Procurement plan for the period of 01/04/2018 to 31/3/2019

Sl. no	Packag e Name	Item Category. (Goods/ Works/ Services)	Item Sub Category(Equ ipment/Books & LRs /Furniture)	Is Proprietary ? (Yes/No)	Through DGS & D? (Yes/No)	Through GEM (Yes/No)	Estimated Financial Sanction Date	Proc. Method	Item Name	Item Description/ Specification	Item Quanti ty	Item Estimated Cost Per Unit (In Rs.)	Total Estimated Cost (In Rs.)	Justification
									Double Beam UV-Visible SpectrophotoMe ter	Double beam Optics with stand alone operation through built in PC and 7" High Resolution Touch Screen LCD Display interface; Wavelength Range: 190-1100nm working range; Bandwith: 1.8nm; Readability: 0.1nm; Repeatability: 0.2nm; Monochromator Design: Czerny Turner; Detector: Silicon Diode; Concave Holographic grating with 1200 lines/mm; Spectrum processing through in built software.	1	4,25,000		1. For B.Tech 5th semester Petroleum Engineering students as an experiment on UV-Visible spectroscopy is included in their syllabus titled To learn the basic principles of UV-visible spectrophotometry and to measure concentration by a UV-visible spectrophotometer. 2. The principles and instrumentation of UV- Visible spectroscopy is included in the B.tech 1st and 2nd Semester theory syllabus.

1	DUIET/TEQIP1/CHEMISTRY	GOODS	EQUIPMENT	NO	NO	NO	2/7/2018	SHOPPING	Fourier Transform Infrared Spectrophotometer	Michelson interferometer (30° incident angle) Equipped with dynamic alignment system (JPN patent No. 3613171) Sealed interferometer with auto dryer (JPN registration of utility model No. 3116465); Single-beam optics; Germanium-coated KBr; High-energy ceramic light source with 3 years guaranteed; DLATGS detector equipped with temperature control mechanism; Wavenumber range 7,800 to 350 cm-1; Resolution- 0.5, 1, 2, 4, 8, or 16 cm-1; S/N ratio - 30,000:1 or higher; Mirror speed - 4-step selection of 2.0, 2.8, 5, or 9 mm/sec; Data sampling - He-Ne laser; Gain - Automatic or manual setting ($\times$1 to $\times$128); Sample compartment - Equipped with automatic accessory recognition mechanism 200 (W) $\times$ 230 (D) $\times$ 170 (H) mm Center focus; Dimensions - 514 (W) $\times$ 606 (D) $\times$ 273 (H) mm; Weight - 35 kg; Software labsolutions IR; Attached Computer	1	16,00,000	2025000	1. For B.Tech 1st (ME & PE) and 2nd (ECE & CSE) semester students as an experiment on IR spectroscopy is included in their syllabus titled Analyze IR spectra of any three organic compounds. Moreover, the principles and instrumentation of UV-Visible spectroscopy is also included in the B.tech 1st and 2nd Semester theory courses. So, the students will have a proper understanding of the topic by having an actual view of the instrument and its use. 2. For B.Tech 5th semester petroleum engineering students as an experiment on IR spectroscopy is included in their syllabus titled To record and analyze the IR spectra of two solids and two liquid samples.
										Set-up for study of application of Cathode Ray oscilloscope (CRO) for frequency and amplitude measurements, Complete Set-Up (CRO, function	4	28500		Purchased in 2009 and now getting out of work, so needed to be replaced.
										Set-up for temperature measurement using thermocouple, Complete Set-Up (thermocouple, temperature bath, heating arrangement etc.)	5	15000		Newly introduced in the syllabus, hence the experimental set-ups should be purchased
										Meldes string apparatus for measurement of frequency in transverse and longitudinal mode, Complete Set-Up (Oscillator, various masses, string system)	5	7000		Purchased in 2009 and now getting out of work, so needed to be replaced.

2	DUIET/ TEQIP2 /PHYSI CS	GOODS	EQUIPMENT	NO	NO	NO	2/7/2018	SHOPPIN G	Physics Equipments	Kit for studying forced and damped harmonic oscillations using LCR circuit, Complete Set-Up (with at least 3 different sets of L,C,R and built in sine wave oscillator)	5	12500	949000	Newly introduced in the syllabus, hence the experimental set-ups should be purchased
										Newton's rings arrangement for Wavelength measurement of monochromatic source of light , Complete Set-Up (light source, microscope with crosswire, glass and lens system)	5	13000		Purchased in 2009 and now getting out of work, so needed to be replaced.
										Set-up for Determination of wavelength of He-Ne laser or any standard laser using diffraction grating, Complete Set-Up (diffraction grating 15000 lines per inch, He-Ne laser)	2	45000		Newly introduced in the syllabus, hence the experimental set-ups should be purchased.
										Set-up for demonstration of Kerr effect in nitrobenzene solution and to measure the light intensity as a function of voltage across the Kerr cell using photo detector, Complete Set-Up (Kerr cell, beam splitter, light source signal analyser)	1	78000		Newly introduced in the syllabus, hence the experimental set-ups should be purchased.
										Set-up for measurement of the light intensity of plane polarised light as a function of analyser position, Complete Set-Up (Light source, polariser, analyser, photodetector)	1	92500		Newly introduced in the syllabus, hence the experimental set-ups should be purchased.
										Set-up for calculation of the numerical aperture and study the losses that occur in optical fibre cable, Complete Set-Up (with light source, optical fibre cable, photo detector)	1	62500		Newly introduced in the syllabus, hence the experimental set-ups should be purchased.
										Kit to study the I-V characteristics of solar cell, Complete Set-Up (light source, solar cell, built in resistance box, light intensity filter)	5	4800		Newly introduced in the syllabus, hence the experimental set-ups should be purchased.
										Set-up for measurement of refractive Index of liquid using Newton's rings method, Complete Set-Up (Newton's ring arrangement, liquid)	5	6800		Newly introduced in the syllabus, hence the experimental set-ups should be purchased.

													Item Description	Qty	Amount		Remarks
													Kit to study common base characteristics of a P.N. P. junction transistor, Complete Set-Up (power supply, meters for voltage and current measurement transistors with terminals)	5	5000		Purchased in 2009 and now getting out of work, so needed to be replaced.
													Set-up for the determination of the moment of inertia of a body about an axis passing through its centre of gravity using Torsional pendulum , Complete Set-Up (torsional Pendulum, bodies of at least three different regular shapes	5	3200		Purchased in 2009 and now getting out of work, so needed to be replaced.
													Set-up for determination of 'J' (Joule's mechanical equivalent of heat) by electrical method, Complete Set-Up (with aluminium containers)	5	1800		Purchased in 2009 and now getting out of work, so needed to be replaced.
													Set-up for determination of the specific heat of a liquid by Newton's law of cooling method, Complete Set-Up (Newton's law of cooling apparatus, thermometers	5	1600		Purchased in 2009 and now getting out of work, so needed to be replaced.
													Resonance air column set-up for determination of the velocity of sound resonance air column, Complete Set-Up (graduated tube with water reservoir, tuning forks with different frequencies	5	6000		Purchased in 2009 and now getting out of work, so needed to be replaced.
													Searle's apparatus to determine the Young's modulus of the material of a given wire , Complete Set-Up (Young's modulus apparatus Searle's pattern	5	3500		Purchased in 2009 and now getting out of work, so needed to be replaced.
													Set-up for determination of dispersive power and resolving power of a plane transmission grating, Complete Set-Up (with grating, light source)	3	37000		Newly introduced in the syllabus, hence the experimental set-ups should be purchased.
												Humanaties	Effective Technical Communication(2nd Edition) by M.Ashraf Rizvi (Publication: Mc Graw Hills Education)	50	530		The given books have been prescribed for students in the syllabus of Humanities(Communication Skills) for the 1st semester and the 2nd semester. The books are of vital importance to develop the communication competence of prospective engineers through which they will be able to
													High School Grammar and Composition By Wren & Martin (Publication: S.Chand Company)	20	475		
													General English (for all competitive examinations) by S.C.Gupta (Publication: Arihant publications)	20	370		

