LABORATORY FACILITIES

The department has well-developed infrastructure facilities. There are specific laboratories for syllabus based that includes the following apart from project based laboratories.

Object Oriented Lab
DBMS Lab
Multimedia Lab
Operating Systems Lab
Case tools Lab
Software Development Lab
Free and Open source Lab
Grid Computing Lab
Web Technology Lab
Software Testing Lab
Data Structures Lab

- OBJECT ORIENTED LAB

1. This lab emphasizes on the regular curriculum materials as well as some advanced real-life applications implemented as practicals. These practicals, written in the spirit of learning by doing, are designed to give students a working knowledge of the Java, C++, C#, Python, PHP, Ruby, Perl, as part of Object design for further coding.

2.To design and strengthen problem solving ability by using the characteristics of an object-oriented approach.

3.To handle exceptions and debugging practices of complex programming paradigms like object orientation amalgamated with functional approach.

4.The conceptual model, drawing a object, class and deployment diagrams using standard notations improves the students understanding of object oriented concepts embedded in set of exercises which in-turn eases the student effort in translating the class diagram into program code by following the syntax.

6.,NetBeans,Software Turbo C,IBM Rational Rose in each individual system with high speed internet connectivity,

7. The design process is typically split into distinct phases: Object-Oriented Analysis (OOA) and Object Oriented Design (OOD) and Design Pattern

8. Importance to real time practical aspects& conceptual visualization examples are provided and solved. Faculty members are also advised that covering these aspects in initial stage itself, will relieve them in future as much of the load will be taken care by the enthusiastic energies of the students once they are conceptually clear

- DBMS LAB

1. Enhanced Ability to use databases for building real time web applications.

2.Gaining thorough knowledge about the internals of a database system and extensive hands .

3.Advanced Concepts like Advanced SQL,ER Modeling,Database Design and Normalization,Accessing Databases from Programs using JDBC,Building Web Applications using PHP & MySQL,Indexing and Query Processing,Query Evaluation Plans,Concurrency and Transactions,Big Data Analytics using Hadoop are covered

4.Interface database with advanced front end tools

5.Requirement of modern day an automated system that manages, modifies and updates data accurately by using various softwares such as SQL, ORACLE, and MS – Access etc

6. Applications of Computing Domain & Research: Able to use the professional, managerial, interdisciplinary skill set, and domain specific tools in development processes, identify the research gaps, and provide innovative solutions to them.

7. Designing database schema for a given application and apply normalization and Developing solutions for database applications using procedures,cursors and triggers

8. All systems are configured in DUAL BOOT mode i.e., Students can boot from Windows XP or Linux as per their lab requirement. This is very useful for students because they are familiar with different Operating Systems so that they can execute their programs in different programming environments.

- MULTIMEDIA LAB

1. Software's: Fedora OS, Ubuntu OS, Java, gcc, Python, OpenGL, Modelio, QT
Hardware: Laser Printer, Web camera, Audio System, Projector, Online UPS

2.Coupled with high-speed and mobile networks, Multimedia Computer Systems have opened a wide spectrum of applications by combining a variety of information sources, such as text, voice, graphics, 3-d animation, images, audio, and video.

3.devoting our research efforts in advancing the key fields in multimedia, including multi-perspective computer vision, compressive sensing/ sparse representation, video forensics, etc. In what follows, we shall describe in details some key fields.

4.new and rich media types such as haptic, on-body and other sensors are being incorporated. e have been exploring composition of multiple media objects such as audio, video, 3D human motions, 3D models, and haptics.

5.Software applications available in the lab include Adobe Fireworks, Flash, and Dreamweaver. Also available are Adobe Photoshop and Adobe Illustrator, among others, the industry standards for multimedia production.Our department also offers access to a

multimedia lab, and it also features Adobe Design programs, plus Sony Vegas editing software.

6.There are ample “open lab” times for students to work on assignments and/or do creative work that is of personal interest.

7.The lab has both Windows and Mac computers.A "bar" where laptop and tablet users can work, charge their computers, and print directly to the Lab's laser printer.A handicapped accessible desk, adjusts at the push of a button to a standing desk.A sound treated, reservable conference room for collaborating. Ideal for a group of 3-7 students working together, viewing video, or participating in CourseShare classes

8.Two lounge areas provide viewing on a large screen, comfortable seating, and wireless headsets for private listening. Students can request to view DVDs, TV streams, or online videos for classes or personal enrichment.

