

MCET | CENTERS OF
EXCELLENCE
UNLOCKING POTENTIAL

Dr. MAHALINGAM
MCET
COLLEGE OF ENGINEERING AND TECHNOLOGY
Enlightening Technical Minds

Dr. MAHALINGAM
COLLEGE OF ENGINEERING AND TECHNOLOGY
An Autonomous Institution
Affiliated to Anna University, Chennai. Approved by AICTE.
Accredited by NBA and NAAC with Grade A
Udumalai Road, Pollachi - 642 003. Tamilnadu.



LINEAGE

The Sakthi Group is an 1.2 billion US\$ Industrial Conglomerate and one of the fastest growing business groups in South India. The Sakthi Group has a strong market presence in a number of Industrial Domains with a host of group companies, institutions, trusts and foundations operating under its umbrella. These organizations have been playing a significant role in shaping the economic and social development of South India.

Sakthi Group owes its genesis (1921) to the pioneering vision of Late Shri P. Nachimuthu Gounder and nurturing by his illustrious son Arutchelvar Dr. N. Mahalingam (Recipient of Padma Bhushan). Nachimuthu Industrial Association (NIA), a trust under the auspices of Sakthi group, was established by Late Dr. N. Mahalingam in memory of his beloved father.

Dr. Mahalingam College of Engineering and Technology (MCET), Pollachi, functioning under NIA Trust was established in the year 1998 to commemorate the 75th birthday of Dr. N. Mahalingam. The present management team is comprised of Dr. M. Manickam, Chairman, Shri. M. Hari Hara Sudhan, Correspondent and Prof. C. Ramaswamy, Secretary.





The institution endeavors to impart high quality, competency based technical education in Engineering and Technology to the younger generation with the required skills and abilities to face the challenging needs of the industry around the globe.

Courses offered by MCET

B.E. / B.TECH

MECHANICAL ENGINEERING
AUTOMOBILE ENGINEERING
CIVIL ENGINEERING

ELECTRONICS & COMMUNICATION ENGG.
ELECTRICAL & ELECTRONICS ENGG.
ELECTRONICS & INSTRUMENTATION ENGG.

COMPUTER SCIENCE & ENGINEERING
INFORMATION TECHNOLOGY

M.E. / MCA

CAD / CAM
APPLIED ELECTRONICS
COMPUTER SCIENCE & ENGG.

COMMUNICATION SYSTEMS
STRUCTURAL ENGINEERING
MASTER OF COMPUTER APPLICATIONS

Ph.D

MECHANICAL ENGINEERING
ELECTRICAL & ELECTRONICS ENGG.
ELECTRONICS & COMMUNICATION ENGG.

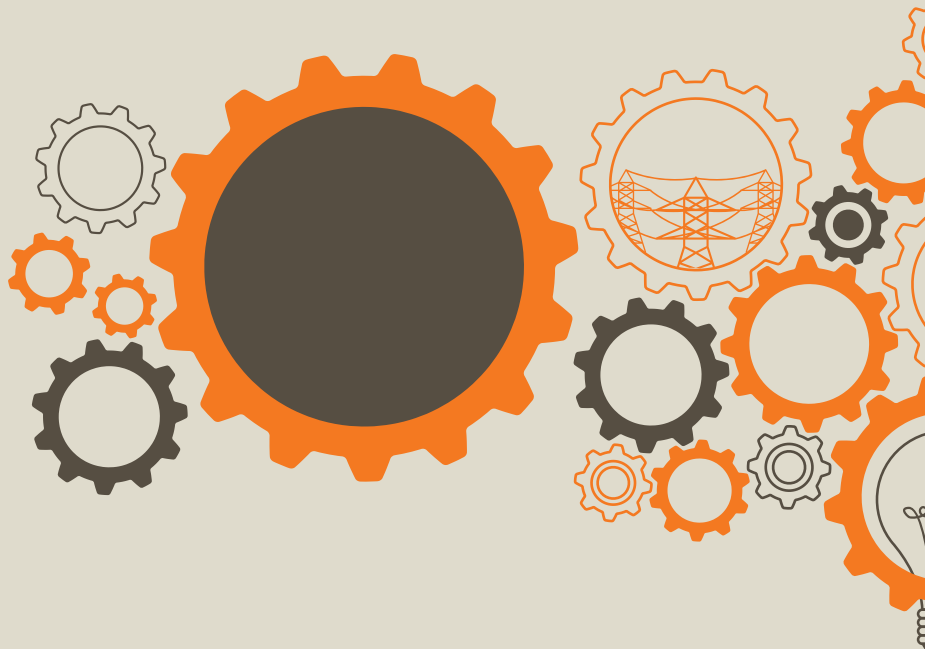
CENTRES OF EXCELLENCE (CoE)

In pursuance of the above mission, MCET recognises the importance of Industry-Institute partnership. The management with its progressive vision has set up from time to time various CoEs in alliance with the industries inside the campus. CoE is a facility with necessary infrastructure to enhance the skills of the students. These centres provide ample opportunities for the students and staff to comprehend the latest industry practices and upgrade their knowledge through industry relevant projects using these facilities. The centres also help train the technicians who are currently employed by the industry as well, hence serving as a revenue generating model. Efforts are on to set up more such centres to strengthen the ties between the industry and the Institution.

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**ELEVATING
ENGINEERING
EDUCATION TO THE
NEXT LEVEL...**



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MCET - BOSCH Rexroth

Regional Centre of Competence in Industrial Automation Technologies

Industrial automation has helped bring down the production costs in addition to achieving consistency and improving the quality of the products enabling them to fare well in the global market. India's economic policy has made it mandatory for us to meet international standards. Automation requires knowledge in drives and controls, which in turn requires insight into PLC, Sensorics and Mechatronics. Full benefit of automation can only be realised when fundamental principles governing these areas of study are properly understood.

An MoU was signed between MCET and Bosch Rexroth on 18.08.2011 and the centre was launched on 25.07.2013.

