

CSE EDUINSIDE

A Newsletter of Department of Computer Science and Engineering, SOE, DSU, Bangalore

VISION AND MISSION OF THE INSTITUTE

Vision

To be a centre of excellence in education, research & training, innovation & entrepreneurship and to produce citizens with exceptional leadership qualities to serve national and global needs.

Mission

To achieve our objectives in an environment that enhances creativity, innovation and scholarly pursuits while adhering to our vision

VISION AND MISSION OF THE SCHOOL

Vision

To transform life through Excellence and Innovation in Engineering Education and Research with an emphasis on Sustainable, Inclusive Technology and Global needs.

Mission

To Develop School of Engineering at Dayananda Sagar University, as Center of Excellence by imparting Quality Education and Research to generate highly Competent, Skilled and Humane manpower to face emerging Technological, Scientific and Social challenges with Ethics, Integrity, Credibility and Social concern.

VISION AND MISSION OF THE DEPARTMENT

Vision

To develop pool of high calibre professionals, researchers and entrepreneurs in the areas of Computer Science & Engineering and Information Technology with exceptional technical expertise, skills and ethical values, capable of providing innovative solutions to the national and global needs.

Mission

To create a robust ecosystem where academicians, concept developers, product designers, business incubators, product developers, entrepreneurs, mentors and financial institutions are brought together under one platform of the department.

To establish Project Environment in the Department with open source tools, provide hands-on experience to students by establishing a process to channelize their effort towards acquiring relevant competencies and skills in their chosen technology areas and domains.

To create continuous learning environment for faculty and establish Research Centres in collaboration with Industries and Institutions of National/International repute and conduct research in emerging areas as well as socially relevant technical and domain areas through funded research projects.

Dayananda Sagar University

Devarakaggalahalli, Harohalli, Kanakapura Road, Ramanaagara Dt., Bengaluru - 562 112

What's inside...

- Articles
- Department Events
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And more....

ABOUT THE DEPARTMENT

The Department of Computer Science & Engineering was started in the year 2015. It offers Undergraduate Programme, **B. Tech** Computer Science & Engineering, which prepares students for the current and future demands of industry and the research world.

The Department offers a Master's Programme namely, **M. Tech** in Computer Science & Engineering. This programme prepares students to become leaders in knowledge driven professions.

In order to provide ample opportunity for innovation and research, the department offers Doctoral Programme (**PhD**) in Computer Science & Engineering and allied areas.

The Department has collaborated with NTTF to offer Two Vocational Degree Programmes namely, **B.Voc** in Information Technology (Data Analytics), and **B.Voc** in Computer Engineering & IT Infrastructure. **B.Voc** is a three-year duration undergraduate programme. This program builds specific job skills in students so that they can serve the industries better.

The Department of Computer Science and Engineering (CSE) has twenty five faculty members with the doctorate degree and twenty perusing the doctoral studies Programs offered by the Department include all sub disciplines and intellectual enterprises of Computer Science and Engineering Discipline.

The faculty members in the Department are active in the Research Areas of Artificial Intelligence, Machine Learning, Data Science, Network Security, Networks & IoT, Wireless Networks, Block Chain Technologies, Big Data, Data Mining, Data Analytics, Cloud Computing, Image Processing, Computer Vision and Video Analytics, Information Retrieval, etc. Apart from core courses, the Department also offers Liberal Studies Courses (as per NEP- 2020). Liberal studies focuses on creating synergy between Humanities, Social Sciences, Performing arts, Law, Management, Fine Arts, Yoga, Painting, Music etc.

Department has well equipped and state-of-the-art Laboratories to train students in various technologies. The Department also makes use of the Innovation Laboratories such as NVidia's High Performance Computing Lab & Analog Devices Lab to train its UG and PG students in the respective technology areas and research.

The Department also conducts value added courses on emerging technologies and industry specific domains. These courses are conducted beyond college hours/summer semester by the faculty of the department. The Department has MoU's with IT Industries like NVIDIA, Analog Devices, UiPath and CodeChef. Department also has several MOU's with academia such as Nokia University, Purdue Indiana University. The Department encourages students to take up MOOC based online courses in NPTEL, Coursera, Udacity and edX. The Department organizes Symposia, Exhibitions, Conferences, Seminars, Hackathons, and Workshops for both students and Faculty.

