Department of Electronics and Communication Engineering
Jaypee University of Information Technology, Waknaghat, Solan

Faculty Name	Project Title	Project Description
1	Multi-utiliy ECE department app	A multi-utiliy ECE department mobile app with the following features: 1. Students can connect with each other and faculty members 2. All the information of students is linked to their account 3. All department related common announcements will be made on the app 4. Every student's webkiosk data is available on the app (registered courses, attendance for each course)
2	Multi-Robot Coordination	Using Robot Operating System (ROS), create a simulation where a drone recognises particular objects from its bird's eye view and sends the location of those objects to a mobile robot (UGV). The mobile robot should be able to reach that object's location autonomously.
3	Lane detection for autonomous driving	Create a simulation of a non-holonomic (2 wheeled or 4 wheeled) robot that can detect lanes visually and plan its path accordingly
4	Malicious user detection in wireless communication	identification of unauthorized users in wireless communication network
5	Spectrum sensing performance parameters in Cognitive Radio	In this project, we develolved model for efficient spectrum sensing and different performance parameters affecting the sensing process in Cognitive Radio Network
6	Follower Robot	Robot that follows person for carrying luggage
7	Wearable electronics	To monitor health by measuring different biomedical parameters
8	Stair climbing robot	Robot that can climb stairs are helpful for physically challenged and sick people
9	Home automation for senior citizen	Home automation will assist senior citizens with health problems and also monitor their health
10	Develop a software/hardware automation prototype for managing the peak hours at the traffic signals	Traffic control is a major problem in highly populated countries like India. For proper management of traffic an authorized police personnel is to be provided with a handheld remote control/IOT device to control the traffic signals by over riding the existing systems. A model with requirements of traffic light systems should be demonstrated.
11	Micro Processor Design	Students shall be required to use their knowledge of Microprocessor architecture in implementing a customized microprocessor for a specific applications. It will include designing micro instruction sets and various parts of a processor including instruction decoded and ALU, Control Unit. You will have to learn verilog HDL .

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12	Design and implementation of Floating point Unit IP core	Design and implementation of Floating point Unit IP core based on The IEEE Standard for Floating-Point Arithmetic (IEEE 754). It is a technical standard for floating-point arithmetic . Student is required to learn and use verilog HDL/ VHDL for the task.
13	Waveform Generator for FPGA based Software Defined Radio	Direct digital synthesis is the technique used in manufacturing waveform generators. Which also find applications in SDRs in communication engineering. Students shall learn xilinx Vivado tool learning to use the DDS IP core at 1st. Later will have to develop an optimized version using verilog HDL.
14	Deep Learning-Based SAR Image Despeckling	To develop method based on deep learning that estimates the speckle noise distribution and the despeckle the image simultaneously
15	Digital Image Processing for Forensic Analysis of Fabricated Documents	Detection of fabrication or any tampering of digital image used as fabricated document in cyber forensics
16	FORENSIC ANALYSIS OF DIGITAL IMAGE TAMPERING	To detect image forgeries created using multiple image sources and specialized methods tailored to the popular JPEG image format
17	Fuzzy decision making and thresholding in image segmentation	The application of fuzzy rule base and inference system in image segmentation
18	DESIGN OF CONFORMAL ANTENNA FOR AIRCRAFT APPLICATIONS	The most challenging thing in real world is communicating with aircraft, even though several communication technologies has been adopted for tracking and monitoring the aircraft there is no cent percent efficiency , for that an implementation of conformal antenna for transmission and reception of the signal is preferred
19	Massive MIMO/Diversity 5G Smartphones Antenna Design for Sub-6 GHz LTE Bands 42/43 Applications.	Antenna system compatible with massive multiple input multiple output (MIMO)/Diversity fourth/fifth generation (4G/5G) smartphones. The antennas are designed at sub-6 GHz long term evolution (LTE) band 42 (3.4-3.6 GHz) and LTE band 43 (3.6-3.8 GHz). A simple slot type antenna is considered as the radiating element, with open ended slots used for obtaining a compact design. These slots also act as decoupling elements to improve the isolation among different radiators.

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20	Frequency selective surfaces for shielding application	FSS provides enormous applications such as radomes, stealth technology, dichroic sub-reflector, photonic sub-reflector, military applications, antenna Technology and earth observing remote sensing instruments. Apart from this, Electromagnetic Interference shielding is the hottest research area due to advancement of mobile communication technology. The growing radiations from these mobile communication can be suppressed by transforming entire or aperture of wall in to FSS surface to protect highly sensitive equipment and human from health hazards
21	Design of Radio Frequency Identification (RFID) Antennas	RFID was the first technology utilised for livestock data recording and management. Implanting an RFID-enabled microchip or ear tag into cattle would allow for immediate identification while also preserving a plethora of personal data such as body type, breeding lineage, lactation quality and growth development. Individual animals can thus be recorded and tracked throughout their lives using RFID. Herd health monitoring is made easier using RFID technology by keeping individual vaccination and medication records, and preventing disease spread through early detection and segregation of infected livestock, allowing for successful isolation and treatment which saves the rest of the herd, thus preserving the meat quality of the respective animal. As a result, RFID aids farm management by increasing efficiency, reducing labour costs and feed, improving herd health and increasing output.
22	Smart Uniform for the worker working in mines	Wearable cloth with sensors embedded into it. Data sensed by the sensor can be tranmitted to the manager who can analyse the health of the worker and can monitor the hazardous conditions.
23	Gym Trainer	Gym Trainer will analyze the movements of the complete body of the person during the workout and will generate a report giving details about the correct posture and of quality of the workout done in comparison to some perfect sports person.
24	Monitoring of Air Quality	System that can detect air quality inside the cabin/car/bus, etc and can accordingly improve it.
25	OCR of Doctors prescription	Interpreting Doctors notes using handwriting recognition and Deep Learning techniques

