

Pbl Project Ideas For Engineering Students

List of best PBL project Ideas For Engineering Students:

Robotics and Automation

1. Design and Build an Obstacle-Avoiding Robot

Ultrasonic distance sensors are used to make a robot that can avoid obstacles by detecting objects in its path.

2. Create a Color-Sorting Robotic Arm

Build a robotic arm with Arduino and servo motors that sort items based on their colour.

3. Develop an Automated Plant Watering System

Use soil moisture sensors to water plants automatically when the soil gets too dry.

4. Build a Voice-Controlled Robot

Make a robot that listens to five basic commands and responds accordingly.

5. Design a Line-Following Robot

Create a robot with infrared sensors that follows a line on the ground.

6. Create an Interactive Robotic Pet

Build a robot pet that responds to touch and sound, acting like a real pet.

7. Build a Stair-Climbing Robot

Use treads and tilt angle sensors to make a robot that can climb stairs.

8. Design a Drawing Robot

Develop a robot that draws shapes and patterns using stepper motors.

9. Create a Motion-Activated Automatic Door

Design a system that opens doors automatically when it detects motion nearby.

10. Build a Maze-Solving Robot

Create a robot that can navigate and solve mazes using wall detection and mapping.

11. Design a Rock-Paper-Scissors Robot Hand

Make a robotic hand that plays rock-paper-scissors using a machine vision system.

12. Create a Solar-Tracking Robot

Build a robot that follows the strongest light source, like the sun.

13. Build a Size-Sorting Machine

Develop a conveyor belt system with optical sensors to sort items by size.

14. Design a Recycling Robot

Machine learning can be used to create a robot that sorts materials for recycling.

15. Create a Musical Robot

Make a robot that plays music by controlling instruments with servo motors.

16. Build an Automated Book Sorting System

Use barcode scanners to sort books into the correct categories.

17. Design a Paper Airplane Folding Robot

Create a robot with precise servo control that folds paper aeroplanes.

18. Create a Self-Balancing Robot

Use gyroscopes and accelerometers to build a robot that balances itself.

19. Build an Automated Pet Feeding System

Design a system that dispenses pet food on a schedule.

20. Design a Block-Stacking Robot

Use computer vision to create a robot that stacks blocks based on patterns.

21. Create an Automated Parking System

Build a system with sensors and mechanical lifts to automate parking.

22. Build an Egg-Handling Robot

Design a robot with a pressure-sensitive gripper that carefully handles eggs.

23. Design a Multi-Zone Plant Watering System

Use moisture level monitoring to water different plant zones automatically.

24. Create a Basketball-Shooting Robot

Develop a robot that shoots basketballs using angle calculations and motor control.

25. Build a Block-Sorting Robot

Create a robot with colour sensors and a conveyor belt to sort blocks by colour.

Sustainable Energy

26. Design a Vertical Wind Turbine

Build a small wind turbine that powers an LED display with generated voltage.

27. Create a Portable Solar Charger

Design a solar charger with voltage regulation and USB ports for charging devices.

28. Build a Water Wheel Generator

Use flowing water to generate electricity with a water wheel.

29. Design a Bicycle Generator

Create a system that generates power for small electronics while pedalling a bike.

30. Create a Parabolic Solar Oven

Build a solar oven with temperature monitoring to cook food using sunlight.

31. Build a Rainwater Collection System

Design a system to collect, filter, and store rainwater for later use.

32. Design a Biogas Generator

Convert food waste into usable energy using a biogas generator.

33. Create a Solar Water Heater

Develop a system that heats water using solar power with temperature control.

34. Build an Anemometer

Measure wind speed with an anemometer using magnetic reed switches.

35. Design a Smart Lighting System

Optimise natural and artificial light with a smart lighting system.

36. Create a Solar-Powered Cooling Fan

Build a fan that adjusts speed automatically based on solar power availability.

37. Build a Sun-Tracking System

Maximise solar panel efficiency with a system that follows the sun's path.

38. Design a Hydrogen Fuel Cell Demonstrator

Create a safe and functional model of a hydrogen fuel cell.

39. Create a Footstep Energy Harvester

Generate power from footsteps to light up an LED display.

40. Build a Thermoelectric Generator

Convert heat differences into electrical power using a thermoelectric generator.

41. Design a Solar Fountain

Create a fountain powered by solar energy with flow control and lighting.

42. Build a Wind-Powered Irrigation System

Wind power is used to run an irrigation system that monitors water levels.

43. Create a Home Energy Monitor

Display real-time energy consumption data in your home with a smart monitor.

44. Design Solar Garden Lights

Build garden lights that turn on automatically when it gets dark.

45. Create a Mechanical Energy Storage System

Store energy mechanically with a flywheel and generator system.

46. Build a Greenhouse Ventilation System

Use solar panels to power ventilation in a greenhouse.

47. Design a Wave Energy Converter

Create a system that captures energy from waves using an oscillating water column.

48. Build a Solar Car

Demonstrate photovoltaic energy conversion with a small, solar-powered car.

49. Create a Plant-Powered LED System

Use the natural electrical potential of plants to power LEDs.

50. Design a Kinetic Energy Recovery System

Capture mechanical motion to recover and store kinetic energy.

Smart Home Technology

51. Create a Video Doorbell System

Design a doorbell with motion detection and alert notifications.