The Department has many Adjunct Professors/Professor of Practice who typically have positions at Industry or other institutions to bring in the industry expertise and research regour in our programmes. provide specialized supervision of student projects.

The students of CSE Department are placed in various top MNCs like IBM, Accenture, Capgemini, Cognizant, Wipro, Infosys, Mindtree, Intel, Mercedes Benz, Sap Labs etc. with an emolument in the range of 4.78 Lakhs to 27 Lakhs per annum.

DEAN'S MESSAGE



Dr. Udaya Kumar Reddy K R
Dean, School of Engineering, DSU

**BE YOU
BE THE DIFFERENCE!!!**

Welcome to the new way of learning at School of Engineering (SoE) of Dayananda Sagar University (DSU). At SoE, we are committed to helping you to make a positive difference in the world.

We at SoE are immensely proud to provide all of our students with an outstanding education that equips them with the skills, experience, and confidence required to stand out from the crowd. The School promotes Culture of Excellence including the culture of Interdisciplinary, Research, Creativity, Innovations, and Entrepreneurship on various Cutting-Edge Technologies. We at SoE, provide the World-Class Education that is Student-centric, Research-centric, and Educational space where all of our students will have a transformative education, learn to be independent critical thinkers, be societally and ethically responsible, and to have a broad understanding of the world.

We value ability, not background, and we support all of our students to achieve their potential. We want you to enjoy your time here, confident that, upon completion of Engineering degree program under SoE, you will have the knowledge, expertise, and employability skills to set you on your chosen career path.

The decision you make about where to study is an extremely important one. I am pleased you are considering the School of Engineering at DSU, and hope that you choose to continue your education with us.

BEST WISHES !

CHAIRMAN'S MESSAGE

Welcome to the Department of Computer Science & Engineering, School of Engineering at Dayananda Sagar University!

It gives me pride and pleasure to introduce Computer Science & Engineering Department. The Department of Computer Science has designed innovative UG program in Computer Science & Engineering and PG programs in Artificial Intelligence & Machine Learning, Cloud Computing, and Network Security. Our aim is to provide a high quality engineering education to our students with adequate hand-on experience.



Dr. Girisha G S
Professor and
Chairman

Faculty members in the department have expertise in the areas of Wireless Networks, Data Networks, Big Data, Data Analytics, Cloud Computing, Image Processing, Information Retrieval and are guiding carrying out active research.

Our department looks forward to contribute in solving technological challenges of the society with active participation from all sections of the society. Thank you for visiting us.

BEST WISHES !

Articles

DIGITAL SUPPLY CHAIN MANAGEMENT

As most of us know, we lack in order management and demand management. There is always one topic that's left behind our imagination. How does a supply management work??? To run a certain management, we need several aspects in concern to business... Here in concern to business, we need to understand about supply chain management in digitized format.

Digital supply chain management is the major part of any industry. It helps to run a production in customized linear format with preventing the day life issues. First, what is supply chain management?? A proper answer would be.... To handle or manage the flow of goods or services from the procurement of raw materials to the delivery of the product at its final destination, these particular tasks are done with the help of latest technologies. Digital supply chain management is as important as manufacturing a product, which means producing a product is not just enough to run a particular company.

Supply chain management is not just limited to the particular production area, as it also includes multiple actions such as inventory management, cycle management, product management, finance management and vendor management. To manage or observe all these activities with accuracy and no errors, all we need is digital tool that helps to reduce the errors and manages consistency.

A digital tool can provide us the accurate data with fewer errors..., this kind of digital tool can be maintained to prevent any hazardous issues, such as shortage of material, overloading of inventory issue and forecast problems. These digital SCM tools helps to optimize the inventory issues or any kind of product related issues... The main objective of digital supply chain management is to holistically manage your orders, invoices and supplier, buyer relationships. It helps to monitor real-time inventory levels; it uses all these information to plan and execute the process easily.

Akshata Mahantesh Athani
23UGENG0290
2nd year



Articles

TECH LAYOFFS Through Time

-AKSHAYA N



The tech industry has long been known for its rapid growth and high demand for skilled workers. However, in recent years, there has been a shift in the industry that has resulted in a number of tech layoffs. This trend is expected to continue in 2024, with companies like Haven Tech and Bonterra Tech announcing layoffs. In this article, we will explore the reasons behind these layoffs and what it means for the future of the tech industry.

