MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL
(FORMERLY KNOWN AS **WEST BENGAL UNIVERSITY OF TECHNOLOGY**)
Main Campus : Haringhata, Nadia, Pin-741249
Kolkata Campus : BF-142, SECTOR-I, SALTLAKE CITY, KOLKATA-700 064, (INDIA)
Website : www.wbut.ac.in

Ref. No. :   Date :

Ref.No.COE/MAKAUT,WB/30/2020   **Date:20/04/2020**

Notice

This is for information of all the Director/Principals/Head of Departments/Faculty Members /Students that the competent authority of University after discussion with the experts of the Board of Studies decides to encourage the students to take up the technology oriented internship project as suggested by the experts (as annexed). This would help the students to continue the internship/project during lockdown period. The Head of departments / guides of different departments of the affiliated colleges are advised to guide the students in this matter accordingly. The list is not exhaustive and further extension of the ideas and innovation can be incorporated by the faculty members. All concerned may contact with the BoS as per time mentioned in the lists.

(Dr. Subhashis Datta)
Controller of Examinations
MAKAUT,WB

MaulanaAbulKalam Azad University of Technology, West Bengal (MAKAUT, WB)
(Formerly West Bengal University of Technology-WBUT)

Board of Studies of Engineering Engineering

Name of Convener: Prof. K. Chakrabarty
Email id: chakrabarty40@rediffmail.com

List of suggested topics for internship / project from home:

Sl No	Topics
1.	Thermal power plant
2.	Hydro electric power plant
3.	Paper mill
4.	Cement plant
5.	Solar power plant
6.	Electrical substation
7.	Process control of an industry
8.	Electric locomotive
9.	Motors and controller for Electric car
10.	Energy Efficient building

This list is not exhaustive. It is only indicative. Mentors may select Topic based on their expertise.

Objectives of Internship /Project from home for Electrical Engineering students:

1. To learn to apply the Technical knowledge in industrial situations.
2. To gain experience in writing Technical reports/projects.
3. To learn Engineer's responsibilities and ethics.
4. To familiarize with various materials, processes, products and their applications along with relevant aspects of quality control.
5. To understand the social, economic and administrative considerations that influence the working environment of industrial organizations
6. To understand the psychology of the workers and their habits, attitudes and approach to problem solving

General guideline for execution:
For students:
(i)   The block diagram representation of the plant/ system
(ii)   The function of each block of the plant/system.
(iii)   The detailed electrical equipments of the plant/system are to be identified with specification and operating principle
(iv)   Different diagnostic techniques in the event of fault of different equipments
(v)   Preventive maintenance techniques of different electrical equipments.

(vi)   The overview of the plant can be obtained from the material available in the digital platform and mentors.

(vii)   The daily activities in the digital platform or with the mentor to be mentioned chronologically.

(viii)   At the end, a report mentioning all the aforesaid points to be submitted by the group and the group will deliver a seminar in the digital platform with mentors.

For Faculties/Guide/Mentors:

(i)   The mentor will share the different diagnostic and preventive maintenance techniques with the group.

(ii)   The mentor will also share the psychology of the workers and their habits, attitudes

(iii)   The mentor will share different live situation faced by him.

(iv)   The mentor will give real life case for diagnosis and solution by the student members of the group.

Evaluation scheme:

1. Continuous:

Students will maintain a diary of regular activities and to be shared with the mentor.

2. End term:

The mentors will award marks based on the performance of the students in the group and on the presentation and viva.

Thermal Power Plant

Sub topics:

1. General Introduction: - Concept of Modern Thermal Power Plant, Location /Site Selection, Plant layout & Power Plant Safety.
2. Constructional details and basic principles of large pulverized fuel Boiler and auxiliaries.
3. Construction and working principles of Turbine and auxiliaries.
4. Various types of Valves and Pumps.
5. Construction and working principles of Alternators and Excitation Systems, Transformers, Motors, Switchgears, Power Supply System and Switchyard
6. Tariff Calculation.
7. Tariff Based Bidding , Concept of UMPPs
8. Fuel Handling Plant, Ash Handling System and Cooling Water System.
9. Water Sources and treatment.
10. Operation, control and supervision of Boiler, Turbine and Alternator.
11. Instrumentation & Control (including DAS & DDC) and Protection system.

12. Power Plant Maintenance practices.

Resources:

1. Material of Power plant training institute
2. Fault detection and diagnosis methods in power generation plants- The Indian power generation sector perspective: An introductory review. www.pdpu.ac.in
3. Electrical modelling of a Thermal power plant. Reinhard Kaisinger,
4. Modelling and simulation of thermal power plants, Jonas Eborn
5. A study of fault diagnosis based on Electrical signature analysis for synchronous generator predictive maintenance in bulk electric system. DOI: 10.3390/en12081506
6. Case study on the effectiveness of condition monitoring techniques for fault diagnosis of pumps in Thermal power plant. doi.org/10.2478/mme-2019-0010
7. Advanced technologies of preventive maintenance for thermal power plants. http://www.hitachi.com/ICSFiles/afieldfile/2004/06/07/r2002_04_101.pdf
8. Organizational Behaviour, Jerosystems.com/2016/ob.pdf
9. Introduction to DCS and DAS in thermal power station and recent trend of technology.
10. Data Acquisition and Controlling in Thermal Power Plants using a Wireless Sensor Network and LabVIEW. International Journal of Engineering Research & Technology (IJERT).

Hydro Electric Power Plant

Sub topics:

1. General Introduction of Hydro Power Plant
2. Power plant familiarization of Hydro Power Plant Engineering
3. O&M of Hydro Power Plant components, Turbine, Governing System, Valves, Generators, Excitation system, etc.
4. Switchgears, protection in HE station
5. Power Plant Operation and function of Load dispatch centre
6. Maintenance of Hydro Power Plant Equipments.

