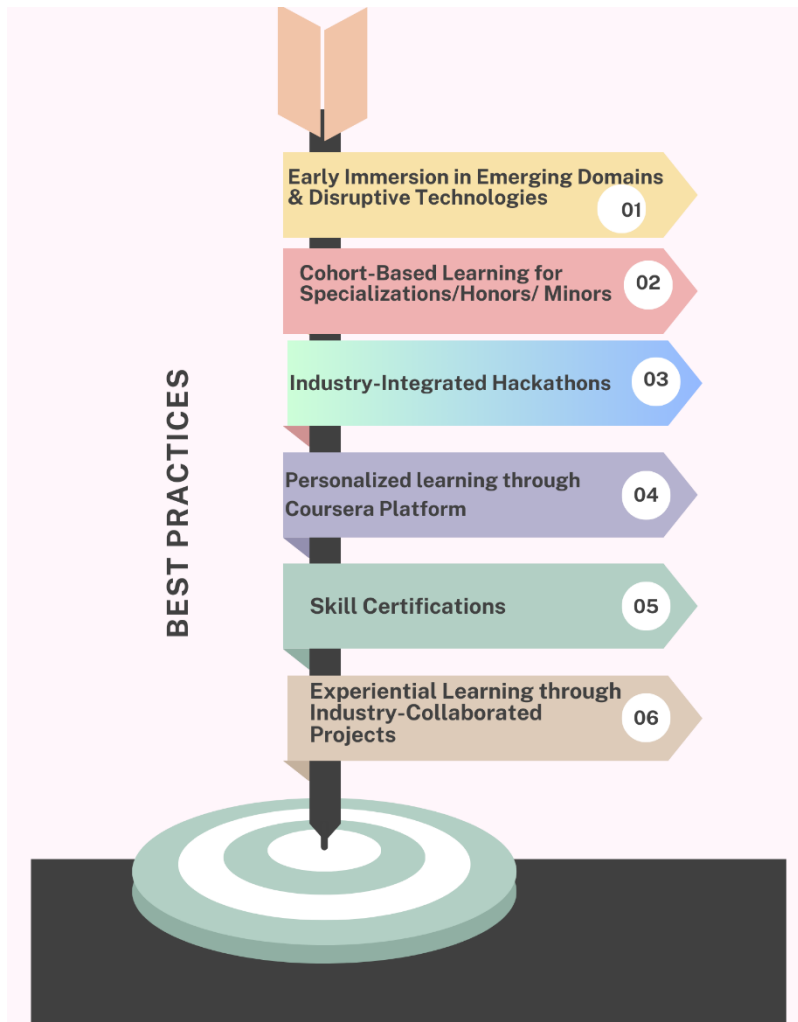# DEPERTMENT OF COMPUTER SCIENCE AND ENGINEERING

Best Practices - Pioneering Innovation in Education

The Department of Computer Science and Engineering (CSE) actively bridges the gap between academia and industry by integrating emerging technologies, industry collaborations, and experiential learning into the curriculum. Through cohort-based learning, industry-integrated hackathons, skill certifications, and hands-on projects, the department equips students with real-world problem-solving skills, interdisciplinary knowledge, and strong industry connections. This holistic approach shapes students into tech-savvy innovators, entrepreneurs, and industry leaders, driving technological advancements across diverse domains.

BEST PRACTICES

01 Early Immersion in Emerging Domains & Disruptive Technologies

02 Cohort-Based Learning for Specializations/Honors/ Minors

03 Industry-Integrated Hackathons

04 Personalized learning through Coursera Platform

05 Skill Certifications

06 Experiential Learning through Industry-Collaborated Projects

DEPERTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course on Emerging Domains: Harnessing Disruptive Technologies for Industry Transformation

The introduction of Emerging Domains, a multi-domain, technology-integrated course in the first year of the Computer Science and Engineering (CSE) curriculum is a strategic innovation aimed at equipping students with future-ready skills from the outset. By exposing students to cutting-edge technologies, industry-driven applications, and interdisciplinary knowledge, this course transforms early engineering education into a dynamic, hands-on, and industry-aligned learning experience.

Benefits

- Early Exposure to Industry Trends & Emerging Technologies
- Digital Learning Ecosystem: LMS, LCMS, MOOCs, and LLMs for Education
- AI-Powered Disruptions Across Industries
- Agriculture & Sustainability: Bridging Tech and Real-World Challenges
- Gaming & Virtual Reality: Expanding Creative Computing
- Tamil Computing & NLP for Regional AI Development

Innovative Aspects of Cohort-Based Learning for Specializations, Honors, and Minors

1. **Cohort-Based Electives**

   o Introduce **modular electives** where students can customize learning pathways within their cohort, choosing skill-focused micro-courses aligned with industry needs.

2. **Enhanced Thematic Cohorts for Capstone Projects**

   o Establish **industry-integrated thematic cohorts** where mentors from organizations co-develop problem statements and provide structured feedback loops.

   o Incorporate **cross-disciplinary projects** allowing students from AI, Cybersecurity, and Data Science to collaborate on interconnected challenges.