THE RAISE OF AUTOMATION..

One of the main reasons for the increase in tech layoffs is the rise of automation. With advancements in technology, many tasks that were previously done by humans can now be automated. This has led to a decrease in the need for certain job roles, resulting in layoffs. For example, customer service roles can now be replaced by chatbots, and data entry jobs can be automated through software. As companies continue to invest in automation, we can expect to see more layoffs in the tech industry.

Economic downturn

In times of economic uncertainty, companies may need to cut costs in order to stay afloat. This can result in layoffs, even in the tech industry. In 2024, there are predictions of a potential economic downturn, which could lead to more layoffs in the tech sector.



Impact on the Future of the Tech Industry

While some companies may be downsizing, others are still hiring and expanding. Additionally, the rise of new technologies and trends means that there will always be a need for skilled workers in the tech industry. It is important for those affected by layoffs to continue to develop their skills and stay up-to-date with industry trends in order to remain competitive in the job market.

Conclusion

In conclusion, tech layoffs are expected to continue in 2024 due to factors such as automation, shifts in consumer demand, and potential economic downturns. While this may be a challenging time for those affected, it is important to remember that the tech industry is still growing and there will always be a need for skilled workers. By staying informed and adaptable, individuals can navigate through these changes and continue to thrive in the tech industry.

Akshaya N
ENG22CS0232
2nd year



Department Events

NAAC awareness for First Year Students

The Department of Computer Science and Engineering conducted NAAC awareness to educate students about the importance of NAAC. This program helped the students understand the quality of education they are receiving and empower them to be active stakeholders in their education. They also provide feedback on their learning experiences on 4th September, 2023.



Outreach Activity : NSS Activity Village Visit

Students of Department of Computer Science and Engineering visited village as part of NSS activity on 25th July,2023. This provided an opportunity for the volunteers to engage directly with rural communities. This fosters a sense of connection and understanding between urban and rural populations. Visiting a village allowed volunteers to gain insights into the challenges and issues faced by rural communities, such as access to education, healthcare, sanitation, and clean water.



Articles

MoU with Infosys Limited



MOU is signed by The Registrar between Dayananda Sagar University and INFOSYS Limited Bengaluru on Infosys-Springboard on 17th July, 2023. This empowers students and faculty enablement programmes with themes of “Learn by doing”, “Motivating to learn”, “Just in time learning” and “Upskill and learn”. Initiative taken by Dr Girisha G.S., Professor and Chairperson and Dr Basavaraj N Hiremath ,Professor, Department of Computer Science and Engineering.

5-day Summer School Course on “Modeling and Simulation in MATLAB - Computational Mathematics”

The Department of Computer Science and Engineering and Department of Mathematics collaborated to organize a 5-day Summer School course on "Modeling and Simulation in MATLAB - Computational Mathematics" held from 25th July 2023 to 31st July 2023. A total of 40 students were registered, with a specific emphasis on learning. The session was handled by Dr. Pramod Kumar Naik, Dr. Basavaraj N Hiremath, Dr. Arun Kumar Gopu, Dr. Ravinder Singh K, Dr. Narayani, Prof. Bhaskar V from Department of CSE and Professors from Department of Mathematics. Participants were provided with a comprehensive understanding of MATLAB, Simulink, ODEs, PDEs, curve fitting, optimization techniques, and more. The various case studies and projects offered valuable practical experience, equipping the participants with essential skills in computational mathematics.



Bridge Course: Mathematics for Machine Learning

Department of Computer Science and Engineering conducted a Bridge Course on "Mathematics for Machine Learning", in virtual mode from 25th July 2023 to 2nd August 2023. Dr. Ravi Kumar Y B, Associate Professor, Dept. of CS&E facilitated the course.

The intended audience were 4th Semester CSE and allied branches, who have been promoted to V Semesters. There were around 360+ students who attended this bridge course.

The Nine-day event included an introduction to Linear Algebra, PCA, Dimensionality Reduction, Eigen values & Eigen Vectors etc. which are very much necessary to learn Machine Learning Course. The students are highly motivated by this Bridge Course on Mathematics for Machine Learning.