										Subject	Book	Qty	Price		Remarks
										Physics	A textbook of Engineering Physics (Author: A. S. Vasudeva (S. Chand & Co.)	40	270		These books are needed for easy availability of reading material for the students as well as to keep them in pace with the advanced knowledge and technology. The Physics syllabus for the first year B. Tech course contains various topics of optics, oscillations and sounds, solid state physics, quantum, statistical physics etc. These books will provide help the students to a large extent.
											Engineering Physics (Author: Dattu R Joshi, McGraw Hill India Ltd)	40	700		
											A text book of Optics (Author: Brijlal and Subramanyam S. Chand & Co.)	10	450		
											Optics (Author: E.Hecht and A.R. Ganesan, Pearson Education)	10	800		
											Principles of Electromagnetics (Author: Mathew N. O. Sadiku, Oxford University Press)	40	700		
										Embedded Syatem	Embedded Systems Fundamentals with Arm Cortex M Based Microcontrollers: A Practical Approach by Alex Dean	2	5490		Texts book for practical simulation embedded system.
											Real-Time Systems: Design Principles for Distributed Embedded Applications (Real-Time Systems Series) by Hermann Kopetz	2	5000		
											Real-Time Systems Design and Analysis: Tools for the Practitioner by Phillip A. Laplante	2	6500		
											Internet of Things with Python by Gaston C. Hillar	10	1000		
											Arduino: Programming Arduino - Beginners Guide To Get Started With Internet Of Things (Arduino Programming Book, Arduino Programming for IOT Projects, Arduino Guide Book for Engineers, Arduino Board)	1	300		
											Arduino : The Complete Beginner's Guide - Step By Step Instructions	1	300		
											Internet of Things and Big Data Technologies for Next Generation Healthcare by Bhatt, Chintan, Dey, Nilanjan, Ashour, Amira (Eds.)	2	10000		
										Data Communication	Data Communications and Networking,4th Edition, Behrouz A. Forouzan,McGraw Hill Education	1	346		Texts book for practical simulation in data communication.
											Practical Data Communication,1st Edition,Roger L. Freeman,Wiley	1	327		
											Introduction to Robotics, 2nd Ed.,S.K Saha, McGraw Hill Education	2	600		Texts book for practical simulation in Robotics.
											Robotics & Control, Mittle & Nagarath,McGraw Hill Education	2	675		

										Robotics	Probabilistic Robotics (Intelligent Robotics and Autonomous Agents series), Sebastian Thrun and Wolfram Burgard,MIT Press	1	4000		
											Robotic Tactile Sensing: Technologies and System,Ravinder S. Dahiya and Maurizio Valle,Springer; 2013 edition (30 July 2012)	1	8900		
											Introduction to Autonomous Mobile Robots 2e (Intelligent Robotics and Autonomous Agents series),Roland Siegwart , Illah R. Nourbakhsh , Davide Scaramuzza,MIT Press,	1	4700		
											Mastering ROS for Robotics Programming, 2nd Ed.,Lentin Joseph,Packt Publishing Limited	1	1100		
											Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, 1st Ed (2017),Aurelien Geron,Shroff/O'Reilly	1	1600		
											ROS Robotic Projects (March 2017),Packt Publishing Limited	1	1100		
											Programming the Raspberry Pi, Second Edition: Getting Started with Python, Simon Monk,McGraw-Hill Education TAB	2	750		
											Programming Arduino: Getting Started with Sketches, Second Edition,Simon Monk,McGraw-Hill Education TAB	2	620		
											Higher Engineering Mathematics Author: B. S. Grewal ISBN-13:9788174091956 Publisher: Khanna Publisher	60	920	Common Text book for all branch. To increase the number of copy in the library so that all student of first and second semester can access this book individually.
											Real and Complex AnalysisAuthor: Walter RudinISBN: 9780070619876, 0070619875 Publisher: McGraw Hill	20	535	For the Topics of MA101: Calculus (all branch)
											Introduction to Probability ModelsAuthor: Sheldon M. RossISBN-13: 978-0123756862 Publisher: academic Press	4	2281	For the topics of MA202: Probability Distributions, Transforms and Numerical Methods (All branch). Especially for ECE branch.

3	DUIET/TEQIP3/BOOKS/ALL BRANCH	GOODS	BOOKS	NO	NO	NO	1/7/2018	SHOPPING	Mathematics	Book details	Qty	Price	662569	Remarks
										Concept of Probability theoryAuthor: Paul E. Pfeiffer ISBN-13: 978-0486636771 Publisher: Dover Publication	10	1000		For the topics of MA202: Probability Distributions, Transforms and Numerical Methods (All branch).
										Matrix Analysis and Applied Linear AlgebraAuthor: Carl D. Mayer ISBN: 978-0-898714-54-8 Publisher: SIAM	2	5900		For the topics of Module 5, 6 of MA201: Linear Algebra & Complex Analysis (All branch)
										Applied Numerical Linear AlgebraAuthor: James W. Dammel ISBN: 978-0-89871-389-3 Publisher: SIAM	2	4598		For the topics of Numerical Methods of MA202: Probability Distributions, Transforms and Numerical Methods Analysis (All branch)
										Algebra Author: Michael Artin Publisher: Pearson	2	5236		For the topics of UNIT 4 of MA203: Discrete Mathematics (CSE), For the topics of Module 5, 6 of MA201: Linear Algebra & Complex Analysis (All branch)
										Complex Analysis for Mathematics and Engineering Author: John H Mathews & Russell W. Howell ISBN-13: 9789380853413 Publisher: Jones And Bartlett Publishers	4	643		For the topics of Module 1, 2, 3, 4 of MA 201: Linear Algebra & Complex Analysis (All branch)
										Applied Numerical Method using MATLAB Author: Yan ISBN-13: 9788126514151 Publishers: Wiley India	15	633		For the topics of MA202: Probability Distributions, Transforms and Numerical Methods (All branch). For the topics of Open Elective-II: Mathematical Methods
										Functions of Matrices (Theory and Computation) Author: Nicholas J. Higham ISBN: 978-0-89871-646-7 Publisher: SIAM	1	4806		Reference book for the topics of Module 5, 6 of MA201: Linear Algebra & Complex Analysis (All branch)
										Linear and Non Linear Programming Author: David G. Luenberger, Yinyu Ye ISBN-13: 978-3-319-18842-3 Publisher: International Series in Operations Research & Management Science	2	7181		For the topics UNIT 1, 2, 3 of Open Elective-II: Mathematical Methods
										Advanced Differential equations Author: M. D. Raisinghania ISBN: 9788121908931 Publisher: S. Sand	20	795		For the Topics of **MA102:** Differential Equations(all branch)

	Book	Qty	Price	Remarks
	Ordinary and Partial Differential Equations Author: M. D. Raisinghania ISBN: 81-219-0892-5 Publisher: S. Sand	10	750	For the topics UNIT 4 of Open Elective-II: Mathematical Methods. Reference book for the Topics of MA102: Differential Equations(all branch)
	Introduction to Graph TheoryAuthor: Gary Chartrand, Ping Zhang ISBN-13: 978-0486247755 Publisher: McGraw Hill	10	700	For the topics of UNIT 5 of MA203: Discrete Mathematics (CSE)
	Multiparameter Eigenvalue Problems and Expansion Theorem Author: Hans Volkmer ISBN: 3-540-50479-6 Publisher: Springer	1	2899	For the topics of Open Elective-II: Applied Linear Algebra.
Communication	Digital Processing of Speech Signals, 1e by RABINER (Author)	15	720	Common Text book for communication engineering. To increase the number of copy in the library so that all student of ECEt can access thease book individually.
	Discrete-Time Speech Signal Processing: Principles and Practice, 1e Paperback – 2003 by QUATIERI (Author)	15	650	
	4.Digital Signal Processing: Principles, Algorithms, and Applications, 4e Paperback – 2007	30	500	
	5.Communication Systems, 4ed, Simon Haykin	30	400	
	6.Fundamentals of Communication Systems, 1e Paperback – 2006 by PROAKIS (Author)	20	500	
	7. wireless communication -principle and practice-by:T.S Rapopat (pearson pub.)	15	350	
information theory and coding	1.Information theory and codin: M.kulkarani,willy pub	10	500	Common Text book for Electronics and communication engineering. To increase the number of copy in the library so that all student of ECEt can access thease book individually.
	2. Information theory and codin: Dr.J.S chitode, technical pub.	10	500	
	3. Modern electronics instrumentation and measurement: W.D Cooper,PHI	15	380	
Computational Fluid dynamics and heat transfer	Computational Fluid dynamics- Basics with Application, John D. Anderson, Jr.,McGraw Hill Education, Indian Edition 2012	50	697	To overcome the shortage in the library.
	Computational Fluid dynamics, Gautam Biswas, Somenath Mukherjee, Narosa Publishing House, third edition 2016	50	443	

										Machine Design	Design of Machine Element bY V.B., Bhandari, publisher Tata Mc Graw Hill,	30	675	To overcome the shortage in the library.
											Mechanical Engineering Des'rgn by J.E.Shigley publisher Mc Graw Hill,gth edition, 2011	30	850	
											Design of Machine Elements bY M.F. Spotts, publisher Prenticehat[, 8th edition, 2006	30	1000	
										Advanced Machining Processes and Convective Heat and Mass Transfer	Manufacturing Processes for Engineering Materials by Serope Kalpakjian,Steven R. Schmid; 5th edition, Pearson Education, 2008; (Paperback)	30	370	For advance learning of manufacturing and machining process for B.tech 7th semester students
											Advanced Machining Processes by Vijay K. Jain; 25th Re-print (2015); Allied Publication; (paperback)	30	395	For advance learning of manufacturing and machining process for B.tech 7th semester students
											Fundamentals of Heat and Mass Transfer by Theodore L. Bergman, Frank P. Incropera, David P. Dewitt; 7th edition; Wiley Publications (International student version).	30	1150	For advance learning of heat and mass transfer for B.tech 8th semester students
										Embedded system pherepheral module	Educational Practice Board for ARM	5	4000	As per syllabus of CSE for embedded, Real Time System Laboratory and IoT
											Educational Practice Board for ARM Cortex M4	5	4000	
											All-in-one General Purpose I/O Board	5	5000	
											CMOS Camera Sensor for EPBM4	1	4000	
											Wi-fi Module for EPBM4	1	2000	
											Finger print sensor interfacing kit	1	2000	
											RFID Interfacing Kit	1	1500	
											Zig-Bee Interfacing Kit	1	1000	
											TFT/Touch Screen Interfacing Kit	1	5000	
										IOT Module	IOT Gateway	1	20000	
											Bluetooth Module	1	1500	
											Router for IoT	1	20000	
											Portable Sensor Kit	5	5000	
											A set of Sensors((Alcohol, Flame, Color, IMU10DOF, Temperature, Humidity, Reed switch, Sound, Sunlight, Touch Key, Ultrasonic, Vibration, Moisture, Dust, Water, Soil Moisture, Accelerometer, Gyro Meter, Magneto, Pressure, PIR Motion Sensor)	1	5000	

