INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

# CSN-101 (Introduction to Computer Science and Engineering)

## *Introduction*

**Dr. Sudip Roy**

*Assistant Professor*

*Department of Computer Science and Engineering*

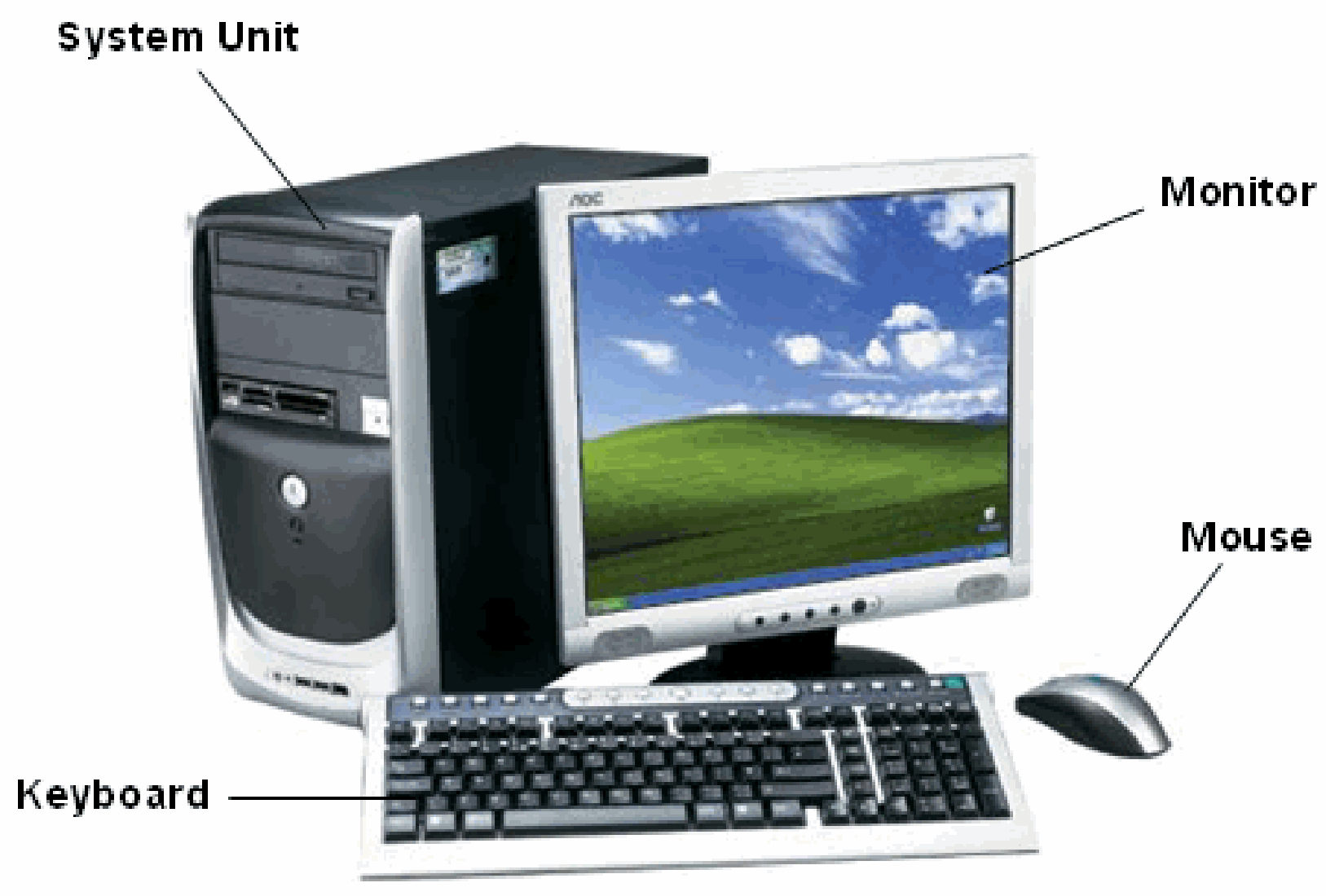
Piazza Class Room: https://piazza.com/iitr.ac.in/fall2019/csn101

