

# Newsletter

## Digital and Computing Services



## Highlights

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## DEAN'S MESSAGE

PROFESSOR ARTI KASHYAP

March 9, 2023- March 9, 2025.



As I pass the baton to Dr. Padmanabhan today, I take immense pleasure in expressing my heartfelt gratitude to our Director, Prof. Behera, for his visionary leadership and for giving me the opportunity to build something from the scratch. Two years ago, when I took on this responsibility, I realized that significant efforts were needed in multiple areas—team building, automation, upgrading outdated digital infrastructure, enhancing computing services, and streamlining other IT-related tasks. Establishing a strong and reliable unit, now known as the **DCS Office**, felt like a herculean challenge. Today, I take great pride in seeing the DCS Office standing tall, serving the institute's diverse needs with efficiency and dedication.

As the first Dean (DCS), I firmly believe that the energy, commitment, and vision of the DCS staff played a crucial role in shaping our decisions and implementing best practices. Their unwavering dedication enabled us to establish robust digital infrastructure and high-quality services. Additionally, the IT Committee has been a pillar of support, backing every initiative with wholehearted commitment. Over the past two years, we have enjoyed every moment of the journey we undertook together. I am confident that the strong foundation we have built will continue to grow and evolve in the next phase.

I would also like to extend my sincere gratitude to all our faculty, staff, and students for their support and patience as we navigated the migration of various services and platforms. Your cooperation has been invaluable in this transformation.

With a deep sense of fulfillment, I look forward to seeing the continued success of the DCS Office in the capable hands of Dr. Padmanabhan.

## INTRODUCTION

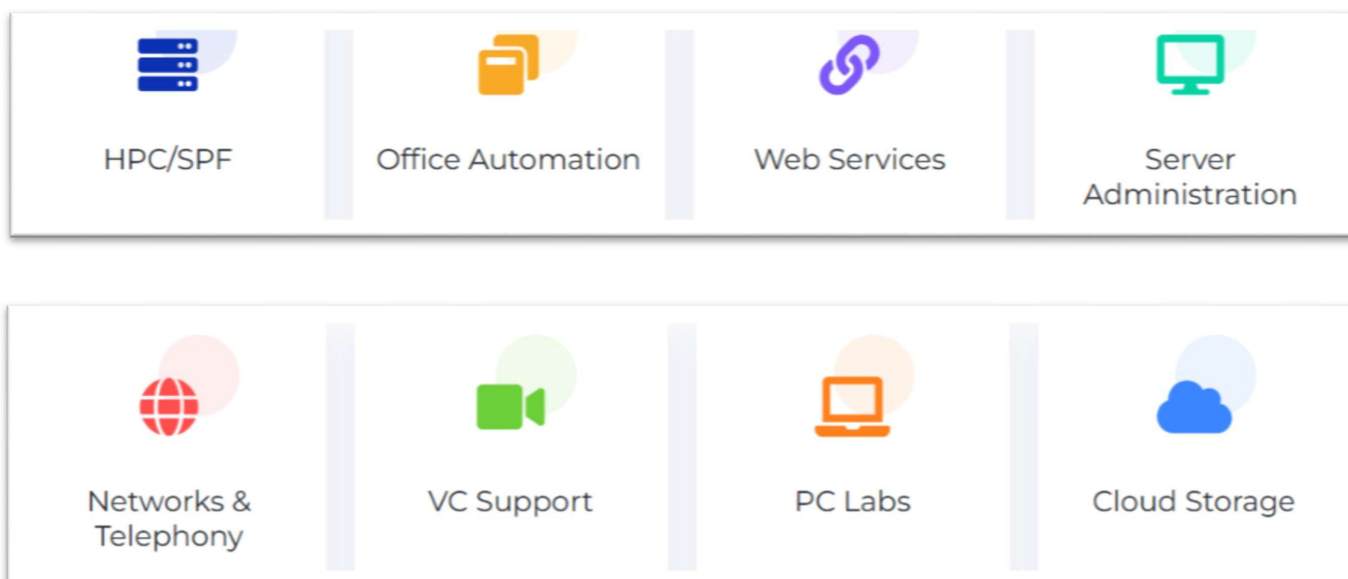
The office of the Dean of Digital and Computing Services (DCS) stands at the heart of IIT Mandi's technological advancement. We drive the innovative development, meticulous management, and strategic budgeting of the institute's digital resources. Our responsibilities encompass the seamless integration and maintenance of websites, networks, software, and voice/data communication systems.