Faculty Development Program: AWS Cloud Essentials

The Department of CSE has successfully conducted a five-day Faculty Development Program (FDP) on "AWS Cloud Essentials", from 9th August to 14th August 2023 at School of Engineering, Dayananda Sagar University, Kudlu Gate, Bangalore. The objective of the FDP is to train faculty with practical skills on AWS cloud services so that faculty members will train students on AWS cloud services. A total of 60 participants have registered for the course and have attended with 100% attendance. According to the schedule all the sessions were delivered effectively by respective speakers. The sessions were engaged by AWS certified Trainer from SSDN Technologies Pvt. Ltd, Gurugram, Haryana Mr. Aman Arya & Key Note sessions by Industry Expert Mr. Prabhudeva V, TCS & Mr. Santosh Gnanasekaran, BOSCH. The Five-Day Faculty Development Program on "AWS Cloud Essentials" successfully empowered participants with essential knowledge and skills in cloud computing and AWS services.

The program not only enriched the participants' professional growth but also contributed to the integration of cloud technology in education and research. Co-Conveners Dr. Basavaraj N Hiremath, Dr. Pramod Kumar Naik, Dr. Arun Kumar Gopu identified the resource persons, trainers and coordinated along with the team, the entire FDP.



Five-day workshop (Virtual) on “Mobile Computing and Application Development”

Department of CSE conducted a Five -day workshop on “ Mobile Computing and Application Development” from 22nd August 2023 to 28th August 2023 in virtual mode.

5 th Sem CSE Students were the target audience. Mr. Shesha Shankar Associate Consultant, Cognizant Servian was the Resource person. The objective of the workshop was:

- To obtain an overview of mobile operating systems.
- To be familiar with Android Studio and its project structure.
- To design various Views followed by various Layouts in Android.
- To learn Activities and Fragments in Android.
- To acquire knowledge on SQLite, Realm and Firebase for database connectivity in Android.



To learn basics of Android networking concepts,architecture patterns.

To develop simple cross platform apps using Flutter.

Prof. Ranjini K Assistant Professor, CSE,Prof. Gaurav Kumar Assistant Professor, CSE Prof.Vedashree L V Assistant Professor, CSE,Prof Bharathy Vijayan, Assistant Professor, CSE were the faculty organizers.

Suraksha Bhandhan

Celebrated Suraksha Bhandhan day on 30th August, 2023 in association with Karnataka No For Tobacco.To prevent children and youth from tobacco drug and other addiction.



Workshop on satellite image processing

Department of Computer Science and Engineering conducted a workshop on Satellite Image processing on 21st September 2023 at School of Engineering, Dayananda Sagar University, Kudlu Gate, Bangalore. The workshop was led by Dr.Diwakar, ISRO Chair and Director of the National Institute of Advanced Studies(NIAS).The primary objective of this workshop was to provide a platform for knowledge exchange and collaboration in the field of Satellite Image Processing. Dr.Diwakar's presentation provided valuable insights into the future of satellite technology and its impact on addressing critical global challenges. The event was coordinated by Dr. Rajesh T. M. and Dr. Gopalkrishna Joshi.



MoU with INFOSYS SpringBoard

Memorandum of Understanding (MoU) has been signed between INFOSYS SpringBoard and Dayanand Sagar University. The updated MoU signed by the authorized signatory of the Infosys SpringBoard was received on 14th September, 2023. This MoU outlines a corporate social responsibility initiative aimed at expanding digital reskilling initiatives to a target of 10 million individuals by the year 2025. INFOSYS SpringBoard offers a curriculum-rich virtual platform that provides high-quality learning experiences, suitable for use on any device. This platform also facilitates closer collaboration between educators and learners. The MoU encompasses a broader aspect of a Faculty enablement programme, which focuses on the next generation of learning. This programme is built upon the following core principles: Motivation to learn, leveraging the Teacher-Student relationship, Just-in-time learning, learning experience, readiness for the future while maintaining excellence in the present. Furthermore, faculty members are also granted access to the courses available on the SpringBoard platform.

Talk on “Health Awareness for Professional Teachers by a Teacher”

The Department of CSE has successfully conducted a commemorative session on the eve of Teachers day, a first event on the main campus at Harohalli, a talk on "Health Awareness for Professional Teachers by a Teacher" for all the faculty members on 9th September 2023 and the session was joined by the faculty of campus 3 through Virtual mode. The Speaker of the event was Dr. Pratibha Nadig, Professor & Head, Pharmacology, CDSIMER, DSU.