										Base Board for Interfacing Sensors	5	4000	
										DC Motors	1	2000	
										Torque Stepper Motor	1	2000	
4	DUIET/ TEQIP4 /CSE/E S_IOT	GOODS	EQUIPMENT	NO	NO	NO	2/4/2018	SHOPPIN G		Proteus IoT Builder with VSM for Arduino	1	40000	715000
									Data Acquisition System (USB Fecilited)	(3 set) Xilinx Z-7010 Processor(667 MHz), Dual-core ARM Cortex-A9 processor, 256 MB Nonvolatile memory and 512 MB DDR3 RAM, Wireless Connectivity with the host computer, 10 analog inputs(Sampling Rate: 500 kS/s), 6 analog outputs(Sampling Rate: 345 kS/s),40 digital I/O lines, Onboard Accelerometer present With 1set : starters accessories kits, Mechatronics Accessory Kit:, Embedded Systems Accessory Kit	2	75000	For performing automation and control of real time projects and research.
									USRP (S/w Define Radio)	20 MHz Bandwidth, 50 MHz to 2.2 GHz, Software Defined Radio Device—The USRP-2920 is a tunable RF transceiver with a high-speed analog-to-digital converter and digital-to-analog converter for streaming baseband I and Q signals to a host PC over 1/10 Gigabit Ethernet. You can also use the USRP-2920 for the following applications: white space; broadcast FM; public safety; land-mobile, low-power unlicensed devices on industrial, scientific, and medical (ISM) bands; sensor networks; cell phone; amateur radio; or GPS.	1	349000	Department has already purchased NI USRP 2920 (01 number) in 2012. But to perform experiments, a set of 2 USRP is required. Hence the requirement.

5	DUIET/ TEQIP5 /CSE/D ATA COMM	GOODS	EQUIPMENT	NO	NO	NO	1/7/2018	SHOPPIN G	Data Communication Trainer	1)Serial Communication: RS-232 Com Port - 9 pin 2)Serial Communication: RS-232 Com Port -25 pin parallel Communication: 5 pin LPT port4) Optic Fiber Communication Transmitter: Peak wavelength of emission 660 nm visible Red (SFH 756V).Receiver: Photo detector with TTL logic output (SFH551 V). Baud Rate: 115 kbps Fiber Optic Cable: Plastic Fiber Step Index, Multimode. Length: 1 feet 5) Modem Communication Modulation: FSK Modulation Baud Rate: 56KBps (Max) Twisted Pair Link: RG 11 telephone Connector 6) Accessories: RS-232 COM1 Cable: 2 Nos. RS-232 COM2 Cable: 2 Nos. Db25 Parallel Cable: 2 Nos. Modem Adapters: 2 Nos. Modem Cables: 2 Nos. Plastic Fiber Cable: 1 No. Manual 1 No.	3	1,12,000	596000	Data Communication Syllabus: To study serial port, parallel port, synchronous serial communication ,asynchronous serial communication,PC-PC serial communication using RS-232 cable, flow control in serial communication, wireless communication, interface
									RJ Port Networking	1)RJ-45 Port Cross networking: RJ-45 Port 2)Accessories: RJ-45 Cable: 2 Nos. 3) Standard Accessories: Trainer PCB	2	40000		Data Communication Syllabus: To study RJ-45 Port communication
									LAN Topology Trainer	1)UTP Cables with connectors: 1 metre * 3 Nos. 2) 10/100 Mbps 8 Port Hub: 1 No. (On Board) 3) Ring Topology:Db9 Sockets	2	90000		Data Communication Syllabus: To study various types of topology, different types of network cables, Hubs, Repeaters, Routers, Bridges, Switches, and Gateway

6	DUIET/ TEQIP6 /CSE/C OM NETW ORK	GOODS	EQUIPMENT	NO	NO	NO	1/7/2018	SHOPPIN G	DSP-2000 LAN Cable Analyzer and LAN cable meters	Cat 6A / Class EA test time:10 seconds;HDTDX/HDTDR diagnostic test times:≈3 seconds; Internal memory:≈12,000 Cat 6A with plots;Level V Accuracy (1 GHz); Resistance Unbalance measurement; Shield integrity check and distance to fault;TCL measurement;Built-in Alien X-Talk capability;Channel Adapter:1 GHz Range;Permanent Link Adapter:1 GHz Range	1	180000	1115000	To measure,detect and analyze the performance of LAN media as per the syllabus
									Switch	48P 4 layer switch	1	200000		To study, configure and working with the switches as per new syllabi
									Switch	48 P 3layer switch	1	200000		
									Router	24-port Gigabit Security Router VPN	2	200000		To study, configure and working with the router as per new syllabi practical network management by students.
									Toolkit	Network maintenance toolkit	1	35000		Helps maintaining and establishing networking in real work environment
									Server Rack	Dell PowerEdge R series	1	100000		For installing and maintain existing servers.
									Turtle Bot 2	Robot Platform (with 3D sensor + NUC i5 controller + Europa CEE 7/16 power cods + 4400 mAh additional battery + docking station + 500 GB HDD extra NUC disc + Assembly & configuration)	1	250000		Robotics Syllabus: Experimental platform for implementation of Simultaneous Localization and Mapping (SLAM) algorithms and Robot planning.
									Laser Scanner	RPLIDAR A2 360° Laser scanner	1	37000		Robotics Syllabus: Range and proximity Sensing Experiments
									3D Depth Sensor	Microsoft Kinect Sensor for Xbox One + Kinect Adapter for Windows/PC	2	20000		Robotics Syllabus: High Level Vision Sensing Experiments
									PPS DigiTacts System	• Digitact senor of chosen design (One extra sensor) • Rechargable D710 electronics interface module with Bluetooth connectivity • Chameleon Visualiztion and data acquisition software • Remote installation and training	1	100000		Robotics Syllabus: Tactile Sensing study and Experiments

7	DUIET/ TEQIP7 /CSE/R OBOTI CS	GOODS	EQUIPMENT	NO	NO	NO	2/4/2018	SHOPPING	Arduino Uno Development kit	1 Arduino / Genuino Uno, 1 USB cable, 1 Breadboard 400 points, 70 Solid core jumper wires, 1 Easy-to-assemble wooden base, 1 9v battery snap, 1 Stranded jumper wires (black), 1 Stranded jumper wires (red), 6 Phototransistor, 3 Potentiometer 10kOhms, 10 Pushbuttons, 1 Temperature sensor [TMP36], 1 Tilt sensor etc.	2	4000	671800	Robotics Syllabus: Robot Programming
									Raspberry Pi 3 Learning and Development Kit	Raspberry Pi 3 - Model B - 1 No. 16 GB Micro SD Card with pre-installed NOOBS – 1 No. Raspberry Pi Wedge B+ - 1 No. Robo India FTDI Basic Breakout - 3.3V – 1 No. Cloured Breadboard MB 102 – 1 No. Acrylic breadboard holder – 1 No. Raspberry Transparent case – 1 No. HDMI Cable – 1 No etc.	2	7000		Robotics Syllabus: Robot Programming
									Lynxmotion BotBoarduino Shield-Compatible Robot Controller	Arduino Duemilanove compatible microcontroller	3	2500		Robotics Syllabus: Robot Programming
									4WD Arduino Mobile Robot Kit with Bluetooth 4.0	Microcontroller: Romeo BLE Controller Operating Voltage: 5V Ultrasonic Sensor Detecting range: 5cm-500cm Rotation range: 0 - 180 Power Supply: 7.5 ~ 12V DC Speed: 90cm/s Dimensions: 200mm x 170mm x 105mm	2	6000		Robotics: Experimental Platform
									DC Geared Motor with Encoder	185RPM 8N.cm 12V SPG30E-20K	4	2400		Robotics Syllabus: Actuators and feedbacks
									LiPo Batteries & balance chargers	(10000 mAh) battery + 6-12 volts charger	2	8000		Robotics: Power Supply for platforms
									PKE 7 In 1 Yellow Soldering Iron Tool Kit With Connectivity And Components Tester	25W High Quality Soldering Iron, Soldering Stand and Wire Cutter & Stripper, Battery ,Transparent Desolder Pump, Soldering Flux Paste and Desolder Wick, Aluminium Soldering Wire 1mm 50gm Roll*2	2	800		Circuit design for robot

