



INVERTIS

UNIVERSITY BAREILLY

Accredited by NAAC

CENTRE FOR SKILL & ENTREPRENEURSHIP DEVELOPMENT (CSED)

AN INDUSTRY INSIDE INVERTIS

FOR

SMART MANUFACTURING, INDUSTRIAL INTERNET OF THINGS (IIoT),
ARTIFICIAL INTELLIGENCE AND SMART AGRICULTURE



SYSTEM INTEGRATOR



TECHNOLOGY PROVIDERS





Honourable Chancellor
SHRI UMESH GAUTAM

Message from Honourable Chancellor Invertis University, Bareilly

It gives immense pride to introduce Invertis-DCS CSED as my dream project. It has 11 centres of excellence in manufacturing & IIoT which will impart project based learning to the students. The sprawling campus of Invertis and the world class infrastructure of CSED will help students to become industry ready for jobs and also successful entrepreneur. I invite you all to explore the future prospects for

ABOUT CSED

Invertis University, Bareilly is keen and committed to promote Skill & Entrepreneurship Development initiatives with DCS as its system integrator, Dassault Systems, PTC and Mastercam as technology providers. Centre for Skill & Entrepreneurship Development (CSED) aims to strengthen technical education infrastructure to promote industry relevant skill development, which will act as a catalyst in inclusive and sustainable industrial development and employment generation for the local

ABOUT THE UNIVERSITY

Invertis University is situated in Bareilly on NH-24, equidistant from the country's capital Delhi and State's capital Lucknow. From a humble beginning in 1998, Invertis has come a long way. From 83 students and one Institute - Invertis Institute of Management Studies, today we stand tall as a full-fledged University with 10 different faculty streams under its name. We offer a range of Doctoral, Post Graduate & Under Graduate programs in Management, Law, Commerce, Computer Applications, Pharmacy, Education, Journalism & Mass Communication, Bio-Science & Technology, Science, Fashion Design, Engineering & Technology and Agriculture.

At Invertis, we believe that the success of a teacher comes along with the achievements of a student. To ensure that our students succeed, we make sure that they get the very best, that's why our faculty comes from premier institutes like IIT's, IIM's & NIT's. Invertis pioneered the concept of holistic development, an approach of more than just text book studying to an all -round approach of learning. It stems from the old management concept of, "Keep your feet warm, back straight and head cool." Our faculty members foster knowledge and acknowledge students who do well not only in classes, but also in



**“AS HOSPITAL IS FOR
MEDICAL COLLEGE
CSED IS INDUSTRY
INSIDE INVERTIS UNIVERSITY”**

ABOUT SYSTEM INTEGRATOR

DYSMECH COMPETENCY SERVICES PVT. LTD. (DCS)

DCS bags to its name a charismatic aggregation of professionals from diverse verticals, excelling the four pillars that helps flourishing business and taking it to newer horizons. Beneath the advisory ship of Mr. Vijay Kumar, a prominent IIT (Kharagpur) Alumnus possessing extensive exposure and experience of the industrial world, the company's management has been honored and dignified to place the company as one of the leading consultants in India with its nationwide presence in more than 15 cities. With the challenges of growing business in the complex world, we help the company reach its potential by addressing the core business values through our verticals Engineering, HR, Business & Strategic Management, Advisory, Audit & Risk Management, Tax Services, and Skill Development. The company pursues, its aim to use the experience gained by its personnel & skilled experts to service clients maintaining high standards of quality while respecting time schedules. Experienced Team with over 150 person-years of expertise in business advisory with single window where technology, advisory with HR simplifies the most complexities. We provide effective workplace that is grounded in years of successful

ABOUT TECHNOLOGY PROVIDER :

DASSAULT SYSTEMS (3DS) is a subsidiary of the Dassault Group was incorporated in 1981 but in fact, started in 1977 with 15 engineers from Avions Marcel Dassault - led by Francis Bernard to develop a new generation of computer-aided design (CAD) software called CATIA. This new European headquarters, located in the south-western suburbs of Paris, is commonly called 3DS Paris Campus.