About the Centre

MCET - Bosch Rexroth Regional Centre of Competence in Industrial Automation Technologies (M-BRAIN) is a collaborative venture between MCET and Bosch Rexroth, Germany who are global leaders in Drives and Control equipment. The centre has a primary objective of producing skilled manpower in latest industrial automation technologies. It has state-of-the-art labs for undertaking research and projects for industry, and for providing world class training in Industrial Automation encompassing Hydraulics, Pneumatics, PLC, HMI, Sensorics and Mechatronics. Twelve faculty of MCET have received advanced training in automation technologies at Bosch Rexroth, India and Bosch Rexroth, Germany.

Objective of the Partnership

Considering the critical role of automation in various facets of manufacturing, the centre has designed a comprehensive and flexible portfolio of training programmes for the professional development of staff and students of engineering colleges as well as technicians from the industry.

Training Programmes

The major focus of the intensive training programmes is on enhancing the practical knowledge and functional area expertise of the participants through intensive, focused, hands-on, and highly interactive training methodologies. The programmes cover the various industrial automation technologies used in Automation Industries.

The programmes aim at providing adequate knowledge and hands-on experience, and are structured around the following components:

- Hydraulics and Hydraulics Components
- Pneumatics Fundamentals and Applications.
- Sensorics and Applications of Sensors.
- PLC Technology, Programming and Applications.
- Real time interfacing using PLC and HMI.
- Motion Control, CNC and Mechatronics

Centre Initiatives

ReCap-D-Research Initiative Capability Demonstration

Under this initiative the Centre will execute R&D projects to showcase MCET-Bosch Rexroth capabilities and at the same time create artifacts useful to Bosch Rexroth in

- Matlab and Simulink-xPC Block sets for Rexroth products
- LabVIEW simulation Components
- Enterprise Architect based UML Patterns

StudPro - Student Project Initiative

- Provide students opportunity to use artifacts of ReCap in Bosch Rexroth relevant projects
- Students can also try out their innovative ideas with the available resources of the Centre
- Provide internship opportunities for students at the Centre



SciBase-E-Scenario Based Experimentation Initiative

Through this initiative one can create and provide innovative solutions to many Bosch Rexroth problems by applying block sets, components and patterns created at the Centre and other similar developments.

Courses Offered

Mechanical Stream:

Duration/Course: 32Hrs (4 Days)

- Basics of Hydraulics and Pneumatics
- Advanced Hydraulics and Pneumatics
- Basics of PLC
- Mechatronics
- Industrial Automation Systems

Circuit Stream:

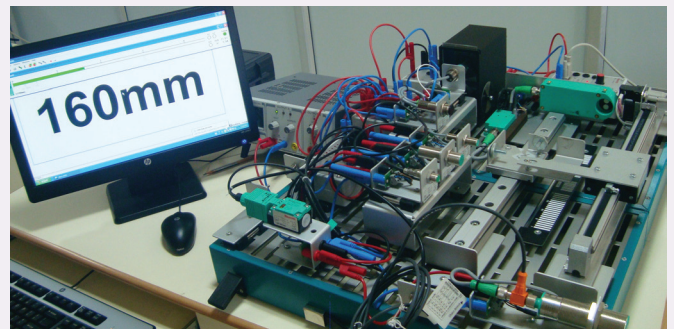
Duration/Course: 32Hrs (4 Days)

- Basics of PLC
- PLC and HMI
- Sensorics
- Mechatronics
- Industrial Automation Systems

IT Stream:

Duration: 32Hrs (4 Days)

- PLC Programming and Applications



SIEMENS

Digital Manufacturing

MCET - Siemens Centre of Excellence for Digital Manufacturing

In January 2014, MCET and Siemens Industry Software India Ltd. jointly set up the Siemens Centre of Excellence for Digital Manufacturing at MCET campus to inculcate industry relevant skills in the students to enhance the employability and to create an infrastructure for application and research oriented learning, by combining the strengths of MCET and Siemens.

Centre for Digital Manufacturing is an interdisciplinary research/training centre in the domain of Product Lifecycle Management (PLM). PLM is an integrated information-driven approach to all aspects of a product's life-from its design inception through its manufacture, deployment and maintenance, culminating in its removal from service and final disposal.

The mission of Siemens centre is to promote the advancement and implementation of PLM through research and education in partnership with industry.

Objectives

- To bring about qualitative improvement in Technical Education through improved Lab infrastructure in line with contemporary industrial requirements and technology.
- To upgrade faculty skills through relevant training and curriculum review to adopt modern industry demands and promotion of innovation through R&D.
- To encourage Industry-Academia interfacing.
- To train students to improve employability
- To attract industries to set up skill development units to exploit the availability of talent pool.

Infrastructure

An exclusive centre that houses Siemens PLM Software Suite and hardware for digital product design, simulation, analysis, manufacturing and product data management.