										Item	Specification	Qty	Price		Purpose
										NiMH / NiCd Smart Charger	6V - 12V charger	1	5500		Charger for Battery Kit
										Jumper Wires	Male to Male, male to female, female to female, 120 Pieces	3	200		Connectors for circuits
										NiMH Battery	6V, 2800mAh	2	4000		Power Supply for Robots
										Microcontroller	Arduino Mega 2560 Rev3	2	1000		Robot Programming
										PCB boards	General Purpose + Female Berg Strips + Male Berg Strips	10	1000		Circuit design for robots
										Biogripp Robotic Hand (3D print)	3D print Robotic Hand	1	150000		Robotics Syllabus: Arm Geometry, Arm Dynamics, Degree of Freedom and Grasp analysis experiments.
										Contact Angle Measuring Equipment and it's accessories	Technical data : Size of the sample stage : 100 x 100 mm Maximum sample size (LxWxH):220x∞x70mm - Max. sample weight : 3.0 kg; 15.0 kg clamped - Traversing range of sample table in x-y-z direction : 110 x 150 x 42 mm3 Optics : 6x parfocal zoom (magnification0.7x...4.5x) with an integrated continuous fine focus 6 mm) and USB Camera, max. resolution : 752 x 480 pixel. Max. sample rate : 311 images/sec, Field of view 1.05 x 0.66 . 6.72 x 4.25 mm Image Distortion : < 0.05% Range of contact angle : 0...180°; 0.1° measuring accuracy Measuring range surface and interfacial Tension : 0.01 ...2000 mN/m; 0.05 mN/m resolution. Power supply: 100...240 VAC; 50...60 Hz; 55 VA Gastight 500 µl precision syringe for the electronic syringe unit ESx Outer-O 0.52 mm; Inner-O 0.26 mm; Length 51 mm For sessile drop measurements and fluids with a viscosity up to 120 mPas Outer - Ø 1.65mm, inner - Ø 1.19 mm; Length 51 mm	1	1700000		☐ Related to subject content. ☐ Very much essential for carrying out experiment for different EOR processes. ☐ Students will be highly benefitted to carry out some final year/research oriented projects. ☐ Wettability alteration is one of the prime factor in EOR technology. So, Students will be highly benefitted with this equipment to proceed with new dimensions of EOR technique.

								Equipment	Specifications	Qty	Price		Purpose
								Coreflooding Equipment	• Maximum operating pressure: -8,000 psi confining pressure -5,000 psi pore pressure • Double Cylinder • Maximum operating temperature: 900C • Core length: 1.5" to 5" • Pressure tap spacing: 2.0" • Core diameter: either 1.0" and 1.5" • Flow rate range: 0.001 to 30 cc/min • 220-240 VAC 50/60 Hz • Oven requires approximately 20 amps @ 220 VAC • System requires approximately 10 amps @ 220 VAC	1	4500000		To determine the following parameters for both academic and research purpose. • To determine the Connate Water Saturation. • To determine the Oil Recovery Efficiency. • To determine the Displacement Efficiency. • To determine the Relative Permeability Curves.
								Distillation Assembly	• Double Stage: with Interchangeable Silica Heater, S. S. Stand and Automatic Cut off Device. • Capable of producing high quality pure water: Output per hour 3.0 to 3.5 liters. • Fitted with silicon/rubber tubings	1	45000		• To produce high quality pure water for laboratory purpose
								pH and salinity Meter - Digital Lab Model	1. Range : 0.00 to 14.00 pH, -1999 to +1999 mV, 0 to 100°C 2. Resolution: 0.01 pH, 0.1 mV from ±199.9 mV 1 mV beyond ±199.9 mV, 0.1°C 3. Accuracy: ±0.01 pH ±0.2 mV from ±199.9 mV ±2 mV beyond ±199.9 mV 0.3°C 4. Offset up to ±150 mV 5. Accurate salinity in the ppm and PSU	1	15000		The pH and the Salinity are the very important properties of drilling fluid on which the other properties of the fluids are highly dependent. Before proceed to measure the other properties, initially we should measure the pH and the Salinity of the mud. It is very much essential to have this equipment in the Drilling Engineering laboratory.
								Fann Viscometer (Model 35)	1. Six speed viscometers have speeds of 600, 300, 200, 100, 6, and 3 rpm 2. 115 Volts 60 HZ	1	50000		In this laboratory, as per our syllabus, we should teach the rheological properties of the drilling fluid which are considered as the most important properties of the drilling fluid. This equipment is required for measuring these properties of the drilling fluid.

											Specifications	Qty	Price	Justification
										High Pressure High Temperature Rheometer (Mud)	1. Maximum Temperature 600°F (316°C) 2. Minimum Temperature 23° (-5°C) (with optional chiller Material No. 204160/115V or 381464/230V) 3. Maximum Pressure: 30,000 (206843 kPa, 2041 atm) 4. Sample Volume: 7.76in3 (175 cm3) (nominal) 5. Power Requirements: 230 Volt, 60/50 Hz, 1 KVA 6. Viscosity Range: 0-300 cP @ 300 rpm 7. Minimum Viscosity: 5 cP @ 600 rpm 8. Displayed info includes: viscosity (cP/mP•s), temperature (°C/°F), shear rate/stress, % torque, spindle/speed, step program status, math model calculations 9. Accuracy of ± 1.0% of range with displayed test data 10. Repeatability of ± 0.2%	1	1000000	In Drilling Engineering Laboratory, as per our syllabus, we should teach the rheological properties of the drilling fluid which are considered as the most important properties of the drilling fluid. This equipment is required for measuring these properties of the drilling fluid at the reservoir condition of pressure and temperature. The knowledge about the change in properties of fluid at the surface and reservoir is very important for understanding the basics of drilling fluid. This is one of the basic equipment of drilling engineering laboratory without which we can able to teach the basics of drilling fluid to our students.
										High Pressure High Temperature (HPHT) Filter Press (Mud)	1. Double Ended Safe Cell, Dual Nitrogen Manifold, 15 ml Backpressure Assembly 2. Temperature of 500°F (260°C) with a 100ml sample or 350 ° F (177°C) with a 130ml sample in thirty minutes. 3. Maximum working pressure is 1800 psig	1	500000	The Filter Press equipment is used to measure the fluid loss and the mud cake thickness both of which are the very important properties of the drilling fluid. Measurement of these properties in the reservoir condition of pressure and temperature gives the proper understanding of the drilling fluid since the properties are highly dependent on the temperature and pressure. Therefore, the High Pressure High Temperature (HPHT) Filter Press, which is used to measure the fluid loss and the mud cake thickness at very high pressure and temperature condition.

DUIET/TEQIP8/PE	GOODS	EQUIPMENT	NO	NO	NO	1/10/2018	NCB	Item	Specifications	Qty	Price	Total	Justification
DUIET/TEQIP8/PE	GOODS	EQUIPMENT	NO	NO	NO	1/10/2018	NCB	EP and Lubricity Test	1. EP/Lubricity Tester capabilities include: 2. Measuring the lubricating quality of drilling fluids 3. Providing data to evaluate the type and quantity of lubricating additives that may be required 4. Predicting wear rates of mechanical parts in known fluid systems	1	100000	8460000	To provide the lubricity in the bottom hole equipment while drilling is one of the functions of drilling fluid. It is very important for the student of petroleum engineering to have the practical knowledge about the Extreme Pressure Lubricity of the drilling fluid at the surface condition.
								Mud Mixers	1. Spindles: 3 2. Volts/Hz : 230/50 3. No. of Speeds: 3	1	120000		Without mixing the drilling fluid, it is impossible to measure the properties of the drilling fluid. This equipment is used to mix the components of the drilling fluid and it is most important to have this equipment in the Drilling Engineering laboratory.
								Magnetic Stirrer with Temperature Variator	1. The Magnetic Stirrer should have additional stainless steel hot plate. 2. The heat energy should be controlled by energy regulator. 3. Should give high torque even at lower speeds and should maintain speed stability despite viscosity or volume changes. 4. Should have good speed regulation even with small volume and low speeds. 5. Accurate step less speed control should maintain excellent speed stability (variation up to 1200-1500 rpm). 6. Should have digital Speed Indicator for displaying of stirring speed. 7. Should be designed for use even in corrosive atmosphere. 8. Top Plate Material: Ceramic 9. Min Temperature (° C):50 10. Max Temperature (° C):500 11. Temperature Accuracy (° C): ±5.0° 12. Low Speed (rpm):100 13. High Speed (rpm):1500 14. Max Stirring Volume (Liters): 5	1	35000		The drilling fluid and the EOR are two very important laboratories in the Department of Petroleum Engineering. In the present day technology, it is very important for the student to have the knowledge for the use of Nanotechnology in terms of Nano-fluids and Nano-materials to the drilling fluids and the EOR methods. The equipment entitled Magnetic Stirrer with Temperature Variator is required for the formulation of the Nano-materials and Nano-fluids in the laboratory.

											Item	Specifications	Qty	Price		Justification
											Powerful Sonicator	1. Features should include pulse mode and a digital display of Time, Pulsation and power control. 2. The unit should be effective for standard cell disruption, DNA/RNA shearing, Homogenization, etc. 3. Power Rating : 250 Watts 4. Frequency : 20 ± 3 KHz 5. Programmable Timer : 10 hours 6. Adjustable Pulse On/Off : 1 second to 10 seconds 7. Voltage : 230V, 50/60 Hz 8. Processing capability : Upto 250ml 9. Capable of storing 10 programs at a time, which can be edited as per requirement 10. Process Timer 0-99.9 min	1	180000		The drilling fluid and the EOR are two very important laboratories in the Department of Petroleum Engineering. In the present day technology, it is very important for the student to have the knowledge for the use of Nanotechnology in terms of Nano-fluids and Nano-materials to the drilling fluids and the EOR methods. The equipment entitled Powerful Sonicator is required for the formulation of the Nano-materials and Nano-fluids in the laboratory.
											Hot air Oven	1. Dimension (WxDxH): 455x455x605 mm 2. Volume : 125 Liters 3. No of Shelves : 02 Numbers 4. Ratings : 1.5 KW 5. Temperature range : 50 °C to 250 °C 6. Control accuracy : ± 1°C or better 7. With Air Circulating Fan 8. Exterior body should be made of mild steel material, which is powder coated in attractive shades 9. Inner chamber should be made of Stainless Steel with mirror polished material. 10. should have high density glass wool insulation on all sides to offer minimum chamber heat loss 11. Oven should be fitted with heating elements on all three sides, ensuring uniform temperature distribution throughout the working chamber 12. Should have minimum heat loss 13. Should have digital temperature indicator cum controller 14. Should have Nichrome heating elements, ensuring long lasting and continuous heating within the chamber	1	50000		

										Vacuum Oven	1. The outer case is mild steel painted in epoxy powder coating. 3. Capacity: 12 Ltrs. 7. Temperature is controlled by electronic digital temperature indicator-cum-controller range 500 C to 1300 C ± 10 C. 8. An indicator lamp shows the operation of the heater. 9. SIZE INSIDE CHAMBER {STAINLESS STEEL}: 22.5 cm Dia x 30 cm Depth. 10. Accessories Required: • Microprocessor PID Controller having 4 ramp & 4 soak profile having set mode, alarm parameter, configuration parameter, profile parameter, set point profile, Pv error indicator, parameter for locking etc. • Alarm: It is possible to provide electronic alarm if, temperature deviates more than +/- 1 °C	1	90000		The drilling fluid and the EOR are two very important laboratories in the Department of Petroleum Engineering. In the present day technology, it is very important for the student to have the knowledge for the use of Nanotechnology in terms of Nano-fluids and Nano-materials to the drilling fluids and the EOR methods. The equipment entitled Vacuum Oven is required for the formulation of the Nano-materials and Nano-fluids in the laboratory.
8										SOXHLET Apparatus	Salient Features •Suitable to heat Soxhlet Flasks •Type of Soxhlet : Unit with 6 - Mantle Type heaters •Insulation : Glass wool insulation below the heating elements to prevent thermal loss •Temp control : Built-in regulators for individual heaters, which controls the heaters •Control panel : Individual on/off switches and Pilot lamps to indicate working of the elements •Suitable : 100/250/500/1000 ml capacity Flasks •Operation on : 230 Volts, AC, single phase,	1	75000		☐ Related to subject content. ☐ Pre-requisite to carry out different laboratory works related to reservoir engineering. ☐ Cleaning of reservoir core samples are done through this equipment to determine reservoir fluid properties like porosity, permeability etc. ☐ Students will be highly benefitted.

| | | | | | | | | | PCB prototype machine | Specification:
Resolution (X/Y): 0.1μm (0.0039 mil)
Working Area (X/Y/Z): 304 x 229 x 33mm (12'' x 9'' x 1.3'')
Table Size: 375mm x 230mm
Machine Dimension: 508 x 432 x 305 mm Milling Spindle: Max 60000rpm – 3 Phase Induction Motor Minimum Width Line & Space: 0.1mm (4mil) Maximum Drilling Cycles: Upto 180 Drill/Min Maximum Thickness of Processed Materials: 33mm Spindle Speed/Min: 5000 to 60000rpm
Control Motor: Stepper Motor | 1 | 2500000 | | • to share with the growing hardware startup community by transforming ideas into products
   • to perform B.tech final year projects .
• to perform advanced research works |
| | | | | | | | | | Benchtop Multimeter 5 ½ Digit | • Instrument Should be 5 ½ Digit Dual display • Fast reading speed of up to 190 readings/sec • Multiple connectivity options – USB 2.0, Serial Interface (RS-232) and GPIB • 11 measurement functions; DC voltage & current, True RMS, AC voltage & current, 2- and 4-wire resistance, frequency, continuity, diode test, capacitance and temperature • Ultra-bright OLED with dual display capability
• Up to 50,000 memory points for data logging • Built-in Histogram function | 2 | 65000 | | |

| | | | | | | | | Regulated Multi output DC Power Supply | Specification:
Constant Voltage & Constant Current operation Protection Against over load & short circuit
Output DC: A: 30V/2A, B: 0 to ±15V/1A Dual Tracking, C: 5V/5A
Voltage Setting Resolution:10mV
Current Setting Resolution: 5mA
Load Regulation: $\leq \pm (0.05\% +10$ mV)
Line Regulation: $\leq \pm (0.05\% +10$ mV)
Ripple & Noise: ≤1mVrms
Internal Resistance: $\leq 10m\Omega$
Stability: ≤ 2.5 mV at full load
Current Limit Adjustment: 100mA to Max Display: Switchable 3 Digit seven segment LED for Voltage & Current
Display Accuracy: V : $\pm$ (1% + 1 digit), I : $\pm$ (1% + 3 digit)
Built-in overheat, over voltage protections Insulation: Between chassis & output terminal > 10 MW at 100 Vdc, chassis & AC plug > 50 MW at 500 Vdc | 3 | 15000 | | |

9	DUIET/ TEQIP9 /ECE/P ROJEC T LAB	GOODS	EQUIPMENT	NO	NO	NO	2/4/2018	SHOPPIN G				3285000
									70 MHz Digital Storage Oscilloscope with Built in Function Generator	Specification: Bandwidth : 70 MHz (Should be future upgradable to 100MHz) Input Channel : 2 Max Memory Depth : 1Mpts Rise Time : $\leq$ 5ns Max Sample Rate : 2GSa/s Input impedance/capacitance : 1MΩ $\pm$ 2%/16 pF $\pm$3 pF Vertical Resolution : 8bits Input sensitivity range : 500μV/div to 10V/div Time base range : 5 ns/div to 50 s/div Horizontal Resolution : 2.5ps Waveform math : add, subtract, multiple, divide, FFT & Low Pass Filters Essential Facility : FFT with Span and Centre Frequency control, Bode Plot Test, User Configurable Hot-Key. Cursor : Both X & Y Courser should be available in FFT Mode with dB measuring Unit. Display Mode : Only FFT signal should be available without main signal Waveform update rate : 50,000 waveform per second Trigger type : Edge,	2	65000	
									Soldering station	☐ Accurate and advanced temperature Control with micro controller technology ☐ Power consumption Soldering : 60 W ☐ Power consumption DeSoldering : 70 W ☐ Power consumption For SMD Rework: 270 W ☐ Hot air temperature: 200 to 550°C ☐ Burn proof silicon cable with thermal resistance up to 600°	2	40000	

										Item	Specifications	Qty	Price	Remarks
										3GHz Hand Held Spectrum Analyzer	Resolution : 1 Hz Frequency Span Range : 0 Hz (Zero Span), 100 Hz to3.0 GHz Resolution Bandwidth (-3 dB Bandwidth) : 10 Hz – 3 MHz (1-3-10 Sequence) Video Bandwidth (-3 dB Bandwidth) : 1 Hz – 3 MHz (1-3-10 Sequence) SSB Phase Noise (100 KHz Offset) : - 99dBc/Hz at CF 500 MHz, Displayed average noise level : - 142 dBm at 7 – 10GHz Range (Preamp off Condition) Maximum Input Power : + 20 dBm Maximum Safe Input Lavel : + 30 dBm (3 Minutes Max) VSWR : < 2 : 1 at 7 GHz – 13.6 GHz Input Attenuator Range : 0 to 50 dB, in 5 dB steps Sweep Time : 2 ms – 1000 s (Span ≥ 100 Hz) : 600 ns – 200 s (Span = 0) Sweep Mode : Continuous, Single Sweep Points : 461 Trigger Source : Free run, video, external, RF burst Optional Tracking Generator Frequency : 5 MHz – 7 GHz with 0 to – 20 dBm Power Level (1 dB Step) Tracking Generator VSWR : < 2.0 : 1 throughout the range Input / Output Connector : N Type, 50	1	400000	For signal analysis (frequency domain).both for academic as well as research projects.
										Recording Instrument Microphone	Three-position sensitivity switch Three-position bass roll-off/cut-off switch Very high sound pressure handling capability	1	30000	For recording speech files from speakers of various languages in a noise free environments while performing lab experiments and mini projects on speech processing domain as per the syllabus contents
DUIET/ TEQIP1 0/ECE/										affordable stereo monitors	front-mounted bass port and built-in 24W stereo power amplifier	1	30000	For listening to the recorded speech files from various speakers while performing lab experiments

10	SIGNAL PROCESSING	GOODS	EQUIPMENT	NO	NO	NO	2/4/2018	SHOPPING	Handheld Digital Recorder	192Khz/24bit compatible linear PCM recorder, SD card(64MB to 2GB), SDHC card(4GB to 32GB), SDXC card(48GB to 128GB), 2 channels(stereo), signal-to-noise ratio	1	30000	125000	For recording speech files from speakers of various languages in a noise free environment
									HeadwornMicrophone	low-impedance, unidirectional dynamic microphone designed for close-talk head-worn applications, 50 to 15,000 Hz, Cardioid, uniform with frequency, symmetrical about axis	1	15000		For listening to the recorded speech files while performing lab experiments and mini projects on speech processing domain as per the syllabus contents
									Professional Open Back Headphones	Open-back, circumaural design Dual-exit, detachable straight cables Includes SRH1440, threaded 1/4" gold-plated adapter, replacement velour ear	1	20000		For listening to the recorded speech files during lab experiments and mini projects on speech processing domain as per the syllabus contents
									8085 trainner kit	• It should operates on SINGLE +5V power supply in on board keypad mode or from host PC through RS-232-C interface. • In both stand alone and serial modes, user can enter programs, run them at full speed and debug them through breakpoint and single step facilities. • It should allows program editing through INSERT, DELETE and BLOCK MOVE commands. • It should allows direct read/write from/to a specified I/O port through IN BYTE and OUT BYTE commands. • It should have four on board ribbon cable connectors for easy expansion and two user defined function keys. • On board battery backup for RAM. • It should be compatible with many interface modules like 8 Channel 12 Bit ADC Interface with MUX, Elevator Interface, Stepper Motor Interface with Stepper Motor (3Kgcm) & Power Adapter, 6-digit, 7-Segment Display with Calculator KBD Interface, Traffic Lights Interface, 4-Digit, 7-Segment LED Display Interface etc. • It should have built in Text editor, Assembler and Disassembler facilities in serial mode. • It should operated at 3.072 MHz. • MEMORY : Three 28 pin JEDEC	15	10000		These are the basic equipments of microprocessor and microcontroller laboratory. There are 30 students in a group and procuring 15 kits, meaning one kit for 2 students. We procured 8085 trainer kit in the year 2013 but presently most of the kits are nor working properly.

| 11 | DUIET/ TEQIP1 1/ECE/ MICRO PROCE SSOR | GOODS | EQUIPMENT | NO | NO | NO | 2/4/2018 | SHOPPIN G | 8086 tranner kit | • It should have on-board provision to interface optional LCD & PC keyboard.
• It should have a powerful, general purpose microprocessor trainer which can be operated either with 8086 CPU or 8088 CPU with a clock frequency of 8MHz in maximum mode.
• It should be versatile and can be configured in a variety of ways via jumper options, to suit specific user requirements.
• The basic system can be easily expanded through the system bus connectors.
• User can have full 1MBytes of addressable memory.
• 128K Bytes of powerful system firmware provides keyboard monitor, serial monitor, single-line assembler, disassembler and driver programs for parallel printer interface.
• The software for the optional PROM programmer interface is also included in the firmware.
• It should be compatible with many interface modules like 8 Channel 12 Bit ADC Interface with MUX, Elevator Interface, Stepper Motor Interface with Stepper Motor (3Kgcm) & Power Adapter, 6-digit, 7-Segment Display with Calculator KBD Interface, Traffic Lights Interface, 4-Digit, 7-Segment LED | 15 | 15500 | 622500 | These are the basic equipments of microprocessor and microcontroller laboratory. There are 30 students in a group and procuring 15 kits, meaning one kit for 2 students. We procured 8086 trainer kit in the year 2013 but presently most of the kits are nor working properly. |

									Item	Specification	Qty	Price		Remarks
									8051 microcontroller kit	Target board 8051 with MCU • 24 MHZ Clock frequency • 64KB RAM • 64 KB ROM • One USB and one RS232 port • LED with demonstration/example programs • Boards should be supplied with schematic diagrams, necessary cables, power supplies etc. • It should be possible to expand these boards with additional hardware like 8 Channel 12 Bit ADC Interface with MUX, Elevator Interface, Stepper Motor Interface with Stepper Motor (3Kgcm) & Power Adapter, 6-digit, 7-Segment Display with Calculator KBD Interface, Traffic Lights Interface, 4-Digit, 7-Segment LED Display Interface etc. Target board should be compatible with industry leading IDE/Software.	10	13500		These are the basic equipments of microprocessor and microcontroller laboratory. There are 30 students in a group and procuring 10 kits, meaning one kit for 3 students. We procured 8051 trainer kit in the year 2013 but presently most of the kits are nor working properly.
									ADC interface module	• 8051 Evaluation Board, 8085 & 8086/88 Trainer Kits should be supported	5	6000		These are the peripheral devices which is required to perform interfacing related experiment
									stepper motor interface	• 8051 Evaluation Board, 8085 & 8086/88 Trainer Kits should be supported	5	6000		
									keyboard display	• 8051 Evaluation Board, 8085 & 8086/88 Trainer Kits should be supported	5	5000		
									Traffic light controller	• 8051 Evaluation Board, 8085 & 8086/88 Trainer Kits should be supported	5	2000		
									7-segment display interface	• 8051 Evaluation Board, 8085 & 8086/88 Trainer Kits should be supported	5	2000		
									Analog Circuits Development Platform with following modules:	Analog Circuits Development Platform with following modules: 1. Transistor Characteristics Common Emitter-NPN 2. FET Characteristics 3. Colpitts Oscillator 4. Hartley Oscillator 5. Diode Clippers 6. Diode Clamper 7. UJT Characteristics 8. MOSFET Characteristics[Size of Breadboard : 172.5mm x 128.5mm ,Tie Points on Breadboard : 1685 nos (solderless), DC Power Supplies : +5V, 1A (fixed) +12V, 500 mA (fixed) -12V,	6	25000		To easily understand various semiconductor device characterstics and performance so that students can developed their own design ideas.

12	DUIET/ TEQIP12/ECE/ DEVICE_ INSTRUMENTATION	GOODS	EQUIPMENT	NO	NO	NO	1/10/2018	SHOPPING	Sensor Module with a. Strain Gauge Module b. LVDT Coil c. Pressure Sensor	Sensor Module with a. Strain Gauge Module b. LVDT Coil c. Pressure Sensor [On board display : 7", capacitive Connectivity : USB & Ethernet Square ,Wave Generator : up to 40KHz, Low Pass Filter : up to 30KHz, High Pass Filter : after 40KHz ,Inverting Amplifier : Variable Gain 1-10 , Non Inverting Amplifier : Variable Gain 2-10, Differential Amplifier : Variable Gain 1-10, Instrumentation Amplifier : Variable Gain 10-20, F/V converter : 1KHz –1V 10 KHz –10V, V/F Converter : 1V –	4	110000	1000000	For better understanding of the function of various sensors used in non electrical quantity measurement.
									MOSFET, IGBT, Transistor & SCR based Step Down Chopper board	[On board PWM circuit : Triangular Comparator circuit, Frequency variation : 27 Hz to 5 KHz (approx.), PWM variation : 0-90% ,DC Geared motor : 24V/ 0.5A, 100 RPM, Interconnections : 2 mm sockets MOSFET : MOSFET IRFZ44N, 55V, 49A, IGBT : IGBT	6	15000		To learn MOSFET, IGBT and SCR based step down chopper characterstics
									SCR Triggering board	[On board AC source : 18 V - 0 V - 18 V, On board DC Supply : +5 V, +12 V, On board triggering circuits : 555 IC triggering circuit, UJT triggering circuit, Interconnection : 2 mm socket SCR :	6	15000		To study of the triggering of SCR using UJT and to study of the triggering of SCR using TC555.
									Power electronics board	[Size of Breadboard : 172.5 mm × 128.5 mm ,DC Power Supply : +5 V, -5 V 500 mA, +12V, -12 V 500 mA +15 V, 250 mA +35V, -35V, 250 mA, AC Power Supply : 18V-0V-18V 0V-15V ,On board Firing Circuits Frequency range : 30Hz to 900Hz variable ,Amplitude : 12V PWM control of G1, G2, G3 and G4 Duty cycle control of "Gate" ,Signal is 0 to 100% SCR Assembly : 4 SCRs 2P4M, 400V/2A Power Devices : IGBT-G4BC20S, MOSFETIRFZ44N, UJT-2N2646, DIACDB3, TRIAC-BT136, PUT- 2N6027 Pulse	6	15000		To learn about the V-I characteristics of power devices, Study of firing Schemes, Controlled rectifiers, DC-DC chopper, Inverter Own circuit Development.