Our mission extends beyond IT infrastructure provision. We pioneer governance strategies for network and information system use, ensuring the IIT Mandi community has access to state-of-the-art functionality and reliable support.

At DCS, we ensure all organizational systems, networks, data, and applications operate harmoniously. Our proficient technical team excels in deploying and maintaining cutting-edge web applications, services, and IT infrastructure, including servers, networks, and storage solutions. We are committed to fostering an environment where technology empowers every member of the IIT Mandi community.

## VISION

The vision of DCS is to revolutionize the IIT Mandi campus with seamless, uninterrupted, and highly efficient digital and computing services. By deploying, managing, and maintaining high performance digital infrastructure, we aim to ensure that the campus community experiences unparalleled digital connectivity and support in all their endeavors.



# A YEAR IN REVIEW:

## OUR WINS AND MILESTONES

### SERVER ROOM UPGRADATION

The Digital Computing Services Data Center has undergone a significant enhancement, incorporating advanced technologies such as smart racks, fibre channel storage and virtualization technology through VMware ESXi and vCenter.



#### Key benefits of upgraded infrastructure

- 1. Performance Boost**
  - Faster processing speeds
  - Improved application performance
  - Enhanced data handling
- 2. Energy Efficiency**
  - Modern equipment consumes less power
  - Reduces environmental impact
  - Cuts down operational costs
- 3. Resource Optimization**
  - Virtualization and server consolidation
  - Better resource management

- Maximizes existing assets
- 4. Advanced Cooling**
    - Newer cooling systems maintain optimal temperatures
    - Reduces wear and tear on hardware
    - Extends hardware lifespan
  - 5. Reliability and Downtime**
    - Enhanced reliability minimizes disruptions
    - Reduces downtime
    - Supports smooth operations in DCS and the Institute

#### Technical Details

##### *Smart Rack:*

Intelligent rack systems used for mounting and organizing servers, network equipment, and other IT hardware. 03 smart racks are equipped with cooling systems, sensors, monitoring tools that enable real-time management and optimization of data center operations.

##### *Storage*

The high-speed fibre channel storage system provides fast, scalable and reliable data storage. The 80 TB storage systems offers high-speed data transfer and low latency

##### *Servers*

Servers are equipped with advanced virtualization technology using VMware8 ESXi and vCenter cluster. Virtualized cluster provides advanced functionality of high availability, fault tolerance and scalability to the applications.

##### *Cluster Details*

- 4 Esxi nodes
- 384 CPU cores
- vCenter with advanced features with HA
- 1.5 TB of RAM

## HPC FACILITY

The HPC facility at IIT Mandi has been significantly upgraded to meet growing research demands. The infrastructure has been moved to a new space with a hot aisle containment system and in-row cooling for improved performance. The facility now has ten racks, including two new ones, and twelve high-end nodes with dual 3rd generation Intel Xeon processors, offering 40 cores per machine. Twenty new 12TB hard drives have been installed and the file system has been restructured, providing each user with 4TB of storage in their home directory. These upgrades enhance hardware, cooling and storage capabilities, empowering researchers with the tools needed to advance knowledge and innovation.