[Access Code: csn101@2019]

Moodle Submission Site: https://moodle.iitr.ac.in/course/view.php?id=45

[Enrollment Key: csn101@2019]

# A Computer:



# About Myself:


## Sudip Roy

Assistant Professor
Department of Computer Science and Engineering
Indian Institute of Technology (IIT) Roorkee
Roorkee 247667, Uttarakhand, India

[**Brief Bio**]

- Home
- Teaching
- My Group
- Publications
- Projects
- Activities
- For Prospective Students
- Contact

**Area of Interests:** Electronic Design Automation and Embedded System Design, Algorithm Design and Optimization Techniques, Microfluidic Biochips, CAD for VLSI, Cyber-Physical and IoT-based System Design, ICT for Disaster Management, Applications of Machine Learning

My research group works on computer-aided-design (CAD) techniques towards development of CAD tools for automation of electronic systems. Please visit my research group web-page: **Computing and Design Automation (CoDA) Laboratory Research Group**.

**Announcements:**

Last updated on Friday, July 5, 2019 at 09:24:19 AM Indian Standard Time (IST)

# Course Information:

- This is a course of Two (2) credits.
- It consists of Two (2) lecture hours per week.

- The basic thrust of the course would be to familiarize the students with the discipline of Computer Science and Engineering.
- We will try to stick to the basic course outline as given in Syllabus, but may deviate a bit.

- **Prerequisite:** Nil.
- **Performance Evaluation:** Class Work Sessional (CWS) = 15%, Mid-Term Exam (MTE) = 35%, End-Term Exam (ETE) = 50%.
- **CWS** (15% marks) will be computed by a weighted sum of different components.

- **Lecture Class Timings:**
  Mondays: 4 - 5 pm, Fridays: 5 - 6 pm
  Lecture Venue: **LHC-005**

# Acknowledgement to My Teaching Assistants:


- Ms. Sumit Sharma (PhD Student)
- Mr. Debraj Kundu (PhD Student)
- Mr. Bhupender singh (MTech II Year Student)
- Mr. Jitendra Giri Goswami (MTech II Year Student)

# Syllabus:

- Given in the website:

| S. No. | Contents | Contact Hours |
|---|---|---|
| 1. | Evolution of Computer Hardware and Moore's Law | 2 |
| 2. | Problem solving using Computers; Flow charting technique and writing algorithms | 6 |
| 3. | Introduction to Computer Structure: CPU, 8085 Assembly Language. | 8 |
| 4. | Basics of Computer Networks, Client Server Computing, Web Technology. | 6 |
| 5. | Emerging trends and applications of Computers Science and Engineering, impact of Computer in Science and Engineering. | 6 |
| | Total | 28 |