Dassault Systems develops and markets PLM software and services that support industrial processes by providing a 3D vision of the entire lifecycle of products from conception to maintenance.

Over the years, Dassault Systems improved its software and expanded to US, Japan, and Germany. This rapid growth triggered a chain of products, acquisitions, and partnerships beyond the company's core 3D CAD/CAM software and led to what is known today as Dassault Systems. In 2007, along with the creation of the new brand 3DVIA, Dassault Systems started to get into online applications. The company used the advantages of the Internet and introduced online PLM with its Version 6 platform.

PARAMETRIC TECHNOLOGY CORPORATION (PTC) is an American computer software and services company founded in 1985 and headquartered in Boston, Massachusetts. The global technology company has over 6,000 employees across 80 offices in 30 countries, 1,150 technology partners, and over \$1bn in revenue. With Fourth Industrial Revolution or Industry 4.0 which has become the fastest growing market for IIoT, PTC ThingWorx platform is a complete, end-to-end technology platform designed for the Industrial Internet of Things (IIoT). It delivers tools and technologies that empower businesses to rapidly develop and deploy powerful applications as Digital Twin, Augmented Reality (AR) experiences. PTC's ColdLight acquisition provides big-data, automated and predictive analytics part.

MASTERCAM INC. Founded in MA in 1983, Mastercam Inc. is one of the oldest developers of PC-based computer-aided design/computer-aided manufacturing (CAD/CAM) software. They are one of the first to introduce CAD/CAM software designed for both machinists and engineers. Mastercam main product, started as a 2D CAM system with CAD tools that let

SMART MANUFACTURING



DEPARTMENT	PROGRAM
Product Design Department	Product Design
Manufacturing Department	Product Manufacturing
Advance Manufacturing Department	Smart Manufacturing
Mold Design & Manufacturing Department	Injection Mold
Design & Manufacturing	
Analysis Department	Product Analysis

1. PRODUCT DESIGN

OBJECTIVES

- To learn the Sketcher Workbench.
- To learn Part Modelling and Designing.
- To learn Wireframe and Surface Designing.
- To learn Assembly Designing.
- To learn Drafting Workbench.
- To learn Product Development Process.

OUTCOMES

- To give shape to the idea, concept design, and controlling the geometrical shape of the designed component.
- To create 3D model of the designed concept, understanding the part designing requirements that fulfil the design needs of various modules like CAM, CAE, Tool Designing, Drafting, 3D printing.
- To understand, create, control the complex shape geometries.
- To design & develop a new product from the existing one.
- To design assemblies, mechanism for validation.
- To understand the industrial drafting standards and generating industrial drawings.



SCOPE

- Design Engineer
- Product Development Engineer
- Entrepreneur

PROJECTS

- New Product Development
- Excavator Design
- Designing of Automobile Parts & Assemblies

2. PRODUCT MANUFACTURING

OBJECTIVES

- To learn different manufacturing process.
- To learn Computer Aided Manufacturing (CAM).
- To learn integrated design and manufacturing.
- To learn CNC programming and machining.
- Manufacturing process optimization.
- To learn jigs and fixtures design.
- To learn Computer Aided Manufacturing using 4 Axis machining centre.

OUTCOMES

- To give shape to the idea, concept design and controlling the geometrical shape of the designed component for manufacturing.
- Geometric and Dimensional Tolerance.
- Understanding process planning.



SCOPE

- Production Engineer
- CAM Engineer
- CNC Supervisor
- Entrepreneur

PROJECTS

- Manufacturing of machine tools
- Manufacturing of automobile parts

3. SMART MANUFACTURING

OBJECTIVES

- To learn the concepts of IIoT.
- To learn the concept of Industry 4.0
- To identify different technology.
- To learn different applications in IIoT
- To learn different protocols used in IIoT.
- To learn the concepts of smart manufacturing development in IIoT.
- To learn the use of IIoT for Predictive Maintenance and Production Control.

OUTCOMES

- Apply the concepts of IOT.
- Identify the different technology.
- Apply IOT to different applications using Thingworx.
- Analysis and evaluate protocols used in IOT.
- Design and develop smart machines in IOT using Thingworx.



SCOPE

- IIoT Designer
- IIoT Developer
- IIoT Analyst
- IIoT Tester

PROJECTS

- Converting existing machine into smart machine
- Machine maintenance analysis
- Development of Smart Machinery
- AI for maintenance and overhauling

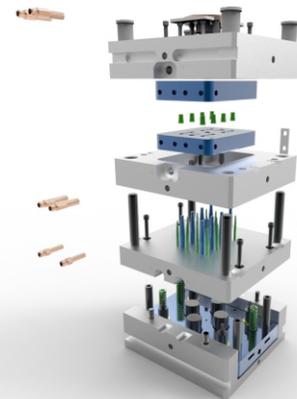
4. MOLD DESIGN AND MANUFACTURING

OBJECTIVES

- To learn the plastic part design requirements.
- To learn the procedure of mold design and its various parameters.
- To validate the design of mold design setup, analysing part design for best gate location and analysis of mold flow.
- To learn the mechanism design procedure and connection between the components.

OUTCOMES

- This enables the students to demonstrate mold making process as well as to work on different types of molds.
- Will be capable to design various injection molding set up components like core, cavity etc.
- Understanding & interpreting results and molding parameters, and also troubleshooting molding problems.
- To analyze scanned data for checking interference between the components etc.
- This enables to configure the motion, evaluate the analysis results.
- It enables to understand various machining processes and creating NC sequences for milling.



SCOPE

- Mold Design Engineer
- Plastic Mold Designer
- CNC Program Engineer
- Entrepreneur

PROJECTS

- Design & manufacturing of molds for plastic components.
- Design of injection mold.
- Manufacturing of injection molds for different industries.

5. PRODUCT ANALYSIS

OBJECTIVES

- To learn simulation of product design and conduct different kinds of analysis.
- To understand pre processing.
- To understand convergence.
- To understand post processing.

OUTCOMES

- Ensures that the product is ready to manufacture and achieves the desired results.
- Ensure the product does, what the company claims it does by sustaining in practical application.
- Provide alternative designs options and study cost effective while meeting the customer requirements.
- The results can aid the business in manufacturing, QA, logistics, and sales.



SCOPE

- Product Analyst-Engineer
- Product Development Engineer
- Product Manager

PROJECTS

- Reverse engineering on disk brakes using thermal analysis.
- Product analysis of automobile parts.
- Static structural analysis of plastic parts made from 3D printer.

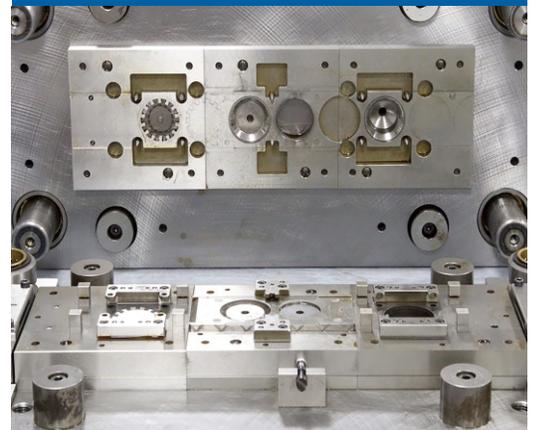
6. PRESS TOOL DESIGN & MANUFACTURING

OBJECTIVES

- To learn sheet metal model fundamentals, creating primary and secondary sheet metal wall features.
- To learn bending and unbending sheet metal models, form features and modifying sheet metal models.
- To learn the process of sheet metal setup and tools and detail sheet metal designs.
- Design of blanking, piercing, progressive and compound dies.
- Introduction & guidelines for design of press tools.

OUTCOMES

- Demonstrate various press machine operations for mass production of sheet metal parts.
- This enables to understand the mechanism behind the effective designing and modifying of the models.
- Prepare working drawings and setup for economic production of sheet metal components.
- Illustrate the principles and blank development in bent & drawn components.
- Identify press tool requirements to build concepts pertaining to design of press tools.



SCOPE

- Sheet Metal Designer
- Tool and Die Designer
- Entrepreneurship

PROJECTS

- Design of sheet metal component for machine design & electronics industry.
- Tool design for sheet metal component.
- Manufacturing of press tool.

INDUSTRIAL IOT



DEPARTMENT	PROGRAM
Smart Water Management System	IloT Foundation
Smart Generator Monitoring System	Communication & Standard Interfaces
Smart Electric Vehicle (EV)	Smart Industrial Connectivity
Descriptive Analytics for EV	Data Analytics for IloT
Predictive and Prescriptive Maintenance for EV	Machine Learning for IloT
Smart EV Monitoring with Deep Learning	Artificial Intelligence for IloT

1. IloT FOUNDATION

OBJECTIVES

- To learn the concepts of IloT.
- To identify the different technologies.
- To learn different applications in IloT.
- To learn different protocols used in IloT.
- To learn the concepts of smart water management with IloT.
- To learn how to visualize the real time data in IloT.

OUTCOMES

- Apply the concepts of IloT.
- Identify the different technologies.
- Apply IloT to different applications using Thingworx.
- Analysis and evaluate protocols used in IloT.
- Design and develop smart things in IloT using Thingworx.
- Analysis and evaluate the data received through sensors in IloT.



SCOPE

- IloT Designer
- IloT Developer
- IloT Analyst
- IloT Tester
- Entrepreneur

PROJECTS

- Smart Water Management System
- Thingworx app development

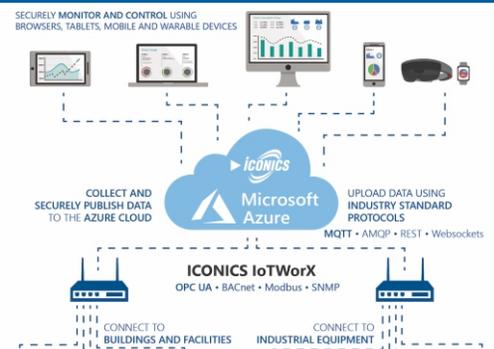
2. COMMUNICATION & STANDARD INTERFACES

OBJECTIVES

- Study the various communication protocols and networking.
- Study the basic concepts of programming/ hardware/ emulator for ESP Controllers.
- Understanding the real time requirement for Smart System Development.
- Study the various server based communication models.
- Build and test smart genset project successfully.
- Improve the team building, communication and management skills of the students.

OUTCOMES

- Identify the requirements for the real world problems.
- Building mashup and widgets using Thingworx.
- Study and enhance software/ hardware skills.
- Demonstrate and build the project successfully by hardware requirements, coding, emulating and testing.
- To report and present the findings of the study conducted in the preferred task.
- Demonstrate an ability to work in teams and manage the conduct of the research study.



SCOPE

- IloT Designer
- IloT Developer
- IloT Analyst
- IloT Tester
- Entrepreneurship
- Communication Engineer

PROJECTS

- Smart Genset Monitoring System
- Thingworx App Development

3. SMART INDUSTRIAL CONNECTIVITY

OBJECTIVES

- To gain knowledge of different industrial protocols.
- To learn designing of user interface using Thingworx platform.
- To learn how to use intents to broadcast data within and between applications.
- To use content providers and handle databases using MySQL/NoSQL
- To discuss various security issues with Thingworx platform.

OUTCOMES

- Study the Raspberry Pi with Linux operating system.
- Implementing industrial protocols like GSM, GPS, RFID etc.
- Use intents for activity and broadcasting data in Thingworx using REST ful API, EMS, KEPWARE.
- Study the web services and properties.
- Design and implement database application and content providers.
- Real time asset monitoring of electrical vehicle.
- Develop Thingworx App with various security features.