Server Racks



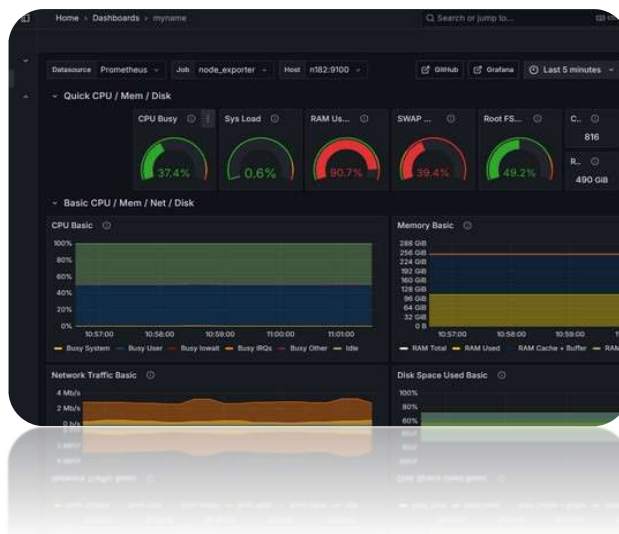
Hot aisle- Containment



## Technical Details

- Total compute nodes: 171
- Total GPU nodes: 10
- Total Capacity: 80 TFLOPS

GRAFANA Monitoring



**410**  
Registered Users

**326**  
Active Students



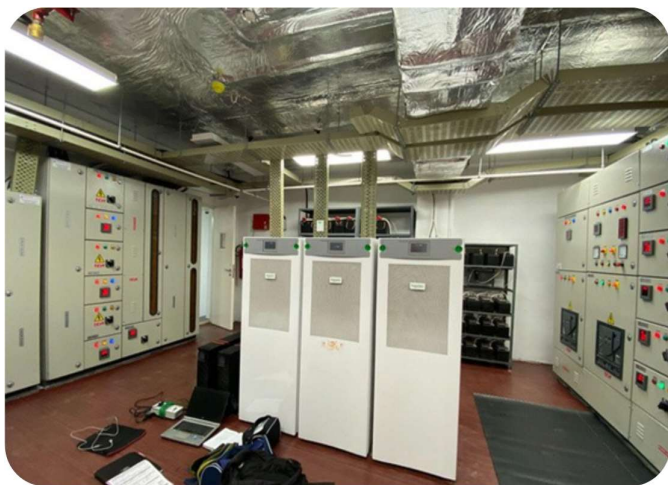
## PARAM HIMALAYA SUPERCOMPUTING FACILITY

The Param Himalaya Supercomputing Facility has made impressive strides since its inception. Initially relying on partnerships with IIT Mandi, NSM entities, and various vendors, it is now independently managed by IIT Mandi. This self-sufficiency demonstrates the increasing expertise and capability of IIT Mandi's technical team, ensuring the facility operates efficiently for the research community.

