Summary

Texas Instruments Innovation Center (TIIC@APSIT) offers opportunity to learn design of Internet of Things (IoT) systems using Texas Instruments, USA modules. TIIC caters to career building to suit Industry 4.0 needs.

Texas Instruments (TI) is a global semiconductor design and manufacturing company.

The TI University Program was established in 1982 and is a global program operating in 35 countries, multiple languages and impacting over hundreds of thousands of students every year. It is dedicated to support educators, researchers and students in facilitating the inclusion of TI analog and embedded processing in engineering classrooms, teaching and research labs, textbooks, design projects and course curriculum. Innovate with 100,000+ analog ICs and embedded processors, along with software, tools and the industry's largest sales/support staff, and bridge the gap between Industry and Academia.

Under TI University Program Dept. of Electronics and Telecommunication Engineering has setup:
1. IoT Application Design Lab – to get a hands-on experience programming Connected devices.
2. TI-Robotics-System-Learning-Kit – to learn robotics with respect to IoT
3. Tiva C and MSP430 ultra low power microcontroller development boards – to design IoT solutions.
4. Analog System Lab Kit PRO – to study the role of analog electronics with respect to IoT.

Events conducted under Texas Instruments Innovation Centre:
1. Three days Faculty Development Program on **"IoT Application Design"** AY 2018-19
   – Train the trainer course, to introduce faculty to IoT
   – Make them proficient enough to teach IoT to students.
2. **"IoT Application Design"** under Project Based Learning **AY 2018-19**
   – Introduce students to IoT, focusing on hands-on learning.
3. **India Innovation Challenge Design Contest** (IICDC) 2018
   – With Texas Instruments Lab, trained faculty and students, APSIT participated in IICDC 2018 and cleared to quarter-finals.
   – Will now be competing in semifinals.

First tie up with Texas Instruments, through EdGate Technologies was for DrishTI Online Test, conducted starting 14th August, 2017 to 18th August, 2017, for EXTC, Computer and IT students. Winners Ms. KHUSHBOO RUPAREL (BE IT) and Mr. YASH KOLI (TE EXTC) received Capacities Touch Booster pack for MSP430 Launchpad from Texas Instruments. The overwhelming response of students lead us to consider tying up with Texas Instruments under the TI University Program.


Figure 1:Yash Koli (centre) receiving award from Principal Prof. (Dr.) U. D. Kolekar and HoD EXTC, Prof. A. M. Deshpande, in presence of Prof. S. V. Furtado and Prof. A. C. Hardas.

Figure 2:Khushboo Ruparel (centre) receiving award from Principal Prof. (Dr.) U. D. Kolekar and HoD EXTC, Prof. A. M. Deshpande, in presence of Prof. S. V. Furtado and Prof. A. C. Hardas.

Successful competition and rising student interest lead us to signing a MoU under Texas University Program with EdGate Technologies Pvt. Ltd.
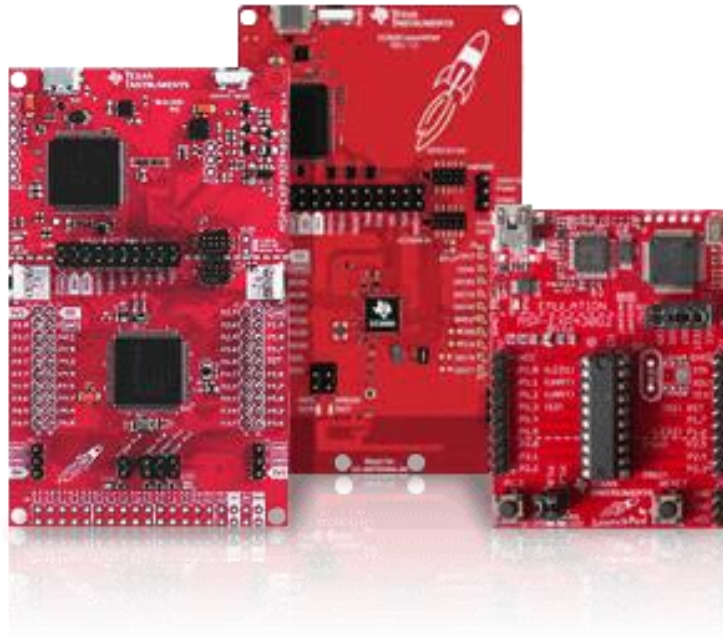
To improve the industry- institute interaction and to enhance the practical knowledge of students, MoU is signed with Texas Instruments (TI) on 18th June, 2018. This MoU is signed to arrange for conduction of workshops, design contests, seminars, etc. Thereby exposing students to current industry trends in analog and embedded industry.

TEXAS INSTRUMENTS INNOVATION CENTER

EdGate TECHNOLOGIES

TI university program

ANALOG DESIGN

WIRELESS DESIGN

The Texas Instruments Innovation Center (TIIC) by EdGate Technologies aims to offer a conducive technical education ecosystem at your campus that bridges the gap between the industry and the academia, bringing real world engineering concepts to life at the labs. We believe that students are engineering tomorrow. Experiential learning and hands on design experience are keys for them to master the basics and be prepared for the start of their careers.

The TIIC labs are a set of technology specific labs driving new and enhanced technology for students to work on. This encourages the students to think about the different ways of doing things and rapidly explore these ideas in an open and collaborative environment. It also provides an opportunity to experiment, innovate and solve real world problems. The TIIC lab is intended to incubate and rapidly demonstrate the feasibility of product ideas. This lab facilitates connections across a wide range of TI platforms and students while also unearthing new uses of technology across a wide range of engineering subjects.

MSP430 DESIGN

SENSOR HUB

WIRELESS INTEGRATION
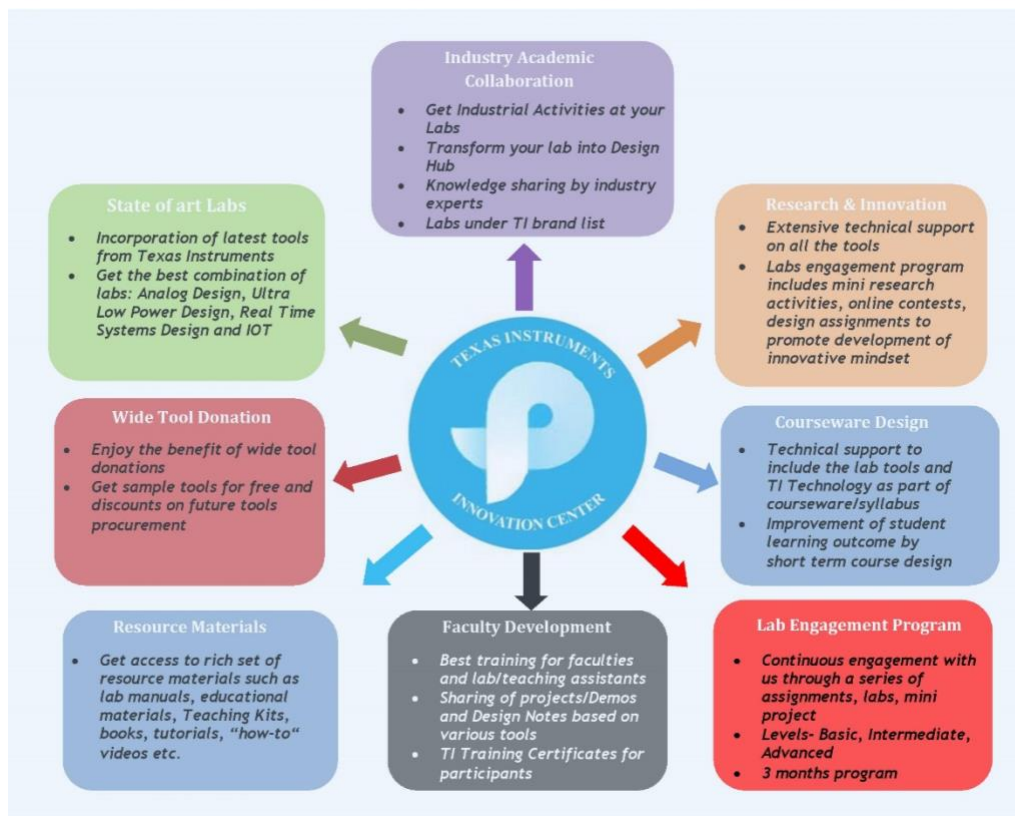
BLUETOOTH DESIGN

IOT DESIGN

TIVA-C DESIGN

DSP DESIGN

SENSORS MODULES

Industry Academic Collaboration
- Get Industrial Activities at your Labs
- Transform your lab into Design Hub
- Knowledge sharing by industry experts
- Labs under TI brand list

State of art Labs
- Incorporation of latest tools from Texas Instruments
- Get the best combination of labs: Analog Design, Ultra Low Power Design, Real Time Systems Design and IOT

Research & Innovation
- Extensive technical support on all the tools
- Labs engagement program includes mini research activities, online contests, design assignments to promote development of innovative mindset

Wide Tool Donation
- Enjoy the benefit of wide tool donations
- Get sample tools for free and discounts on future tools procurement

Courseware Design
- Technical support to include the lab tools and TI Technology as part of courseware/syllabus
- Improvement of student learning outcome by short term course design

TEXAS INSTRUMENTS INNOVATION CENTER

Resource Materials
- Get access to rich set of resource materials such as lab manuals, educational materials, Teaching Kits, books, tutorials, "how-to" videos etc.

Faculty Development
- Best training for faculties and lab/teaching assistants
- Sharing of projects/Demos and Design Notes based on various tools
- TI Training Certificates for participants

Lab Engagement Program
- Continuous engagement with us through a series of assignments, labs, mini project
- Levels- Basic, Intermediate, Advanced
- 3 months program

The essential features of the MoU are listed below:

1. Contribution and Expectation of **EdGate Technologies under Texas Instruments India University Program**

   As on-ground deliverables, EdGate Technologies will provide the following:

   a) Curriculum: EdGate will provide the Curriculum for Texas Instruments Labs. **A. P. Shah Institute of Technology, Maharashtra** will find ways to incorporate curriculum in their syllabus.

   b) **Lab Setup**: **A. P. Shah Institute of Technology, Maharashtra** will set up a lab which will be entitled **"Texas Instruments Innovation Lab"** at its premises.

   c) **Faculty Development Program**: **A. P. Shah Institute of Technology, Maharashtra** will organize faculty development program in its premise for its faculty members and faculty members of other engineering institutions to teach TI Platform. The College will provide the infrastructure facility for conducting the faculty development program. **EdGate Technologies Pvt Limited** will help the college in conducting this program, by providing resource persons.

   d) **Workshops/Events**: If the College wishes to organize a national event in the area of TI Platform, **EdGate Technologies Pvt limited** will provide speakers.

   e) **Training Programs**: **EdGate Technologies Pvt Limited** will assist the college in organizing training programs/tutorials on topics related to TI Platform. Faculty members from the college who have undergone train-the-trainer program and who are certified by **EdGate Technologies Pvt Limited** as trainers may run certified training programs. **A. P. Shah Institute of Technology, Maharashtra** will provide certificates for the participants of such programs.

   f) **TI Lab Engagement Program**: EdGate Technologies Pvt. Limited will help the College Name to get engaged into the TI Innovation Center Labs under this program over a period of 3 months at three different levels i.e., Basic, Intermediate and Advanced.

2. Contribution from **A. P. Shah Institute of Technology, Maharashtra**

   a) **Faculty Mentor:** Qualified Faculty of Electronics & Communication Engineering, Computer Engineering, and Information Technology (preferably with programming knowledge on C; C++) will be made point of contacts and will mentor students.

   b) **A. P. Shah Institute of Technology, Maharashtra** has set up lab based on below:

Sr. No.	Item	Quantity
1	**Analog Lab**: A dedicated Lab focus on Teaching Analog signals	
A	ASLK PRO Kit	2
B	Analog in a box / ASLK PRO Kit	2
C	TI Bread Board	2
2	**TI Robotics Lab:**	
A	Robotics System Lab Kit	3

3		**Analog Attach MCU Labs (ARM)**: A secondary Element that attached to Micro controller Lab	
	A	CC110L Booster pack	2
	B	TIVA TM4C123G Launchpad Bundle	5
	C	Sensor Hub Booster Pack bundle	2
	D	IoT Enabled ARM® Cortex®-M4F TM4C129X Connected Development Kit	1
4		**Connectivity Attach Lab (Ultra Low Power Lab/Internet of Things Lab (IOT))**: A secondary Element that attached to Micro controller Lab Or standalone solution focusing on connectivity	
	A	Ez430RF-2500 MSP430 Wireless Development Tools	2
	B	MSP 430 G2 Launchpad	10
	C	SimpleLink Wi-Fi CC3100 BoosterPack	3
	D	SimpleLinkTM CC2650 Wireless MCU Launchpad Kit	2
	E	MSP430F5529 USB Launchpad Evaluation Kit	4
	F	SimpleLink Wi-Fi CC3200 Launchpad	3
	G	MSP 430 F5969 Launch Pad	4
	H	C2000 Development Kit, Motor control	1
	I	**Sensors:** Sound Sensor, 3-Axis Accelerometer, Moisture Sensor, Ultrasonic Sensor, Electret Microphone, Water Sensor, Temperature Sensor, Light Sensor	1 Each

1. Center: Institute will identify and maintain Texas Instruments Innovation Center with at least 15 laptops on latest configuration.
2. Peripheral components: Institute will make arrangement for other equipment required for setting up the lab and for the maintenance of the lab.
3. Financial: Institute will operate the center with the help of existing staff.