- However, we will deviate a bit whenever necessary

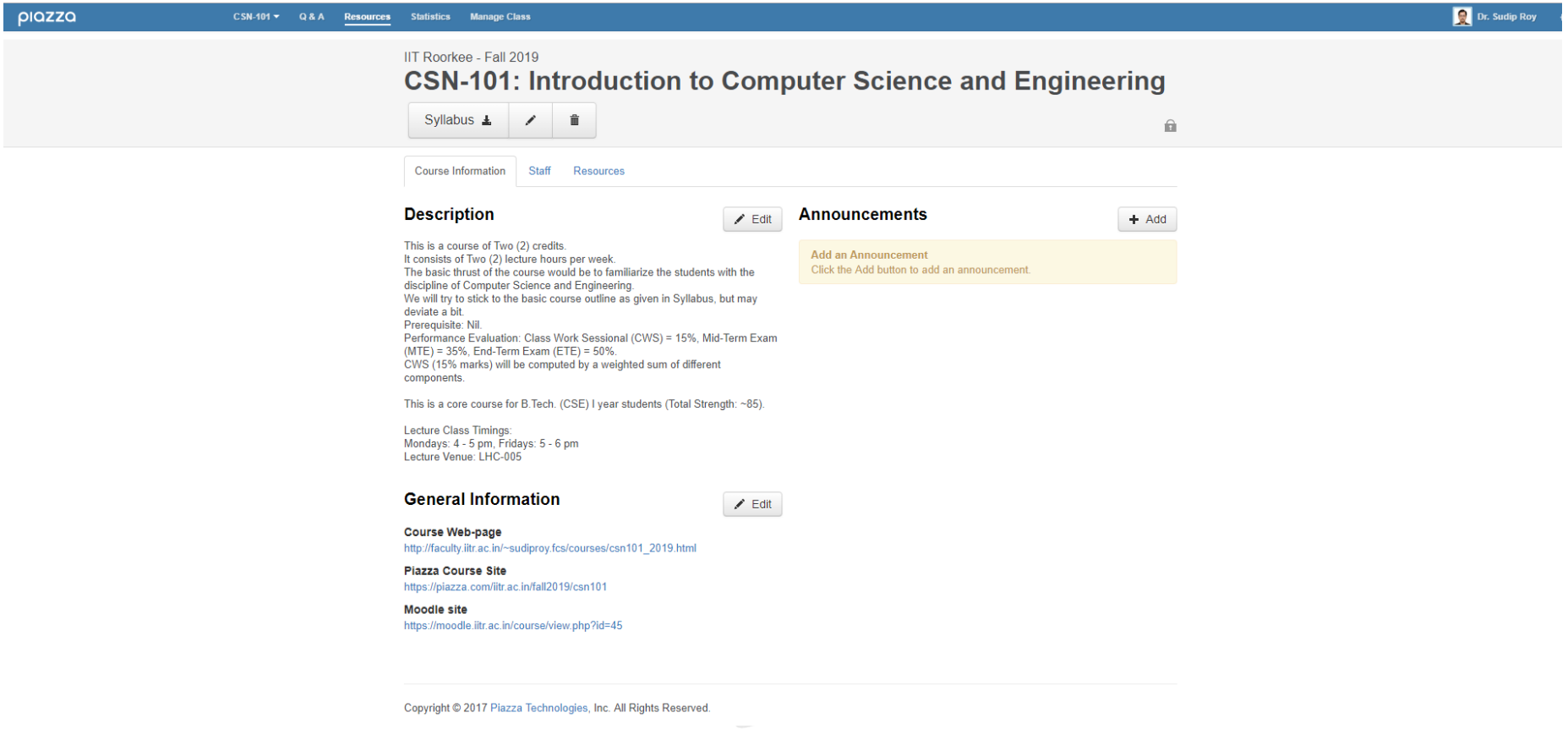
# Plan for Lecture Classes in CSN-101 (Autumn, 2019-2020)

| Week | Lecture 1 (Monday 4-5 PM) | Lecture 2 (Friday 5-6 PM) |
|---|---|---|
| 1 | Evolution of Computer Hardware and Moore's Law, Software and Hardware in a Computer | Computer Structure and Components, Operating Systems |
| 2 | Computer Hardware: Block Diagrams, List of Components | Computer Hardware: List of Components, Working Principles in Brief, Organization of a Computer System |
| 3 | Linux OS | Linux OS |
| 4 | Writing Pseudo-codes for Algorithms to Solve Computational Problems | Writing Pseudo-codes for Algorithms to Solve Computational Problems |
| 5 | Sorting Algorithms – Bubble sort, selection sort, and Search Algorithms | Sorting Algorithms – Bubble sort, selection sort, and Search Algorithms |
| 6 | C Programming | C Programming |
| 7 | Number Systems: Binary, Octal, Hexadecimal, Conversions among them | Number Systems: Binary, Octal, Hexadecimal, Conversions among them |
| 8 | Number Systems: Negative number representation, Fractional (Real) number representation | Boolean Logic: Boolean Logic Basics, De Morgan's Theorem, Logic Gates: AND, OR, NOT, NOR, NAND, XOR, XNOR, Truth-tables |
| 9 | Computer Networking and Web Technologies: Basic concepts of networking, bandwidth, throughput | Computer Networking and Web Technologies: Basic concepts of networking, bandwidth, throughput |
| 10 | Different layers of networking, Network components, Type of networks | Network topologies, MAC, IP Addresses, DNS, URL |
| 11 | Different fields of CSE: Computer Architecture and Chip Design | Different fields of CSE: Data Structures, Algorithms and Programming Languages |
| 12 | Different fields of CSE: Database management | Different fields of CSE: Operating systems and System softwares |
| 13 | Different fields of CSE: Computer Networking, HPCs, Web technologies | Different Applications of CSE: Image Processing, CV, ML, DL |
| 14 | Different Applications of CSE: Data mining, Computaional Geometry, Cryptography, Information Security | Different Applications of CSE: Cyber-physical systems and IoTs |