SCOPE

- Thingworx Developer
- IIoT Entrepreneur

PROJECTS

- Smart Electric Vehicle
- Thingworx App Development
- Database Management System

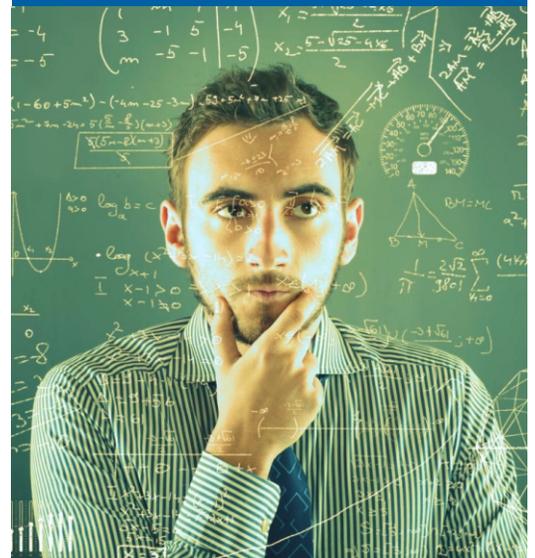
4. DATA ANALYTICS FOR IIoT

OBJECTIVES

- This course will serve as a comprehensive introduction to various topics in Data Analytics.
- Conceptualization and summarization of data pre-processing and data wrangling.
- Representation of data and visualization of data with different techniques.
- Descriptive analytics for industrial data.
- Study the various Thingworx libraries.

OUTCOMES

- At the end of the course the students should be able to design and implement machine learning solutions to classification, regression, and clustering problems; and be able to evaluate and interpret the results of the algorithms.
- Ability to identify the characteristics of datasets and compare the trivial data and big data for various applications.
- Ability to select and implement data analytics techniques and computing environment that are suitable for the applications under consideration.
- Ability to solve problems associated with batch learning and online learning, and the big data characteristics such as high dimensionality, dynamically growing data and in particular scalability issues.



SCOPE

- Business Analyst
- Product Analyst
- Machine Learning Engineer
- Data Scientist

PROJECTS

- Smart Transportation

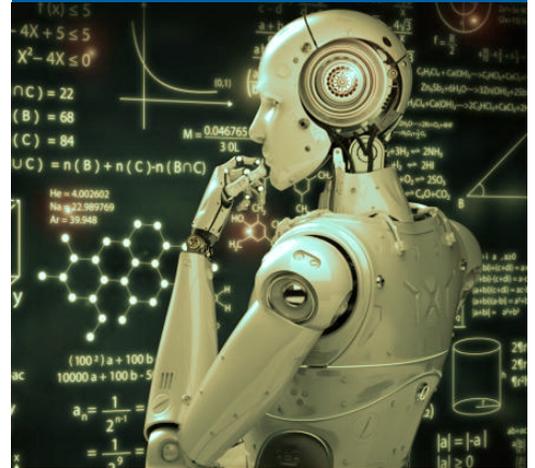
5. MACHINE LEARNING FOR IIoT

OBJECTIVES

- To provide Big data computing environment: Analyse and configure a predictive maintenance Thingworx model that can be implemented into a production environment for real time streaming data.
- To provide Machine learning techniques: Three phases of machine learning - Support vector machine, decision trees and random forests.
- To provide Scaling up machine learning: Dimensionality reduction techniques, Principal component analysis and feature hashing.

OUTCOMES

- Ability to understand and apply scaling up of machine learning techniques, associated computing techniques and technologies.
- Ability to recognize and implement various ways of selecting suitable model parameters for different machine learning techniques.
- Ability to integrate machine learning libraries, mathematical and



SCOPE

- Business Analyst
- Product Analyst
- Introduction to Cloud Computing
- Machine Learning Engineer

PROJECTS

- Predictive maintenance for Electrical Vehicle
- Prescriptive maintenance for

6. ARTIFICIAL INTELLIGENCE FOR IIoT

OBJECTIVES

- To create appreciation and understanding the achievements of AI with the theory underlying those achievements.
- To introduce the concepts of Thingworx AI and different type of Agents that can be designed to solve industrial problems.
- To review the different stages of development in the field of AI from human behaviour to Rational Agents.
- To impart basic proficiency in representing difficult real-life problems in a state space representation to solve using AI techniques.
- To create an understanding of the basic issues of knowledge representation logic, blind & heuristic search, as well as an understanding of other topics such as minimal, resolution, etc. that play an important role in AI programs.
- To introduce advanced topics of AI such as planning, bayes networks, natural language processing and cognitive computing.