Siemens software Commercial Licence value:	Rs 150.25 Crores (Under Siemens GO PLM Grant)
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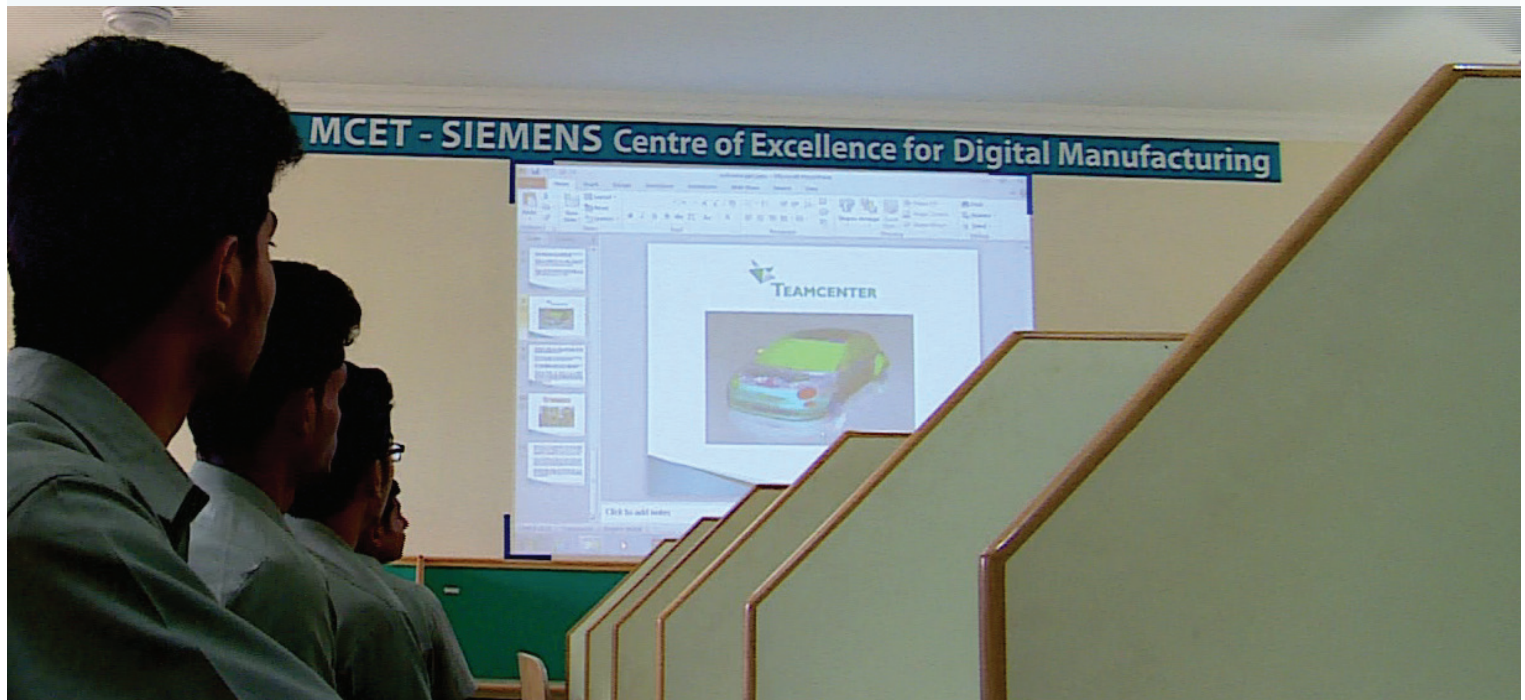
PLM software suite numbering 10 to 60 in each:	Rs 120 Lakhs (Investment by MCET)
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Benefits

- Improvement in employable skills widely demanded by industry.
- Improved placement prospects & remuneration levels.
- Attract quality faculty and enhance the level of academic standards.
- Collaborative opportunities with greater number of industries.
- Create an environment with more R&D focus.
- Shorter gestation time and reduced training expenses for making the employee role ready.
- Greater employee productivity.

Courses Offered

The centre offers a wide range of training programs in the field of Product Life cycle Management (PLM). Trainings on Siemens PLM software range from basic, intermediate to advanced levels – participants can opt for a particular tool and level based on the requirement and proficiency. The Centre offers training program throughout the year an indicative list of courses conducted is given below-prospective participants can contact the centre to book for a personalised training schedule.



Courses in CAD / CAM / CAE

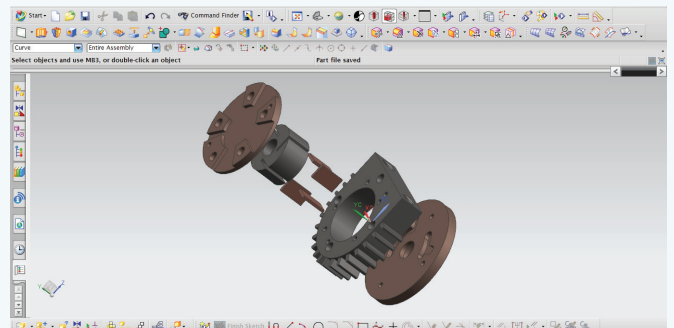
- Solidedge
- NX for Design
- NX Manufacturing Fundamentals
- Introduction to FEA with NX
- FEMAP

Courses in Product Data Management

- Introduction to Teamcentre

Courses in Digital Manufacturing (Tecnomatix)

- Plant Simulation Basics
- Factory CAD
- RobCAD
- Classic Jack



C-DAT

MCET - C-DAT Centre for Design Analysis and Testing

Centre for Design Analysis & Testing (C-DAT) provides “Concept to Product Design” solution to Automotive & Industrial Domains. Activities include Design, Modeling, Computer Aided Engineering, Analysis & Testing. C-DAT leverages on the extensive experience, expertise and professional competence of M/s. Sakthi Auto Component Pvt Ltd. & Department of Mechanical Engineering, MCET. CDAT, an ISO 9001 – 2008 certified centre, was established in the year of 2011.

Infrastructure available

Testing Capability:

- Static Testing • Impact Testing • Durability Testing
- Specialised Tests as per customer requirements
- Failure Simulation & Analysis

Impact Test

Multi-body dynamics calls for the effect of velocity on a colliding body. Evaluation of impact resistance becomes an important data in product validation. The Dynatup impact tester allows this validation.

Specification

Machine Name	: Dynatup
Model	: 9250 HV
Manufacturing	: INSTRON, USA
Maximum load	: 80.5 Kg
Maximum Velocity	: 20m/s
Maximum Joules	: 1603
Type	: Pneumatic System
Minimum Pressure	: 6 PSI
Power	: 240 V
Load Cell Accuracy	: $\pm 2\%$ of Set Value

Fatigue Test

Fatigue contributes to majority of the component failures. The resistance to fatigue load is much lower than the breaking strength of a material. This calls for evaluation of safe working load under actual working condition. A fatigue test both virtual and real validates the product against failure.

Specification

Manufacturer : Instron structural system (IST), Germany

Actuator - I : Hydraulic Actuator

Model : PL 63 R

Rated Force : ± 50 KN

Span : -75mm to +75mm

Actuator- II : Hydraulic Actuator

Model : PL 25 R

Rated Force : ± 25 KN

Span : -75 mm to +75 mm

Design, Virtual Analysis & Verification

Software Capabilities

With most of the products made available in the virtual mode, it is possible with appropriate software to carry out virtual analysis and verification in order to reduce time to 'Market'.