She raised awareness among professional teachers in her discussion about the value of health. Teachers have a vital role in society as instructors, and both students and society depend on them being in good health. The speaker, who is also a practicing doctor and a teacher, emphasized the need of supporting a balanced diet and staying hydrated throughout the day to maintain energy levels and focus. Teachers should receive training in stress reduction strategies and have access to yoga and meditation classes and other mental health facilities. The talk's conclusion was that creating a favorable learning environment for children can help a teacher be more effective. The teachers enthusiastically engaged with their own experiences, acknowledged the sessions' relevance, and learned how to maintain a healthy lifestyle going forward. The Session was organized by Dr. Basavaraj N Hiremath, Dr. Savitha Hiremath, and Prof. Nandini K.



Image of the group of professional professors on the 9th floor of the computer science and engineering department invited by the DSU on the occasion of Teachers' Day at Dayananda Sagar University. The event is on the occasion of Teachers' Day and Dr. Prabha Nadiq talking about health awareness for professional teachers.

Internal Hackathon for SIH 2023

An Internal Hackathon for SMART INDIA HACKATHON 2023 was held at Dayananda Sagar University on 27th September 2023 at School of Engineering, Dayananda Sagar University, Kudlu Gate, Bangalore. This event mainly focused on providing an opportunity for students to enhance their technical and problem solving skills. By working on real world challenges, students can gain hands-on experience and develop practical skills that are applicable to their academic and professional growth. Organised by SPOC Dr. Basavaraj N Hiremath, Faculty Coordinators Dr.Pramod Kumar Naik, Prof. Rashmi Mothkur, Prof. Nandini K.



Student Achievements



Bhargav Ram C S, Chethan R, Bharath Kumar, Adarsha Subrahmanya Department of Computer Science and Engineering was selected for State Level Seminar and Exhibition of KSCST 46th series of SPP Projects held at Alva's Institute of Engineering and Technology, Moodubidire on 11th and 12th August 2023. The project was carried out under the guidance of Prof. Nandini K. The team has won the KSCST best project of the year and cash prize for the project titled "Insider attack detection using restricted Boltzmann machine in machine learning".



Department of CSE students attended Nokia Symposium on 17th August, 2023. They learnt about technologies like 5G, 6G and insights of IoT networks.



Paritosh Premnath ENG20CS0247 of final year played in Karnataka State Football Association (KSFA) - C Division Group Stage for Blues Football Association (BFA).

Faculty Achievements



Dr. Savitha Hiremath, Prof. Shwetha G S and Dr. M K Banga along with students MS. SUMA MUKKAMALA, MS. NETI SAHITHI, MS. NIKITHA MEKALACHERUVU, MS. PAVITRA ANKESH published a patent titled “Blockchain based Method to Detect and Rectify Insider Attack in Hydroponic” with Application No. 202321015422 on 26th May, 2023 at Indian Patent Office.



Dr. Rajesh T.M. has successfully published a Patent entitled “SYSTEM AND METHOD OF CLASSIFYING EGG-CARRYING FISH” at the Intellectual Property Rights of India on 30th June 2023. He along with Dr. Sharath, M.N, Surabhi, K.R, Nikshepa, T, Sowmya, S.R. has published a paper in 14th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2023, 2023, pp. 1497-1502 titled “Detection and Classification of Blood Cancer using an Auto Encoder and a Regularised Extreme Learning Machine” indexed in Scopus.



Dr. Rajesh T M, Dr. Praveen Kulkarni has successfully published a Patent entitled “CLASSIFIER DEVICE, SYSTEM, AND METHOD” at the Intellectual Property Rights of India on 30th June, 2023. They have also published a paper in IEEE International Conference on Contemporary Computing and Communications (InC4) 979-8-3503-3577-4/23/\$31.00, 2023 IEEE titled “Facial Emotion Detection Using Deep Learning: A Survey” indexed in Scopus.

Faculty Achievements



Dr. Arunkumar Gopu was invited as a resource for the webinar titled “Career Pathways on Information Technology Academia, Industry, and Entrepreneurship” on 27th July, 2023 organized by K.S.Rangasamy College of Technology, Tiruchengode. He along with Kalaipriyan Thirugnanasambandam, Rajakumar R, Ahmed Saeed AlGhamdi, Sultan S. Alshamrani, K. Maharajan and Mamoon Rashid published a paper titled “Energy-efficient virtual machine placement in distributed cloud using NSGA-III algorithm” in Journal of Cloud Computing, Springer indexed in Scopus on August 2023.



