CS224+252: Computer Networks

Course Overview & Logistics

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(Course website: bodhitree1.cse.iitb.ac.in)

Questions ???

- Computer networks, what is it ?
- Why should I study it?

Course Contents

Topic No:	Topic Description
1	Course overview and introduction to networks
2	Goals; OSI Protocol Stack (Layering)
3	PHY layer: Theory (Shannon's theorem), Encoding schemes: NRZ, NRZI, Manchester, 4B/5B
4	Link Layer: Framing, Error control, Reliable data transfer, MAC protocols, Ethernet, Switching

Course Contents (continued)

5	Network Layer: Inside a router, IP addressing and forwarding, Routing Protocols (Distance Vector, Link State, BGP), Supporting protocols (ICMP, ARP)
6	Transport Layer: Udp, TCP
7	Application Layer: DNS, Email, Web, Peer-2-Peer File transfer

Additional References

- Computer Networks: A Systems Approach; 4th edition by Larry L. Peterson and Bruce S. Davie
- Computer Networking: A Top-Down Approach; 5th edition by James. F. Kurose and keith W. Ross
- Computer Networks; 4th edition by Andrew S. Tanenbaum

CS 224

- Open for **CSE 2nd year UG** students
  - All others need permission (email me by tomorrow)
- CS224m is open for other department students

CS 252

- Lab course: Practical implementation/simulation of concepts learnt in CS 224
  - Hands-on feel for computer networks
- 3 hour lab each week in OSL, thu 2-5pm
  - Can have off-lab projects as well
  - Unless otherwise specified, lab work to be done in groups of 2 (so pair up)

Pre-Requisites

- Sincere, hard-working: committed learning
- Time management: methodical learning
- Social (discussion & participation): group learning
- Straightforward, honest: ethical learning
  - Cheating will be reported to DDAC
- A bit of humor, wit will liven the classroom