- 2D to 3D Conversion
- Packing study (3D Modeling)
- Reverse Engineering
- Bill of Materials
- 2D drafting
- Tolerance Analysis
- Modal Analysis
- Crash Simulation
- Optimization
- Non-Linear Analysis
- Computational Fluid Dynamics
- Static Analysis (Linear)
- Fatigue Analysis
- Thermal Analysis



CAD / CAE / CFD Software Facilities

Structural Analysis

FE Pre/Post Processing

- HYPER WORKS 13.0

FE Analysis

- ANSYS 15
- RADIOSS

Flow & Thermal Analysis

- CFX
- FLUENT

The state-of-the-art facility to evaluate simple and complex products

Testing Capabilities

- Longitudinal Strength
- Lateral Strength
- Bending Strength
- Torsional Strength
- Testing Facility for Steering Knuckle
- Lateral Force Test
- Longitudinal Force Test
- Braking Force Test
- Control Arm Force Test
- Steering Arm Force Test
- Strength under Panic Braking Load Test
- Bending Fatigue Test
- Static Braking Load Test
- Fatigue Test under Braking Load
- Impact Test (Room & Cold Temp)
- Steering Arm Impact Test (Inboard & Outboard)
- Steering Torque Test
- Strut Clamping Test
- Static Strength Test
- Natural frequency analysis

Objective: CDAT provides design solution to industries through analysis and testing with sophisticated software and with latest testing facilities.

It also focuses on the following:

- Promote joint ventures with industries and academic institutions.
- Identify industry need based projects and convert students' projects to benefit both.
- Accommodate other Academic Research projects, the Area of fatigue and Impact assessment of mechanical component.
- Promote consultancy to industry and training their personnel.

Course offered

Module Name: Fatigue and Impact Testing of Mechanical components. Duration : 40 hrs

Topics covered: Introduction, Fatigue strength estimation, Design for finite life and infinite life, Basic components of fatigue and impact machine, Hands on training in fatigue and impact testing machine.

Achievements of the centre

- 35 fatigue, static and impact tests on auto components are carried out.
- 2 PhD, 10 ME and 20 BE Research projects are completed so far using the facility available at C-DAT.
- Nearly 100 students have been trained in the centre through one credit course


TÜVRheinland®

MCET – TUV Rheinland Centre
for Advanced Training
(Automotive Technology)

The centre was established by MCET in the year 2014 in collaboration with TUV Rheinland (P) Ltd. and Automotive Skills Development Council (ASDC) to impart knowledge and skill in the automotive field. The centre consists of state-of-the-art training facilities including the German based software Labsoft and hardware UNI-TRAIN, where one can visually learn the working of various automotive systems by interfacing with the hardware. The centre helps to raise the level of competence in line with industry expectations.

Training Objectives

This centre aims at providing skill oriented training in the automotive field that is customised to the requirements of the industry. It offers a range of training programs to cater to the needs of the college students, faculty and practicing engineers.

Infrastructure

The centre is equipped with the cut section and working models of almost all the automotive components and systems like the suspension system, cooling system, lubrication system, steering system, air-conditioning system, ignition system, MPFI system, transmission system, braking system and automotive wiring layout.

The software available in the centre (Labsoft) is unique in its category in facilitating the students to learn the advanced technologies in the automotive electrical, electronics and automotive systems like Sensors in Automobile, Vehicle Stability system (ABS, ESP, ASR), Chassis electronics, Communication protocols (CAN, LIN), CRDI, Electronic ignition system, Pulse width Modulation, Battery charging systems.

Achievements of the Center

- The centre has trained about 300 students from MCET and other institutions in automotive technology including the Automotive System Simulation course.
- The centre has conducted a two-day workshop on Advanced Automotive System Using Lucas Nulle Kit. Twenty participants from various institutions attended and benefited from the workshop.
- The centre offers one credit course on Automotive Electrical and Electronics for students of MCET studying in various disciplines like ECE, EIE, EEE and ICE.

Courses Offered

The centre offers the following courses

Course Name	Course Duration	Eligibility
ASDC Service Technician Level 4 *	2 Months	10th / ITI / Diploma
Basics of Automotive Technology	1 Month	10th, +2, ITI
Automotive System Simulation using Lucas-Nulle Labsoft	1 Month	Diploma / B.E
Automotive Electrical & Electronic Systems	3 Weeks	ITI / Diploma / B.E
Advanced Automotive Systems	2 Months	Diploma / B.E

*Course certified by Government of India through ASDC (Automotive Skills Development Council), 1 month theory classes and 1 month on-the-job training at selected automotive service stations.



Altair

MCET - ALTAIR
Centre of Excellence

M/s Altair is the recognised leader, with over 25 years track record of providing best-in-class modeling, solution and optimization tools. Altair consistently delivers solution to automotive and aerospace manufactures like, BMW, Chrysler, Fiat, Ford, GM, Honda, Hyundai, Jaguar Land Rover, Mercedes, Nissan, Saab, Toyota, Volkswagen, Airbus, Bae Systems, Bell Helicopter, Boeing, Bombardier, CESSNA & Sakthi Auto Components.

To promote consultancy and training activities for the benefit of students and staff, MCET has signed a MOU with Altair in the year 2009 and established “ALTAIR Centre of Excellence” with state-of-the-art facility to elevate the students for industrial requirements through Hyper Works software training.

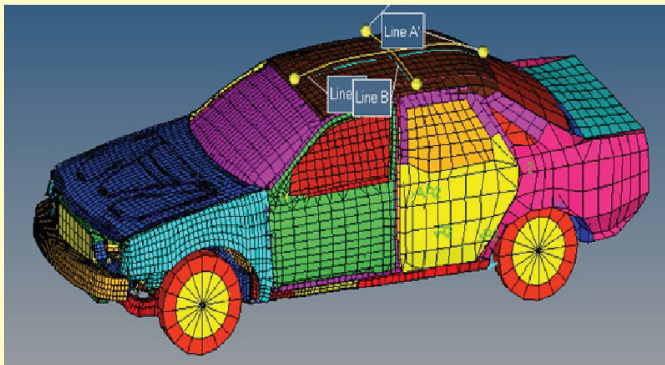


About the Centre

The centre was established in 2009 to transform knowledge into competence by training the students in various software available at the centre of excellence.

