIS COURSE?

WHY THIS COURSE?

(apart from being a core course!)

No one can avoid networks these days

Might as well make the best of it

By understanding its workings behind-the-scenes

Takes you from a network user to a network designer/developer

LEARNING OUTCOMES

To be able to use OS-based computer networking commands

To be able to diagnose computer networking issues
 Analytically as well as empirically

To be able to develop computer network applications

(No, you may not become the next world-class hacker)

COURSE CONTENT

Theory

Design of Computer Networking protocols at all layers

- transmission media, data link protocols, media access control, routing and congestion control, admission control, traffic shaping and policing, Internet working (IP) and transport layer protocols (TCP)

Performance analysis of networks

Lab

Experiments to support study of the Internet protocol stack:

- Experimental study of application protocols such as HTTP, FTP, SMTP, using network packet sniffers and analyzers such as Ethereal. Small exercises in socket programming in C/C++/Java.

- Experiments with packet sniffers to study the TCP protocol. Using OS (netstat, etc) tools to understand TCP protocol FSM, retransmission timer behavior, congestion control behaviour.

- Introduction to ns2 (network simulator) - small simulation exercises to study TCP behavior under different scenarios.

- Setting up a small IP network - configure interfaces, IP addresses and routing protocols to set up a small IP network. Study dynamic behaviour using packet sniffers.

- Experiments with ns2 to study behaviour (especially performance of) link layer protocols such as Ethernet and 802.11 wireless LAN.

BOOKS

Textbook

☐ Computer Networking: a Top Down Approach (8th Ed.), Jim Kurose and Keith Ross

☐ https://gaia.cs.umass.edu/kurose_ross

Reference books

☐ Computer Networks: A Systems Approach, Bruce S. Davie and Larry L. Peterson

☐ Computer Networks, Andrew S. Tanenbaum and David J. Wetherall

ADMINISTRATIVE ASPECTS

Credit Structure (L-T-P-C)

- Theory: 3-0-0-6
- Lab: 0-0-3-3

Contact hours

- Theory
  - A1: 08:30 AM – 09:20 AM (Mondays)
  - A2: 09:30 AM – 10:20 AM (Wednesdays)
  - A3: 10:30 AM – 11:20 AM (Fridays)
- Lab
  - L1, L2: 3:20 PM – 5:55 PM (Tuesdays)

Google Classroom

- Class code: ke7eofj

Attendance

- 80% requirement to appear for end-sem
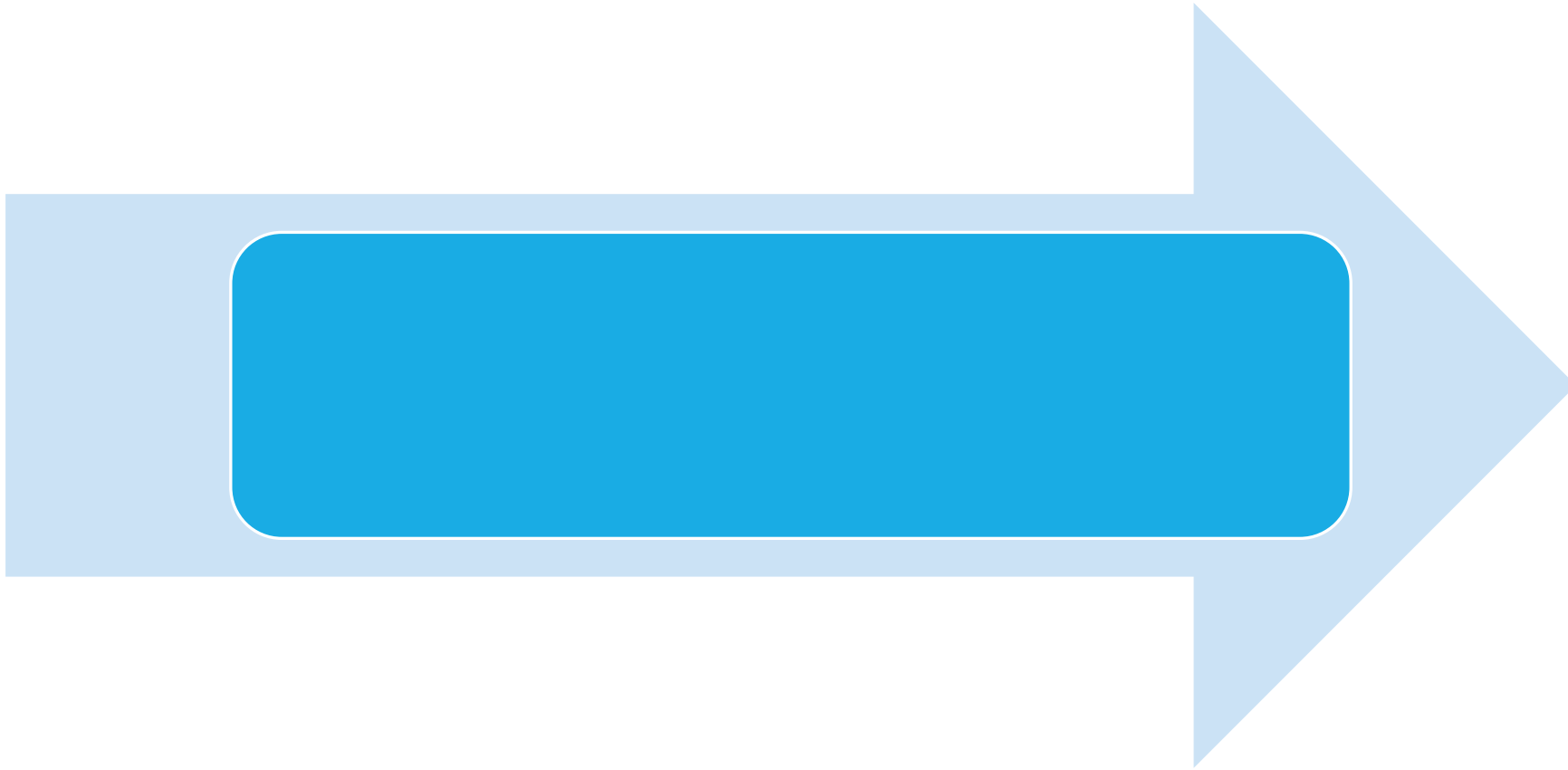
Instructor