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26	Face Detection out of a Video clip from a database of 2500 images using Machine Learning for JUIT	Face detection out of a video clip of CCTV footage is a challenging task for humans. This project will help by providing a solution by detecting the face of persons from a video clip of any CCTV footage/similar nature clip. The machine learning algorithms should be used to train the model with existing around 2500 images. Thereafter, the designed model should be capable of detecting the face of any person from any video clip in situation of dark/bad weather etc.
27	Human Bodies Detection through Wall/barriers using Improved RF/Microwave Techniques	This project will have application in Military purposes. In military purposes, the soldiers have to detect any intruder/enemy who can be hidden inside home/similar nature. The designed project will be a great help for the country. Also, sometimes in case of any natural calamity/accidents; when the humans are trapped inside the debris, this project will help to detect the human and their lives can be saved.
28	An Algorithm Development for the Identification of Textile Fabric	A tool which can identify the correct identity (fabric) of the purchased textile has to be developed which is highly important in view of customer protection.
29	Application of Deep Learning Approach for Estimation of Probability of Flood Induntation	Floods are natural calamities. During a flooding event, inundation mapping is an important step for emergency management, prioritizing relief efforts, and damage assessment. In this project, deep learning approach has to be developed for 3D induntation mapping.
30	Design of different lowpass filters with cutoff frequencies (say 100 MHz and 1GHz)	Stpes involved: 1. Do mathematical analysis to get the components required.2. Draw a layout using Eagle Autocad 3. Fabricate 4. Test
31	Development, Design and Analysis of digital signal processing based AI algorithm for the application areas such as predictive maintenance, bio-signal (ECG, EMG, EEG) processing, Speech Processing , genomics data, analysis, & VLSI Signal processing,	Development, Design and Analysis of digital signal processing based AI algorithm for the application areas such as predictive maintenance, bio-signal (ECG, EMG, EEG) processing, Speech Processing ,genomics data, analysis, & VLSI Signal processing.
32	Inverted Pendulum	The inverted pendulum is a classical control problem, which involves developing a system to balance a pendulum. The goal of project is to design a mechanical system for the inverted pendulum problem and then implement a feasible controller using processing unit.
33	App for measurement of Water Quality	The changing watercolor is direct indicator of changing water parameters and its suitability of usage. Measurement of water leaving radiance in visible region and its transformation to hue angle do provide necessary water parameters. Development of App for measurement of Water Quality using smartphone.

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34	Medical support in remote hill areas using Drone	Traveling in hilly areas is very inconvenient. Medicines can be delivered to the needy by drone.
35	Robotic Vehicle Control using Brain Computer Interface	An approach to control a car with brain signals using a brain computer interface (BCI). The car will be equipped with a variety of sensors and can be controlled by a microprocessor.
36	Design of Low Power Arithmetic Circuit using CMOS	Due to widespread application of portable electronic devices and the evaluation of microelectronic technology, power dissipation has become a critical parameter in low power VLSI circuit designs. In emerging VLSI technology, the circuit complexity and high speed imply significant increase in the power consumption. In low power CMOS VLSI circuits, the energy dissipation is caused by charging and discharging of internal node capacitances due to transition activity, which is one of the major factors that also affect the dynamic power dissipation. The reduction in power, area and the improvement of speed require optimization at all levels of design procedures.
37	Wireless Lock System Through OTP	Using the same password for your digital locks isn't the most secure way to keep intruders away since they only need to capture it once. However, OTP systems (one-time passwords) present a smart security solution that discards every password.
38	Circuit Breaker Using Password	If you've ever wondered whether it's possible to control electrical lines using a password, you'll find this project quite interesting. Using an 8051 microcontroller, you can set up any circuit in a way the on/off button is replaced with a password.
39	Gesture Control Bluetooth Speaker Arduino	The gesture based speaker takes Bluetooth speakers to the next level of modernization. The device makes use of 6 watt speaker with subwoofer along with arduino, battery charging board, Lidar sensor, audio amplifier IC, Bluetooth module and Battery Set. The system uses Bluetooth module to allow phones to connect to the speaker for audio input.
40	HMI based Home Automation System	Touch screen based wifi controlled Home automation system
41	Automated Menu selection and order /billing system for restaurants	Touch screen based Restaurant order, billing system
42	No contact attendance system.	No contact attendance system is the need of the hour. Using Image Processing and Machine learning techniques, an untouchable system can be designed to mark the attendance of students and employees. Also they can't cheat with the system.

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43	Elderly Activity monitoring system	Activity of the elderly person living in isolation can be analysed by analyzing the information collected by different sensors placed at different locations in the home. For any abnormal activity detected alarm can be raised.
44	Design of simultaneous wireless and information power transfer (SWIPT) system	As RF waves could also be used to harvest the energy in a wireless terminal in order to meet the energy requirement of the current scenario without the need of frequent charging of the device along with a medium for tramsission of information. This type of system design will be helpful for meeting the power requirement of small handheld or sensor nodes.
45	Spectrum sharing in cognitive radio	Cognitive radio helps in alleviating the spectrum scarcity issue in wireless networks. However efficient spectrum sharing techiques need to be devised which enhances the cognitive network performance while avoiding the interefrnce to the primary users.
46	Simulation and analysis of 5G network	In India, 5G network is in deployment stage. However, there is requirement of analyzing the performace of 5G system. MATLab provides the toolbox for 5G, which could be explored for analysing and improving the performnace of 5G network.