Hackathons with Industry

The department actively collaborates with industry partners to conduct thematic hackathons aligned with real-world challenges and **Sustainable Development Goals (SDGs)**. These hackathons provide students with valuable exposure to industry practices, fostering innovation, problem-solving skills, and hands-on experience in emerging technologies.

Notable hackathons conducted include:

- **Sustainathon '24**
- **Designathon '24**
- **Wise-AI-Thon '24**

DEPERTMENT OF COMPUTER SCIENCE AND ENGINEERING

- **Sustainathon '25**

Industry-based collaborations, such as **Hyperverge and Wiseworks**, play a key role in these hackathons, offering them as platforms to identify and recruit talented students for **internship and career opportunities**.

Benefits of Industry-Integrated Hackathons

- **Hands-on Learning:** Practical exposure to real-world industry challenges.

- **Internship & Career Opportunities:** Direct recruitment platforms for students by industry partners.

- **Innovation & Problem-Solving:** Encourages creative solutions aligned with SDGs.

- **Networking with Experts:** Connects students with industry leaders and professionals.

- **Skill Development:** Enhances technical, teamwork, and entrepreneurial skills.

Through these engagements, students gain valuable industry insights, develop impactful solutions, and contribute to sustainable technological advancements.

Personalized learning through Customized Learning Modules via Coursera Platform

Integrating **Customized Learning Modules** through the **Coursera platform**, curated by our faculty with the assistance of **Generative AI**, enables students to tailor their educational experiences to align with specific learning outcomes and career goals. This approach is particularly beneficial for capstone projects, engineering sprints, and elective courses, offering a personalized and outcome-focused learning pathway.

Key Features:

- **AI-Assisted Faculty Curation:** Our faculty leverage Generative AI tools to design and organize course content that aligns with desired learning outcomes, ensuring relevance and rigor in the curriculum.
- **Personalized Learning Paths:** Students can select from a vast array of courses and specializations available on Coursera, allowing them to focus on areas that align with their academic and professional aspirations.
- **Global Expertise Integration:** By accessing content delivered by international experts and institutions, students gain a global perspective and exposure to diverse methodologies and practices. Coursera collaborates with over 350 leading universities and industry partners, providing world-class learning content.
- **Enhanced Capstone and Project-Based Learning:** Coursera offers numerous capstone projects that enable students to apply theoretical knowledge to practical, real-world challenges, thereby enhancing their problem-solving skills and industry readiness.

Benefits:

DEPERTMENT OF COMPUTER SCIENCE AND ENGINEERING

- **International Exposure:** Access to insights and teachings from global experts broadens students' horizons and prepares them for the international job market.
- **Flexibility and Relevance:** Customized modules allow students to focus on areas that are most pertinent to their career objectives, increasing the relevance and impact of their education.
- **Collaborative Opportunities:** Engagement with international content fosters collaboration with peers and professionals worldwide, enriching the learning experience and building a global professional network.

Skill Certifications with Academia-Industry Partnerships

The department collaborates with industry leaders to offer **industry-recognized certification programs** that provide students with **practical exposure to emerging technologies**. These certifications equip students with **advanced technical and professional skills**, helping them stay competitive in the **global job market**.

Key Certification Programs Offered:

- **Unity Certified Associate** (Game Development & AR/VR)

- **Fortinet Certified in Cybersecurity** (Cyber Threat Management)

- **AWS Certifications** (Cloud Computing & Infrastructure)

- **Google Cloud Certifications** (Cloud Engineering & AI)

- **Microsoft Azure Certifications** (Cloud & Data Analytics)

Benefits :

- **Hands-on Experience:** Gain practical skills in industry-standard tools and platforms.
- **Global Recognition:** Certifications validate expertise and improve career prospects.
- **Higher Employability:** Enhance job readiness in high-demand technical fields.
- **Skill Advancement:** Stay ahead in evolving domains like cybersecurity, cloud computing, and networking.

Experiential Learning through Industry-Collaborated Projects

- The department fosters **experiential learning** by engaging students in **industry-collaborated projects**, providing hands-on exposure to **real-world problem-solving**. These collaborations bridge the gap between academia and industry, enabling students to apply their theoretical knowledge to practical challenges while working on cutting-edge technologies.

DEPERTMENT OF COMPUTER SCIENCE AND ENGINEERING

- **Key Industry Collaborations for Industry Collobrated projects**

    - ◆ **Nexus – Hyperverge** (AI & Computer Vision Solutions)
    - ◆ **Roche** (Healthcare)
    - ◆ **Wisework** (Generative AI & Automation, Full Stack Web application   development)
    - ◆ **Samsung PRISM** (AI, Data Science, Computer Vision)

By incorporating innovative learning methodologies, industry collaborations, and hands-on experience, the department is redefining engineering education. The emphasis on emerging domains, certification programs, hackathons, and industry-integrated projects ensures students are not just academically strong but also innovation-driven and industry-ready.

This transformative approach prepares students for high-impact careers, entrepreneurial ventures, and leadership roles in the fast-evolving tech landscape.