OUTCOMES

- Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.
- Analyse and formalize the problem as a state space graph, design, heuristics and different search algorithms.
- Develop intelligent algorithms for constraint satisfaction problems and Industrial Manufacturing Processes.
- Attain the capability to represent various real-life problems domains using logic-based techniques to perform inference or planning.
- Formulate and solve problems with uncertain information using Bayesian approaches.



SCOPE

- AI Developer and AI Analyst
- Data Scientist

PROJECTS

- Smart City Project
- Smart Electrical Vehicle

7. SMART AGRICULTURE :

UN projects the world population to reach the 10 billion mark by the middle of the 21st century. With the rapid urbanization and the rise of middle class, food demand for such a large population will rise exponentially which is estimated to be doubled by that period. Impact of climate change will further put immense pressure on agriculture for healthy, equitable, and sustainable food production around the world specially country like India. It requires special efforts in which smart Agritech solutions would prove instrumental by optimizing agricultural practices, minimizing waste, developing climate resilience, and providing timely agricultural advisory.

In this direction Centre For Skill & Entrepreneurship Development (CSED) at Invertis University has been set up to strengthen infrastructure to promote smart agriculture relevant skill development, eco system and promote successful Entrepreneurs, which will act as a catalyst in inclusive and sustainable Agriculture Development and employment generation for the local youth. COE will support the community to experiment devices and applications by combining various technologies.

1. Smart Cultivation

- Soil Chemical (NKP)
- Physical Analysis (Electrical Conductivity, PH etc.)
- Pollution
- Soil Moisture
- Crop Cultivation Advise (Data Science)

2. Smart Farming

- Automatic Irrigation
- Computer Vision for Disease Detection
- Weather Monitoring
- Crop Farming Advise (Data Science)
- Animal Intrusion Detection

3. Smart Harvesting

- Basic Farm Equipment Manufacturing
- Farm Equipment Monitoring
- Automatic Equipment Warning System
- Waste to Consumable Ratio



BENEFITS TO STUDENT

- Students gain confidence by working on industrial problem statements.
- Students get working experience of 2 to 3 years with graduation.
- Assistance in quality placements.
- Industrial certification.
- Opportunities to attend seminars by industry experts.
- Studying the finest practices and applications.
- Provide a platform to do publications and patents.
- Assistance to students who are interested to become entrepreneur.
- Assistance for higher education.
- Discovering the latest technology build up.
- Hands-on training and overall development of individual's personality.

EMPLOYMENT ASSISTANCE

- OEM, Mid-market to MSME will be invited for campus interviews
- Pre-placement talk
- Written test
- Group discussion
- Technical interview
- Formal interview
- Post-placement talk
- Train students to score big in campus interviews

BENEFITS OF PROJECT-BASED LEARNING

- Opportunities to develop complex skills, such as higher-order thinking, problem solving, collaborating, and communicating.
- Growth in self-reliance and improvement in attitude toward taking greater responsibility.
- Students will gain decisions making aptitude and move from being driven to the driving seat.
- Project-based learning improves student's academic performance.

MANUFACTURING RECRUITERS

XYLEM
 GENROBOTIC INNOVATIONS PVT LTD
 EDLOCUS SOLUTIONS PVT. LTD.
 MTEK ENGINEERS, INC
 CADMAXX SOLUTIONS PVT. LTD.
 ARMSTRONG FLUID TECHNOLOGY
 CYBER METRIC SERVICES (INDIA) PVT LTD
 CKDPACK PACKAGING PVT. LTD.
 SONOVISION AETOS
 CRADLE RUNWAYS INDIA
 CADENCE DESIGN SYSTEMS
 VACUUM TECHNIQUES PVT. LTD.
 CADTREE DESIGNS
 ACESOFT LABS INDIA PVT. LTD
 CIRCOR
 AXISCADES
 ARWADE INFRASTRUCTURE LTD
 ELENO ENERGY LLP
 SMART ENOVATIONS
 MORGENTEC
 CAPGEMINI
 VALEO
 CADENCE DESIGN SYSTEMS
 CLAAS INDIA PVT. LTD.
 POLYONE CORPORATION
 ALSTOM
 TEXTRON INDIA PVT. LTD.
 and Many More...