Param Himalaya Supercomputing Facility



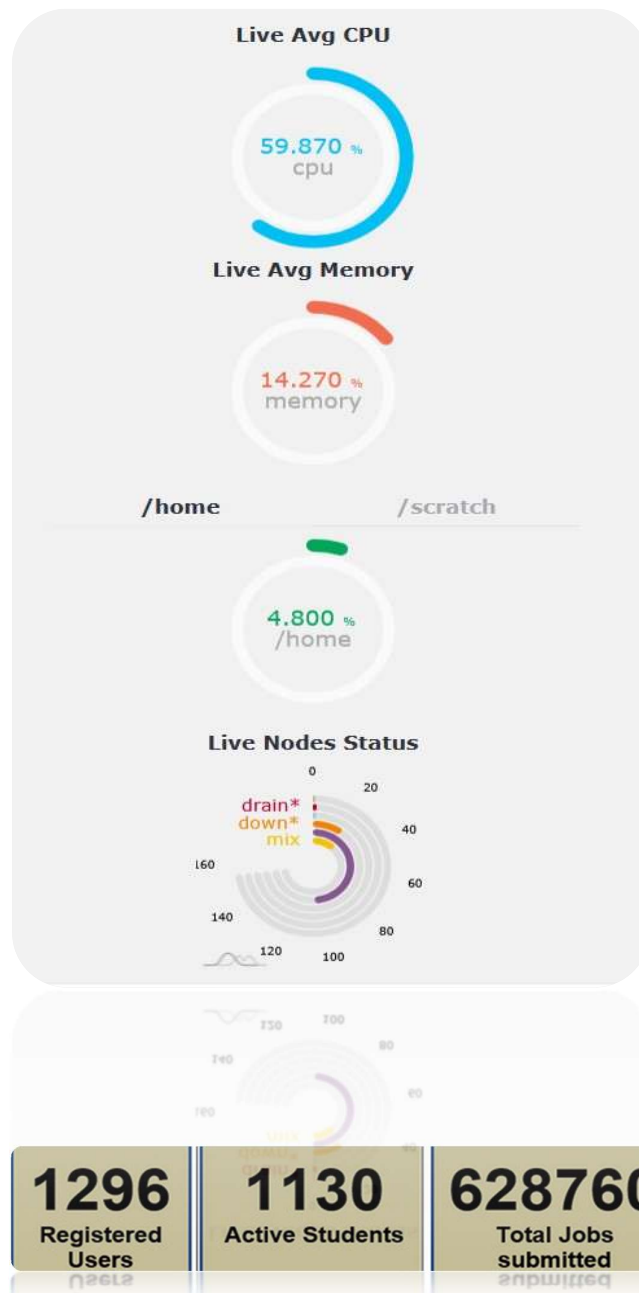
Building Management System



### Technical Details

- Total Number of nodes: 156
- Total CPU nodes: 107
- Total High Memory nodes: 39
- Total GPU Accelerated Nodes : 10
- Total Capacity: 838 TFLOPS

### Live Stats



## NETWORKING

High-speed networking interconnects all cluster components ensuring seamless communication. Two network switches are deployed to provide redundancy and ensure network availability.

### Network upgrades

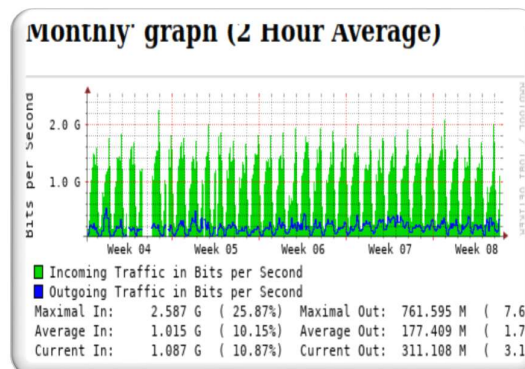
- Backbone upgraded from 1 Gbps to 10 Gbps for high-speed connectivity.
- Network segmented with VLANs to prevent broadcast issues

### Deployment of Arista 7050X3 Series switches:

- High-performance, low-latency switches for modern data centers and cloud environments.
- Switching Capacity: Up to 6.4 Tbps, high packet forwarding rate, low latency.
- Performance: Non-blocking architecture, ultra-low latency (as low as 600ns), deep buffer architecture.
- Interface Types: 100G Ethernet (QSFP28), 40G Ethernet (QSFP+), 10G and 25G Ethernet (SFP28 and SFP+).
- Power Supply: Redundant, hot-swappable power supplies, efficient power consumption.
- Cooling: Hot-swappable fans, efficient cooling mechanisms.



- Latency: Ultra-low latency designs for financial trading and low-latency applications.
- Operating System: Arista EOS with advanced features for automation, monitoring, and management.
- Advanced Features: VXLAN support, L2/L3 capabilities, advanced QoS, segmentation, multi-tenancy, full programmability using Arista's Cloud Vision