Infrastructure

The MCET - Altair Centre of Excellence is equipped with 57 HP Workstations. The workstation is configured with Intel (R) Core (TM) i5 – 4590s, 500GB HDD, 4 GB DDR II RAM. The centre functions with the licensed software viz. HYPER WORKS 13.0 and ANSYS 15 for both education and commercial purpose.



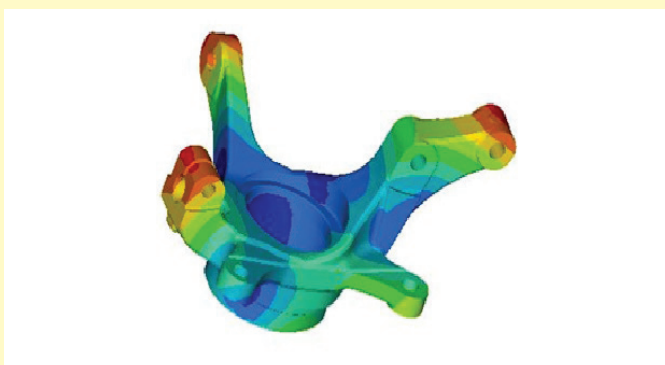
Altair HYPER WORKS Products

Modeling and Visualization

HyperMesh-HyperView-HyperGraph-HyperCrash-MotionView-HyperMath-SimLab-solidThinking

Analysis & Optimization

OptiStruct-RADIOSS-AcuSolve-HyperStudy-MotionSolve-HyperForm-HyperXtrude-Virtual Wind Tunnel



Knowledge Transfer:

In order to create a competitive designer, the centre has designed the knowledge transfer in the form of Modules, through which the students get benefited and get trained apart from their curriculum as a Value Added Education. The centre also caters to the need of the industry by doing different type of consultancy and projects in which the students are deployed along with experienced faculty members.



The students are evaluated throughout the course with various case studies and awarded with MCET - ALTAIR Centre of Excellence certificate to help add value to the students' career.

Future Road Map

The MCET - ALTAIR Centre is looking forward to cater the industry needs by jointly working with industrial projects which benefits the Industry and helps in knowledge sharing for both the students and the faculty members.

TRAINING MODULES

Module No	Module Name	Content	Software Name	Training Hrs
1	Altair Hyperworks Platform for Innovation	a) Preprocessors -Hypermesh -2D Meshing -3D Meshing	Hyperworks 13	50
		b) Solvers - Radioss - Motion Solve - Acusolve	Hyperworks 13	40
		c) Post processor - Hyper View - Hyper Graph		
		d) Design and Optimization - Optistruct - Hyperstudy	Hyperworks 13	40
2	Ansys Using APDL	a) Dynamic Analysis c) Thermal Analysis d) Modal Analysis e) CFD Analysis	Ansys 15	60



MCET-Harita Techserv Research Center on New Product Development and Manufacturing Technologies

On September 5, 2014, Dr. Mahalingam College of Engineering, Pollachi and M/S Harita Techserv Ltd, Chennai joined together to set up a Research Center on New Product Development and Manufacturing Technologies at MCET Campus, Pollachi. MCET and Harita signed an Memorandum of Understanding to collaborate in the field of new product development in automotive industries. The centre aims to bring in, training, research, and development activities in campus by forming faculty-student research teams.

Objectives

- To conduct research on new product development and manufacturing technologies
- To enable student researchers to learn and conduct research
- To train students on latest tools and technologies
- To develop skills in the field of new product development

Infrastructure

MCET has set up the research center with the required infrastructure, workstations and the recommended digital

manufacturing software (Dassault Systems) to enable the faculty members and student researchers to learn and conduct research on the new product development and manufacturing technologies.

Faculty Research Teams

Domain based research teams composed of faculty members trained by Harita Techserv on the required software and tools are formed – faculty research team receive exclusive training by Subject Matter Experts (SMEs) identified by Harita.





Student Research Team

With the core faculty research team, MCET students from Third Year and Final year are enrolled annually through identified and evaluated student selection process. The selected student, from different engineering streams, will undergo intense training on the subject matter and will do collaborative research.

Institution-Industry Interface Benefits

- The research center provides mentorship and enhances MCET faculty members' competencies in design, skill development, engineering research activities, and performances.
- The center evaluates students' learning progression and provides appropriate orientation as and when required.
- The centre provides the opportunity to undergo internship programs and industrial visits at Harita Techserv, Bangalore offshore development centre.
- Harita Techserv conducts "Campus Placement Drive" for recruiting "Trainee Engineers" amongst the students.
- Harita will bring in live projects, products, design and research activities to be executed by the research team.

Courses Offered

- CATIA V6
- DELMIA V5





MCET - TUV Rheinland
Centre for Advanced Training
(Welding Technology)

MCET - TUV Rheinland Centre for Advanced Training (Welding Technology) is established by the collaborative effort of TUV Rheinland India Private Limited and MCET jointly with ABT Ltd, Coimbatore.

MCET – TUV Rheinland Centre for Advanced Training (Welding & NDT) offers training in welding and its allied fields like cutting, brazing and surfacing. This centre focuses on developing the welding skill of the youth. Aspirants can avail the opportunity to learn and enhance their skill in welding, brazing, surfacing, cutting and Non Destructive Testing (NDT). Training programs supported by welding equipment manufacturers, consumable manufacturers and trainers from the academic and industrial background are the key highlights.

Infrastructure

The Centre is equipped with 19 welding training stations / booths, 14 TIG and ARC Welding and 5 MIG / MAG equipment with Individual fume extraction system for all the booths and a welding simulator.

The NDT lab has facility and equipment to conduct training in Dye Penetrant Testing, Ultrasonic Testing, Magnetic Particle Testing, Visual Testing and Radiographic Testing Methods.

Training programs

Welding training offered for groove and fillet - all positions - down hand, vertical, horizontal and overhead in plate, 1G, 2G, 5G and 6G pipe positions in pipe on ferrous and non-ferrous materials. The training programs aims at enhancing/ upgrading the skill level of the participants through right techniques taught by experienced personnel. The skill level demands for welding critical components in automobile, aerospace, oil and gas, petrochemical and ship building is so high and industries cannot afford repair, rework as time and material are of high importance. Welders trained and skilled in the particular welding process can produce high quality weld resulting in high quality products.

Welding qualification to any international standards is offered on need basis. Seminars in the area of welding and allied subjects are conducted by inviting experts from industry and academics. The trainings are offered in the areas of:

- Shielded Metal Arc Welding (SMAW) / Manual Metal Arc Welding (MMAW)
- Gas Tungsten Arc Welding (GTAW) / Tungsten Inert Gas (TIG) Welding

- Gas Metal Arc Welding (GMAW) / MIG/ MAG
- Flux Cored Arc Welding (FCAW)
- 6G position pipe welding
- Oxy-Acetylene gas welding/ cutting and brazing

Since its inception in January 2013, the centre has trained more than 300 participants from various industries and institutions and have also helped participants get internship and placement opportunities.

Major industries whose employees have been trained in the centre.

- Roots Industries, Coimbatore
- AKG India Pvt Ltd, Coimbatore
- ELGI Equipment, Coimbatore
- Sambros Tex Global, Pollachi
- SE Electricals, Coimbatore
- Caresoft Global, Pollachi

Also Diploma and B.E., students from various colleges in Tamil Nadu and rural youth from various districts have undergone training in the centre.





Welding Courses

Course	Duration	Eligibility
Arc Welder Training	4 Weeks	10th/ +2/ Diploma
MIG / MAG Welder Training	4 Weeks	10th/ +2/ Diploma
TIG Welder Training	4 Weeks	10th/ +2/ Diploma
Gas Welder Training	4 Weeks	10th/ +2/ Diploma
Certificate course in Welding Technology for Engineers	1 Month	Diploma / B.E., Mech, Auto, Aero and related courses
Skill Training in Welding and NDT for Engineering college students	10 Days	Diploma / B.E., Mech, Auto, Aero and related courses
Short Term course on Non Destructive Testing (NDT)	5 Days	Diploma /B.E., Mech, Auto, Aero and BSc. / MSc, Physcis

Customised training as per industry requirement and individual's requirement also can be arranged.





Agilent Technologies

MCET - AGILENT TECHNOLOGIES.
Centre of Excellence in RF design and
Verification

A Centre of Excellence in RF design and Verification has been established in the year 2012 in collaboration with M/s Agilent Technologies. Personnel from MCET have undergone 'train the trainer' program on the software and the hardware installed by Agilent. Training was given by the subject matter experts from the industry. This is serving as a platform for students and aspirants to pursue their research interest in the field of RF design.

Objective:

This centre is intended to benefit students who wish to pursue their career in the field of advanced wireless communication and RF design.

Infrastructure:

The lab has the following facilities:

1. Personal Computers- 10 Nos
2. Multipurpose lab stations - 6 Nos
3. Agilent "Advanced Design Software" - 5 Licenses

Each Multipurpose lab station constitutes:

- i) MSO 7014B 4+16 channel mixed signal oscilloscope
- ii) 33521A 30 MHz arbitrary function generator
- iii) E3631A triple output DC power supply
- iv) 34401A 6 ½ Digit True RMS Digital Multimeter
- v) VSA and VEE pro software

Achievements of Center:

UG and PG students of ECE Department are doing projects in the area of RF design in the following topics:

- Indoor base station antenna and Dual-Band patch antenna array for WLAN and for WiMAX applications
- Dual-band notched monopole antenna and design of selective reconfigurable band pass filter for Ultra Wide Band applications
- Design of isotropic planar antenna for radio frequency identification
- Design and implementation of beam forming network for phase array antenna.
- Design of Phased Array Antenna for wireless applications.

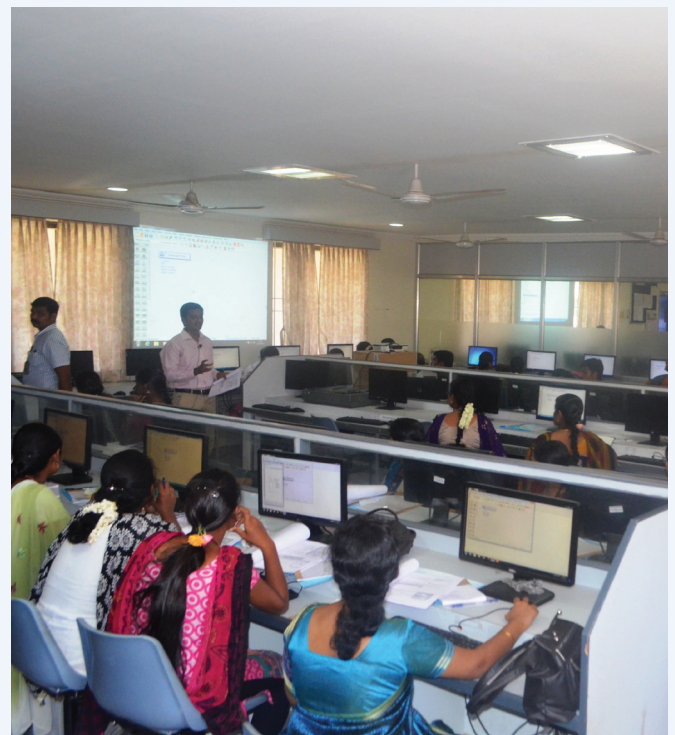
A hands-on training on Multipurpose Lab Station was conducted for faculty members of ECE Department

Faculty development program and hands-on training on Agilent Advanced Design System (ADS) Software was conducted for faculty members of ECE Department on by Agilent Technologies.

Two-day workshops on "RF design and Wireless Technologies" were conducted by Application Engineers from Agilent Technologies.

Courses Offered:

- One credit course on "RF circuit design using ADS" offered for 6th semester UG students.
- Value added Course on "RF system design".





MCET - CENTRE FOR RESEARCH ON GREEN ENERGY AND ENVIRONMENT

Given the current demand at the global level for energy and the necessity to protect the environment, there are growing pressures to find alternative sources. Suitable and affordable energy is important for socio-economic development. In this regard, the Centre for Research on Green Energy and Environment (CRGEE) was established at MCET in the year 2010 to create awareness on Renewable Energy (RE) technologies. To achieve its objective, the centre has been working on various aspects of renewable energy utilisation and for the technology development in collaboration with other research institutions, implementing agencies and industry.

OUR PARTNERS

Academic Partners

MCET has entered into a Memorandum of Agreement (MoA) with the Verschuren Centre for Sustainability in Energy and Environment (VCSEE), Cape Breton University (CBU), Nova Scotia, Canada, Periyar Maniammai University, Vallam, Thanjavur and Karunya University, Coimbatore for collaborative energy and environment research activities. Two of our faculty members worked on sabbatical in energy and environment research activities at CBU for three months in 2012 and honored as Verschuren Centre Research Fellow

Industrial partners

MCET has entered into Memorandum of Understanding (MoU) with the following industries for collaborative energy and environment research activities.

CRGEE ROADMAP & INTERNATIONAL ACTIVITIES

- **2010:** Commencement of CRGEE
- **2011:** Dr. Allen Britten & Dr. Edwin from CBU visited our Centre facilities and interacted with technocrats working in RE.
- **2012:**
 - > Dr. Ross McCurdy, COO, VCSEE visited our Centre and nearby RE based industries.
 - > Five faculty members participated in Canada-India Summit held at CBU, Canada.
 - > Two faculty members worked on sabbatical in energy and environment research at VCSEE, CBU.
- **2013:**

MCET-CRGEE organised India-Canada Project Summit and commenced research activities in following areas:

 - > Domestic Wind Energy Research
 - > Hybrid Solar -Wind Energy System
 - > Biomass
 - > Water Management & Remediation

Dr. Dale Keefe, Dean Research, CBU & his team visited CRGEE and nearby RE based industries to explore future collaborations.
- **2015:** Organised International Conference on 'Renewable Energy and Sustainable Environment-2015'



Programme Organised @ MCET

- To create awareness among youngsters a workshop on "Green Energy Technologies" was conducted on 20th August 2010.
- To bring out the latent talent of the young minds, one-day Exhibition on "Energy Conservation and Management" was organised on 20th August 2011.
- To create awareness among public and school students, a Two-day Exhibition cum Seminar on "Green Energy Technologies" was held on 5-6th October 2012.
- Electrical Energy Audit & Conservation Practices held on 27-28 August 2015.

INDUSTRY CONSULTANCY ACTIVITIES

CRGEE offers Energy Audit, Power Quality Audit (PQA) solutions and design, installation and commissioning of SPP to industries, institutions and commercial buildings. We have conducted the PQA at the following companies during the academic year 2014-2015.



GREEN INITIATIVES @ MCET

Solar

- 10.12 kWp Grid connected Solar Power Plant (SPP) installed in 2012.
- 40.32 kWp Grid connected SPP installed in 2013.
- Design and Development of 4kWp standalone SPP (2kWp mono crystalline flexible panel and 2kWp polycrystalline panels in 2014 for solar street light applications.
- Currently all street lights are green powered

Wind

- Wind Energy conversion system of 1kW installed in 2012.

Hybrid (Solar-Wind)

- 1.4 kWp solar mill installed in 2015.

Bio-Gas

- With a capacity of 150 Cu.M is functioning inside the campus.

SAKTHI GROUP IN GREEN ENERGY PRODUCTION

Sakthi Group is conscious of the need for clean energy sources and as part of its initiative, the group started commissioning windmills in the year 1993 in Tamil Nadu to preserve environment and promote green energy.

Company Name	No of Units	Production Capacity in MW	Location (Districts)
ABT	48	18.5	Kanyakumari and Tirunelveli
Sakthi Finance Ltd	28	5	Kanyakumari, Tirunelveli and Coimbatore
NM & CO	5	1.0	Kanyakumari
ARC	1	0.25	Kanyakumari
ABT Industries	2	0.5	Kanyakumari

The power plant at Sakthi Sugars promotes significant usage of renewable energy sources using bagasse, a fibrous sugarcane residue as its primary source of power production and coal as its secondary which is used for supplementing the deficit of bagasse. Further the process of power production also fosters energy recycling. The steam extracted from Turbo Generators is diverted towards sugar processing and distillation of alcohol.

Since these power plants contribute to the generation of electricity and also provide necessary steam energy for industrial application they are termed as Co-Generation Power Plants.

The aggregate power generation capacity of all three cogeneration power plants put together is 92 MW.

Company Name	Capacity (MW)
Sakthi Nagar Unit, Appakudal	32 MW
Sivaganga Unit	35 MW
Modakurichi Unit	25 MW

After meeting the power requirements of the sugar plant excess power is exported to the power grid.

cādence[®] | MCET - CADENCE ASIC Centre of Excellence

ASIC Centre of Excellence is passionate in bridging the skill and knowledge gaps of today's Electronics engineers by offering world class training in custom IC design in the field of analog, digital and mixed signal disciplines.

The Centre has been equipped with the state-of-the-art CADENCE EDA suite with 20 user license and following facilities.

CADENCE VIRTUOSO - 64 design environment	Schematic entry/ HDL design creation in gpdk 180, gpdk90 & gpdk 45 technologies.
CADENCE IES	Digital and mixed signal design verification.
CADENCE ENCOUNTER RTL compiler	Supports multiple implementation of mixed signal circuits for parameter optimization.
CADENCE ENCOUNTER Digital Implementation	Physical design of mixed signal circuits.
CADENCE SPECTRE	Simulation, analysis and parameter estimation of analog & mixed signal schematic / layout designs.
CADENCE ASSURA	DRC, LVS & RC Extraction of analog and mixed signal designs.
CADENCE ALLEGRO	PCB design solutions.

Objective:

In pursuit of MCET's Institute-Industry partnership initiatives, ASIC Centre of Excellence was established in the year 2013 with the following objectives.

- To impart a basic knowledge in CMOS design rules and their relationships to circuit topology.
- To train students to acquire technical competence in custom IC design and implementation in the field of analog and mixed signals.
- To train students in CMOS design performance tradeoffs in terms of area, speed and power dissipation.

Infrastructure:

The centre has

- 20 PC systems with Intel Core I5 processor, Speed- 3.2 GHZ, 4GB RAM, 500 GB HDD.
- A server with Intel Xeon E5-2609 v2 (quad core) processor, Speed – 2.5 GHZ, 16GB RAM, 2*1TB HDD with raid controller.

Achievements:

The activities performed at the centre include conducting the following programmes:

- Two-day training programme on “Custom analog and mixed signal IC design “ to Faculty members and PG scholars of Dr. MCET.
- Short-term training course on “Custom Analog IC design using Cadence EDA tool” to UG students from other Engineering colleges.
- Two-day workshop on “Custom Analog IC Design Using CADENCE EDA tool” to external participants and internal students.
- Two-day workshop on “System design using FPGA and Cadence EDA tools” to external participants and internal students.
- Two-day workshop on “Custom Digital IC Design Using CADENCE EDA tool” to external participants and internal students.

Projects & Publications

The project works carried out at the Centre by the PG scholars of the institution, which resulted in the following publications:

- VLSI implementation of Area Efficient FIR filter for Signal Processing Applications.
- ASIC implementation of High Speed Area Efficient Arithmetic Unit Using Vedic Mathematics.
- VLSI implementation of high speed carry look ahead adder using cross carry logic.



Courses Offered:

The Centre offers Custom IC design program that combines IC design theory with real world experience, and develops the skills that students need before entering Electronics ecosystem. Our incremental approach to training moves from Very Large Scale Integration (VLSI) fundamentals to deeper exploration of focus areas with complete IC design flow, to guided hands-on design examples that are industry relevant. The program focuses on state-of-the-art design methodologies on two disciplines: digital IC design and analog/mixed signal IC design.

1. Custom Digital IC Design

Module 1: Design Entry and Verification (Hrs: 30)

- Introduction to Digital Design
- Digital Circuit Design using VHDL & Verilog
- Design entry and synthesis using Cadence Encounter-RTL compiler
- Simulation & Timing analysis using Cadence IES

Module 2: Physical Design, Logic Simulation and Parameter Estimation (Hrs: 30)

- Settling time and hold time in sequential system design
- Clock Tree Synthesis (CTS)-Constraint file generation
- Post CTS simulation and synthesis
- Physical design and parameter estimation of digital circuits using Cadence Encounter-Digital Implementation
- GDS file generation

2. Custom Analog IC Design

Module 1: Schematic Entry and Simulation (Hrs:30)

- Analog vs Digital Circuits - Introduction
- Schematic Design of CMOS inverter using CadenceVirtuoso-64
- Pre-layout simulation (DC & Trans analysis)
- Parameter estimation using Cadence Spectre
- CMOS realization of Logic expressions, Transistor sizing

Module 2: Physical Design, RC extraction and Parameter Estimation (Hrs: 30)

- Physical design of CMOS circuits using Cadence Assura
- DRC, LVS and RC extraction using Cadence Assura
- Post layout Simulation
- Parameter estimation using Cadence Spectre
- GDS file generation





Microsoft Innovation Center

Microsoft Innovation Centre (MIC) is a state-of-art technology facility for collaboration on innovative research, technology and software solutions, involving a combination of government, academic and industry participants. Microsoft Innovation Centre(MICs) are facilities that provide world-class resources and support for students, entrepreneurs and start-ups, accelerating the creation of new companies, jobs, and growth of the local software ecosystem. The programme also supports innovation at the grass-root level and encourages entrepreneurship. The creation of the Microsoft Innovation Platform in the campus will go a long way in equipping every student with current technology and innovation spirit.

Microsoft Innovation centre was inaugurated at MCET on 6th December 2012 by Mr. Joseph Landes, General Manager, DPE - Microsoft, India and MCET was one among the 15 Innovation Centres in India at that time.

MCET is holding the premium subscription for Dreamspark account through which students can download all kinds of Microsoft software free of cost. 350 students used the above benefits for developing apps, projects etc.

Objectives:

- To connect people and organizations in the software ecosystem and give them access to resources, experts and facilities for collaboration and skills development.

Infrastructure Facilities:

- A well-furnished lab with 70 Systems are available for the students.
- Each system is packed with latest Windows 8.1 OS and its software packages.
- Students may utilize the MIC lab for developing app and projects.



Centre Initiatives:

Microsoft Virtual Academy (MVA):

- Students can learn and upgrade their knowledge in Microsoft technologies like Cloud development, Web development, Database development, C#/XAML, HTML & CSS5 etc.,
- Around 450 students benefit through MVA courses every year.

Massive Empowered Classroom:

- Provides online courseware on 5 subjects like DAA, Computer Networks, Data structure, Linear Algebra and Theory of Computation.
- Students have to undergo this courseware and appear for a series of online tests. High scoring students will be credited with goodies from Microsoft and also get a chance for an internship.

One Credit Course (OCC) on Mobile application Development(MAD):

- Students may choose MAD course as their OCC to get a credit on their semester mark statement during their Sixth semester.
- Students from different branches have enrolled and benefited through MAD OCC



Notable achievements:

- 350 students were trained on windows 8.0/8.1 App Development programme
- 130 apps were uploaded in the windows app store by our students.
- Dr.A.Rathinavelu, Manager- MIC @ MCET , has attended the Microsoft Innovation Centre(MIC) Summit at seattle, USA during October 2014. MCET was the one among the four colleges in India who had participated in MIC Summit.
- 50 students of MCET participated in "Microsoft Windows AppFest'12- A Guinness Record event " organized by Microsoft in Bangalore on 21st and 22nd September 2012 as part of DreamSpark Yatra'12 , out of which 7 student's app were selected by Microsoft and they were awarded with prizes.
- Organised one day Orientation workshop on "Windows 8.1 Mobile App Development" for the benefit of II and III year students on 12.2.15 and nearly 340 students participated .
- MCET received MEC championship award during 2014 for enrolling more participants for MEC courses.
- Three faculties received MIC championship award for their active participation in MIC activities.

Course Offered:

Windows 8.1 Mobile Application Development

Windows mobile application development course is tailored for developers looking to leverage C#/XAML to build cool apps and games for Windows Phone 8.1 and also for windows Desktop 8.1

Course Contents:

- Introducing Windows Phone 8.1 Life Cycle
- Designing and Building Apps
- Maps and Location
- Using Phone Resources
- Push Notifications
- Tiles and Lock Screen Notifications





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