										Function Generator Trainer	Function Generator Trainer [Frequency Ranges : Selectable, 1Hz to 10Hz,10 Hz to 100Hz,100Hz to 1kHz, to 10kHz, 10kHz to 100kHz Sine Wave Generation : By Wave Shaping Circuit, Switched Faults : 04 Nos. Fuse : 350mA, Mains Supply : , 50Hz Dimensions (mm) : W 36 x D 260 x H 120Weight : 2kg (approximate)]	4	10000		To understand the internal functions of a function generator.
										Meter Demonstrator	Meter Demonstrator [Inbuilt Variable AC Supply : 0 to 230V Inbuilt Variable DC Supply : 0 to 6V (with load), Meters Used AC Voltmeter : 0 to 300V, DC Voltmeter : 0 to 10V , AC Ammeter : 0 to 1A, DC Ammeter : 0 to 1A, AC Wattmeter (Dynamometer) : 0 to 500W, Mains Supply : 230V ±10%, 50Hz Dimensions (mm) : W 600 x D 450 x H 600 Weight : 15kg (approximate)]	4	25000		To study different functioning of measuring meters.
										Installing pressure and crank angle sensors in VCR engine of IC lab and converting it to Open ECU	PCB/Kristler cylinder head pressure sensor, 360ppr crank angle encoder, IP,IMEP indications,IP,IT variation,etc	1	600000		Existing VCR engine does not give combustion parameters (like peak combustion pressure, etc.) also Injection timing and Injection pressure readings are not available. So, pressure head sensor and crank angle encoder sensor needs to be fitted with the existing engine, also the ECU must be made programmable to make available the IT and IP data readings. The engine is to be used for B.Tech experimentation in the course of IC engines and also B.Tech projects which needs variable engine parameter modulation can be performed on the engine.

										Item	Specification	Qty	Amount	Total	Justification
13	DUIET/ TEQIP1 3/ME/ WORK SHOP_ MMI_R ESEAR CH LAB	GOODS	EQUIPMENT	NO	NO	NO	1/10/2018	SHOPPIN G		Flue gas Analyzer	any make(Oxygen (O2) 0 to 25% 0.1% Carbon Monoxide (CO) 0 to 10% 0.1% Carbon Dioxide (CO2) 0 to 99% calculated Nitric Oxide (NO) 0 to 5000ppm 1 ppm Nitrogen Dioxide (NO2) 0 to 1000ppm 1 ppm Sulphur Dioxide (SO2) 0 to 5000 ppm 1 ppm Temperature -20 to 1250 oC 0.1 Oc Excess air 0 to 850 % Efficiency 0 to 100% Pump Suction 450 mbar Data storage 900 tests)	1	400000	4971310	The Engine laboratory needs a Flue gas analyser for studying IC engine emissions which is to be included in the Lab curriculum of B.Tech students. The different also has a VCR engine which needs the emission analyser for emission analysis of different fuels at different operating engine conditions which shall also be greatly helpful for the UG student projects.
										EDM Drilling Machine	any make(EDM Drilling machine with 3 axes DRO and standard accessories)	1	1250000		Upgradation
										SPOT & PRCJECTION WELDING MACHINE	any make(Single phase input 400 V,50/60 Hz, Rated power at 50% 50 KVA, Max. welding power 113 KVA, Installed power 38 KVA, Cross section connecting cables 35 sq mm ,Delayed Fuse 100 A, Circuit Voltage 5.9 V,Short circuit current 24 KA, Short circuit power 142 KVA, Max. welding current 19 KA, Electrode force max (6 bar) 470 daN,Water consumption a 300 kPa (3 bar) – 7 L/min)	1	1150000		Upgradation
										PRECISICN CONVENTIONA L LATHE MACHINE	• Centre distance : 1500 • Centre height : 250 • Swing over bed : 502 • Swing over gap : 700 • Gap length in front of face plate : 160 • Bed width : 300 • Swing over carriage : 440 • Swing over cross slide : 310 • Cross slide travel : 250 • Tool post slide travel : 130 • Maximum tool dimensions : 25 X 25 • Headstock Main spindle bore : 58 • Main Spindle Nose: A2 -6/Camlock-6 • Main Spindle morse taper : 4(MT) • Speed Range : 40- 2300 rpm • No. of Speed Range : 3 • Speed Range 1 : 40- 310 rpm • Speed Range 2 : 310-840 mm	1	1250000		Upgradation
										Digital micrometer	Mitutoyo Digimatic Micrometer 0-25mm	2	10000		For modernizing and strengthening of existed lab
										digital vernier calliper	Digital Caliper 150mm 6-inch with Displa	2	655		For modernizing and strengthening of existed lab

									Item	Specification	Qty	Price		Remarks
									Experimental set-up for calibration of pressure gauge/ Dead Weight Pressure Gauge Tester	(Range 0-710 mmHg, Screw Pump, Free Piston Assembly of special steel, Set of Weights directly marked in convenient values of pressure and easily stacked on the carrier weight, Gauge Connector of 1/2" BSP (female) union for connecting gauge to be tested, Baseplate of sturdy construction provided with legs and leveling screws)	1	150000		For modernizing and strengthening of existed lab
									Experimental set-up for calibration of thermocouple	(Thermocouple (N-type and R-type, RTD, Digital temperature Indicator, digital micro voltmeter extension cables)	1	150000		For modernizing and strengthening of existed lab
									Desktop	Intel® 7th Generation Core i7 Quad Core CPU with minimum clock speed of 3.4 GHz, 8MB Cache or better, Intel® Q Series commercial chipset, OEM Motherboard with OEM logo empossed on the motherboard, Memory 8 GB DDR4 RAM expandable to 64GB; Four DIMM slots; Non-ECC dual-channel upto 2133 MT/s DDR4 SDRAM , Hard Disk Drive 1TB HDD, 7200 RPM, SATA III 6 Gbps, SMART IV Optical Drive SuperMulti DVD Writer, Graphics Integrated Graphics, Audio High Definition Integrated Audio with Internal Speaker Ethernet Integrated Gigabit (10/100/1000 NIC) LAN Slots Minimum 4 low profile PCI/PCIe Slots (3 x PCIex1 and 1 x PCIex16) Bays Minimum 5 bays with atleast (2) 3.5" Drive bays & (1) ODD bay Ports Front I/O (2) USB 2.0 ports,	29	55000		**(1**). For implementation of the kits for lab experiments.Note: 1 kit require 2 PCs (Data Communication Trainer and RJ Port Networking) 1 kit require 3 PCs (LAN Topology Trainer) **(16 desktop for datacommunication lab CSE)** (**2**). Workstation for Simulation and programming in the laboratory. **(10 Desktop for ES and IOT lab CSE)** **(3)** For record keeping and to perfor various lab related works. **(1 Desktop for Instrumentation lab ECE)** **(4)** For record keeping and to perfor various lab related works. **(1 Desktop for mobile communication lab ECE)** **(5)** For record keeping and to perfor various lab related

| 14 | DUIET/ TEQIP1 4/ALL DEPT/ COMP UTER_ PROJE CTOR | GOODS | EQUIPMEN T | NO | NO | NO | 2/4/2018 | SHOPPIN G | | Laptop | light weight with high battery-backup capacity laptop [Processor :i7-7500U; Hard drive capacity :1 TB,RAM:8 GB, graphis card- 4GB, weight at max1.4 kg] | 8 | 70000 | 3340000 | **(1)**Field work workstation for IoT simulation and data collections. **(1 laptop ES and IOT lab for CSE)**

(2). To carry out field experiment and measurement such as fault detection and performance analysis of the Internet connections and devices in an organization as per syllabus. **(1 laptop for network lab CSE)**

(3) High processing mobile unit for autonomous robots, mapping and localization, outdoor image & video processing |
| | | | | | | | | | | Projector | LCD Projector [RESOLUTION: 1024 X 768 PIXELS, Lamp: 1 LAMP OF 200W UHE, LAMP LIFE: 5000HR, PROJECTION DISTANCE: 10.4 FT, MAXIMUM PROJECTION SIZE: 300 INCH, BRIGHTNESS: 3600 LM (STANDARD), 3600 LM (MAXIMUM), FOCAL LENGTH: 18.4, FOCUS MECHANISM: MANUAL FOCUS, AUDIO TYPE: MONAURL, VGA: 15 PIN D SUB, HDMI: 1 HDMI PORT, VERSION 1.3] | 7 | 70000 | | To use to teach, the procedure of different lab exprements. (1 for EDC lab, 1 for instrumantation lab, 1For mobile communication lab, 1 for signal processing lab,1 for project lab, 1 for embedded lab ECE) (1 for drawing class room) |