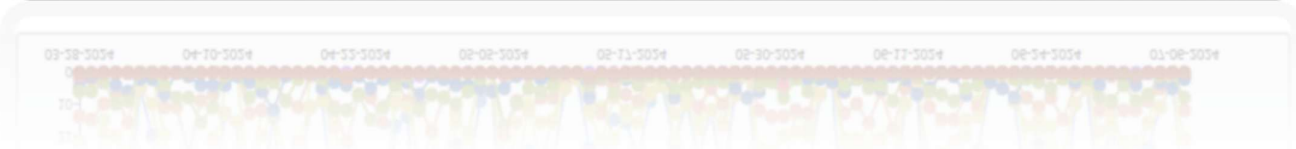
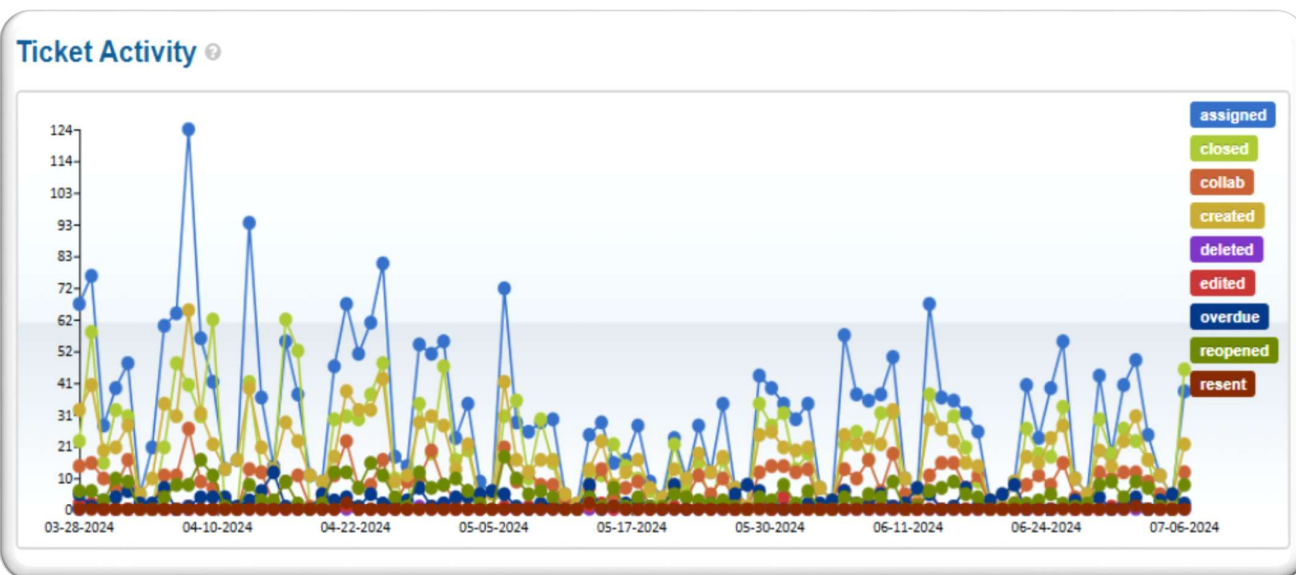
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CALLGIG I0: 1'081 G ( 10'81%) CALLGIG O0: 311'108 M ( 3'1
YAGL006 I0: 1'012 G ( 10'12%) YAGL006 O0: 177'409 M ( 1'1
WXTW01 I0: 1'281 G ( 12'81%) WXTW01 O0: 187'282 M ( 1'8
  
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## IT Helpdesk

DCS has designed an IT Helpdesk specifically for IIT Mandi community to provide seamless support with IT related issues. It offers efficient system/service maintenance, solution for regular issues, while also handling user account creation, permissions, and access control. Our Helpdesk is equipped to resolve incidents quickly, ensuring minimal disruption, and provides remote assistance for timely solutions.

Quarter	Opened	Assigned	Overdue	Closed	Reopened	Service Time In Hours	Response Time In Hours
January-March 2024	1555	2334	325	1517	446	182.7	50.6
April-June 2024	1688	2908	266	1731	437	193.5	55.2
July-September 2024	2065	3657	364	2080	618	163.2	46.5
October - December 2024	830	1860	243	874	216	491.8	82.1