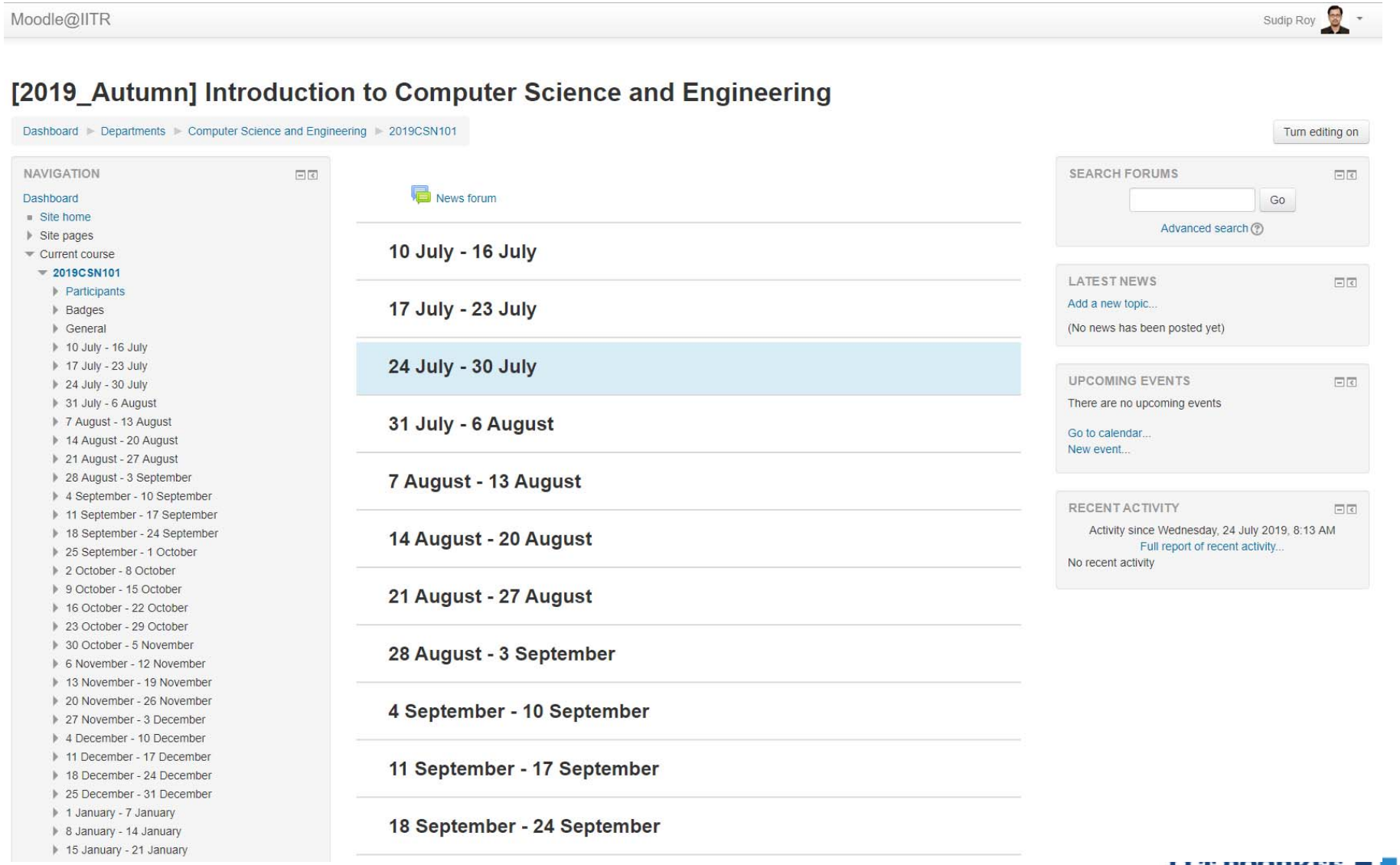
# Online Course Management:

- Course Website: http://faculty.iitr.ac.in/~sudiproy.fcs/courses/csn101_2019.html
- Piazza Class Room: https://piazza.com/iitr.ac.in/fall2019/csn101 [Access Code: csn101@2019]
- Moodle Submission Site: https://moodle.iitr.ac.in/course/view.php?id=45 [Enrollment Key: csn101@2019]

# Piazza Classroom site:

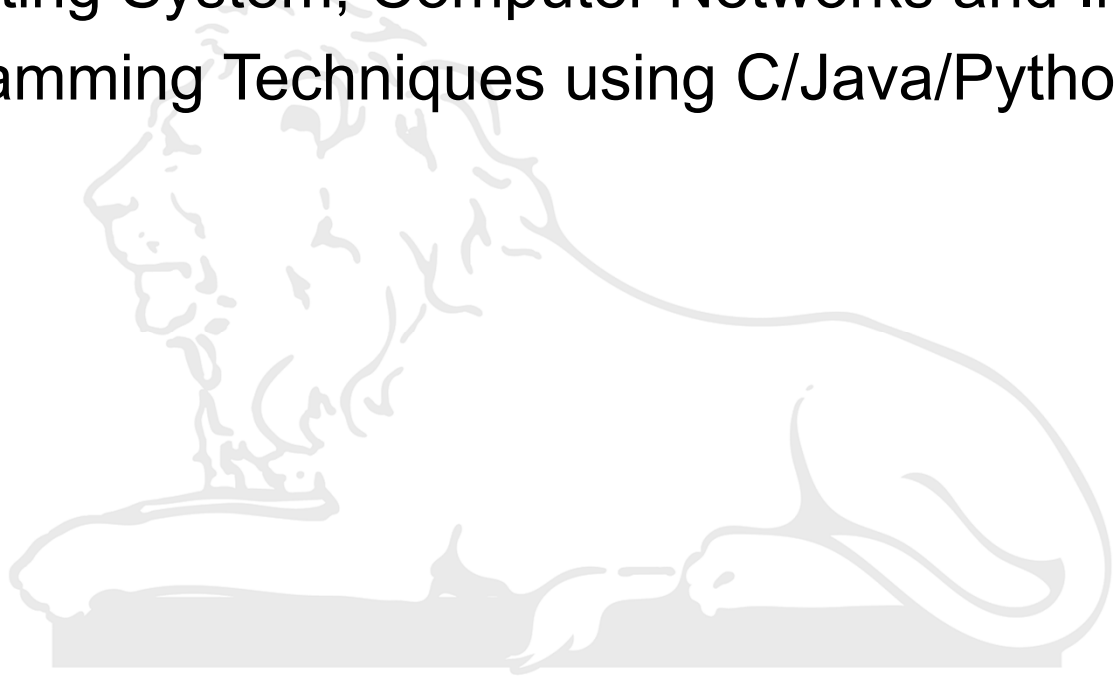


# Moodle site:


Moodle@IITR
Sudip Roy
[2019_Autumn] Introduction to Computer Science and Engineering
Dashboard ► Departments ► Computer Science and Engineering ► 2019CSN101
Turn editing on
NAVIGATION
Dashboard
Site home
Site pages
Current course
2019CSN101
Participants
Badges
General
10 July - 16 July
17 July - 23 July
24 July - 30 July
31 July - 6 August
7 August - 13 August
14 August - 20 August
21 August - 27 August
28 August - 3 September
4 September - 10 September
11 September - 17 September
18 September - 24 September
25 September - 1 October
2 October - 8 October
9 October - 15 October
16 October - 22 October
23 October - 29 October
30 October - 5 November
6 November - 12 November