Resources:

1. Renewable and Sustainable Energy Reviews, Renewable and sustainable energy review.69,610-619.
2. Hydro power, http://www.ncert.nic.in/html/learning_basket/energy10class/hydropower.htm
3. Components of a Hydropower Plant and their functions, https://theconstructor.org/structures/hydropower-plant-components-functions/19705/
4. Hydroelectric power plant: Layout, working and types. https://www.electricaleasy.com/2015/09/hydroelectric-power-plant-layout.html
5. Best practices in operation & maintenance of Hydro power stations, http://www.cea.nic.in/reports/others/hydro/hetd/best_practises/chapter-6.pdf

6. Risk Based Maintenance in the Hydroelectric Power Plants, energies-12-01502.pdf ,
7. Organizational Behaviour, Jerosystems.com/2016/ob.pdf

Paper mill

Sub topics:

1. Paper industry in India
2. Importance of pulp and paper industry
3. Raw material for paper industry
4. Paper making process
5. Electric drive in paper industry
6. Control and synchronisation of motor in paper mills.
7. Homemade paper making process

Resources:

1. Pulp and paper manufacturing process in the paper industry. www.pulpandpaper-technology.com
2. Home made paper making process. www.intructables.com>craft>paper
3. Detailed project report on hand made paper manufacturing and conversion unit.(nirdpr.org.in)
4. Control and synchronisation of motors in paper mills using PLC, IOSR Journal of Engineering, May 2019.
5. Installing, operating and maintaining DC motors in a paper mill environment. (Doi: 0.1109/PPIC.2017.8003872)
6. Drive selection for rolling mills. (russula.com)
7. Universal control block for paper machine drives.(www.academia.edu)
8. Organizational Behaviour, Jerosystems.com/2016/ob.pdf

Cement Plant

Sub topics:

1. Background about cement
2. Description of raw material of cement
3. Cement plant in India
4. Availability of raw material in India
5. Process of cement making
6. Electric drive in cement making   industry
7. Control of electric motor in cement making industry.
8. Environmental impact for cement making industry.

Resources:

1. Cement Manufacturing.(10.13140/RG.2.1.3461.0003)
2. Selecting AC induction motors for cement plant applications, electrical-engineering-portal.com › Technical Articles
3. IEEE recommended practice for Cement plant electric drives and related electrical equipment. doi:10.1109/ieeestd.1983.114396.
4. organizational Behaviour, Jerosystems.com/2016/ob.pdf

Solar Power Plant

Sub topics:

1. Solar power plant diagram
2. Solar power plant working principle
3. Solar power plant in India
4. Advantages of Solar energy.
5. Solar power plant cost
6. Preparation of a project report for 10 KW solar plant for your institute with all details.
7. Control of power and voltage of solar grid connected system
8. Implementation of the solar plant with available software.

Resources:

1. How to build a commercial solar power plant in India.
   https://economictimes.indiatimes.com/small-biz/productline/power-generation
2. Solar energy research Enclave, IIT Kanpur
3. www.wbreda.org
4. mnre.gov.in
5. Control of Power and Voltage of Solar Grid Connected, International Journal of Electrical and Computer Engineering (IJECE)
6. Organizational Behaviour, Jerosystems.com/2016/ob.pdf

Electrical substation

Sub topic:

1. Function of substation
2. Electrical substation diagram
3. Substation components
4. 33/11 KV substation layout.
5. Maintenance of equipments of substation
6. Protection of substation
7. Design of substation.

Resources:

1. Electrical substation, en.wikipedia.org
2. Electrical substation components and their working, www.elprocus.com
3. Designing of HV power substation and layout, electrical- engineering-portal.com
4. Basics of designing of power substations, 3phaseassociates.com
5. Substation design manual, www.ergon.com.au
6. Fundamental of electrical substation and switch gear, https://www.ieee.li/pdf/viewgraphs/substation_enclosed_switchgear_pcc-fundamentals.pdf
7. Design of 132/33KV Substation, International Journal of Computational Engineering Research||Vol, 03||Issue, 7||
8. Presentation on summer training from UPPTCL 132/33 KV substation.
9. Organizational Behaviour, Jerosystems.com/2016/ob.pdf

Process control of an Industry

Sub topics:

1. Introduction to Automatic process control
2. Importance of process control
3. Elements of process control
4. Process control instrumentation
5. Control model
6. Development of modern process control operation
7. Examples of process control system
8. Design and validation of process control scheme of an industry

Resources:

1. Process control, en.wikipedia.org
2. Automatic process control for the food industry: an introduction, Doi: 10.1533/9780857095763.1.3
3. Process control and instrumentation, Prof. A.K. Jana, NPTEL lecture
4. Introduction to process control, pc-textbook.mcmaster.ca
5. Organizational Behaviour, Jerosystems.com/2016/ob.pdf

Electric locomotives

Sub topics:

1. Overview

2. History
3. Manufactured locomotives
4. Traction motors
5. Locomotive production unit in India
6. Traction system in Indian railways
7. Power transmission
8. Electric traction around the world
9. Electric locomotive parts with schematic diagram
10. Electric traction power
11. Maintenance of Electric locomotive
12. Control of speed and torque of traction motor

Resources:

1. Electric locomotive, The railways technical website
2. Locomotive & coach factories in India, erail.in
3. Electric locomotive, en.wikipedia.org
4. Configuration and control of traction motors for electric vehicle: a review,
    Doi10.23919/CJEE.2017.8250419
5. Traction motors in diesel locomotives, https://www.ee.co.za/article/traction-motors-diesel-locomotives.html
6. Organizational Behaviour, Jerosystems.com/2016/ob.pdf

Motors and controller for Electric car

Sub topics

1. Electric car motor and controller
2. Best motor for electric car
3. 300 hp electric car
4. 48 V dc motor for electric car.
5. BLDC motor for electric car
6. Methods of control of BLDC motor
7. Simulation of BLDC motor along with controller with available software
8. Electric car motor price in India
9. Design and soft ware implementation of E rickshaw using solar panel.