IIoT RECRUITERS

QUALCOMM
 DELL TECHNOLOGIES
 BOSCH
 INTOUCH HEALTH
 SKYBITZ
 SAVIANT CONSULTING
 DELOITTE INDIA
 QUEST INFOSENSE
 BHARAT FORGE
 SOLULAB
 ACCENTURE TECHNOLOGY
 ARUBA NETWORK
 YASH TECHNOLOGIES
 HACH
 INSEGO
 XENONSTACK
 SPIREON
 MOTOROLA SOLUTIONS
 FORTINET
 INTEGRATED ROADWAYS
 MOBILOITTE
 UDELV
 SCITECH
 IBM
 COGNIZANT
 CAPGEMINI
 IDEAS2IT TECHNOLOGIES
 and Many More...



4 AXIS CNC VERTICAL MACHINING CENTER



3D ROUTER



RAPID PROTOTYPING MACHINE - FDM



HYDRAULIC DEEP DRAW PRESS



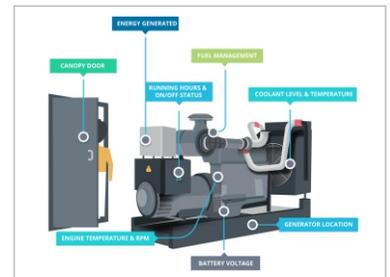
WHITE / BLUE LIGHT SCANNER



PIPE BENDING MACHINE



SMART E-VEHICLE



SMART GENSET





CSED VISION

To be a world class centre of excellence that transforms ambitious students into highly competent work professional and prepare next generation entrepreneurs who will contribute to the growth of excellence and innovation in their



CSED MISSION

Develop and promote the employability and entrepreneurship through multidimensional technical skills in order to enrich the inclusive growth and



Dr. R. K. SHUKLA
Dean Engineering - Invertis University

In this era of technology, dynamic changes are taking place. To meet the challenges we have started CSED to equip students with the latest technology related to industry 4.0. CSED will help students to think and develop problem solving attitude. Students will be made employable through the different programs of CSED.

CSED Incubation centre will do the mentoring that will help young entrepreneurs, bring their ideas to marketplace.

Ms. HARMAN KHINDA
International Tie-up Coordinator - Invertis University

We at Invertis University are committed to every individuals students and shaping their career.

CSED aims at Skill up gradation and capacity building for the next generation technologies of Industry 4.0, Smart Manufacturing, Industrial Internet of Things (IIOT), Machine Learning and Artificial Intelligence.

Invertis University Students, will no longer be considered as fresher but will be eligible for lateral hiring as experienced professionals with CSED experience centre inside the campus.

The project-based learning approach through industry experts will help in to bridge the gap between the industry requirement and institute curriculum.

The incubation cell will do hand holding of the entrepreneurs by providing technological support and guidance through industry experts. CSED will act as an R&D Centre for the nearby industries.

I appeal to students to become knowledge rich and employable by acquiring next generation skills of Industry 4.0 at CSED. Evolve as job givers rather than job seekers by becoming entrepreneur.



RAHUL NAIDU
Chief Advisor - Dysmech Competency Services Pvt. Ltd.

CSED is a centre where the finest consulting practice on Skill & Entrepreneurship Development is executed, coming out with experimental learning and giving a completely different direction on the way Skill Development need to be addressed in India. CSED is developing skill warehouse with cross matrix to serve industries from IT, Manufacturing and Aerospace. CSED is a unique concept of setting up an "Industry with in the Institute", which acts as an 'Experience Center', in short it's like a Hospital within a Medical College. CSED also encourages R&D, has the capacity to incubate start-ups and generate placements as part of the deliverables. I appeal students to partner with CSED and become future assets for the country.



CAMPUS :

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LET'S GET CONNECTED



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