13 November - 19 November
20 November - 26 November
27 November - 3 December
4 December - 10 December
11 December - 17 December
18 December - 24 December
25 December - 31 December
1 January - 7 January
8 January - 14 January
15 January - 21 January
News forum
10 July - 16 July
17 July - 23 July
24 July - 30 July
31 July - 6 August
7 August - 13 August
14 August - 20 August
21 August - 27 August
28 August - 3 September
4 September - 10 September
11 September - 17 September
18 September - 24 September
SEARCH FORUMS
Go
Advanced search
LATEST NEWS
Add a new topic...
(No news has been posted yet)
UPCOMING EVENTS
There are no upcoming events
Go to calendar...
New event...
RECENT ACTIVITY
Activity since Wednesday, 24 July 2019, 8:13 AM
Full report of recent activity...
No recent activity

# Course Content

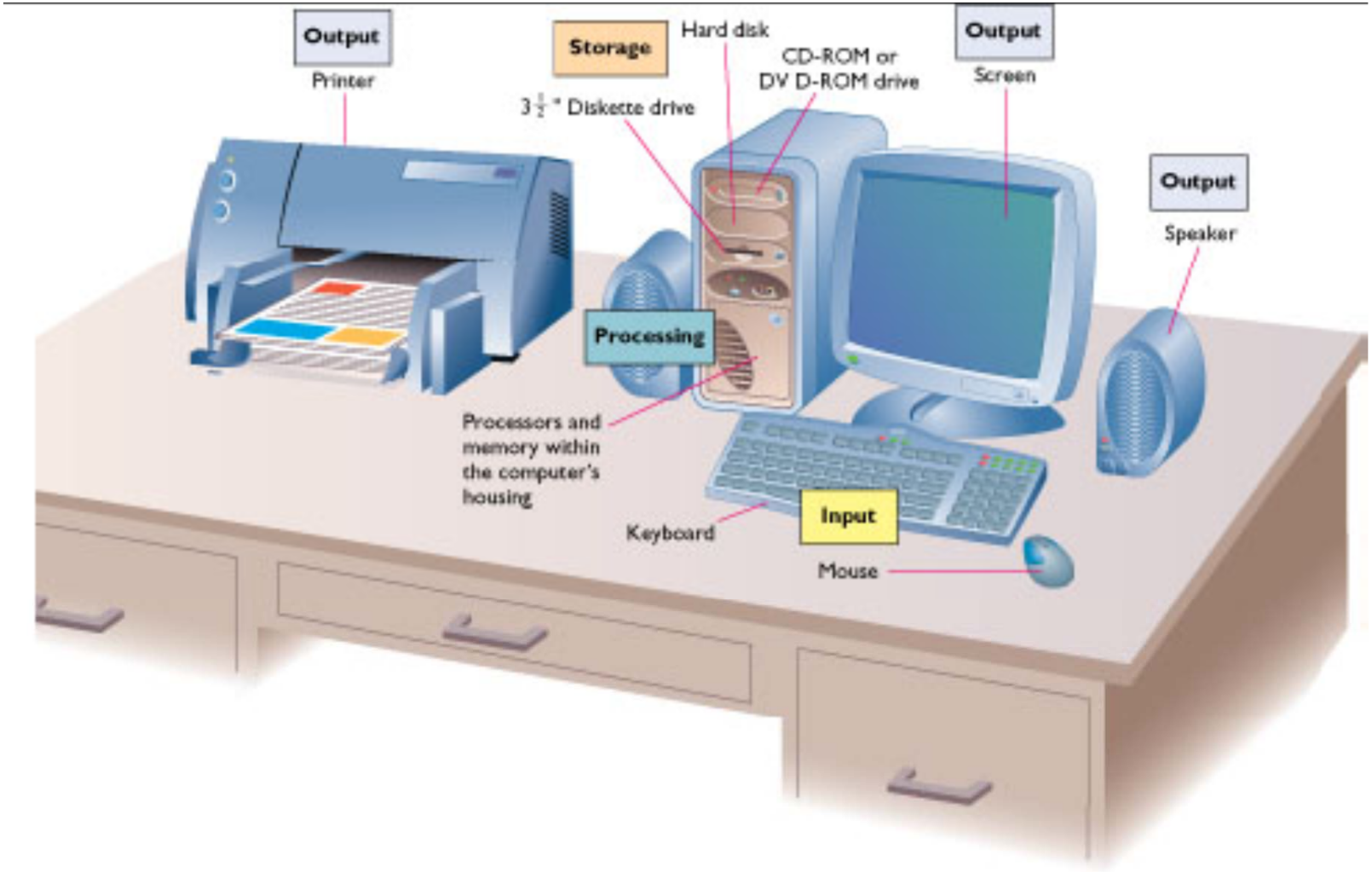
- The course is divided into two parts
  - Introduction to Computer Hardware & Software, Operating System, Computer Networks and Internet.
  - Programming Techniques using C/Java/Python



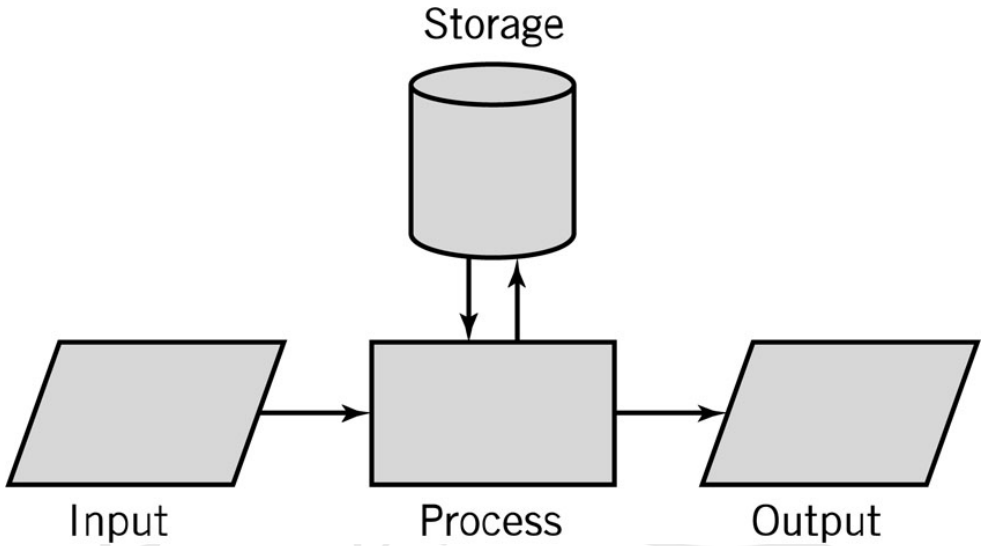
# Lab Topics

- There will be three Lab sessions
  - Working in Windows Environment
  - Working in Linux Environment
  - Network and Internet
  - C Programming
  - Embedded Systems and IoT

# Today's Computer



# Computer Model




- Input: keyboard, mouse, scanner, punch cards
- Processing: CPU executes the computer program
- Output: monitor, printer, fax machine
- Storage: hard drive, optical media, diskettes, magnetic tape

# Continued to Next Class…