Resources:

1. Design and Implementation of an Electric Drive System for In-Wheel Motor Electric Vehicle
    Applications, Doi 10.1109/VPPC.2011.6043070
2. An introduction to BLDC DC motor control. https://www.digikey.in/en/articles/an-introduction-to-brushless-dc-motor-control.

3. Automotive 1-kW 48-V BLDC Motor Drive Reference Design.
   http://www.ti.com/lit/ug/tiduay9/tiduay9.pdf.
4. Electrical Wiring Diagram Of E Rickshaw,
   https://wiringdiagramall.blogspot.com/2019/06/electrical-wiring-diagram-of-e-rickshaw.html
5. high torque 50hp 300hp electric e bus vehicle ac traction motor and controller ,
   https://zjalpha.en.alibaba.com/
6. Organizational Behaviour, Jerosystems.com/2016/ob.pdf

Energy Efficient building

Sub topics:

1. Goal of green building
2. Energy efficiency
3. Water efficiency
4. Material efficiency
5. Green building features
6. Reduction of impact onto electricity network
7. Cost and payoff
8. Regulation and operation
9. International frame works and assessment tools
10. Green building by country.
11. Green building design strategies and measure in the light of Electrical Engineering.

Resource material:

1. Case study of an energy efficient commercial building: validating design intent & energy simulation results with monitoring performance data. https://www.beepindia.org/wp-content/uploads/2013/12/2-CASE-STUDY-OF-AN-ENERGY-EFFICIENT-COMMERCIAL-BUILDING.pdf
2. Case study on Energy Efficient Building. http://peda.gov.in/main/case_study_15.12.2016.pdf
3. Green building, https://en.wikipedia.org/wiki/Green_building
4. Green building design strategies and measures. https://www.engineeringexchange.com/profiles/blogs/11-green-building-design-strategies-and-measures-6-advance-water
5. Planning, design and construction strategies for green buildings. https://www.greenbiz.com/sites/default/files/document/O16F22028.pdf
6. Organizational Behaviour, Jerosystems.com/2016/ob.pdf

Maulana Abul Kalam Azad University of Technology, West Bengal (MAKAUT, WB)

(Formerly West Bengal University of Technology-WBUT)

Board of Studies of Textile Technology & Apparel Production Management

Name of Convener: Dr. Mallika Datta
Phone numbers: 9163058150
Email id: dattamallika8@gmail.com
Preferable hour of contact (if any): 10.00 am to 6 pm

List of suggested topics for internship / project from home:

Sl No	Topic	Expected Outcome	Duration	Remarks (Resource/Plan etc)
1	**Yarn Manufacturing**			
	Details of Job : • 1st group Product - 100% cotton grey yarn with Average count - 30s/ Capacity - 10 tons carded, 10 tons combed per day • 2nd group :Product - P/C blended grey yarn , Average count - 30s, Blend -52/48, Capacity - 10 tons carded and 10 tons combed per day • 3rd group : Product : 100 % Acrylic yarn, Average count - 20s, Capacity -15 tons/day **Work to be carried out** Identification of Raw material, Specification of raw material, Machine lay out, List of machineries, Production calculation of individual machine, Types of accessories, Machine utilization, Yarn realization, Waste calculation, Machine parameters, Process parameters, Work load,			

	Types of activities of operator, Maintenance, life of accessories, Manufacturing cost, Maintenance cost, Manpower requirement, Machine balancing, Power cost, Humidification system, process control, R&D.Technolgical development.			
	Fatigue behaviour of core-spun yarns containing filaments by means of cyclic dynamic loading			
2	**Fabric Formation**			
	Development of 3D Structure/fabric			https://www.intechopen.com/books/non-woven-fabrics/3d-fabrics-for-technical-textile-applications Application of Nonwoven in Technical Textile
	Designing of Nonwoven structure for filtration			
	Designing of Nonwoven structure for insulation			
	Development of knitted structure			
	Development of braided structure			
3	**Textile Chemical Processing**			
	Flame retardant finish on dyed cotton readymade garments intended for export.			
	Effect of Plasma Treatment on Air Permeability and Water-Vapour Permeability of natural fibre (Bamboo/Others) Knitted Fabric.			
	Application of Nano material for improve Air Permeability and Water-Vapour Permeability on textile structure			
	Anti-microbial finish of textile structure			
	Water repellent finish of textile structure			
	Soil repellent finish of textile structure			
4	**Technical Textile/Smart textile/Protective Garment**			

	Identification of suitable fibre/polymer structure and designing filer media for waste management with suitable specification.			Handbook of Material Weathering, Authors: George Wypych
	Identification of group of textile fibre and/or structure for protective garment for Thermal protection—extreme weather clothing			Handbook of Technical Textiles Edited by: A. Richard Horrocks and Subhash C. Anand
	Identification of group of textile fibre and/or structure for protective garment for Chemical protection.			Textiles for protection Edited by Richard A. Scott
	Identification of group of textile fibre and/or structure for protective garment for Thermal protection—fire fighting suit			
	Application of fibre/polymer/ textile structure in Medical-Textiles.			
	Identification of suitable fibre/polymer structure and designing of 3 layer protective mask with suitable specification.			
	Use of fibre/polymer/ textile structure in Biotextiles.			
	Colour-shifting cloth –a part of smart textiles			Handbook of Smart Textiles Editors: Tao, Xiaoming (Ed.) Cover for Smart Textiles and Their Applications Edited by: Vladan Koncar
	Studies on Geotextiles reinforced soil for pavements.			Cover for Soil Improvement and Ground Modification Methods Authors: Peter G. Nicholson
	Application of fibre/polymer/ textile structure as E-Textile			Electronic Textiles-- Smart Fabrics and Wearable Technology Edited by: Tilak Dias
5	**Simulation/Optimisation of Textile Structure /Machine/Production line**			
	Simulation of textile structure for moisture management			Soft Computing in Textile Engineering Editors: Abhijit Majumdar
	Simulation fibrous structure and yarns in relation to application like filtration, insulation, protection.			
	Simulation of braided structure to establish the wicking property.			
	Simulation of woven for different application (ballistic protection)			

		Simulation of knitted structure			
		Neural networks application in textile technology			
		Evolutionary method in textile technology			
		Fuzzy logic in textile technology			
		Simulation of textile machinery			
		Development of production planning and control tools for small and medium garment factories.			
		Design, Developments of Silk cocoon test reeling instrument and it's fabrication.			
		Work study and Optimisation of Work Methods in a Garment Unit For Maximising Productivity.			

This list is not exhaustive. It is only indicative. Mentors may select Topic based on their expertise.

General guideline for execution:

(i)   For Faculties/Guide/Mentors:

- To motivate the students
- To prepare a pre-determined set of questions for identify the area of interest of the student.
- To clarify the objective/s of the project to the student.
- To make the student aware of the hypothesis as identified.
- To Identify mathematical/statistical/Simulation method in connotation with project assign
- To share any other additional information
- To guide the students through sharing of his/her knowledge and experience
- To interview/evaluate weekly performance of the individual students over digital platform.

(ii)   For students:

- Step 1 : To form GROUP of 4-5 candidates as per their area of interest (such as Yarn Manufacturing, Fabric Manufacturing, Textile wet and chemical Processing, Technical Textile, Simulation, Garment designing, Advance Pattern making)
- Step 2 : To form a whatsapp group for internal communication
- Step 3 : To link among Individual member of each with the mentor/s
- Step 4: To circulate/distribute the completed task among (details as prescribe by mentor) among themselves
- Step 5: To Submit the weekly progress report by the group to mentor/s
- Step 6: To present weekly report by individual student through digital platform
- Step 7: To compile the task of individual contribution
- Step 8: To submit the final report.

Evaluation scheme:

(i)   Continuous:

        Students will maintain a diary of regular activities and to be shared with the mentor over digital platform

(ii)   End scheme:

        Submission of hard copy of the final report at the end of 7th Semester.

Maulana Abul Kalam Azad University of Technology, West Bengal (MAKAUT, WB)
(Formerly West Bengal University of Technology-WBUT)

Board of Studies: Computer Science & Engineering/Information Technology

Name of Convener: Dr. Somdatta Chakravortty, MAKAUT, WB
Phone numbers: 9433897685
Email id: csomdatta@rediffmail.com
Preferable hour of contact (if any): 11am-6pm

List of suggested topics for internship / project from home:

Sl No	Topic	Expected Outcome	Duration	Remarks (Resource/Plan etc)
1.	Tracking and Predicting epidemics from Space through Remote Sensing	Tracking and Prediction Model	8 weeks	Artificial Intelligence and Machine Learning tools
1.	Sentiment Analysis of people during lockdown period from social networking sites.	Sentiment Analysis Model	8 weeks	Artificial Intelligence and Machine Learning tools
2.	Design a self newsfeed generator like Google News that can take feed from various sites and do classification to segregate them into topics.	Newsfeed App	8 weeks	Artificial Intelligence and Machine Learning tools
3.	Analyse Air Quality Dynamics in your locality with machine learning and remote sensing during the lockdown period with use of IMD and Satellite Data.	Air Quality Dynamics Model	8 weeks	Artificial Intelligence and Machine Learning tools
4.	Application of satellite images to predict well-being of country	Human Development/Well Being index	8 weeks	Artificial Intelligence and Machine Learning tools
5.	Seasonal pattern recognition in the weather forecasting	Trend Analysis and Prediction	8 weeks	Artificial Intelligence and Machine Learning tools
6.	Fake News detection over Social media	Fake New Detection Model	8 weeks	Artificial Intelligence and Machine Learning tools
7.	Prediction of output of a chemical reaction given the involved reactants and the conditions	Chemical Reaction Prediction Model	8 weeks	Artificial Intelligence and Machine Learning

				tools
8.	Intelligent and interactive tutoring systems	Customised Interaction and Feedback Model	8 weeks	Artificial Intelligence and Machine Learning tools
9.	Adaptive learning tools for customised learning: Effectively manage multi-level / multigrade classrooms, by judging learning levels of individual students, and allowing automated development of customised educational content adapted to each child's class and learning level.	Adaptive learning software	8 weeks	Artificial Intelligence and Machine Learning tools
10.	Real time Multiple Choice Question generation with NLP	MCQ Generation Model	8 weeks	Artificial Intelligence and Machine Learning tools
11.	Predictive tools to inform pre-emptive action for students predicted to drop out of education	System to analyse probable student activities and inform pre-emptive action.	8 weeks	Artificial Intelligence and Machine Learning tools
12.	Generating Artificial Music	AI Generated Music	8 weeks	Artificial Intelligence and Machine Learning tools
13.	Restoring old paintings and old photographs using Deep learning	Reconstructed Images	8 weeks	Artificial Intelligence and Machine Learning tools
14.	Design Social media intelligence platforms that can provide aid to public safety by gathering information from social media and predicting potential activities that could disrupt public peace.	Intelligent safety systems:	8 weeks	Artificial Intelligence and Machine Learning tools
15.	Neural Machine Translation to translate between languages	Multi-lingual Machine Translation Model	8 weeks	Artificial Intelligence and Machine Learning tools
16.	Predict peak traffic routes, offer alternative routes/modes for traffic optimization in travel and tourism	Air/Rail/Road Traffic Route Prediction Model	8 weeks	Artificial Intelligence and Machine Learning tools
17.	Studying the quality of the soil to predict which crops can be grown	Soil Qiality Prediction Model	8 weeks	Artificial Intelligence and

				Machine Learning tools
18.	Analysing social media posts for user behaviour and possibly identifies users in danger of harming themselves/others.	User Behaviour Model	8 weeks	Artificial Intelligence and Machine Learning tools
19.	Conversational chatbots (speech and text) in Indian languages for query management	Multilingual Conversational Chatbots	8 weeks	Artificial Intelligence and Machine Learning tools
20.	Developing Content on technical subjects or core subjects in the form of animated and interactive "Tutorials" on subjects of choice.	Generated Content on specific topics	8 weeks	Machine Learning, Animation and Graphical tools
21.	Design a encryption technique using chaotic map		8 weeks	Tools in Cryptography
22.	Design data hiding method using pixel value difference		8 weeks	Tools in Cryptography
23.	Authentication protocol using Hash function		8 weeks	Tools in Cryptography
24.	Cloud resource allocation	Resource Management	8 weeks	Amazon AWS Cloud
25.	Block chain		8 weeks	Java-script
26.	IoT based design		8 weeks	Raspberry pi /Arduino kit
27.	Fuzzy design for health care analytics	Health Care Model	8 weeks	Fuzzy Maths model
28.	Crowd computing		8 weeks	Five Mobile phones
29.	Mobile cloud computing	Offloading huge data	8 weeks	Mobile phone
30.	Garbage disposal system in Smart Cities	Smart Garbage Disposal System	8 weeks	Sensors

General guideline for execution:
  (i)   For Faculties/Guide/Mentors: Students will select project of interest and may work independently or in groups if similar projects are selected. Supervisors will be selected from colleges or parent University
  (ii)   For Students: Real/Simulated Data available from websites and Software Tools and Sensors available at hand should be used in project execution

Evaluation scheme:
  (i)   Continuous: Weekly Report of Progress to Mentor
  (ii)   End scheme: Submission of Project Report and Execution of System Developed

Maulana Abul Kalam Azad University of Technology, West Bengal (MAKAUT, WB)
(Formerly West Bengal University of Technology-WBUT)

<u>Board of Studies of Applied Electronics and Instrumentation Engineering (AEIE)</u>

Name of Convener: Prof. Hiranmoy Mandal, HOD, Asst. Prof., AEIE, Academy of Technology.

Phone numbers: 9477003562/ 7044233307

Email id: hiranmoy.mandal@aot.edu.in

Preferable hour of contact (if any):

List of suggested topics for internship / project of ECE, CSE, IT, AEIE, EE, ME and ENGG. Sc. from home:

Serial No.	Topic	Expected Outcome	Duration	Remarks (Resource/Plan etc)
01	**Efficient chatbot for complaint filing**	At present, in India, filing a formal complaint with police is intimidating and time consuming. A chat-based system like CHAT BOT would help to improve the same.	**2 Months**	CHAT BOT is a Python library that makes it easy to generate automated responses to a user's input. It uses a selection of machine learning algorithms to produce different types of responses.
02	**A mobile based inventory management system using QR code application**	o Add, Update, Delete Equipment Details o Add details by scanning the QR Code o User Authentication o Real time data add, update, delete Facility	**2 Months**	o For a worker it is difficult to go and measure stock and equipment details with his computer o To get rid of this problem we have to create a mobile based inventory management system.
03	**Centralised attendance monitoring system of employees of RMDD (Rural Management and Development Department)**	o A smart centralised mobile/web app o 24x7 Live Chat feature. o Multiple Region Language Support. o Cross Platform Support. o Low- Latency support	**2 Months**	we are planning to differentiate every module that we want to keep in our app so that we can integrate it into our final prototype, we have to break our work into several subparts.
04	**Online credentials verification through Digital Locker**	Online credential verification of the candidates through Aadhaar card, Voter Id card, Results and certificates. The employer can verify it through a secure online medium	**3 months**	Develop a digital locker accessing technique, upload data in digital locker and searching technique.

05	**Recommendation system to guide the university students**	Students in the University come from different environments. Every student has some strengths and weaknesses. Recommend or suggest him methods/ways to improve or work on his weaknesses. The input to the system can be students personal information, background that he comes from, things in which he is good at etc. The recommendations should be in terms of improvements required in communication skills, writing skills, technical skills, way of presentation etc. The solution should also generate a individual progress report.	**3 months**	Develop a student database, apply machine learning technique to find the strength and weakness of a student.
06	**Smart services in university**	All in one app where we can have complete smart services for university related to cleanliness, lost & found, canteen orders, event notifications, etc.	**2 months**	Different activity center in the university will mapped to a mobile app. PHP, MySql.
07	**Mobile App for recording and playing geo-tagged videos**	The mobile application should have two views. In one view, the recorded video should play while simultaneously plotting field-of-view (orientation) cone and marker on an interactive map in the order view in a synchronized manner. The position shown on the map should match the play position of the videos.	**2 months**	App development S/W, Camera, Google mapped are combined here.
08	**Farmers-to-Buyers Network**	System that provides farmers an interface to sell their produce and connect with the buyers all over India. Simple interface that works on mobile SMS to upload product details and respond via phone calls and SMS. Interface for anyone to buy the produce/vegetables –initially visit the place and buy or have courier service integrated to deliver the vegetables. Farmers can get a better price for their product, without any additional cost spent in marketing and delivery of goods, Make the Farmers live with pride and make additional income.	**3 months**	App through which farmer can benefited they directly communicates with the buyers no middleman.