- OPERATING SYSTEMS LAB

1. Popular modern operating systems include Android, BSD, iOS, Linux, Mac OS X, Microsoft Windows, Windows Phone, and IBM z/OS are covered.
2. The first part concentrates on getting familiarized with x86 assembly language, the QEMU x86 emulator, and the PC's power-on bootstrap procedure. The second part examines the boot loader for our 6.828 kernel, which resides in the boot directory of the lab tree. Finally, the third part delves into the initial template for our 6.828 kernel itself, named JOS, which resides in the kernel directory.
3.Instead of teaching operating systems exclusively in traditional classroom lectures, OS Lab provides a modular e-learning course with a strong focus on hands-on training.
4.The course currently consists of seven modules that deal with some of the most elementary topics of operating system architecture: process scheduling, inter-process communication, memory management, file systems, distributed file systems, security, device drivers and I/O (input/output). The modular concept of the course allows it to be extended incrementally as needed.
5.The majority of the computers in theLab run on Windows 10, but the lab also has Linux machines and Macs running OS X with individual system for each student,

6.Students will develop programs for multithreading, manipulating kernel objects, thread synchronization, interprocess communication and virtual memory.
7.Linux and/or Windows based exercises to practice/simulate: Scheduling, Memory management Algorithms, Concurrent programming, Use of threads and processes, Kernel reconfiguration, Device drivers and systems administration of different operating systems, Writing utilities and OS performance tuning
8. Each Student is provided with an individual system and exercise workbook with continuous monitoring of their progress. Integrated systems basically with Linux and Windows recentt versions provided for system programming exercises in Shell and familiar operating system interfaces to achieve the learning objectives in OS curriculum.

- CASE TOOLS LAB

1. Computer Assisted Software Engineering (CASE)tools lab keep the objective the professional system developer and improve their complexity productivity in the complex task of developing large information systems from a modern developers viewpoint
2. To provide support for modelling aspects of the system using a variety of notations and techniques: from diagrams to mathematics and text, producing prototype code, and even verifying the correctness of the system design.
3.To go through software development cycle stages Knowledge along with simplification using several tools such as design, analysis, project management, database management, documentation, etc. and the use of these tools speeds up the project development to obtain desired results.
4.Importantly, they improve the quality of the development processes by supporting, and to a large extent enforcing, a standard methodology and sound by understanding front-end, back-end or cross life cycle CASE products,
5. Unified Modeling Language Data modeling tools, and Source code generation tools are covered in depth based on tools Visual Paradigms and IBM Rational Rose
6.Software Testing and Bug tracking Methodologies are also Practised along with the main concepts.
7. Examine fundamental object-oriented analysis and design techniques and Applying design patterns for viewing a system as a set of procedures.
8. Preparation of case studies by students for analyzing modeling techniques with real time examples

- SOFTWARE Development LAB

1. Full lifecycle R&D and support services, as well as proven processes (Agility RPM) and dedicated engineering teams.
2.Blending Science, Collaboration, and Art to Drive Business Value,dep product development expertise to create software labs that work with you to build your innovative products more rapidly and repeatedly
3.Agile dev/test with bursty patterns along with an infinite pool of infrastructure resources to replicate various scenarios.
4.bulk of inbuilt user friendly tools for understanding programming language concepts and implementing the event driven requirements and providing solutions with best practices.
5.HP elite Desktop
Intel Core i7 Processor
8 GB RAM
500 GB HDD
18.5" LED Monitor,
Dell Keyboard, Dell Mouse
6. All Machines Have
Turbo C
Netbeans / Eclipse
code Blocks
Oracle Database
7.Adavnecd Concepts such as analyzation of big data,bioinformatics , AI,are done by multidisciplinary teams
8.Hackathons and Seminars are conducted on Latest Emerging Technologies with extensive Hands On.