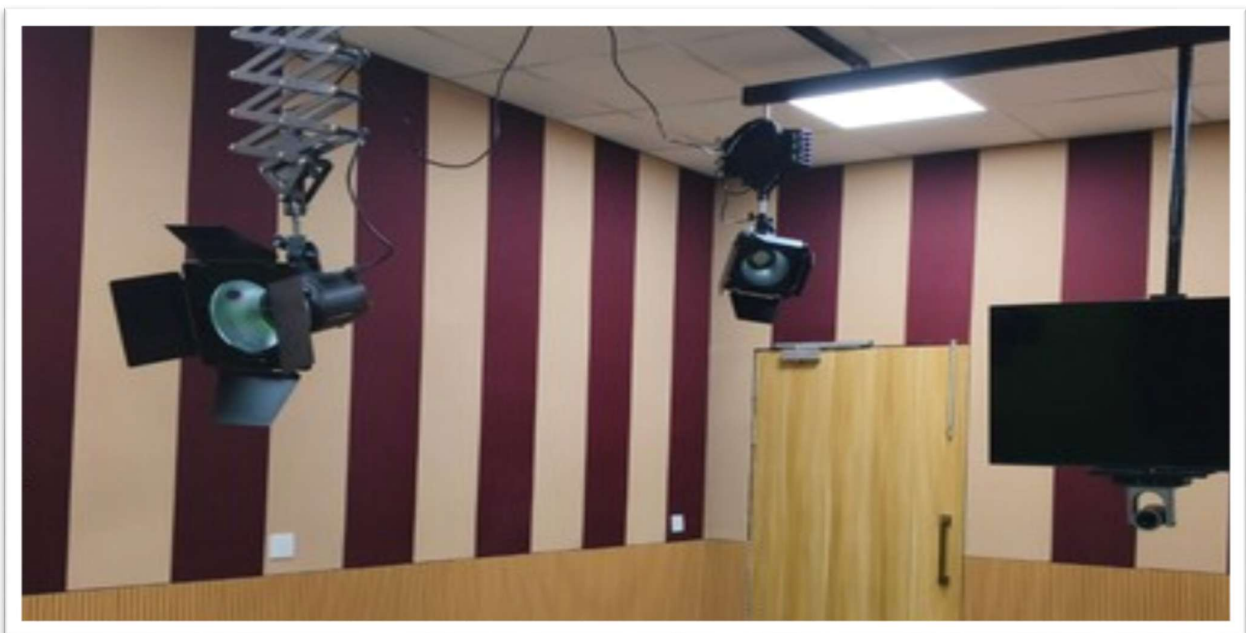


## RECORDING STUDIO

- Advanced soundproofing and acoustic technology, ensuring a quiet and distraction-free environment.
- Ideal for live and professional-quality recordings
- Premium acoustic treatment provides optimal sound isolation and clarity.
- Remote Controlled Lighting System



Recording Studio



Recording Studio Setup A11 (North Campus)

- 86" interactive display for board teaching.
- 16-channel digital mixer to support or manage new microphones and devices as required.
- Wireless lapel and handheld microphones
- Lecture capture system that integrates multiple screens of multiple devices smoothly without the need for third-party software.
- Unified USB Type-C connection system linking LAN, speakers, microphones, and camera via a single interface
- 24" Wacom touch tablet for online teaching
- 43" screen used as a teleprompter
- Ideal for live and professional-quality recordings



## VC FACILITIES UPGRADATION

### Introducing the Cutting-Edge Virtual Classroom Facility at South Campus

This multi-functional virtual classroom is ideal for interactive teaching, online training, corporate events, and large-scale webinars. It combines sophisticated technology with user-centric design to deliver an unparalleled learning experience. Whether you're a teacher, student, or organizer, this facility is designed to meet your educational and communication needs.

#### A1 NKN SOUTH CAMPUS

A1 Virtual Classroom is Designed to provide an immersive, seamless, and highly interactive learning experience for up to 150 students, this state-of-the-art facility is perfect for both in- person and remote learning.

- **High-Quality Video Conferencing:** Powered by a Codec system with 20x optical zoom, expect crystal-clear video and audio for lectures, workshops, and meetings.
- **BYOD Facility:** Connect effortlessly with a single Type-C USB cable, supporting multiple functions including camera, microphones, speakers, network, and charging.
- **16-Channel Audio Mixer:** Dynamic audio adjustments for optimal sound quality, accommodating additional microphones on demand.
- **Professional Audio Equipment:** Equipped with wireless ceiling tile microphones, high-quality speakers, powerful amplifiers, and a subwoofer for superior sound distribution.

- **Motion Detection PTZ Cameras:** Smart tracking of instructors and presentations with 3 PTZ cameras, including two with motion detection technology.
- **Touch-Controlled Room Devices:** Intuitive touch-control panels for easy access to display screens, camera settings, and audio controls.
- **Wireless Presentation System:** Seamlessly share materials from any device, fostering a collaborative learning environment.
- **Expandable DSP:** Future-proof with a DSP that supports the addition of new ports and devices for scalability and customized upgrades.



## SAMARTH

The ultimate unified digital platform revolutionizing the way educational institutions operate. By seamlessly integrating modules like student information management, faculty records, payroll, and examination systems, Samarth delivers unmatched efficiency, transparency, and accuracy.