Ideal Classroom

Course Model

- Flipped Classroom
  - http://en.wikipedia.org/wiki/Flip_teaching

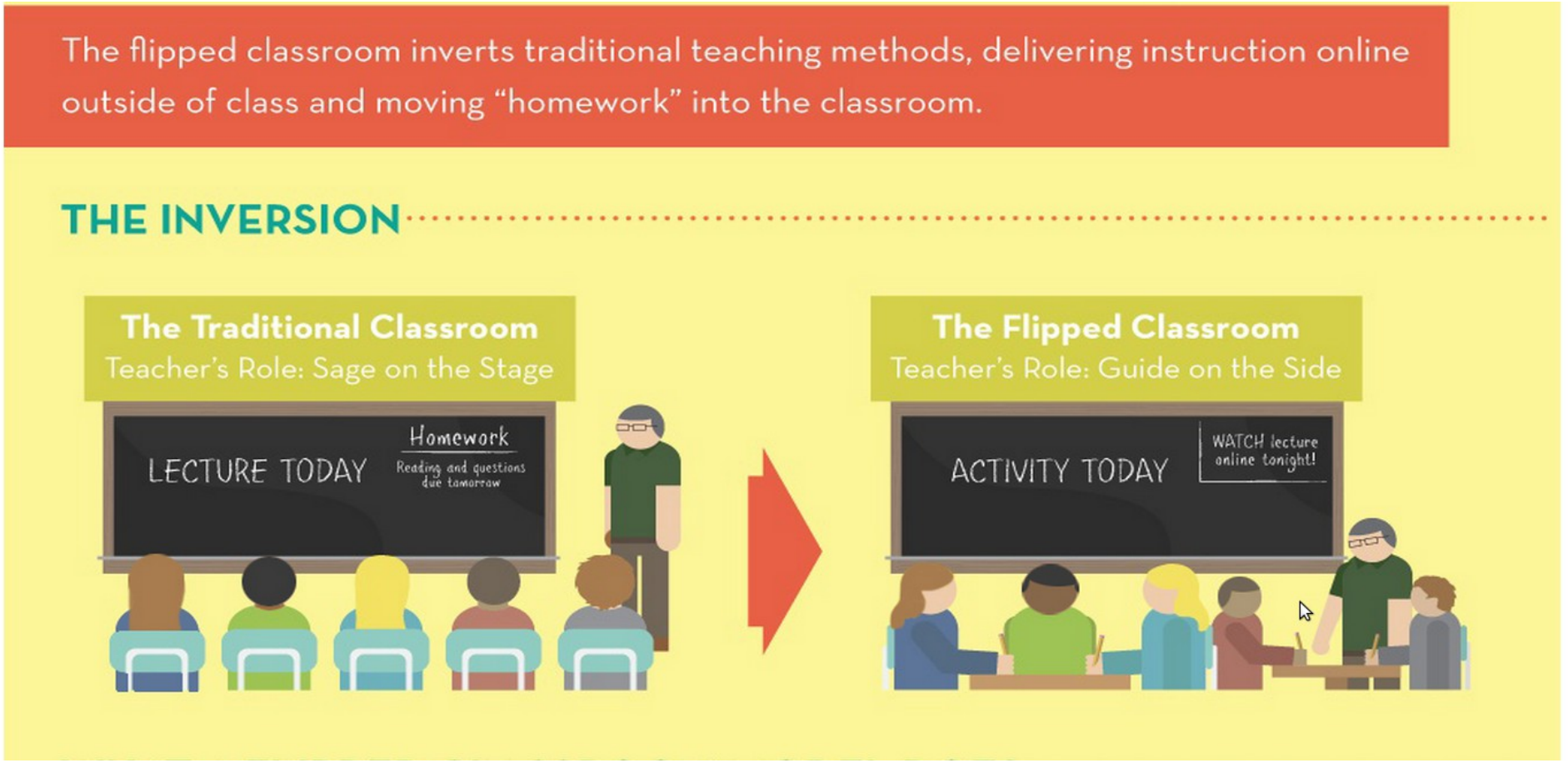


Fig. From http://www.knewton.com/flipped-classroom/

Online Content: Video

Concepts packed as modules to watch at own pace

- Video based (ppt & blackboard)
  - Typically 10-20 min
- Interactive with embed questions
  - Pause, think, understand, answer
- Total watching time: 1.30 to 2 hrs per week
- All reference material provided including slides

- You choose your own
  - Time
  - Place
  - Group
  - Pace

Online Content: Practice Problems

- Concepts and grouped concepts have associated practice problems
  - Work at your own pace and time
- Problems: Multiple choice, Fill-In-Blanks and Descriptive
  - First two are scored online (not for grades, but for your own record)
  - Can potentially cheat but defeats purpose of learning

Tutorial

- Sessions in small groups of 35 (3 groups)
- A group meets once a week for 50 min
  - Slot 2 timings for the 3 groups
- **Simple Quiz** every tutorial for first 10 min (accounts for 10% grade)
  - Will experiment with SAFE (android app)
- Discussions, Clarifications, Q&A session, Practice problems
- **Compulsory Attendance**

Quiz

- Periodic Review Quiz (weightage 40% of grade)
  - Keeps you on top of things
- Fixed slot for entire sem wed/fri @ 8.30am (slot 7) or slot 2

Learning

Personalized

- Instructor talking just to you :)
- **ALL** get to answer questions without fear of embarassment
- Focused small group tutorials

Flexible

- Your choice of time, place, group
- Your pace:

  Take as much time to view or solve questions
- No procrastination due to periodic quizes

Complete

- Each concept is complete: video, slides, reference material, practice problems
- Interspersed watching and study time
- Move ahead after mastering concept

Comparison

Traditional Model	Flipped Model
• Fixed Timing/place	• Flexible timing/place
• Focus ?	• Focus?
• Watch once	• **Watch many times**
• Instructor pace	• **Student pace**
• Few questions	• **Many questions**
• Target few students	• **Target all students**
• **Immediate feedback**	• No immediate feedback

Cons

- No immediate feedback
- Compensated by Discussion Forum
  - Post questions, get answers from friends,TAs or Instructor
  - Can email instructor also if urgent
- Designate slot 7 every week for watching; I will be around to help out