09	**Smart Garbage Management System**	o Monitoring the waste management. o Minimizing human intervention. o Reducing human time and effort.	**2 Months**	Ultrasonic sensor - To measure the height of the garbage. App - Iindicates the bins which requires the attention so that the garbage collector can collect the garbage as fast as possible.
10	**ATM Security and Fraud Restriction**	In the existing process of a transaction at ATM/POS, no such features are available to properly verify the credentials of the user. We have introduced two different mechanisms for two different cases for ensuring safety: o If Account Holder is presenta. Then IRIS SCAN is done and matched with the Scanned data of the existing AADHAR IRIS DATA. o If Account Holder is not presenta. If another person who is sent by the Account Holder (due to some emergency) then, we do 2-step verification process.	**2 Months**	o If we consider 1st Case, it's possible to do IRIS REORGANIZATION o If we consider 2nd Case, then it is possible to do OTP Verification & Voice Recognition by the following Steps shown in the figure below. o In both the cases, The PIN Verification process will perform.
11	**IoT based human body temperature monitoring system to prevent from Covid-19**	After completion students will be able to o Get basic idea of sensors o Understand Python programming and Networking.	**6-7 weeks**	Python programming and Networking.
12	**Development of Application for Webcam Motion Detection using Python in various light conditions**	A program in python language that interfaces the webcam and detects any movement of the object captured by the camera	**1 – 1½ Month**	o Python, an open source platform, so available to all o Duration may vary depending on the knowledge of Python
13	**Development of sequence of event control for industrial automation and everyday lives with PLC**	After completion students will able to o Build fundamental knowledge about basic PLC operation. o Develop PLC Ladder logic program for different practical applications. o Design control loop using PLC.	**4 Weeks**	PLC simulator software or PLC online program simulator under Virtual lab/ Electrical Engineering/ PLC Lab http://plc-coep.vlabs.ac.in/
14	**Simulation of MPPT techniques for photovoltaic systems using MATLAB**	In this project we are going to simulate a complete model of Maximum Power point Tracking of a solar cell. For that we need to develop a circuit model of PV cell with	**Within 3 months**	As we are going to implement the project only in simulation, so as a

		ratings available from different practical solar cell company. Now in some version of MATLAB, the modelling of solar cell is already being given we can also use that for simplicity of our project. We are going to model a buck converter that is actually the power modulator circuit that controls the power outcome from the PV cell. The duty cycle of the buck converter will be controlled by perturb and observe (P & O) method to maintain the output power of the PV cell at its maximum power point. Also we know that there may be some local as well as global maxima present in the P-V characteristics of a solar cell in that case it may so happen that the P & O method would find any local maxima point and resides in it whereas the global maxima is not being found, So we are planning to apply in the advanced stage such a logic so that the tracker can find out the global maximum point instead of local maximum point.		resource we need only an advanced version of MATLAB and proteus software. The planning of the project is given below o We are going to model a Photovoltaic cell in MATLAB in case it is not readily available. o Design and develop a Buck Converter as a power modulator considering the ratings of the PV cell. o Implement the control circuit with Perturb and Observe logic to manage the duty ratio of the DC-DC converter in such a way that it can find exact operating point which can deliver the maximum power to the load.
15	**Smart Electronic Voting Machine (SEVM)**	Election in this republic of India where we have our basic right to elect our desired candidate to represent us and our needs for the betterment of our society. Thereby this process should occur with utmost clarity, genuinity and transparency for the benefit of the nation and its people. But unfortunately, frauds and illegal interference occurs in this process and sometimes even the voters are not allowed to cast their vote and someone else forcefully does so in their name. Nowadays this has become a great issue and even politicians do invest a lot to promote this illegal culture for their personal benefit. Mostly in the day of Election we see most anxiety among the people in the election booth. Some of them says that the members of any political party defend them to reach	**Within 3 months**	**Plan:** Before 2004 the voting system was based on Ballot Paper. From 2004 the Electronic Voting Machine is used to take votes from the voters. Till now no such machine has been discovered where only the citizen himself will be able to cast their vote and nobody else can do that on others name. A Smart Electronic Voting Machine (SEVM) is a machine that will collect votes from the voters by matching their fingerprints. The machine looks similar to the Electronic Voting Machine (EVM) but in case of EVM there are normal buttons to pressed to cast the vote. But in SEVM a small improvisation is made with EVM. Here we will use <u>Fingerprint Scanners</u> in place of those buttons. Now every citizen is holding their AADHAR card which contains the biometric information of that citizen. The fingerprint will be verified twice before casting the vote. Firstly, the fingerprint will be verified

