Teaching Statement

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I believe that effective engineering education should enable students not merely to learn a technology, but to understand what it is, why it is required, how it works, and where it can be applied. My teaching philosophy is therefore founded on three interconnected principles: strong conceptual foundations, experiential learning, and continuous integration of industry and research practices.

With more than 11 years of teaching and research experience in Computer Engineering and Information Technology, I have developed my teaching approach through courses, laboratory instruction, project mentoring, technical events, industry-oriented activities, and research supervision. My academic interests span Cybersecurity, Artificial Intelligence and Machine Learning, DevOps, Cloud Computing, Linux, Computer Networks, Big Data Analytics, and Open-Source Technologies.

Teaching Philosophy: From Concepts to Application

Computer science and information technology are rapidly evolving disciplines. Technologies that are current today may change significantly within a few years. Therefore, I believe that teaching should not focus exclusively on tools or commands. Instead, students must develop a strong conceptual foundation that enables them to learn new technologies independently.

In my classes, I try to answer three fundamental questions:

What is it? Why is it required? How is it applied?

For example, while teaching DevOps, students should not only learn definitions of continuous integration, continuous delivery, containers, or automation. They should understand the software-development problems that motivated these practices and subsequently implement them using tools such as Git, Docker, CI/CD platforms, and cloud services.

Similarly, cybersecurity concepts are taught through practical scenarios, demonstrations, attack-defence models, and implementation-oriented activities so that students can understand both the theoretical foundations and the practical consequences of security decisions.

Experiential and Hands-on Learning

I strongly believe that engineering students learn more effectively when they actively build, test, troubleshoot, and improve systems. Consequently, I integrate hands-on exercises, demonstrations, case studies, implementation assignments, and project-based learning into my courses.

For example, in cloud and DevOps-related teaching, students work through practical workflows involving application development, containerization, CI/CD automation, cloud deployment, and application security. I have also developed practical learning material demonstrating AWS-based CI/CD pipelines involving GitHub, AWS CodeBuild, AWS CodePipeline, and Amazon S3.

Similarly, my recent Faculty Development Program activities have included hands-on learning in Linux and networking, full-stack development, Docker and containerization, Kubernetes, cloud deployment, CI/CD, authentication, password hashing, JWT, web vulnerabilities, HTTPS, SSL certificates, and secrets management.
I use such practical activities to transform a lecture from a one-way transfer of information into an environment where students observe, experiment, troubleshoot, discuss, and construct solutions.

Problem-Based and Project-Based Learning

I consider project-based learning particularly important in engineering education because it brings together knowledge from multiple subjects.

I encourage students to begin with a real problem, understand its users and constraints, conduct a literature review, identify existing limitations, propose a solution, select appropriate technologies, develop a prototype, evaluate the system, and communicate their findings.

My project mentoring experience includes AI-enabled educational systems, financial risk assessment, academic project management using machine learning and genetic algorithms, virtual cybersecurity laboratories, generative AI applications, AI-enabled security orchestration, smart examination systems, IoT systems, and other applied technology projects.

This approach helps students develop not only technical skills but also problem-solving, teamwork, research thinking, documentation, presentation, and engineering decision-making abilities.

Connecting Teaching with Research

I believe that teaching and research should reinforce each other. Research introduces students to unanswered questions, experimentation, critical evaluation, and continuous learning. My own research in AI-based cybersecurity, malware analysis, risk assessment, and intelligent security systems provides opportunities to introduce current research problems into classroom discussions and student projects.

For advanced students, I encourage research-oriented activities such as literature reviews, comparative analysis, experimentation, dataset preparation, model evaluation, and scientific writing. Students are encouraged to understand the difference between simply implementing an existing system and generating evidence-based knowledge.

My research experience includes AI-based malware analysis, threat detection, risk prediction, security orchestration, cybersecurity virtual laboratories, and AI-enabled applications, allowing me to bring contemporary research problems into teaching and mentoring.