CS 224: Evaluation Plan

Quizzes	50%
MidSem	20%
EndSem	30%

CS 252: Evaluation Plan

- Labs (includes projects): 60%
- Periodic Exams: 40%

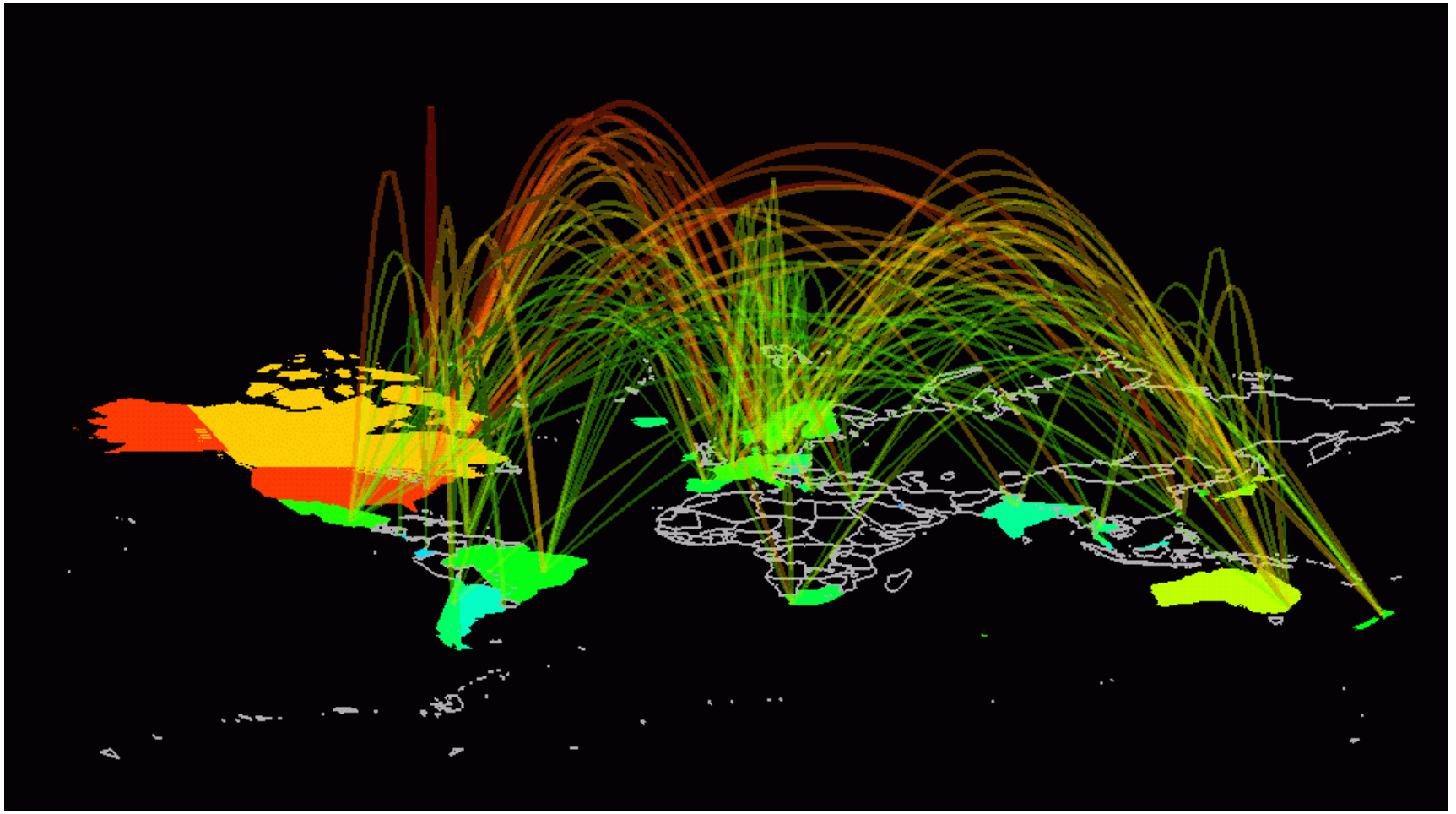
Walk Through

- Content: Kameswari
- Web Page Development: A whole lot of your seniors
- Ongoing work: Many seniors involved
- Overall Goal: Open it up for every student in India
  - Sincerely request your co-operation and **help**
- **Feedback most appreciated**

Action Items (Next Week)

- **Signup** (I will email you) and watch the videos at http://10.129.1.153 or http://bodhitree1.cse.iitb.ac.in
  - Will need to bypass proxy
  - Look at the wiki for the schedule of videos to watch for the week
  - Don't take it easy: Tutorials starting Jan 11th ; upcoming quiz Jan22nd or the following week; First Lab on 14th Jan
- Job of CR?
  - List of students per tutorial group (android phone preference)

Enter the World of Communication Networks



Picture of the Internet, from the Internet