		the booth. Other political parties then demand that the opponent party's members made such attempts for giving illegal vote. To get relief from this unfortunate situation this Machine is obviously helpful for our society and the citizens. With the help of this SEVM only the voter himself can cast his/her vote and nobody else can do so against in name as because his credentials(fingerprint/retina) will be verified twice and then only the SEVM will be active, thereby creating a clean and smooth election process.		by a staff (engaged by the Election Commission) before going to the SEVM chamber. If his/her fingerprint is matched with his/her given fingerprint of his biometric Information (that fingerprint data will be fetched from his/her AADHAR Card number) then only the SEVM will be switched ON and the voter can go to the SEVM chamber. There the SEVM switches for the different parties are also finger print scanners who will only accept the vote for any party if and only if the fingerprint matches thereby providing a secure election system. We need to design an application (or a simple programming) which is to installed in the computer of the personnel engaged by the election commission. This software/application will contain the link of the biometric data or suppose the biometric data of suppose 300 people who will be casting their vote at that booth and it only needs to just tally the finger print of the voter and the biometric stored inside against a particular AADHAR number. **Resources:** Before getting access to the EVM we need to first design the application for which we require multidisciplinary members particularly from CS/IT department. We also require some finger print scanners which are available in market and definitely a good configured computer to develop and test it.
16	**Special face mask design to fight against Corona**	**Kill virus:** The special face mask has a pouch containing a special liquid of Aloevera & soap and charcoal that not only resist the bacteria to enter into the nose but also efficiently kill bacteria, viruses and also absorb pollutants in the air and save human being. **Disposal problem:** Normal masks are not disposed properly, creating hygienic problems that may spread viruses or bacteria more. So, our mask has a thin outer layer of film that can be replaced after coming from outside or after treatment of	**This special mask can be prepared & designed within 10 days.** The main structure of the mask can be used for 1 month. The thin film has to be replaced	The proposed special face mask will contain a pouch containing gel. The gel will contain alcohol riched soap water, Aloevera gel and charcoal. The alcohol riched soap water will kill the virus completely, the aloevera gel will keep the mouth portion cold by removing all heating and sweating problem from the mask and the presence of charcoal will effectively absorb the pollutants. This proposed face mask contains an inlet channel through which air can be passed inside the mask. When someone will inhale the air, then that air will get inside the mask through that inlet channel and enter into the chamber containing gel where the virus will be killed

		the patients and replaced by new one. Again, the liquid in the pouch can be easily be refilled after using for 3 days. **Fitting problem:** Normal masks have small portion near the nose opening, through which the virus can enter. We have customized fitting option to get a complete protection. **Heating problem:** In a humid country like India, sweating problem occurs inside the mask which is removed by our mask using the Aloevera gel that will evaporate the heat and the exhale valve will allow easy exit of CO_2 and water vapour. In cold temperature using mask, it is difficult for people wearing glasses, The exhale air fogs up the glasses, Even doctors face the problem. So in our product, we have options so that air cant exit from the area of glasses. **Red marks:** Wearing masks for long time may lead to causing red marks irritation and skin problem. The gel will provide necessary padding and Aloevera gel is good to skin and minor cuts.	regularly after coming from affected place. The gel has to be replaced after 3 days.	by that alcohol-based soap water and the pollutants will be absorbed by the charcoal. This mask mainly has 3 parts: a. Outer thin film b. Middle mask c. Inner pouch containing the gel. **Plan:** o We need material that can hold the gel and, in that context, the gel containing alcohol riched soap water, Aloevera gel and charcoal will be kept within an **oil paper material** over the mask. The mask of polypropylene fiber material product is of ffp2 standard. Rest of which can be easily procured and everything can be put together. o It is a very cheap but effective mask with great future and its cost will be within 100-125 Rs.
17	**Portable non-bio degradable waste disposal system**	Portable non-bio degradable waste disposal system can interest institutions producing bio-medical wastes such as hospitals, nursing homes etc. Even producers of diapers, napkins can be roped into invest on such waste management systems. Even municipal authorities will be interested as such wastes cause clogging of sewerage systems and drains thereby producing adverse impact on the Environment.	**4 months**	The design can be prepared, prototype building will depend upon the availability of resources.

18	**Energy generation from used cooking oil**	This is an environment friendly alternative source of Energy may be one of the best replacements for diesel and could be a probable solution to update the cars as per BS-VI standards. This would help a group of students to identify an area of alternate energy generation.	**4 months**	Resources are identified. Product Design is underway.
19	**Solution of Agricultural Problems through IoT and Rain Water Harvesting**	Development of prototype model, if it found suitable through analysis, then it can be implemented in large scale. The idea is going to bring green revolution specially to rain fed areas.	**4 months**	Development of prototype depends upon the availability of resources
20	**Home security system**	This is an Arduino based Home Security System. This product is a cost-efficient system that can be installed with the lock. When an intruder tries to break the lock or do any misconduct, it will send signals to the required person immediately. This system can be implemented in many applications requiring low-cost and short distance working conditions and household purposes.	**3 months approx.**	Process and product design are in progress. Resources are identified.
21	**LEMONADE**	This is a smart IOT product developed to bring convenience in Lemonade extracts solutions to every household. The development cost is low but the product has immense potential for substantial revenue generation. This would help a group of students to identify an area of revenue generation.	**2 months**	Resources are identified. Product Design is underway.
22	**Smart multi crops production system for farmers**	Target customers for this product will be farmers / end users / rural populations, Smart device will help farmers to enhance their crop production & increase profit. Also, in view of rural populations in India there will be a remarkable growth of fabrication industry.	**4 Months (based on availability of materials)**	Resources need to be identified. Product Design is underway.