- Tamal Das (tamal@iitdh.ac.in)

Teaching Assistants

- Aditya Kulkarni (222011001@iitdh.ac.in)
- Ashit Subudhi (212011002@iitdh.ac.in)

Lecture feedback (Anonymous)

- https://forms.gle/veoUaHCwE4DG9LRq5

ATTENDANCE POLICY

COURSE POLICIES

## Evaluation weightage

- Theory
  - Mid-sem (30%)
  - End-sem (50%)
  - Assignments (20%)
- Lab
  - Weekly assignments (30%)
  - Mid-sem (30%)
  - End-sem (40%)

Plagiarism policy

- You can discuss, but cannot copy
- Source from internet is copy
- Will be reported to DAC
- Late submissions will be disqualified
- Strict enforcement as per academic malpractice guidelines

LIFE OF A PACKET

https://www.youtube.com/watch?v=9BGWrLiT9qs
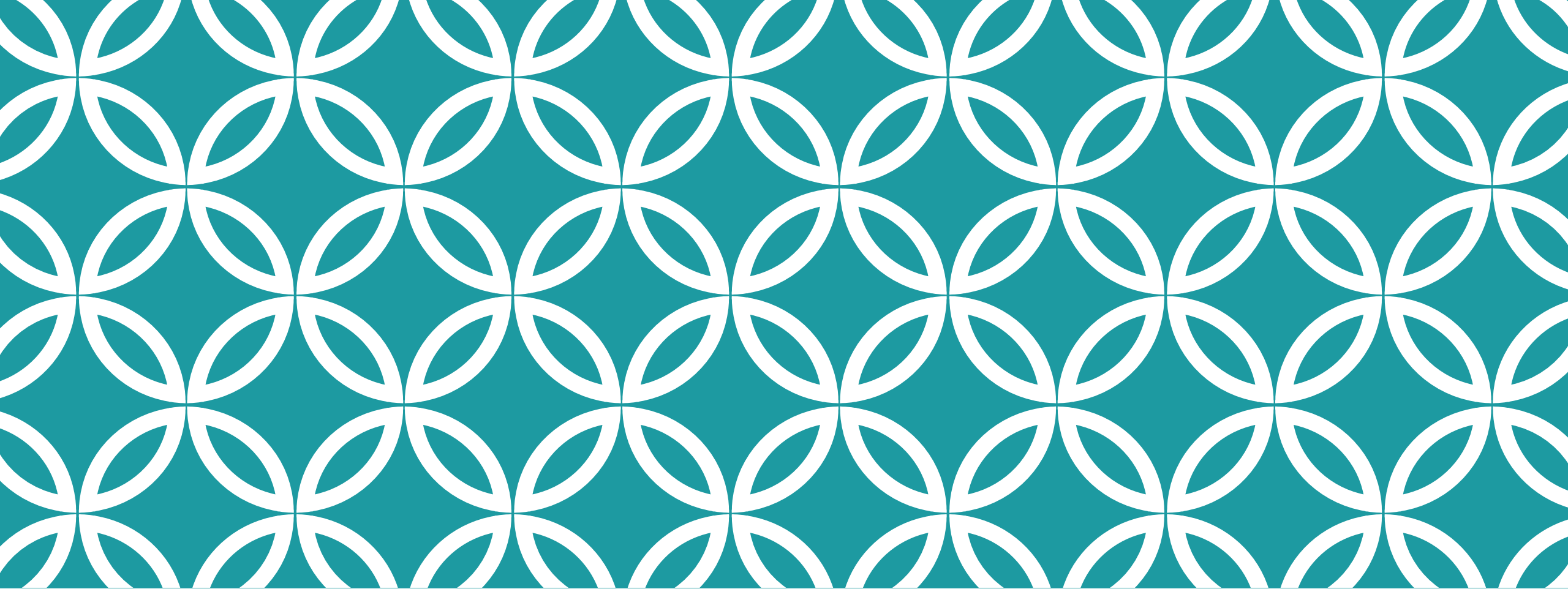
THANK YOU

Communication channels
- [Google classroom](#)
- [Lecture feedback](#) (anonymous)