- FREE AND OPENSOURCE LAB

1. . Senalte -It is used in active development with a lot of customization room for developers e.g. its excellent implementation of RESTful JSON API and Modularity.
2.PHP and PostgreSQL to run on Linux servers and in any modern web browser and it features a friendly GUI. Open LIMS Software extend its features using free extensions for different types of projects.
3. SVG-Edit to create vector graphics within the browser, without any additional software installation on your system. It is a cross-browser javascript graphic design tool.
4.modern, scalable, and flexible automatic interfacing with lab analyzers, real-time lab test processing, and full integration with GNU Health built to serve in the biomedical sciences.functionality for accounting, managing stock, working with digital signatures, reporting, invoicing, auditing, managing workflows, etc. It also supports multiple languages, plugins to extend its feature list, and is powered by the open source community.
5.to create new fields for storing data appropriately. It has comprehensive documentation and can be used with AWS Lightsail among other services.
6.Building a responsive UI for use on mobile and tablet devices and a focus on tools needed for lab inventory, cataloguing, reporting, etc.
7.Buliding of integrated modules for inventory management
8.Applications with SAML2 authentication, a scheduler, a file manager, and molecules drawing.

- GRID AND CLOUD LAB

1. Lab conducts research in areas of mobile grid computing, mobile cloud computing, mobile edge computing, and cyber physical systems.

2.The objective this Lab is to develop next generation of mobile and distributed computing systems where mobile nodes should be able to share computing resources either with pre-existing network infrastructure-based computing systems or with nearby mobile nodes using short range wireless communication technologies.

3. Mobile cloud computing,4Mobile ad hoc cloud computing, mobile ad hoc networks, Internet of Things are the main concepts covered.

4. Usage of Globus Toolkit or equivalent Eucalyptus or Open Nebula to demonstrate Cloud.

5. Develop secured applications using advanced security mechanisms available in Globus Toolkit.

6. GRAM concept.,OSGA Compliant Web Service,Learn to use Hadoop

7. Be exposed to tool kits for grid and cloud environment.Learn to run virtual machines of different configuration. Be familiar with developing web services/Applications in grid framework and run real time application with the help of the concepts learnt

8. JVishwa tool (IIT Madras Licensed under MOU) for grid computing synthesis.

- **WEB TECHNOLOGY LAB**

1. Design and develop dynamic web pages with good aesthetic sense of designing and latest technical know-how's.
2. Have a good understanding of Web Application Terminologies, Internet Tools other web services
3. Design and develop static and dynamic web pages., how to link and publish web sites.
4. Familiarize with Client-Side Programming, Server-Side Programming, Active server Pages.
5. . Construct pages that meet, guidelines for efficient download and cater to the needs of an identified audience. Evaluate the functions of specific types of web pages in relationship to an entire web site.
6.Regular Seminars and Hackathons on Latest Emerging Web Technologies with extensive Hands on.
7. Create web pages that meet accessibility needs of those with physical disabilities and apply the effects of CSS in web page creation.
8. Demonstrate the ability to retrieve data from a database and present it in a web page. Use FTP to transfer web pages to a server.

SOFTWARE TESTING LAB

1. Able to use **Selenium** an automated software IBM testing tool for testing web applications
2. Ability Unified Functional Test is leading cross-platform automation testing tool. It can automate Web, Desktop, SAP, Delphi, Net, ActiveX, Flex, Java, Oracle, Mobile, PeopleSoft, PowerBuilder, Siebel, Stingray, Visual Basic amongst other applications.
3. Understand the myths and facts of software testing through black box and white box testing
4. Analyze and design test cases using black box testing technique which includes decision tables domain testing and transition testing.
5. Analyze and design test cases for a white box testing technique which includes path testing, data flow graphs and matrix representation for a given problem.
6. Execute how to run test script wizard and Execute how to do performance testing using testing tools including Loadrunner ,Winrunner and JMeter respectively.

7.We provide software program’s user scenario testing. Through real-world scenarios, we simulate software usage behavior and validate actual software performance capabilities.Various types of application software: cell phone App, cell phone games, PC applications, game applications, etc.

- DATA STRUCTURES LAB

This lab explores and explains the theory of computation for upper and lower bound arguments for decidable problems.

It extends the student’s knowledge of algorithms and data structures and to enhance their expertise in algorithmic analysis and algorithm design techniques.

To learn a variety of useful algorithms and techniques and to extrapolate from them in order to apply those algorithms and techniques to solve problems which leads to various design strategies.

It covers various concepts of C / Python programming language, searching and sorting algorithms, stacks and queues.

It gives Ability to develop C programs as well as in Python for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists