Electronics Mini Projects Ideas

Now-a-days many engineering students are trying to improve their knowledge and skills by creating new projects. Especially in electronics field, there is lot of chance to prove themselves as good electronics engineering student as they have to do lot of hard work in completing the project. So, we are providing some list of mini electronics project ideas for engineering students.

Nowadays electronics play vital role on the Earth. And we all know that it has become a part in our daily life. So, many people are showing lot of interest on electrical and electronics concepts. Even the students are also showing lot of interest on ECE and EEE branches in Engineering for better future. Especially the demand for ECE branch is increasing at rapid rate.

For engineering students, projects play very important role. They have to use their knowledge and do the projects individually with innovative ideas.

So, here we are providing the list of many ECE projects ideas on various categories to create better knowledge on what type of projects that an ECE student can choose. Here we are providing the list of ECE projects in various categories such as Embedded, Electrical, Robotics, Communication based, DTMF, GSM, PC, Solar based, Sensor based, power electronics, general electronics, RF based, RFID based projects.
## Mini Electronics Project Ideas List for Engineering Students

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>PROJECT IDEAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Auto Intensity Control of Street Lights</td>
</tr>
<tr>
<td>4</td>
<td>Thyristor Power Control by IR Remote</td>
</tr>
<tr>
<td>6</td>
<td>Thyristor Controlled Power for Induction Motor</td>
</tr>
<tr>
<td>7</td>
<td>Lamp Life Extender by ZVS (Zero Voltage Switching)</td>
</tr>
<tr>
<td>8</td>
<td>Three Phase Solid State Relay with ZVS</td>
</tr>
<tr>
<td>9</td>
<td>Industrial Power Control by Integral Cycle Switching without Generating Harmonics</td>
</tr>
<tr>
<td>10</td>
<td>Industrial Battery Charger by Thyristor Firing Angle Control</td>
</tr>
<tr>
<td>14</td>
<td>Bidirectional Rotation of an Induction Motor with a Remote Control Device</td>
</tr>
<tr>
<td>19</td>
<td>Optimum Energy Management System</td>
</tr>
<tr>
<td>22</td>
<td>PC Based Electrical Load Control</td>
</tr>
<tr>
<td>24</td>
<td>Density Based Traffic Signal System</td>
</tr>
<tr>
<td>29</td>
<td>Line Following Robotic Vehicle Using Microcontroller</td>
</tr>
<tr>
<td>33</td>
<td>Programmable Load Shedding Time Management for Utility Department</td>
</tr>
<tr>
<td>36</td>
<td>Street Light that Glows on Detecting Vehicle Movement</td>
</tr>
</tbody>
</table>

Vatsal N Shah
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>Portable Programmable Medication Reminder</td>
</tr>
<tr>
<td>109</td>
<td>Parallel Telephone Lines with Security System</td>
</tr>
<tr>
<td>144</td>
<td>Using TV Remote as a Cordless Mouse for the Computer</td>
</tr>
<tr>
<td>161</td>
<td>Cell Phone Based DTMF Controlled Garage Door Opening System</td>
</tr>
<tr>
<td>166</td>
<td>Display of Dialed Telephone Numbers on Seven Segment Displays</td>
</tr>
<tr>
<td>167</td>
<td>Smooth Start of a Single Phase Induction Motor</td>
</tr>
<tr>
<td>174</td>
<td>Wireless Power Transfer</td>
</tr>
<tr>
<td>178</td>
<td>Life Cycle Testing of Electrical Loads by Down Counter</td>
</tr>
<tr>
<td>181</td>
<td>BLDC Motor Speed Control with RPM Display</td>
</tr>
<tr>
<td>185</td>
<td>Stamp Value Calculator for Postage Needs</td>
</tr>
<tr>
<td>188</td>
<td>Hidden Active Cell Phone Detector</td>
</tr>
<tr>
<td>189</td>
<td>Long Range FM Transmitter with Audio Modulation</td>
</tr>
<tr>
<td>192</td>
<td>Sun Tracking Solar Panel</td>
</tr>
<tr>
<td>193</td>
<td>Remote Jamming Device</td>
</tr>
<tr>
<td>202</td>
<td>IR Obstacle Detection to Actuate Load</td>
</tr>
<tr>
<td>203</td>
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</tr>
</tbody>
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<table>
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</tr>
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<tr>
<td>204</td>
<td>Rhythm Following Flashing Lights</td>
</tr>
<tr>
<td>205</td>
<td>Mains Operated LED Light</td>
</tr>
<tr>
<td>206</td>
<td>Thermistor Based Temperature Control</td>
</tr>
<tr>
<td>208</td>
<td>Step Up 6 Volt DC to 10 Volt DC Using 555 Timer</td>
</tr>
<tr>
<td>209</td>
<td>Over Voltage or Under Voltage Tripping Mechanism</td>
</tr>
<tr>
<td>211</td>
<td>Object Counter with 7 Segment Display</td>
</tr>
<tr>
<td>212</td>
<td>Incoming Phone Ring Light Flasher</td>
</tr>
<tr>
<td>214</td>
<td>Wire Loop Breaking Alarm Signal</td>
</tr>
<tr>
<td>215</td>
<td>Video Activated Relay to Control the Load</td>
</tr>
<tr>
<td>216</td>
<td>Touch Controlled Load Switch</td>
</tr>
<tr>
<td>218</td>
<td>Time Delay Based Relay Operated Load</td>
</tr>
<tr>
<td>221</td>
<td>Electronic Eye Controlled Security System</td>
</tr>
<tr>
<td>222</td>
<td>Fastest Finger Press Quiz Buzzer</td>
</tr>
<tr>
<td>224</td>
<td>Sine Pulse Width Modulation (spwm)</td>
</tr>
<tr>
<td>225</td>
<td>Speed Checker to Detect Rash Driving on Highways</td>
</tr>
<tr>
<td>227</td>
<td>Wireless Audio Transmitter for TV</td>
</tr>
</tbody>
</table>

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<table>
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<td>Intelligent Overhead Tank Water Level Indicator</td>
</tr>
<tr>
<td>234</td>
<td>PC Controlled Scrolling Message Display for Notice Board</td>
</tr>
<tr>
<td>237</td>
<td>High Voltage DC by Marx Generator Principles</td>
</tr>
<tr>
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</tr>
<tr>
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<td>Speed Checker to Detect Rash Driving on Highways</td>
</tr>
<tr>
<td>254</td>
<td>Phase Sequence Checker for Three Phase Supply</td>
</tr>
<tr>
<td>1A</td>
<td>Beacon Flasher Using Microcontroller</td>
</tr>
<tr>
<td>1C</td>
<td>Discotheque Light Stroboscopic Flasher</td>
</tr>
<tr>
<td>PIC108</td>
<td>Density Based Traffic Signal System Using PIC Microcontroller</td>
</tr>
</tbody>
</table>
Following is the list of some more mini electronics project ideas which may be developed by engineering students with their own knowledge:

- Auditorium Control System Using IR
- Attendance Monitoring System for Classroom
- Automatic Mobile Recharge Station
- Appliances Security Controller Using Power Line
- Access Control System Using Microcontroller/Microprocessor
- Automatic Sprinkler Control System
- Anti-Sleep Alarm
- Automatic Burglar Alarm System for Single-Zone
- Automatic Speed Controller for Fans and Coolers Using Current Sensor
- Auto Scheduler for Multiple Machines
- Blind Navigation System Using RFID for Indoor Environments
- Bomb Detection Robotics Using Embedded Controller
- Bi-Directional Visitors Counter
- Conversion of Audio CD player To Video CD Player Using Microcontroller
- Cell Phone Operated Robot
- Card Based Security System
- Call Bell with Welcome Indication Using 555 Timers IC
- Component Pick and Place Scheduling Robot
- Dumb Signs System by Speech Communication Using Microcontroller
- Design of Manchester Encoder-Decoder in VHDL
- Door Locking System Using DTMF
- Device Controlling System Using DTMF
- DC Motor Control Using RF
- Direct Torque Controlled Induction Motor Drive Using Fuzzy Controller
- Digital Stop Watch Circuit
- Distance Measurement System Using Ultrasonic Sensor
- Design of a Color Sensing System for Textile Industries
- Digital Voltmeter Using Microcontroller
- Direct Torque Controlled Induction Motor Drive Using Space Vector Modulation
- Electronic Vehicle Identification in the Intelligent City

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- Electronic Passport Using RFID
- Electronic Number Lock
- Electricity Theft Monitoring System
- Efficient Coding Technique for Aerospace Tele-Command System
- Electric Guitar Preamplifier
- Ethernet Controller
- Electronic Card-Lock System
- Emergency Light
- Electronically Lock For Door by Keypad
- Embedded Car Control System Using IR
- Electrical Apparatus Control in Plant Using Mobile
- Employee Time Management System Using RTC with Display
- Enhancement of Voltage Quality in Isolated Power Systems
- Fire Fighting Robot
- Frequency Counter Circuit Using AVR Controller
- Face Recognition System
- Function Generator with Frequency Counter
- GSM Digital Security Systems for Printer
- GSM Autonomous Car Parking
- GSM Advanced Wireless Earthquake Alarm System for Early Warning
- GSM Unmanned Arial Photography Using Remote Flying Robot
- GSM Real Time Street Light Control Systems
- GSM Petrol Reader Systems
- GSM Path Planning For Blind Person Using Ultrasonic
- GSM Path Finding System
- GSM Based Wireless Load Controller
- GSM Energy Meter Debugger Systems
- GSM Automated and Unmanned Control System of Railway Crossing
- Gas Leakage Information System Using Robot
- Guitar Effect Pedal Power
- Hiding Of Host Image Using Cover Image
- Home Automation Using DTMF Decoder
- High And Low Voltage Cut-Off with Delay and Alarm
- IR Based Appliance Control System
- Intelligent Railway Station Monitoring and Alert System
- Industrial Devices Operating System Using Mobile
- Industrial Security with Alert System Using Fire Sensor
- Induction Motor Speed Control Using Power Electronic Drives (TRIAC)
- Improvement in Dynamic Response of AC Motors with PID and Fuzzy Logic Based Controllers
- Improvement in Dynamic Response of DC Motor with PID and Fuzzy Logic Based Controllers
- Indirect Vector Control of 3-Phase Induction Motor Drive by Using Hysteresis Band Controller
- Inverter Fed D-Q Modeling Of 3-Phase Induction Motor
- Intelligent Fire Sprinkler System
- Intelligent Alcohol Detection System for Car
- Involuntary Train Collision Prevention System
- Implementation of Content Based Watermark
- Low Cost Anti-Lock Braking and Traction Control
- Low Cost Fire Alarm Circuit
- Light Activated Switch Circuit
- Multiplier Accumulator Component VHDL Implementation
- Multi-Channel IR Remote Control
- Monitor and Control of Greenhouse Environment
- Mobile Incoming Call Indicator
- Mobile Car Stereo Player
- Motion Sensor for Security Light
- Mobile Based DC Motor Speed Control
- Mobile Based Advertisement System
- Mobile Based Involuntary Robotic Control System
- Mobile Control Robot with Voice Feedback
- Network Monitoring System Communication
- New Generation Polling Method Using RF
- Obstacle Detection by Robot
- Over Speed Indication and Automatic Accident Avoiding System for Four Wheeler

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- Path Finding and Mapping System
- Pyroelectric Fire Alarm
- PC Based Home Automation
- PC Based Device Control System
- PC Based Data Logger System
- Power Grid Control through PC
- Remote Airfield Lighting System
- RF Based Accident Identification System
- Radar Data Acquisition System
- Remote Vehicle with Unlimited Range
- Reverse Power Protection of an Alternator
- Sensor Based Motion Control of Mobile Car Robot
- Sound Operated Switch with a Relay Driver
- Single Chip FM Radio Circuit
- Sound Actuated Lights
- Servo Motor Controller
- Speed Controlled Temperature DC Fan
- Tongue Motion Controlled Wheel Chair System
- Tracking and Positioning Control System
- Touch Screen Based Digital Devices Control System
- Two-Axis Solar Tracking System Using Microcontroller
- Two Ways Wireless Anti Theft Alarm System for Two Wheeler
- Tanker Robot for Vision Based Surveillance System
- Traffic Light Control System
- Telephone Triggered Switches
- Tester Mobile Electronic Workbench
- Telephone-Operated Calling System Using DTMF
- Transistorized Code Lock with Torch
- Voice Operated Intelligent Fire Extinguisher Vehicle
- Vehicle Speed Control and Smoke Detecting System
- Vehicle over Speed Sensing System
- Wireless Motor Control System

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o Water Level Controller Using Micro Controller
o Wireless Sensor Network for Sewerage Monitoring Using Zigbee
o Wireless Vehicle Path Tracer Using IR & RF
o Wireless music player
o Wind turbine power generation system
o Wind mill power generation system
o Who's First (Game) Indicator
o Weather Canvas
o Water turbine power generation system
o Water Level Controller
o Voice Tuner
o Variable Auxiliary Power Supply
o UNIPOLAR 4-Phase Stepper Motor Controller Board
o Ultra Bright LED Lamp
o U.S.B. Connectivity To Micro Controller
o Traction control system
o Touchpad/Infrared Music Synthesizer
o Touch Dimmer
o Tissue Impedance Digital Biopsy
o Temperature Controlled Soldering Station
o Telephone Receiver
o Telephone Number Display
o Telephone Call Counter
o Teach-In 2002 Lab Work â€œ 5 â€œ Strain Gauge Weighing Machine
o Stepper Motor Control Using Microcontroller
o Stepper Motor Based Valve Controller
o Solar wheel chair for physically disabled
o Solar water heater
o Solar ups with auto tracking
o Solar remote controlled video analyzing pick and place vehicle
o Solar railway track crack detecting vehicle
o Solar race car

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- Solar powered voice controlled vehicle
- Solar powered visitor guided with material handling vehicle
- Solar powered unaided guided vehicle (solar ugv)
- Solar powered remote operated weapon system
- Solar powered remote controlled bomb detecting robot
- Solar powered path finding robot
- Solar powered fire fighting with visitor guided vehicle
- Solar powered automatic vehicle accident information system
- Solar powered automatic temperature controller with cooling system
- Solar powered automatic rain operated wiper
- Solar powered automatic railway gate controller
- Solar powered automatic head light dim/bright controller
- Solar powered accident prevented for train
- Solar power generation with auto tracking
- Solar lighting with auto changeover system
- Solar lighting system with auto tracking
- Solar lighting system
- Solar irrigation system
- Solar intelligent vehicle (car model)
- Solar fan with lighting system
- Solar emergency lighting system with battery charger
- Solar electric two wheeler with rechargeable battery
- Solar electric go bed drive
- Solar cycle
- Solar car (running model)
- Solar Battery Charger And Shunt Regulator
- Solar automatic traffic and street light controller
- Solar automatic cell phone charger with pay system
- Solar automated track guided vehicle (solar atgv)
- Solar automated guided vehicle (solar agv)
- Solar air cooler with auto tracking
- Solar air cooler

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- Solar air conditioner
- Solar agricultural water pumping system with auto tracking
- Solar agricultural water pumping system
- Snake arm Multiple PID motor controller
- SMS controlled solar moving vehicle for industrial application
- SMS Chatting Using RF
- SMS based solar pick and place robot
- Six Channel Petrochemical Fire Monitoring And Control Station
- Sinewave Generator
- Simple Function Generator 12v
- Simple Code Lock
- Self-Adjusting Window Shade
- Season Based Automatic Streetlights Switching
- Robot Plotter
- Robot Control Using TV Remote
- RF Control Of Induction Motors And Other Industrial Loads
- Remote controlled solar car
- Remote Controlled Fan Regulator
- Remote Control For Home Appliances
- Quality FM Transmitter
- Programmable Synthesized Guitar
- POV display
- Ph Controller
- PC To PC Laser Communication
- PC based solar car
- Particulates Monitoring Using Light Beam Attenuation
- ODB-II Automotive data interface
- NES emulator
- Musical Touch Bell
- Multi sensor Data Transmission
- Multi functional wind mill
- Modern House Automation (Ac/Dc) Using IR Communication

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- Mobile Phone Battery Charger
- Mobile Cell Phone Charger
- Microcontroller based Scrolling Message Display
- Microcontroller Based Intelligent Glass Break Detector
- Micro Controller To Ethernet Interface
- Micro Controller Clock
- Long Range Fm Transmitter
- Long Duration Timer
- Logic Analyzer
- Line Telephone Share
- Line Follower Robot
- Light Sensitive Inductive Load Controller
- Light Sensing Robot
- LED-Based Message Display
- LED Sensor Keyboard
- LED Panel Meter
- Leaf Moisture Analyzer
- Laser Torch Based voice Transmitter and Receiver
- Laser Audio Transmitter
- L293 H-Bridge Dc Motor Controller
- Knock Alarm
- IRDA (Infra Red Data Communication Protocol Implementation
- IR Remote Switch
- Ionizer Mains (230v Ac)
- Invisible Broken Wire Detector
- Interfacing IBM Key Board To Micro Controller
- Interfacing Color Sensor With Different Wave Lengths to Microcontroller
- Intelligent solar emergency light
- Intelligent Battery Charger
- Infrared Toy Car Motor Controller
- Infrared Remote Control Timer
- Infrared Control For PC
o Infrared Card less Head Phone
o Infrared Auto Switch
o Infra Red Illuminator
o Industrial Protection System Using Light Dependent Resistor
o Industrial Automation Data Acquisition System
o I2cprotocol Based Real Time Clock Control Application
o Hydro power plant (model)
o House security system
o Home Automation Using Television Remote Control
o Home Automation (Ac/Dc) Using Pc Interface
o Heliostat (MP4)
o GPS Data Logger with Wireless Trigger
o Gesture Recognition Based on Scratch Inputs
o Fluid Level Detection
o Fluid Flow Measurement (Liquid)
o Fire & Smoke Alarm System
o FET 4 Input Mixer (+/-9v)
o Fastest Finger First Indicator
o Fart Intensity Detector
o Eye Ball Control of Wheel Chair for Physical Handicapped person
o ESD Foam Touch Controlled Brick Blaster
o Electronic watchdog
o Electronic security system
o Electronic Jam
o Electronic Eye With Security System
o Electronic Card Lock System
o Electricity and water pumping system using wind mill
o Electrical power generation using thermal power plant
o Electrical power generation using steam power plant
o Electrical power generation using speed breaker
o Electrical power generation using foot steps
o Electrical power generation system using railway track

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- Electrical Equipment Controller
- Electric Etch
- E2prom Based Data Entry Real Time Clock Control Application
- Dual Motor L298 H-Bridge Control
- DTMF Telephone Remote Control
- DTMF Proximity Detector
- DTMF Development Board
- Ding-Dong Bell
- Digital Receipts System
- Digital Panel Meter (5v)
- Digital Object Counter (5v)
- Digital Compass/Navigation
- Digital Alarm Clock
- Designing A Digital Thermometer By Using A Selected Temperature Sensor
- Depth Of The Medium/Liquid Level By Change In Conductance
- Depth Of The Medium Based On Attenuated Reflectance
- DC Motor Direction Control
- DC Motor Control PWM Technique
- Data Logger
- Condenser Mice Audio Amplifier
- Colour Reflectance Measurement (Solids)
- Colour Intensity Measurement (Liquids)
- Coin Based Toll Gate System.
- CO2 & O2 Monitoring In Green House
- Clap Switch
- Cell phone controlled solar vehicle
- Burglar Alarm System
- Built Your Own Multi-Frequency Digital Signal Generator
- Build The Breath O-Meter
- Build A Simple Infrared Illuminator
- Build A Carbon Monoxide SNIFTER
- Blackout game

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- Biopic Heartbeat Monitor
- Ball Picker Robot
- Autonomous Self-parking car
- Automatic Speed Regulation Depending On Incoming Vehicle On High Ways (Fuel Injection)
- Automatic Speed Regulation Depending On Incoming Vehicle On High Ways (Fuel Injection)
- Automatic solar street light controller
- Automatic Light Lamp with Morning Alarm
- Automatic Light Beam Shifting Of Vehicles On High Ways
- Automatic Heat Detector
- Automatic Exhaust Fan Control Coupled To Gas Leak Detection
- Automatic Control for Unmanned Railway Gate.
- Automated Vehicle Identification and Toll-Pass System.
- Automated Traffic Signal Controller
- Automated Car Parking System
- Auto turn off battery charger
- Auto charging grinding machine with solar power
- ATmega644 JTAG Debugger
- Anti Theft Alarm For Bikes
- Altimeter — To Measure The Altitude
- Altimeter — To Measure The Altitude
- Alarm clock with speech synthesis
- Air Flow Sensor
- Access Control System
- 4 Digit 7-Segment Multiplex DISPLAY
- 4 Channel Infrared Remote
- 3D ultrasonic mouse
- 3D scanner

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List of ECE Projects Ideas for Engineering Students:

- Propeller display of Time / Message
- Vehicle tracking By GPS – GSM
- Auto Intensity Control of Street Lights
- Automatic Irrigation System on Sensing Soil Moisture Content
- Programmable Switching Control for Industrial Automation in Repetitive Nature of Work
- Automatic Wireless Health Monitoring System for Patients
- Precise controlled Digital Temperature system
- Optimum Energy Management System
- Security System Using Smartcard Technology
- PC Based Electrical Load Control
- Secret Code Enabled Secure Communication Using RF Technology
- Density Based Traffic Signal System
- Line Following Robotic Vehicle
- TV Remote Operated Domestic Appliances Control
- Password Based Circuit Breaker
- Programmable Load Shedding Time Management for Utility Department
- Object Detection by Ultrasonic Means
- Street Light that Glows on Detecting Vehicle Movement
- Tampered Energy Meter Information Conveyed to Concerned Authority by Wireless Communication
- Distance Measurement by Ultrasonic Sensor
- Portable Programmable Medication Reminder
- Programmable Energy Meter for Electrical Load Survey
- Security System With User Changeable Password
- Networking of Multiple Microcontrollers
- Solar Powered LED Street Light with Auto Intensity Control
- SCADA (Supervisory Control & Data Acquisition) for Remote Industrial Plant
- Parallel Telephone Lines with Security System
- Using TV Remote as a Cordless Mouse for the Computer
- Movement Sensed Automatic Door Opening System
- Railway Level Crossing Gate Control through SMS by the Station Master or the Driver

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- GSM Based Monthly Energy Meter Billing via SMS
- DTMF Based Load Control System
- Synchronized Traffic Signals –
- Pick N Place with Soft Catching Gripper
- Fire Fighting Robotic Vehicle
- War Field Spying Robot with Night Vision Wireless Camera
- Theft Intimation of the Vehicle Over SMS to Owner Who Can Stop the Engine Remotely
- Closed Loop Control for a Brushless DC Motor to Run at the Exactly Entered Speed
- Automatic Surveillance Camera Panning System from PC
- Flash Flood Intimation Over GSM Network
- RFID security access control system
- Integrated Energy Management System Based on GSM Protocol with Acknowledgement Feature
- Cell Phone Based DTMF Controlled Garage Door Opening System
- Display of Dialed Telephone Numbers on Seven Segment Displays
- Non Contact Tachometer
- RFID based attendance system
- Line Following Robotic Vehicle Using Microcontroller
- Automatic Dialing to Any Telephone Using I2C Protocol on Detecting Burglary
- Life Cycle Testing of Electrical Loads by Down Counter
- GSM Based Energy Meter Reading with Load Control
- BLDC Motor Speed Control with RPM Display
- Predefined Speed Control of BLDC Motor
- Stamp Value Calculator for Postage Needs
- Dish Positioning Control by IR Remote
- Hidden Active Cell Phone Detector
- Long Range FM Transmitter with Audio Modulation
- Railway Track Security System
- Sun Tracking Solar Panel
- Remote Jamming Device
- Wireless Electronic Notice Board Using GSM
- IR Obstacle Detection to Actuate Load

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- Automatic Dusk to Dawn (Evening on to Morning Off)
- Rhythm Following Flashing Lights
- Thermistor Based Temperature Control
- Object Counter with 7 Segment Display
- Incoming Phone Ring Light Flasher
- Solar Power Charge Controller
- Wire Loop Breaking Alarm Signal Video Activated Relay to Control the Load
- Touch Controlled Load Switch
- Time Delay Based Relay Operated Load
- Electronic Eye Controlled Security System
- Fastest Finger Press Quiz Buzzer
- Pre-programmed Digital Scrolling Message System
- Speed Checker to Detect Rash Driving on Highways
- Home Automation Using Digital Control
- Four Quadrant DC Motor Speed Control with Microcontroller
- Intelligent Overhead Tank Water Level Indicator
- Speed Synchronization of Multiple Motors in Industries
- Pre Stampede Monitoring and Alarm System
- Unique Office Communication System Using RF
- PC Controlled Scrolling Message Display for Notice Board
- Touch Screen Based Industrial Load Switching
- Touch Screen Based Home Automation System
- Speed Checker to Detect Rash Driving on Highways
- RF Based Home Automation System
- Wireless message Communication Between Two Computers
- Obstacle Avoidance Robotic Vehicle
- Solar Powered Auto Irrigation System
- Auto Metro Train to Shuttle Between Stations
- Touch Screen Based Remote Controlled Robotic Vehicle for Stores Management
- Metal Detector Robotic Vehicle
- RFID Based Passport Details
- Beacon Flasher Using Microcontroller

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• Discotheque Light Stroboscopic Flasher
• IR Controlled Robotic Vehicle
• Automatic Bell System for Institutions
• Cell Phone Controlled Robotic Vehicle
• RFID Based Device Control and Authentication Using PIC Microcontroller
• Theft Intimation of Vehicle Over SMS to Owner Who Can Stop the Engine Remotely
• Street Light that Glows on Detecting Vehicle Movement
• Density Based Traffic Signal System Using PIC Microcontroller
• Solar Energy Measurement System
Electronics:

Power Electronics Project Ideas

Power electronics refers to a subject in electrical engineering research that deals with design, control, computation and integration of nonlinear, time varying energy processing electronic systems with fast dynamics. It is an application of solid state electronics to control and conversion of electric power. There are many solid state devices like Diode, Silicon controlled rectifier, Thyristor, TRIAC, Power MOSFET, etc.

Projects Ideas:

- Thyristor Power Control by IR Remote
- Thyristor Controlled Power for Induction Motor
- Lamp Life Extender by ZVS (Zero Voltage Switching)
- Three Phase Solid State Relay with ZVS
- Industrial Power Control by Integral Cycle Switching without Generating Harmonics
- Industrial Battery Charger by Thyristor Firing Angle Control
- Cyclo Converter Using Thyristors
- Precise Illumination Control of Lamp
- Sine Pulse Width Modulation (SPWM)
- SVPWM Space Vector Pulse Width Modulation
- FACTs by SVC (Flexible AC Transmission)
- FACTs (Flexible AC Transmission) by TSR
- UPFC Unified Power Factor Control
- RF Based Home Automation System
- Programmable AC Power Control
- Dual Converter Using Thyristors

General Electronics Project Ideas:

- Propeller display of Time / Message
- Vehicle tracking By GPS – GSM
- Line Following Robotic Vehicle
- Induction Motor Protection System
- Three Phase Fault Analysis with Auto Reset on Temporary Fault and Permanent Trip
  Otherwise

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- Smooth Start of a Single Phase Induction Motor
- Wireless Power Transfer
- Hidden Active Cell Phone Detector
- Long Range FM Transmitter with Audio Modulation
- Remote Jamming Device
- Automatic Dusk to Dawn (Evening on to Morning Off)
- Rhythm Following Flashing Lights
- Mains Operated LED Light
- Thermistor Based Temperature Control
- Step Up 6 Volt DC to 10 Volt DC Using 555 Timer
- Over Voltage or Under Voltage Tripping Mechanism
- Incoming Phone Ring Light Flasher
- Solar Power Charge Controller
- Wire Loop Breaking Alarm Signal
- Video Activated Relay to Control the Load
- Touch Controlled Load Switch
- Time Delay Based Relay Operated Load
- Electronic Eye Controlled Security System
- Fastest Finger Press Quiz Buzzer
- Pre-programmed Digital Scrolling Message System
- Speed Checker to Detect Rash Driving on Highways
- Home Automation Using Digital Control
- Wireless Audio Transmitter for TV
- Intelligent Overhead Tank Water Level Indicator
- High Voltage DC by Marx Generator Principles
- Four Quadrant DC Motor Control without Microcontroller
- Phase Sequence Checker for Three Phase Supply
- Automatic Emergency LED Light
- Self Switching Power Supply
- Electronic Soft Start for 3 Phase Induction Motor

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Communication:

DTMF Based Project Ideas

DTMF or Dual Tone Multi Frequency is used for telecommunication signaling over analog telephone lines in voice frequency band between telephone handsets, other communication devices and the switching center.

There are many DTMF based projects developed for engineering students. So, here we are listing out few good and important DTMF Project Ideas which are more helpful.

- DTMF Based Load Control System
- Cell Phone Based DTMF Controlled Garage Door Opening System
- Display of Dialed Telephone Numbers on Seven Segment Displays
- Automatic Dialing to Any Telephone Using I2C Protocol on Detecting Burglary
- Cell Phone Controlled Robotic Vehicle

Look at the following some more interesting and useful DTMF project Ideas.

- DTMF Based DC Motor Control
- DTMF Based Home Appliance Control
- DTMF Based Stepper Motor Control
- Mobile Switching Device Using DTMF
- DTMF Based Human Less Boat Control for Oceanic Research Applications
- DTMF Based Remote Control System
- DTMF Based Home Automation System
- DTMF Based Car
- DTMF Based Device Control System
- DTMF Based Prepaid Energy Meter
- DTMF Based Electronic Voting Machine
- DTMF Based Switching System for Power Efficiency
- DTMF Based Industry Automation
- DTMF Based Irrigation System
- DTMF Based IR Proximity Sensor
- DTMF Based Land Rover
- DTMF Based Pick and Place Robot
- DTMF Based Spy Robot
GSM Based Projects

GSM or Global System for Mobile Communications projects are based on one of the emerging technology of the century. It deals with design of a stand-alone embedded system that can monitor and control several devices remotely irrespective of distance limitations. Generally sending and receiving SMS is the concept followed in embedded domain. The system has two parts, namely; hardware and software. The hardware architecture consists of a stand-alone embedded system using a 8-bit microcontroller, several type of interface and driver circuits. The system software driver is developed using an interactive C programming language.

Railway Track Security System:
This project is designed to find the breakages or cracks on railway tracks and alert the railway department. It is the latest technology to avoid railway accidents. Here we use GSM Communication protocols to send the message of breakage detection via SMS. A microcontroller can be used to process this data and convey it through required communication protocol.

Flood Intimation over GSM Network:
This project is designed to detect rise in the water level and convey the message to the concerned authorities by using GSM protocols. As the water level rises from a fixed level, (which can be sensed by using any sensor) the microcontroller gets interrupted.

GSM based wireless Electronic Notice Board
The main concept of this project is to develop a digital notice board. A control unit is connected to the notice board. Message sent by the user is received by the control unit. A GSM modem is interfaced to the control unit to receive messages from the users.

GSM based Vehicle Location Identifier:
Theft intimation of a vehicle can be conveyed to the owner of it via SMS by using GSM communication protocols. A control unit comprising of a microcontroller and GSM modem is connected to the vehicle. Once the theft takes place, an interrupt is given to the controller which in turn generates an alert message and transmits it to the owner of the vehicle via GSM modem.

Energy Meter Reading with Load Control using GSM:
This project is designed to transmit energy meter readings to the concerned authority via SMS. Additionally, we can also control the electrical appliances by sending an SMS to the control unit.

GSM based integrated Energy management system
This project is designed to control electrical appliances by using GSM communication protocols. It can be used to control home appliances or even industrial loads also. The concept behind the project is when an SMS is sent to the GSM modem by the user, the modem conveys this message to the microcontroller through RS232 communication.

Energy Meter status transmission using GSM:
This project is developed to convey the status of the energy meter to the concerned authority using GSM communication protocols. The system is designed to send an SMS to the department
in the event of the energy meter being tampered. The control unit comprises of a microcontroller and a GSM modem along with sensors and other peripherals.

**GSM based Railway Gate crossing control:**

Railway level crossing gate can be controlled by the station master or the engine driver by using GSM communication. The control unit comprises of a microcontroller and a GSM modem along with various peripherals and is connected to a DC motor (used for demonstration purpose).

**GSM Based Energy Meter Billing**

This involves reading electrical energy consumed in units and calculating the bill by the electrical department and sending the bill by sms to the user.

**Theft Intimation of the Vehicle Over SMS to Owner Who Can Stop the Engine Remotely:**

This involves remote controlling of the vehicle by its owner at the time of situations like unauthorized access of the vehicle, by using wireless technology to disable the vehicle engine.

**RFID Based Device Control and Authentication:**

It involves checking the authentication of any person to enter the secured area in places like any company or industry.

**Following is the list of some more examples for GSM Based Projects:**

- Propeller Display Of Time / Message
- Vehicle Tracking By GPS – GSM
- Wireless Heart Attack Detector Using GSM
- A Wireless Vending Machine System Based On GSM
- Automatic Meter Reading System Using GSM
- GSM Controlled Robot Using DTMF Technology By Voice Call
- Industrial automation with feedback control system using DTMF GSM Technology
- Students Enquiry System Based On GSM
- GSM Based Fantasy House
- Body Temperature And Electrocardiogram Monitoring Using An SMS Base Telemedicine System
- Home security and automation using GSM.
- SMS based AC Control.
- SD card Device driver for mobile platform.
- Intrusion Detection Using RFID with password by GSM

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- Vehicle Position Tracking Using GSM Modem
- GSM Based IVRS System
- Intelligent quiz server based on GSM Technology.
- Intelligent mobile phone with GPS enabled features.
- Microcontroller and GSM based Automatic irrigation control.
- GSM based wireless substation Fuse blown indicator
- SMS based irrigation system
- GSM mobile based device monitoring and control system
- Railway accident tracking system
- Multi user digital remainder
- Multi purpose security system using GSM.
- GSM based instantaneous vehicle registration details extraction system very useful for traffic police
- Home appliances monitoring and controlling system using GSM with fencing auto alerts
- Automated Electric Billing System
- Cell phone operated land rover with cam.
- Embedded and GSM based IA marks monitoring system.
- Embedded and GSM Based intelligence irrigation system.
- Home appliance control with security system.
- GSM based patient tracking system.
- Automatic Sensing of taxi trip and Indicating System through GSM.
- Gas leakage detection system using GSM.
- Vehicle safety system with alcohol detector.
- SMS based weather monitoring system.
- Interactive voice response(IVR) system
- GSM based school children security system based on RFID.
- Real-time home automation based on GSM and wireless ZigBee
- Credit card security in real time application using GSM technology
- GSM based digital Notice board with display on GLCD display
- GSM based digital Notice board with display on PC Monitor
- GSM/GPRS based digital Notice board with display on Scrolling LED Display
- SMS based SCADA implementation for industrial applications with fencing security system
- Dual GSM Modems based irrigation water pump controller for illiterates
- SMS based notice board using GSM & LCD with period bell
- Security Integrated system based on wireless access protocol for industrial Applications with SMS alert system using GSM modem
- Phase irrigation motor monitoring and Auto-controlling based on GSM Technology
- GSM based pre-paid Energy Meter with low balance alert
- Temperature based Fan Speed Controller and SMS alerts using GSM modem
- UPS battery monitoring system over GSM for high availability Systems (Banking/finance/medical etc)
- Smart card and GSM based advanced security system
- Advanced Real time Remote LED scrolling notice board using GSM with SMS
- Voice operated Home appliance control System
- GSM and GPS interface for human tracking system
- Confirming Order Through SMS Printer
- Automatic geo-positioning and SMS alerts on road traffic density
- SMS Based DC Motor Speed Controller with password protection
- ECG data transferring through GSM network
- SMS based remote SIM card’s address book access system
- Voice enables device switching for physically challenged and emergency alerts through SMS
- Home security System based on LPG gas, Smoke and Fire Sensors with SMS Based alerts
- Digital Fuel level Indicator with vehicle tracking system using GSM
- Automatic – Phase alert message with Micro controller based irrigation system
- Design Of Intelligent Mobile Vehicle Checking System Based On ARM
- GSM mobile phone based automobile security system
- SMS based home Automation system
- GSM based speed control of single phase induction motor
- GSM based speed control of three phase induction motor
- SMS based security system
- GSM controlled industrial monitor/controller
- Call based home appliance controller
- Security breach information for unauthorized entry based on mobile
- Mobile and smart card based voting system

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• Post paid Energy mater using GSM
• Solar based cell phone charger with coin pay system
• Statistical analysis of weather forecasting in outdoor game stadiums
• Development of remote monitoring system for cold storage (ieee)
• Wind power generation monitoring system based on wireless sensor network
• Railway anti collision system using gps
• GSM Based Industrial Fault Diagnose
• Advanced Vehicle Security System with Theft control and Accident Notification
• Daily SMS report based prepaid energy meter
• Accident detection system
• Microcontroller based embedded closed loop feedback control system using GSM technology
PC Based Projects Ideas:

- PC Based Electrical Load Control
- Unique Office Communication System Using RF
- PC Controlled Scrolling Message Display for Notice Board
- Wireless message Communication between Two Computers
- SCADA (Supervisory Control & Data Acquisition) for Remote Industrial Plant
- Automatic Surveillance Camera Panning System from PC
- Using TV Remote as a Cordless Mouse for the Computer
- Using TV Remote as a Cordless Mouse for the Computer Using PIC Microcontroller

Following are Few more interesting PC Based Projects Ideas which may be useful for engineering students.

- PC based cordless pick and place Robot
- PC Based Room Cooling System
- PC Based Stepper Motor Speed Control System
- PC Based Electrical Appliances Control System
- PC to PC Data Transmission through Infrared Rays
- PC Based 4-Axis Stepper Motor Tracking System
- PC Based Auto Feed Bottle Washing Machine
- PC Based Automatic Mono Rail System
- PC Based Wireless Welding Robot
- PC Based Remote Controlled Material Handling Vehicle
- PC Based Wireless Code Locking System for Machines
- PC Based Wireless Robot
- PC Based Solar Car
- PC Based Material Handling Equipment
- PC Based Temperature, Voltage and Speed (T-V-S) Measuring System
- RS 232 Communication Based Voltage Monitoring System
- PC-PC Communication Using Infrared Rays
- PC Based On-Load Monitoring of Distribution Transformer Tap Changer Using RF Communication
- Multi Device Control System Using PC
• PC Based Home Automation
• PC Based Multi Motor Control System
• RS 232 Communication Based Touch Screen Monitoring
• Fuzzy Logic Based PC-PC Communication through Laser Beam
• Add on Cards for PCs to extend the Output Ports Using 8255 for ISA Slot
• PC Based Moving Message Display
• PC Based Motor Speed Monitoring System
• RS 232 Communication Based Length Measurement System
• PC Based Different Industrial Parameter Measuring Using ADC Control
• PC Based Wireless Multi-Machine Control System
• RS 232 Communication Based Automatic Moisture & Light Control System
• PC Based Auto Dialing Home Security System
• PC Based Packing Control Machine for Industrial Application
• PC Based DC Motor Speed Controller Using PWM Techniques
• RS 232 Communication Based Stepper Motor Position & Angle Controller
• PC Based Auto Dialing Industrial Security System
• PC Based Metro Train Auto Ticketing System
• PC Based Function Generator
• PC Based Digital Clock
• PC Based Relay Switching to Operate Motor
• PC Based Multimeter
• PC Based Bio-telemetry for Medical Aided Information
• PC Based Light, Fan Control
• PC Based Relay Switching
• PC Based Mobile Phone Activation for PC File
• PC Based 4-Axis Stepper Motor Control
• PC Based Frequency Measurement
• PC Based Seismograph
• PC Based Visitor Counter
• PC Based Bank Token Number Display
• PC Based 3D XYZ Axis Motor (Matrix) Control
• PC Based Data Acquisition Card for PC

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- PC Based Simple Analogue Interface for PC
- PC Based Speed Monitoring System (Tachometer)
- PC Based Computerized Morse code Generator/Transmitter
- PC Based 7-Segment Rolling Display
- PC Based Heart Beat/Pulse Monitor
- PC Based Satellite Antenna (Dish) Tapping
- PC Based Voltage Transducer
- PC Based DC motor Control
- PC Based Audio Playback Device
- PC to PC Communication
- PC Based Robotic Arm
- PC Based Robotic Car
- PC Based IR Based Unmanned Railway Crossing
- PC Based Lift/Elevator Controller
- PC Based Touch Screen Sensing System
- PC Based Digital AM/FM Tuner
- PC Based Temperature Indicator cum Controller
- PC Based IR Remote Dimmer with Status Indicator
- PC Based Light Dimmer Control
- PC Based Electronic Voting Machine
- PC Based Metal Detector with Speed Indication
- PC Based Process Automation
- PC Based Time Operated Device Control
- PC Based Smart Traffic Light Control System
- PC Based Speech/Voice Recognition System
- PC Based Boiler Cum Indicator
- PC Based Sun Seeker
- PC Based Telephone Call Recorder Cum Time Keeper
- PC Based Multimode Light Chaser
- PC Based Liquid Level Monitor/Controller
- PC Based Combustion Engine Control
- PC Based Over Speed Indicator & Detection
- PC Based Phone Banking System for Account Statement
- PC Based Smart Card
- PC Based School Bell
- PC Based Dial Clock with Timer
- PC Based Bus Route Detector with Hazard/Bus Full Indication
- PC Based Wireless LAN Bluetooth Technology
- PC Based Mouse Control Using Eye Blink
- PC Based Radar Console Simulator
- PC Based AC/DC Motor Speed Control with IGBT Drives
- PC Based 5 Channel Logic Analyzer
- PC Based Angle Measurement Tool
- PC Based Distance Measurement Robot
- PC Based Smart Card for Music Shop
- PC Based Wireless Object Counter for Industry
- PC Based Radio Frequency Identification Tags (RFID)
- PC Based Security Alarm Transmission
- PC Based ‘music on demand’ at Your Mobile Phone
- PC Based Eye Detection for Message Reading
- PC Based Tongue Operated Mouse
- PC Based Remote Voting System through mobile
- PC Based 7-Segment Display
- PC Based Proportionate TRIAC and Control Using PC
- PC Based Power Control
- PC Based Fibre Communication
- PC Based Wind Direction Indicator cum Speed Measurement
- PC Based Car Parking Monitor
- PC Based Global Positioning System: GPS
- PC Based Finger Operated Mouse
- PC Based Programmable Logic Controller
- PC Based Joystick Controller
- PC Based Temperature Controller
- PC Based Light Finder
- PC Based Club Entry Smart Card
- PC Based Analog Reader
- PC Based Scale for Measurement
- PC Based Telephone Exchange
- PC Based Telephone Dialer
- PC Based Simulation of NPN Transistor Busing Visual C#.
- PC Based Smart Home-Control
- PC Based Auto Braking System
- PC Based object Rejection and Counting Machine
- PC Based Paper Cutting Machine
- PC Based Multiple Device Switching Control
- PC Based PNR Numbered – Auto Ticket Vending Machine
- PC Based College Premises Position Detector
- PC Based Time Schedule Operated Robotic Sweeper
- PC Based 4-Bit PC to PC Parallel Port Communication
- PC Based Wireless Electronic Meter Billing System
- PC Based Automation for China Made Robot
- PC Based ATM Machine
- PC Based Antenna Position Control
- PC Based Unmanned Petrol Pump Controller
- PC Based Depth Sensor
- PC Based Wireless Remote Car
- PC Based Earth Fossil Locator
- PC Based Voice to Text with Simultaneous LCD Display at Port
- PC Based Earthquake Proof Building
- PC Based Interactive Voice Response System (IVRS)
- PC Based Shooting Game (Laser Based)
- PC Based Voice Operated Car
- PC Based Overload Controller
- PC Based Solenoid Valve Operated Liquid Stirrer
- PC Based Lath Machine Control
- PC Based Over Head Water Level Indication & Control

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• PC Based Fuzzy Logic System
• PC Based Screw/Drill System
• PC Based Virtual Trainer Kit for 8085 Microprocessor Programming
• PC Based Simulation of NPN Transistor Biasing Using Visual C#
• PC Based Wireless Industrial Fault Finder
• PC Based “SCADA” Control for Distribution Line Automation
• PC Based Mobile Robot for Navigation
RF Based Project Ideas:

- Automatic Wireless Health Monitoring System in Hospitals for Patients
- Wireless Power Transfer
- War Field Spying Robot with Night Vision Wireless Camera
- Fire Fighting Robotic Vehicle
- Pick N Place with Soft Catching Gripper
- Metal Detector Robotic Vehicle
- RF Based Home Automation System
- RF Controlled Robotic Vehicle with Laser Beam Arrangement
- Touch Screen Based Home Automation System
- Secret Code Enabled Secure Communication Using RF Technology
- Unique Office Communication System Using RF
- Speed Synchronization of Multiple Motors in Industries
- Speed Synchronization of Multiple Motors in Industries Using PIC Microcontroller

Following are some more interesting project ideas based on RF technology.

- Advanced Railway Signaling Process by Excluding Manpower Using RF
- Channel RF Based Remote Control
- Hi-Tech Wireless Equipment Controlling System
- Home/office Security System (Safeguard) Using RF
- Incoming/Outgoing Vehicle Alert from Main Gate
- Industrial Automation System Using RF
- Detecting the Conditions of Remote Areas through Data Acquisition System Using RF Module
- Wireless Vehicle Path Tracer Using IR & RF
- RF based Wireless Remote Control Project
- Electrical Apparatus Control System in a Plant Using RF Wireless Communication
- Electronic Eye with Security System Using RF with Message Broad Casting
- Involuntary Attendance Maintenance System through Door Access Control
- Microcontroller Based Fire Monitoring System in Petrochemical Industries Using RF Communication
- Modern House Automation (AC/DC) Using RF Communication
- Railway Gate Control System Using RF

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• Remote Areas Data Acquisition Using RF Module
• SMS Transmitting Using RF Module
• To Control Office Using SMS Transmitting through RF Module
• Tracking Policeman Using RF Proximity Card
• Unique Office Communication System Using RF
• Unmanned Bus Ticket Issuing System for Passengers
• Wireless Chatting Using RF
• Wireless Data Acquisition System Using RF
• Wireless Data Encryption and Decryption Using RF Communication
RFID Based Project Ideas

Radio-Frequency Identification (RFID) is a technology that uses radio-frequency electromagnetic fields to transfer information from an RFID tag to RFID reader for identification purposes. The tags used do not require battery power and in turn they derive power from the electromagnetic field generated from the reader. Few tags are also available which have their own power source.

RFID technology is used in many industrial applications for tracking purpose. For example, it is used in manufacturing industries such automobile industry to track the vehicle during the complete production cycle of it. RFID tag can also be fixed to books, mobile phones, electronic equipments for tracking purposes.

Below mentioned are few RFID based projects ideas that will help engineering students to understand RFID technology and to develop various applications out of it. Each project mentioned below can be used for multiple applications by just modifying the program burnt in the microcontroller.

1. RFID Security Access Control System:

RFID system is used to authorize the tag holder to enter a secure area. It reads the data present on the RFID tag and compares it with data present in the microcontroller. If the data is matched, it displays the status of authorizing the entry which is indicated with a lamp coupled with an LCD display.

2. RFID based Attendance System:

A RFID tag is used along with the reader to input the details of the employee/ student for tracking their attendance. When the RFID is swiped on the reader, the data of the tag is compared with data in the microcontroller (interfaced to the reader) to identify the user. An LCD is interfaced to the microcontroller to display the name of the user. Additionally, a status button is used to display the overall attendance of the user.

3. RFID based Passport Details:

This project is designed to identify the passenger and display his/her passport details on the display. Each user is allotted with a dedicated RFID tag. This RFID tag when swiped over a reader, access the database on the microcontroller and displays all the required details of that particular user.

4. RFID based Device Control And Authentication:

RFID device control system is designed to authorize the tag holder to control a particular device. RFID reader reads the data present on the tag and compares it with data present of the microcontroller. The data if matched will result in accessing the particular device connected to the system. An LCD is interfaced to the microcontroller to display the status of the device.

PIC16F8 series microcontroller is used in this project.

Following is the list of some more RFID Based Projects:

- RFID Application Strategy and Deployment in Bike Renting System
• Consumer Acceptance of RFID Technology: An Exploratory Study
• Application Fields of RFID in Health Safety and Environment Management
• Shopping Path Analysis and Transaction Mining Based on RFID Technology
• RFID Instrumentation in a Field Application
• RF Controller Development and Its Application in Intelligent Transport System
• A Multi-Carrier UHF Passive RFID System
• Transportation Quality Monitor Using Sensor Active RFID
• A Component-based Reconfigurable RFID Middleware
• Parameter Estimation of RFID Network Data Traffic Load
• Adaptive k-Way Splitting and Pre-Signaling for RFID Tag Anti-Collision
• Design and Experiments on Cable Inspection Robot
• RFID based Indoor Antenna Localization System using Passive Tag and variable RF-Attenuation
• The Electronic Passport and the Future of Government Issued RFID based Identification
• Replacing Cryptography with Ultra Wideband (UWB) Modulation in Secure RFID
• Utilizing RFID Signaling Scheme for Localization of Stationary Objects and Speed Estimation of Mobile Objects
• RFID based Library Automation System
• Security Access Control System Using Bar Code Reader
• RFID based Electronic Passport System
• RFID Security Access Control System
• Library Automation Using Bar Code Reader
• Smart Card based Access Control System
• RFID based Airport Luggage Security Scanning System
• Smart Card based Electronic Passport System
• RFID based Banking System
• RFID based Latch.
• RFID based Library Management.
• RFID based Health Care system
• RFID based bus Indicator.
• RFID based Toll Booth Automation.
• RFID based Intelligent Signals.

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• RFID based Unmanned Petrol Pump.
• RFID based Car Parking.
• RFID based Hotel Room Management.
• RFID based Person Tracking.
• RFID based CAR for signal break detection.
• RFID based Shopping cart.
• RFID Based Pre-Paid Energy Meter.
• RFID based Bus Announcement System for Blind.
• A Mobile RFID Tracking Security System
• RFID based Prescriptions in Automated Pharmaceutical Systems
• RFID based Intelligent Books Shelving System
• RFID based Equipment/Personnel Tracking in Hospitals
• RFID based Valuable Objects Insurance Identification
• RFID based Vehicle Tracking and Monitoring System
• RFID Fare Verification – RFID Bus Pass System
• RFID based Automatic Toll Tax Deduction System
• RFID based Electronic Road Pricing for Controlling the Traffic
• RFID based Event Tracking System for Sports
• RFID based Inventory Tracking System
• RFID based Parts Tracking System for Manufacturing
• RFID based Prepaid Energy Meter with Recharge Option
• RFID based Railway Platform to Display Exact Position of Each Coach
• RFID based Railway Reservation
• Bus Fare Pay System for Passengers
• Medi-card for Patients
• RFID Enabled Passport Verification
• RFID Enabled Voter-ID
• RFID based Ration Card
• RFID based Voting Machine
• Score Card for Industries using RFID

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Embedded Project Ideas

**Embedded system:**
An embedded system is designed to perform one function with real-time applications. Embedded systems are found in simple devices like calculators, microwave & television remote controls and also in more complicated devices such as a home security and neighbourhood traffic control systems. Many Talented people can take the advantages of simple embedded systems and turn them into a more integrated system for controlling other devices.

So, Now-a-days many engineering students are showing lot of interest to improve their practical knowledge in embedded systems in early stage by doing the embedded systems projects in their final year. Generally we use 8051 Microcontroller or PIC Microcontroller based projects as they serve as good reference for final year electronics engineering projects.

**8051 Microcontroller Projects:**
A micro controller is an integrated circuit or a chip with a processor and other support devices like program memory, data memory, I/O ports, serial communication interface etc integrated together. 8051 is the most popular and widely use microcontroller. So, many engineering students show lot of interest in doing the 8051 Microcontroller projects.

**Following is the list of few embedded systems project ideas for final year engineering students:**

- Propeller display of Time / Message
- Vehicle Tracking By GPS – GSM
- Auto Intensity Control of Street Lights
- Auto Metro Train to Shuttle Between Stations
- Auto Power Supply Control from 4 Different Sources: Solar, Mains, Generator & Inverter to Ensure No Break Power
- Automatic Bell System for Institutions
- Automatic Dialing to Any Telephone Using I2C Protocol on Detecting Burglary
- Automatic irrigation System on Sensing Soil Moisture Content
- Automatic Surveillance Camera Panning System from PC
- Automatic Wireless Health Monitoring System in Hospitals for Patients
- Beacon Flasher Using Microcontroller
- Bidirectional Rotation of an Induction Motor with a Remote Control Device
- BLDC Motor Speed Control with RPM Display
- Cell Phone Based DTMF Controlled Garage Door Opening System
- Cell Phone Controlled Robotic Vehicle
- Closed Loop Control for a Brushless DC Motor to Run at the Exactly Entered Speed

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- Cyclo Converter Using Thyristors
- Density Based Traffic Signal System
- Detecting Power Grid Synchronization Failure on Sensing Frequency or Voltage Beyond Acceptable Range
- Discotheque Light Stroboscopic Flasher
- Dish Positioning Control by IR Remote
- Display of Dialed Telephone Numbers on Seven Segment Displays
- Distance Measurement by Ultrasonic Sensor
- DTMF Based Load Control System
- FACTs (flexible ac transmission) by TSR
- FACTs by SVC (flexible ac transmission)
- Fire Fighting Robotic Vehicle
- Flash Flood Intimation Over GSM Network
- Four Quadrant DC Motor Speed Control with Microcontroller
- GSM Based Energy Meter Reading with Load Control
- GSM Based Monthly Energy Meter Billing via SMS
- Industrial Battery Charger by Thyristor Firing Angle Control
- Industrial Power Control by Integral Cycle Switching without Generating Harmonics
- Integrated Energy Management System Based on GSM Protocol with Acknowledgement Feature
- IR Controlled Robotic Vehicle
- IR Obstacle Detection to Actuate Load
- Lamp Life Extender by ZVS (Zero Voltage Switching)
- Life Cycle Testing of Electrical Loads by Down Counter
- Microcontroller Based Line Following Robotic Vehicle
- Design and Implementation of Metal Detector Robotic Vehicle
- Automatic Door Opening System with Movement Sense
- Networking of Multiple Microcontrollers
- Microcontroller based Non Contact Tachometer
- Object Counter with 7 Segment Display using Microcontroller
- Object Detection using Ultrasonic Sensor
- Obstacle Avoidance Robotic Vehicle

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- Optimum Energy Management System
- Parallel Telephone Lines with Security System
- Password Based Circuit Breaker
- PC Based Electrical Load Control
- PC Controlled Scrolling Message Display for Notice Board
- Pick N Place with Soft Catching Gripper
- Portable Programmable Medication Reminder
- Power Saver for Industries & Commercial Establishments
- Pre Stampede Monitoring and Alarm System
- Precise Digital Temperature Control
- Precise Illumination Control of Lamp
- Predefined Speed Control of BLDC Motor
- Programmable Energy Meter for Electrical Load Survey
- Programmable Load Shedding Time Management for Utility Department
- Programmable Switching Control for Industrial Automation in Repetitive Nature of Work
- Railway Level Crossing Gate Control through SMS by the Station Master or the Driver
- Railway Track Security System
- Remote Jamming Device
- RF Based Home Automation System
- RF Controlled Robotic Vehicle With Laser Beam Arrangement
- RFID based attendance system
- RFID Based Passport Details
- RFID security access control system
- Scada (Supervisory Control & Data Acquisition) for Remote Industrial Plant
- Secret Code Enabled Secure Communication Using RF Technology
- Security System Using Smartcard Technology
- Security System With User Changeable Password
- Sine Pulse Width Modulation (spwm)
- Solar Powered Auto irrigation System
- Solar Powered LED Street Light with Auto Intensity Control
- Speed Checker to Detect Rash Driving on Highways
- Speed Control Unit Designed for a DC Motor

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- Speed Synchronization of Multiple Motors in Industries
- Stamp Value Calculator for Postage Needs
- Sun Tracking Solar Panel
- SVPWM Space Vector Pulse Width Modulation
- Synchronized Traffic Signals
- Tampered Energy Meter Information Conveyed to Concerned Authority by Wireless Communication
- Theft Intimation of the Vehicle Over SMS to Owner Who Can Stop the Engine Remotely
- Three Phase Solid State Relay with ZVS
- Thyristor Controlled Power for Induction Motor
- Thyristor Power Control by IR Remote
- Touch Screen Based Home Automation System
- Touch Screen Based Industrial Load Switching
- Touch Screen Based Remote Controlled Robotic Vehicle for Stores Management
- TV Remote Operated Domestic Appliances Control
- Ultra Fast Acting Electronic Circuit Breaker
- Underground Cable Fault Distance Locator
- Unique Office Communication System Using RF
- Using TV Remote as a Cordless Mouse for the Computer
- War Field Spying Robot with Night Vision Wireless Camera
- Wireless Electronic Notice Board Using GSM
- Wireless message Communication Between Two Computers

**PIC Microcontroller Projects:**

PIC Microcontroller is another type of microcontroller which is widely used in many electronics projects by the engineering students. Following is the list of few PIC Microcontroller Projects for engineering students.

- Density Based Traffic Signal System Using PIC Microcontroller
- GSM Based Energy Meter Reading With Load Control Using PIC Microcontroller
- Portable Programmable Medication Reminder Using PIC Microcontroller
- Pre Stampede Monitoring and Alarm System Using PIC Microcontroller
- RFID Based Device Control and Authentication Using PIC Microcontroller
- Solar Energy Measurement System
- Speed Synchronization of Multiple Motors in Industries Using PIC Microcontroller
- Street Light that Glows on Detecting Vehicle Movement
- Synchronized Traffic Signals at Various Junctions Using PIC Microcontroller
- Theft Intimation of Vehicle Over SMS to Owner Who Can Stop the Engine Remotely
- PIC Based TV Remote as a Cordless Mouse for the Computer
Robotics Project Ideas

In the area of robotics, it is important to deal with design, operation, construction, structural disposition, manufacture and application of robots. Using computer technology one can work on their control, sensory feedback, and information processing using appropriate hardware and sensors. Lot of motors are used in robotics which is controlled through dedicated micro-controllers with appropriate program. Therefore, language knowledge in assembly and ‘C’ is a must to design robotic applications.

Nowadays many engineering students showing lot of interest on robotics projects and they create lot of interest as compared to others. Robots such as line following, pick n place, firefighting, wall tracking, hexapod, humanoid etc are few popular projects in academic level.

Following are the few interesting Robotics Projects Ideas:

1. RF Controlled Robotic Vehicle with Laser Beam Arrangement
2. Line Following Robotic Vehicle
3. Pick & Place With Soft Catching Gripper
4. Fire Fighting Robotic Vehicle using Microcontroller
5. RF controlled robot with Night Vision Wireless Camera for Spying in War Field
6. Microcontroller Based Line Following Robotic Vehicle
7. Obstacle Avoidance Robotic Vehicle using Ultrasonic Sensor
8. Auto Metro Train to Shuttle between Stations
9. IR Controlled Robotic Vehicle
10. Cell Phone Controlled Robotic Vehicle Metal Detector Robotic Vehicle

List of some more robotics projects ideas for engineering students:

- Accelerometer (Gyroscope) Controlled Robot
- Radio Frequency (RF) Controlled Wireless Robot
- Voice operated robot with speaker identification technology
- Computer controlled Pic and Place Robot (wired or wireless)
- Zigbee controlled Boat with wireless video and voice transmission with night vision capability
- Autonomous Robot with artificial vision for obstacle detection
- Smoke and LPG Gas detection robot with wireless control
- Visible light follower Robot
- Android mobile phone controlled bluetooth robot
- Wireless operated War field spying Robot with night vision wireless camera
- Construction of flying Quad Rotor Chopper with Video camera surveillance system
- Digital Compass and GPS based self navigating Robot

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- Bomb detection Robot
- DTMF based humanless Robotic boat control for ocean research application
- Wifi robot controlled from Android smart mobile phone
- Wireless room freshener spraying robot with video vision
- DTMF based Mobile phone controlled Robot
- flying Quad robot chopper with wireless video camera
- GPS and Digital Compass based self navigating robot
- Bomb displacing robot with wireless video camera controlled form PC/Laptop
- GSM (SMS) Mobile Phone Controlled Intelligent Robot
- Wireless Voice and image transmission robot for surveillance system
- Infrared Light tracing Robot (TV Remote controlled)
- Live Human detection and alerting Robot
- Micro Electro Mechanical Sensor (MEMS) Accelerometer/Gyroscope based self-balancing robot
- Mobile phone Bluetooth operated robot
- Mobile phone controlled four-legged walking robot with speed and direction control
- Obstacle detection robot with mechanical sensing switches
- Obstacle detection Robot with Ultrasonic Sensors
- PC Controlled Wired Robot
- Wireless operated war field land Rover that alerts on sensing planted Land Mines
- Human-robot interface using robust speech recognition
- PC controlled wireless Multipurpose robot
- Wireless operated Fire extinguisher Robot with water jet spray
- Remote Controlled Land Rover
- Robot Controlled Wireless Audio-Video Streaming Camera
- Servo motor controlled wireless video camera control system
- Wall Follower Robot
- speech controlled wireless elevator system
- Speech recognition robot with ultrasonic obstacle avoidance system
- Touch Screen Controlled intelligent robot
- Voice operated Intelligent Fire extinguisher vehicle
Sensor based Electronics Projects

Sensors are backbone of plant automation and robotics. Interfacing their output to the firmware is one of the important areas in industrial applications. Understanding their parameters is of great importance in designing a control system. Sensors such as temperature, gas, humidity, IR, ultrasonic, laser, PIR etc are widely used in the industries. Developing projects involving such sensors give a clear idea in understanding their use & limitations. Data acquisition, SCADA, fuzzy logic control are few advanced level projects those usually adopt embedded systems and requires software domain knowledge particularly the “C” language.

List of sensor based projects ideas:

- Thyristor Power Control by IR Remote
- Bidirectional Rotation of an Induction Motor with a Remote Control Device
- Automatic Wireless Health Monitoring System in Hospitals for Patients
- Precise Digital Temperature Control
- Optimum Energy Management System
- Density Based Traffic Signal System
- Line Following Robotic Vehicle
- TV Remote Operated Domestic Appliances Control
- Object Detection by Ultrasonic Means
- Street Light that Glows on Detecting Vehicle Movement
- Tampered Energy Meter Information Conveyed to Concerned Authority by Wireless Communication
- Distance Measurement by Ultrasonic Sensor
- SCADA (Supervisory Control & Data Acquisition) for Remote Industrial Plant
- Using TV Remote as a Cordless Mouse for the Computer
- Movement Sensed Automatic Door Opening System
- Railway Level Crossing Gate Control through SMS by the Station Master or the Driver
- Closed Loop Control for a Brushless DC Motor to Run at the Exactly Entered Speed
- Non Contact Tachometer
- Line Following Robotic Vehicle Using Microcontroller
- Wireless Power Transfer
- BLDC Motor Speed Control with RPM Display
- Predefined Speed Control of BLDC Motor
- Dish Positioning Control by IR Remote

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- Remote Jamming Device
- IR Obstacle Detection to Actuate Load
- Thermistor Based Temperature Control
- Object Counter with 7 Segment Display
- Speed Checker to Detect Rash Driving on Highways
- Speed Synchronization of Multiple Motors in Industries
- Touch Screen Based Home Automation System
- Speed Checker to Detect Rash Driving on Highways
- Obstacle Avoidance Robotic Vehicle
- Auto Metro Train to Shuttle Between Stations
- IR Controlled Robotic Vehicle
- Street Light that Glows on Detecting Vehicle Movement
- Density Based Traffic Signal System Using PIC Microcontroller
- Solar Energy Measurement System
- Speed Synchronization of Multiple Motors in Industries Using PIC Microcontroller
- Using TV Remote as a Cordless Mouse for the Computer Using PIC Microcontroller

Some more examples for sensor based projects ideas:

- Advanced Wireless Automatic Digital Pumping System for Agriculture using Soil Sensor
- Advanced Wireless Earth Quake Alarm System for Early Warning
- Temple Security System — Hi End Temple Security System with Frequency Jammer
- Integrate Intelligent Security System for Industrial Surveillance with WAP & Auto Dialer
- Driver Fatigue Accident Prevention using Eye Blink Sensor
- Eye Ball Controlled Automatic Wheel Chair
- Multisensor – Smoke, Fire, Temperature, Gas, Metal & Intruder based Security Robot – Zigbee
- RF Enabled ICU Care Taker – Life Support System
- American Sign Language based Hand Gesture Recognition & Performance
- Library Robot – Path Guiding Robotic System with Artificial Intelligence using Microcontroller
- Motion Detection, Robotics Guidance & Proximity Sensing using Ultrasonic Technology
- Real Time Lane Detection for Autonomous Vehicles – Ultrasonic Sensor

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Touch Screen Based Projects

Touch screen technology has been around for a number of years but advanced touch screen technology has come on in leaps and bounds recently. Companies are including this technology into more of their products. The three most common touch screen technologies include resistive, capacitive and SAW (surface acoustic wave). Most of low end touch screen devices contain on a standard printed circuit plug-in board and are used on SPI protocol. The system has two parts, namely; hardware and software. The hardware architecture consists of a stand-alone embedded system using a 8-bit microcontroller, several type of interface and driver circuits. The system software driver is developed using an interactive C programming language.

Home Automation System:
The project is designed to wirelessly control electrical appliances using RF communication. It uses a control board at the receiver end and another control board at the transmitting end. A touch screen display along with a microcontroller is used at the transmitting side. By using this display one can transmit the information on which load is to be ON / OFF. On the receiver side a microcontroller along with other peripherals is used to process the data received by the transmitter.

Remote Controlled Robotic Vehicle for Stores Management:
A touch screen based remote control is designed to control a robotic vehicle using RF technology. At the receiving end, a robotic vehicle is used which picks an object and displaces it from one location to another. A microcontroller is used in this project at both the ends i.e., at the transmitting and receiving side to control the complete project. The robotics vehicle consists of a soft catching arm to avoid excessive pressure on the object which is handled.

Industrial Load Switching:
A touch screen display is used in this project to manage switching of industrial loads. Using conventional switches in highly inflammable area could lead to disasters. So touch screen displays can be used in these conditions for switching of these appliances. The control unit comprises of a microcontroller interfaced with the touch screen display along with other peripherals to perform the desired operation.

Following is the list of some more Touch screen based projects:

- Touchscreen Controlled Wheel Chair
- Color LCD with Touch Screen Interface Based Motor Speed Control.
- Microcontroller Based Password Protected Authentication System Using Touch Pad.
- Development of Touch Sensing Application in Different Fields of Electronics Equipments.
- Finger Print Based Office Attendance and Password Protected Using Touch Pad.
- Touch Screen Based Temperature Monitoring and Control System with Graphical LCD.
- GPS and Graphical Display Based Tourist-Guiding System with Touchscreen Keyboard Input for Dynamic Location Recording.
- RFID Tags and Touch Pad Based Petrol Filling Stations.
- Construction of Touchscreen Based Portable Digital Clock.
- PC Key Board Based Touch Screen Sensing System.

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• Multi Channel Analog Capacitive Touch Screen Sensing and Control for Industrial Robotic Realization Environments
• Automatic Touch Screen Based Vehicle Driving System.
• Prepaid Digital Energy Meter Using Touch Screen
• Touch Screen Operated Liquid Dispensing System.
• Touch Activated Speaking Robot
• Induction Motor Controlling Using Touchscreen.
• Design and Construction of Mems Accelerometer Based Tilt Operated Touch Free Mobile Phone.
• Design and Development of Mobile Phone Using Modem, Graphical LCD, Buzzer and Touchscreen Based Keypad.
• Design and Development of Touch Screen Based ATM Machine.
• Touch Screen GLCD Based Digital Devices Control System
• Touch Screen Based Moving Message Display System Using Touch Pad.
• Touch Panel Based Automation.
• Construction of Microcontroller Based Touch Screen Mobile Phone with Password Protected Features.
• Implementation of Mobile Keypad Based Hi-Tech Door Locking System.
• Touchpad Controlled Robot.
• Industrial Process Control & Monitor Using Touch Screen.
• Target Catching Robotic Arm Manipulator Using Touch Screen.
• Touch Screen Based Electronic Voting Machine.
• Touch Screen Based Ordering System for Restaurants.
• Microcontroller and RF Transceiver based Chatting Application with Touch Screen Keyboard Implementation.
• Engine Temperature Monitoring and Controlling Through Touch Screen.
• Touch Screen Based Advanced Home Automation System for Next Generation Apartments.
• Home Appliance Control Using Touch Screen.
• Touch Screen Based Wireless Communication Assistant for Dumb/illiterates in Airlines.
• Touch Screen Based Wheel Chair Implementation.
• Remote Control Robot Using Touch Pad
• Touch Screen Controlled Motor Speed and Direction Controlling System.
• Image Viewer in Graphical LCD Touch Screen.

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- Haptic Interfacing for the Disable Persons by Designing Simple Logical Touch Activated System.
- Touch Screen Based DC Motor Speed Control
- Touch Screen Based Nurse/attendant Calling System for Physically Impaired.
- Touch Screen Based Digital Slate for Next Generation Elementary School Children.
- Microcontroller and Touchscreen Based Wireless Library Book Catalog System.
- Image Based Password Authentication for Illiterates With Touch Screen.
- Touch Screen Controlled Lamp Dimmer for Next Generation Apartments.