23	**Shoe with self defence mechanism**	This is a self-defence mechanism, hidden in a specialised shoe-sole. The product will be controlled by a spring returned mechanism. The development cost is very low. This would help a group of students to identify an area of revenue generation.	**Initially it may take 2 months.**	Resources have been identified. It is at design stage.
24	**Analysis of pond water quality**	Hardness of water, Alkalinity of water, Chloride content, DO content and pH of pond water.	**30 days**	o Collection of water from different ponds, to be processed for 24 hrs. to remove particles etc. and then determine the above-mentioned parameters for each collection. o One part of this project can be done by simulation.

GENERAL GUIDELINE FOR EXECUTION:

(i) For Faculties/Guide/Mentors:

o Project idea must be properly clarified to the students.

o Guide is responsible for making all the resources available to the students, including softcopy of the study material or link.

o Software platform or its download link must be available to the students.

o Only idea/guidance will be provided to the students. No design/code/algorithm should be supplied to the students.

(ii) For students:

o The high-speed internet connectivity, laptop/computer etc. are the requirements to be fulfilled by student himself/herself.

o Failing to submit the weekly report may cause the student to lose the continuous evaluation marks.

o Beyond college hour, students are permitted to contact the guide with prior permission.

EVALUATION SCHEME:

(i) Continuous: Students have to submit a midterm progress report.

(ii) End scheme: Design, Simulation, Execution and Output will be presented in a video with student's voice in the background. A complete report of the project must be attached with this video file. The final evaluation will be based on these two files.

MaulanaAbulKalam Azad University of Technology, West Bengal (MAKAUT, WB)
(Formerly West Bengal University of Technology-WBUT)

Board of Studies of Electronics and Communication Wngineering

Name of Convener: Amit Kumar Aditya

Phone numbers: 8335056828

Email id: amit.aditya@skf.edu.in

Preferable hour of contact (if any):

List of suggested topics for internship / project from home:

SI No	Topic	Expected Outcome	Duration	Remarks (Resource/Plan etc)
1	IOT based smart irrigation system for rural agriculture.	Help the farmers who grow multiple crop which requires variable quantity of water	1 month	Theoretical design only. Data collection regarding irrigation requirement of various crops (internet). Study of different types of soil moisture sensors (internet). Design a system to supply required amount of water to different types of crop. Draw a flow chart of the system.
2.	Develop an online portal for booking Ambulance	Will help the citizen to locate and book ambulance at the time of emergency.	1 month	A GPS system has to be developed to locate the ambulance and the citizen and direct the nearest ambulance to the person who booked it. To be linked with a payment gateway.
3.	IOT based integrated node regulator	Will help the institutes to switch off the computers remotely. A number of computers can be switched of from a single device which will help the Laboratory in charge to switch of all the	3 weeks	

			computers after the class is over. This will reduce the power requirement.		
4.	An automatic body temperature scanner.	To scan body temperature of persons entering a mall/ apartment complex.	1 month	Design a system to monitor the body temperature automatically when a person enters a mall or apartment complex. The system should also note the time of person entering. It may also be connected to CCTV. A smart card may also be added to the system.
5.	An automatic dispensing machine for hand wash.	Will be required at all hospitals, shopping malls and apartment blocks	3 weeks	
6.	Design of LPG, Smoke, alcohol detection system with automatic mains cut off	Requirement of any household as well as Industry.	1 month.	Study of various sensors, Give the schematic of the design. The entire design should be maintained as well protected from the high corrosive gaseous properties, water attachments and obviously short circuit related problems.
7.	RFID based door access system	It will allow only authorise persons to enter the room which are of restricted entry like Exam control room, server room, Cash section, etc	1 month	A smart proximity card with unique id number will be required to have entry. The card reader will interpret the data and will send to the microcontroller. The microcontroller then sends the data to the host data base server which incorporates the data of the worker who is

				holding the unique id. If it finds that the person is authorised, the door opens and allow the worker to enter.
9.	Health monitoring wearable	Required for aged people and people with heart ailment.	3 weeks	Design a simple wearable which will sense the pulse on a person and display the heart beat.
10.	Design and comparison study of a secure digital communication system by using various security scheme	Will give the understanding of security system in digital communication	1 month	
11	Design of Monopole Antennas	Students will learn design methodology for Antenna Design	1 month	
12	Study and design of basic reversible logic gates		1 month	
13	Build own IoT smart home network -Accessing and Monitoring IoT Devices for Smart Home with CISCO Packet Tracer.	Will be useful where aged people stay alone.	1 month	
14	Simulation and fabrication of multi band filters in ultra wide band range for wireless applications			
15	Design of multi-frequency impedance transformers for matching frequency dependent complex loads to the source impedance, analytic analysis validation by simulation using suitable simulator			
16	Some studies and variations in Ridge Gap Waveguide Structures			
17	Monitor and control of Greenhouse Environment	Will have the small farmers.	1 month	To design a simple affordable , easy tto install moicronctroller based circyuit to monitor and record values of temperature, humidity, soil moisture and sunlight

			of the natural environment and to continuously modify and control in order to optimize them to achieve maximum plant growth and yield.

General guideline for execution:

(i) For Faculties/Guide/Mentors: The mentors shall provide necessary guide lines for implementing the project. They will help the students in choosing the right types of sensors and other electronics components. Also will guide them how to use data sheets

(ii) For students: The students will explore the literature available in the internet about the project. Choose the right components. Design a scheme for implementation of the project. Provide with schematic diagram. It can be hand drawn or suitable software can be used. Draw a flow chart where ever applicable. The report should consist of

    i. Literature survey
    ii. Scheme of the project
    iii. Expected outcome
    iv. Cost estimation of the project
    v. Conclusion

Evaluation scheme:

(i) Continuous:

(ii) End scheme: Evaluation will be based on report and online question answer session.

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** please mention respective board of studies