The Samarth platform at our institute integrates a variety of modules to address academic and administrative needs effectively

- **Leave Management:** Streamlines leave applications and approvals.
- **Admission System:** Simplifies the entire admission process.
- **Organizational Unit:** Manages institutional hierarchies and departments.
- **Organigram:** Visualizes the institution's organizational structure.
- **User Management:** Controls user access and role assignments securely.
- **Employee Management:** Handles employee records and administrative functions.
- **Payroll Management:** Automates payroll processing with precision.
- **Recruitment System:** Eases faculty/staff recruitment processes.
- **Program Management:** Organizes academic programs and courses.
- **Academic Management:** Manages curriculum planning and scheduling.
- **Evaluation and Grading:** Supports grading systems and result generation

## Upcoming Enhancements

To further improve efficiency and user experience, the following enhancements are planned for the next phase of Samarth implementation:

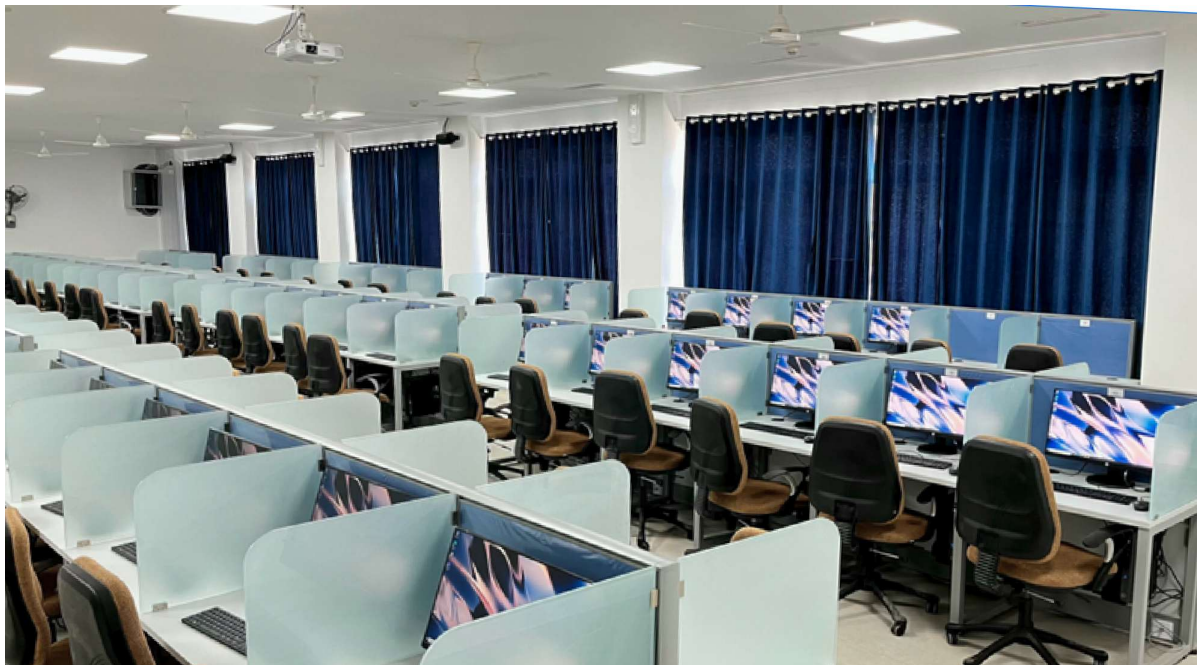
- **Simplified Course Registration Process:** Introducing a streamlined registration system with an integrated approval mechanism involving course instructors.
- **Simplified Grade Submission Process:** Enabling faculty to submit grades more efficiently with an intuitive and user-friendly interface.
- **Easy Access to Student Records:** Facilitating quick and secure access to comprehensive student records for academic and administrative purposes.
- **Specific Report Generation:** Providing tailored report generation features to meet diverse institutional needs.
- **Enhanced User Interface:** Rolling out a more interactive and visually appealing user interface for improved usability and navigation.



## Computer Labs

Our Computer Lab stands as the epicenter for learning, research, and academic pursuits. Here's why our state-of-the-art facilities are unmatched:

- **Versatile Usage:** Catering to lab courses, workshops, online exams, placements, and interviews, our lab serves students, faculty, and staff with utmost efficiency.
- **Recent Upgrades:** We've added 200 new high-performance Intel Core i5/i7 latest-generation computers, boosting our capacity and performance to new heights.
- **Strategic Distribution:** These advanced systems are thoughtfully allocated across different labs, ensuring seamless performance for UG and PG exams, workshops, placements, and other critical activities.
- **Expanded Infrastructure:** Now boasting a total of 318 computers across five separate labs, our upgraded infrastructure significantly enhances the efficiency and experience for all users.



Computer Lab





# Digital and Computing Services Newsletter IIT Mandi

## Digital and Computing Services Team