Industry-Relevant Education

One of my major teaching priorities is keeping academic learning connected to current industry practices. I regularly update course material, practical exercises, assignments, and project themes to reflect emerging technologies.

My teaching interests and professional activities span Cybersecurity, AI/ML, DevOps, Cloud Computing, Linux, Big Data Analytics, and Open-Source Technologies, which are also reflected in my research profile.

I also believe that interaction with industry professionals is valuable because it exposes students to practical expectations that may not be visible in conventional textbooks. In my academic activities, I have been involved in technical events, expert sessions, hackathons, and industry-oriented learning activities. I have served as SPOC, evaluator, and mentor for Smart India Hackathon and have contributed to technical project competitions and internal hackathons.

Inclusive and Engaging Classroom

Students enter an engineering classroom with different levels of prior knowledge, learning styles, and interests. I therefore try to create an environment in which students are encouraged to ask questions, experiment, make mistakes, and learn from those mistakes.

I use demonstrations, real-world examples, short problem-solving activities, group work, discussions, and hands-on exercises to maintain engagement. For difficult technical concepts, I attempt to move from a simple conceptual explanation to a visual representation and finally to implementation.

My objective is not merely to complete a syllabus but to ensure that students can independently apply the concepts after completing the course.

Assessment and Feedback

I believe assessment should measure more than memorization. My preferred assessment approach combines conceptual understanding with application and problem-solving.

Depending on the course, I use:

- Practical assignments and laboratory exercises
- Case-study analysis
- Open-ended problem statements
- Mind map Activity, Flipped Classroom
- Technical presentations
- Team-based projects
- Implementation-based assessments
- Research-oriented assignments
- Viva and technical discussions
- Continuous formative feedback

I particularly value iterative assessment. Students should have opportunities to receive feedback, identify weaknesses, improve their implementation, and demonstrate progress.

Mentoring and Professional Development

My role as an educator extends beyond classroom teaching. I consider mentoring an important responsibility, particularly for students undertaking major projects, research, competitions, and career preparation.

I mentor students in selecting meaningful project problems, identifying appropriate technologies, conducting literature reviews, designing systems, implementing prototypes, evaluating results, and presenting technical work. My experience in supervising interdisciplinary and technology-oriented projects has reinforced my belief that students learn most effectively when they are given responsibility for solving authentic problems.

I also believe faculty members must remain lifelong learners. My engagement with professional certifications, research, technical communities, invited lectures, and Faculty Development Programs helps me continuously update my knowledge and bring current practices into the classroom. My professional profile includes Red Hat Academy educator recognition, IEEE Senior Member status, academic reviewing, technical talks, and curriculum-related academic contributions.

Future Teaching Vision

In the coming years, I intend to further develop a research-integrated, project-driven, and technology-enabled teaching environment.

My teaching vision includes:

1. Developing practical laboratory modules around cloud, DevOps, cybersecurity, AI/ML, and open-source technologies.
2. Integrating real-world datasets and case studies into undergraduate and postgraduate courses.
3. Increasing the use of project-based and challenge-based learning.
4. Connecting student projects with research problems and industry requirements.
5. Encouraging students to participate in hackathons, technical competitions, open-source projects, and research publications.
6. Developing reusable virtual laboratories and cloud-based practical environments.
7. Introducing responsible and secure use of generative AI into computing education.
8. Guiding students toward lifelong learning and professional certification.

Teaching Vision

Ultimately, my objective as an educator is to develop engineers who can think critically, learn independently, build practical solutions, and adapt to technological change.

I want students to leave my classroom not merely remembering a set of commands, algorithms, or technologies, but possessing the confidence to approach an unfamiliar problem, identify what they need to learn, evaluate possible solutions, implement an appropriate approach, and justify their engineering decisions.

I see teaching, research, mentoring, and professional engagement as interconnected responsibilities. Through this integrated approach, I aim to contribute to the development of technically competent, research-oriented, ethically responsible, and industry-ready engineers who can create meaningful technological solutions for society.