Dr. Savitha Hiremath along with students Jinendra Rathod, Neha Kolagal, Harshvardhan Purohit, Joya Verma published a conference paper titled “Emoji Recommendation System Using Deep Learning Algorithms” at 9th International Conference on Electronics, Computing and Communication Technologies, IEEE CONECCT on July 14th 2023 indexed in Scopus. She was also invited as Evaluator for mock NBA from the Department of ECE, GSSSIETW conducted on 18th, 19th and 20th August 2023.



Dr. Bondu Venkateshwaralu, Associate Professor, Department of CSE published a research article titled “Dynamic Association Mining Techniques for the faster Extraction of High Utility Item set for the Incremental Databases” indexed in Scopus Q1 rated “Applied Computing and Informatics” (ACI) Journal with This the cite score 16.3, impact factor 1.589 and the H index 35.



Dr George Fernandez I, Associate Professor, Department of CSE served as Journal Reviewer in “Journal of Super Computing” and “Journal of Intelligent & Fuzzy Systems, IOS Press, Netherlands” in August, 2023.

Faculty Achievements



Dr. Meenakshi Malhotra, Kiran Waghmare, has published an Indian patent with the title "Wellness Application for Analyzing EEG Signals and Assisting Individuals with Mental Health Disorders", 202341043756 on 1st September, 2023.



Dr. Pramod Naik was invited as a resource for the event being organized by MOOG India Technology Center (MITC), Bengaluru during 13th, 14th September, 2023 to deliver a talk on the topic 'Artificial Intelligence & IOT in Aerospace' on the occasion of 'Engineering Confluence 2023'. MOOG is a leading company in design, development, and manufacturing of advanced motion control products for aerospace, defense, industrial and medical applications. They are a leading integrator of precision motion control systems. Their motion control portfolio has expanded to include all forms of actuation technology, sophisticated control electronics and system software. The 'Engineering Confluence 2023' is an event organized by MITC to foster knowledge sharing across the engineering functions in Bengaluru.



Dr. Revathi V, has published a Book Chapter in "Technological advancement in modern Engineering" Volume 1 - Chapter 8: Big data in healthcare, ISBN : 978-93-95196-67-3 by ESN publications in September 2023.



Dr. Mouleswaran S K has published a Book Chapter in "Technological advancement in modern Engineering" Volume 1 - Chapter 9: Securing the Storage Infrastructure, ISBN : 978-93-95196-67-3 by ESN publications in September 2023.

Faculty Achievements



Prof. Ranjini K, has published a Book Chapter in “Technological advancement in modern Engineering” Volume 1 - Chapter 10: Machine Learning in Healthcare: Breast Cancer Detection, ISBN : 978-93-95196-67-3 by ESN publications in September 2023.



EDITORIAL COMMITTEE

•Faculty Coordinators•



Prof. Lavanya B Koppal
Assistant Professor



Prof. Bharathy Vijayan
Assistant Professor

•Student Coordinators•



Mr. Kishore Kumar K
4rd Year



Ms. Manvi Singh
4rd Year



Ms. Keerthanyaa N
4th Year



Ms. Vaishnavi P
3rd Year



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PROGRAM OUTCOMES (PO'S)

PO1 - Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 - Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 - Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 - Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 - Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 - The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 - Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 - Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 - Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 - Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 - Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 - Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

PEO1 - Engage in the design, development, testing/verification and validation, and operation of computational systems in the field of Information Technology and related areas, or in multidisciplinary teams in any field where computing can be applied.

PEO2 - Solve problems of social relevance applying the knowledge of Computer Science Engineering and/or pursue higher education and research.

PEO3 - Work effectively as professional and as team members in computing in multidisciplinary projects, and demonstrating initiative, persistence in problem solving, and excellent technical communication skills.

PEO4 - Engage in lifelong, self-directed learning and career enhancement, anticipate changing professional and societal needs, and adapt rapidly to these changing needs.

PROGRAM SPECIFIC OUTCOMES (PSO'S)

PSO1 - Develop, Analyse, Review and Contribute to efficient, secure and high quality design, implementation, testing and operations of computing system

PSO2 - Find and articulate digital and intelligent solution that can fully or partially automate various aspects of human activity.



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