										Item	Specification	Qty	Amount	Total	Purpose
										Online UPS 5KVA	5 KVA/4.5 KW ,Input Voltage 160 - 280V;1 Phase @100% load,50Hz ± 10% (Suitable for Generators), 220/230 V AC, 50 +/- 0.5 Hz, 3:1, 125% for 10 minutes, 130% for 60 seconds Harmonic Distortion < 2% (for linear loads) &<5% (for non linear loads), LED mimic diagram + LCD Display with measurements (Input / Output / Bypass V & Hz, Battery V & capacity level indicator, Load % & level Indicator, Suitable Alarms for Battery Operation / Overload, 1 x Intelligent-Slot (SNMP), 1 x RS232 Serial Port.,Required VAH : 12000 VAH for 120 minutes back-up and 17,000 VAH for 180 minutes back-up. Battery Make: EXIDE/QUANTA/ Panasonic only,	6	110000		For uninterrupted power back up. (6 ECE lab)
										Projector Screen	Projector Screen [SIZE: 8 FT. X 6 FT, SCREEN SURFACE:MATT WHITE FABRIC, MOUNT: WALL FOLDING: SPRING ACTION MECHANISM]	6	5000		To display the output of the projector.
15	DUIET/ TEQIP1 5/ALL DEPT/ LABW ORK BENC H		GOODS	FURNITURE	NO	NO	NO	1/1/2018	SHOPPIN G	Teqip cell furniture	chair, work table, storage etc	1	400000	2800000	To setup TEQIP cell
										Lab Work bench	Heavy Marble Table (with Steel Boxes) (2 Meter Breath, 5 Meter Length)	6	400000		Required furniture to set up the laboratory (2 for CSE 2 For ECE 3 for PE)
										Lab Work bench	Heavy Marble Table (with Steel Boxes) (2 Meter Breath, 5 Meter Length)	1	400000		
										White Boards	(4.5ft X 3.5 ft)	16	1500		Demonstration purpose.
										book Case	4 door book case	16	20000		Book & Documents storage for faculty cabins (6 CSE, 7 ECE, 3 ME)
										Godrej Chair Bravo Visitor	Godrej Chair Bravo Visitor for conference hall	130	5000		to set up new conference hall

										Specification	Qty	Unit	Total	Remarks
16	DUIET/TEQIP16/ALL DEPT/FURNITURE	GOODS	FURNITURE	NO	NO	NO	2/7/2018		Desk cum bench	Two seater Desk-cum-Bench with shelf. (width=1048 mm, depth=895 mm, height=750 mm)	20	10000	2174000	There is a shortage of desk-bench in the classroom in comparison to the number of students due to which the normal teaching-learning has been affected.
									Rack	6'x4' open	13	20000		To keep lab report and completed project (ECE 1 no), The storage shelf shall be used for NBA record keeping, books, student final year project thesis as well as other important documents (ME 6 nos ECE 6 nos)
									Seating Tool		70	1000		Required furniture to set up the laboratory for student seating (15 for ES CSE lab, 16 For data communication lab) (20 for n/w lab CSE) (19 for ECE labs)
16	DUIET/TEQIP16/ALL DEPT/AC	GOODS	EQUIPMENT	NO	NO	NO	2/4/2018	SHOPPING	Air conditioner	Split AC; 2 ton capacity Energy Rating: 5 Star warranty: 1 year comprehensive; 5 years on compressor Anti dust filter, active carbon, nono silver, catechin filter, acaro bacterium and silver ion	24	50000	1200000	8 for Four ECE computer and simulation and embedded system lab and project lab (Each lab 2). (1 no fo chemistry lab……..One number AC is required in the Equipment lab containing UV-Visible Spectrophotometer and FTIR Spectrophotometer. This is very essential as these equipment's
17	DUIET/TEQIP17/ALL DEPT/SW/MATLAB	GOODS	LR	YES	NO	NO	1/1/2018	DIRECT CONTRACTING	Matlab	Matlab (25 usar) , Simulink (25usar), signalprocessing (15 usar), control syatem (15 usar), dsp (15 usar), communication (15 usar), image processing (15 usar),antenna (15 usar),RF (15 usar), nural network (25 usar), optimization tool box (25), simscape multibody (12 usar), simscape fluids(12), symbolic math (12)Fuzzy logic toolbox (12 usar) Global optimization toolbox (12 usar)	1 sw (25 usar)	2200000	2200000	Matlab software is very essential for he department of ECE and ME and CSE for simulation purposes.

18	DUIET/ TEQIP1 8/ECE/ SW/M ULTISI M	GOODS	LR	YES	NO	NO	1/1/2018	DIRECT CONTRA CTING	MULISIM	With Multi MCU module: For Analog, Digital and Mixed mode circuit simulation and microcontroller based circuit design and simulation.	1 sw (25 usar)	600000	600000	For validation of theory concepts through circuit designs simulation ..require for syllabus based experiments and also for project and research works
19	DUIET/ TEQIP1 9/ALL DEPT./ SWAY AM PRABH A	GOODS	LR	NO	NO	NO	1/1/2018	SHOPPIN G	TV Set with Setup Box	TV: LED screen 55", in-built audio system, USB, WIFI, HDMI,	5	100000	500000	It is under AICTE mandate
20	DUIET/ TEQIP2 0/ALL DEPT/S MART CLASS	GOODS	EQUIPMENT	NO	NO	NO	2/4/2018	SHOPPIN G	Conference hall video conference kit	Display and Video sysyem (Indigenous Podium in Metallic Frame and Wooden Top as per thepic with in-built 19U Rack withWith 19" Panel Motorized Tilting, LCD projector) Audio system (Class-D mixer amplifier (Lo-Z: 120W x2 @4Ω, 100W x2ch @3Ω/8Ω, Hi-Z: 120W x2ch or 200W x1ch, 70V/100V) equipped with 6 mic/line inputs, 2 stereo inputs and powerful DSP functions for high quality music playback and microphone use., Wireless Microphone) Desk top PC etc. Video conferencing kit etc.	1	100000	6000000	to set up new conference hall
									Smart class room	Display and Video sysyem (Indigenous Podium in Metallic Frame and Wooden Top as per thepic with in-built 19U Rack withWith 19" Panel Motorized Tilting, LCD projector) Audio system (Class-D mixer amplifier (Lo-Z: 120W x2 @4Ω, 100W x2ch @3Ω/8Ω, Hi-Z: 120W x2ch or 200W x1ch, 70V/100V) equipped with 6 mic/line inputs, 2 stereo inputs and powerful DSP functions for high quality music playback and microphone use., Wireless Microphone) Desk top PC etc.	10	500000		Classroom upgradation one for each department.

No	Package	Category	Type	Col5	Col6	Col7	Date	Method	Item	Description	Qty	Cost	Total	Purpose
21	DUIET/ TEQIP2 1/CES/ SW/NE TSIM	GOODS	LR	YES	NO	NO	2/4/2018	DIRECT CONTRA CTING	NETSIM	Net-Sim [Network Simulator Software]	1 sw (30 usar)	300000	300000	To demonstrate and simulate different types network scenarios.
22	DUIET/ TEQIP2 2/ALL DEPT/ COMP UTER_ PRINTE R	GOODS	EQUIPMENT	NO	NO	NO	1/1/2018	SHOPPIN G	Multifunction Laserjet Duplex Printer	black and white, Two side scanning, Auto Duplex, print from USB, Built-in WiFi,	4	50000	505000	
									Desktop	Intel® 7th Generation Core i7 Quad Core CPU with minimum clock speed of 3.4 GHz, 8MB Cache or better, Intel® Q Series commercial chipset, OEM Motherboard with OEM logo empossed on the motherboard, Memory 8 GB DDR4 RAM expandable to 64GB; Four DIMM slots; Non-ECC dual-channel upto 2133 MT/s DDR4 SDRAM , Hard Disk Drive 1TB HDD, 7200 RPM, SATA III 6 Gbps, SMART IV Optical Drive SuperMulti DVD Writer, Graphics Integrated Graphics, Audio High Definition Integrated Audio with Internal Speaker	3	55000		
									Laptop	light weight with high battery-backup capacity laptop [Processor :i7-7500U; Hard drive capacity :1 TB,RAM:8 GB, graphis card- 4GB, weight at max1.4 kg]	2	70000		
23	DUIET/ TEQIP2 3/CES/ SW/ER P	GOODS	LR	YES	NO	NO	1/1/2018	DIRECT CONTRA CTING	ERP SW	Academic module, Examination module, students database(customized)	1	500000	500000	To mainatin 900 students database and efiiciency of results system
24	DUIET/ TEQIP2 4/LAB/ CIVIL WORK	Civil Work	renovate work	no	NO	NO	1/1/2018		Lab Partition	Lab Partition and minor civil work		1000000	1000000	Lab and class room partition

											2000000	2000000	Set up new conference hall
25	DUIET/ TEQIP2 5/LAB/ CIVIL WORK	Civil Work	renovate work	no	no	no	2/4/2018		Conference hall	Conference hall minor civil work				
TOTAL: 48117179													