52. Build Voice-Controlled Lighting

Use a microcontroller and relay modules to control lights with your voice.

53. Design a Room Temperature Control System

Automatically adjust a fan to control room temperature.

54. Create a Smart Mirror

Build a mirror that displays weather updates and your daily schedule.

55. Build a Security System

Use PIR sensors and a camera module for home security.

56. Design Automated Blinds

Control blinds based on sunlight and temperature levels automatically.

57. Create a Smartphone-Controlled Garage Door Opener

Open your garage door remotely with a smartphone and monitor its status.

58. Build Voice-Activated Fan Control

Use speech recognition to turn a fan on and off with your voice.

59. Design a Plant Monitor

Measure moisture, light, and temperature levels to care for plants better.

60. Create an Automated Pet Feeder

Dispense food portions on a schedule and monitor your pet's eating habits.

61. Build a Laundry Completion Detector

Detects when laundry is done using vibration sensors.

62. Design an Occupancy Counter

Count the number of people in a room with an infrared beam detection system.

63. Create a Kitchen Inventory Tracker

Keep track of kitchen supplies with a barcode scanning system.

64. Build Automated Bedroom Lighting

Control bedroom lights based on motion and brightness levels.

65. Design a Water Leak Detector

Automatically shut off the water supply when a leak is detected.

66. Create a Gesture-Controlled Universal Remote

Control devices with gestures using infrared LED technology.

67. Build a Medicine Reminder System

Set scheduled alerts for taking medicine and track usage.

68. Design a Motorized Curtain Controller

Open and close curtains based on light levels with a motorised system.

69. Create an Air Quality Monitor

Measure CO₂ and particulate matter in the air for better indoor quality.

70. Build a Voice-Controlled Music Player

Play music and control playback with voice commands.

71. Design a Smart Fridge Inventory System

Use weight sensors inside a fridge to monitor food inventory.

72. Create an Automated Ventilation System

Control ventilation based on CO₂ and temperature levels in a room.

73. Build a Pressure-Sensing Doormat

Track entry and exit with a doormat that senses pressure and lights up.

74. Design Motion-Activated Closet Lighting

Automatically light up a closet when someone opens the door.

75. Create a Smart Thermostat

Learn user preferences and adjust room temperature automatically over time.

Environmental Solutions

76. Build a Plastic Sorting System

Sort plastics using infrared sensors to identify different materials.

77. Create a Water Quality Tester

Measure pH and detect contamination in water samples.

78. Design an Air Pollution Monitor

Detects levels of particulate matter in the air to monitor pollution.

79. Build a Temperature-Controlled Composting System

Automatically mix compost based on temperature readings.

80. Create a Noise Level Meter

Measure sound levels and analyse frequencies for noise pollution.

81. Design a Soil Testing System

Measure soil nutrients and pH levels for better agriculture.

82. Build a Rainwater Calculator

Calculate the volume and flow rate of collected rainwater.

83. Create an Electronic Waste Sorter

Identify and sort e-waste materials using detection technology.

84. Design a Carbon Footprint Calculator

Track daily energy consumption and calculate your carbon footprint.

85. Build a Gas Detector

Detects harmful gases in the air and provides safety alerts.

86. Create a Smart Waste Compactor

Monitor fill levels and compact waste automatically.

87. Design a Biodegradable Materials Tester

Test how fast materials decompose and track the process.

88. Build a Water-Cleaning Robot

Use a robot with nets to clean floating debris from water bodies.

89. Create a Tree Health Monitor

Track growth and environmental conditions of trees for health monitoring.

90. Design a Recycling Bin Sorter

Use image recognition to sort different types of waste in a bin.

91. Build a Water Consumption Monitor

Detects leaks and tracks water usage with a monitoring system.

92. Create an Electronic Pollution Detector

Measure air quality parameters to detect various types of pollution.

93. Design a Food Waste Reduction System

Use weight-tracking technology to monitor and reduce food waste.

94. Build a Paper Recycling Machine

Convert waste paper into usable paper with a simple recycling machine.

95. Create a Solar-Powered Air Purifier

Clean air using solar power and track filtration efficiency.

96. Design a Compost Monitor

Track temperature and moisture content in compost for optimal decomposition.

97. Build a Leak Detection System

Detects water leaks using moisture sensors and sends alerts.

98. Create an Eco-Friendly Packaging Tester

Test packaging materials for biodegradability and strength.

99. Design a Renewable Energy Calculator

Show the environmental impact and savings from using renewable energy.

100. Build a Material Analyzer

Identify recyclable items using sensor technology for better recycling practices.

Health and Medical Technology

101. Build a Heart Rate Monitor

Use an LED display to show real-time pulse data.

102. Create a Pedometer

Measure steps and distance with an accelerometer sensor.

103. Design a Medication Reminder System

Set scheduled alerts to remind users to take their medicine.

104. Build a Blood Pressure Monitor

Use a pressure sensor to measure and display blood pressure readings.

105. Create a Temperature Tracker

Monitor body temperature and alert users when there's a fever.

106. Design a Hydration Monitor

Track daily water intake and remind users to stay hydrated.

107. Build a Posture Detector

Warn users about incorrect sitting posture to prevent back problems.

108. Create a Sleep Monitor

Analyse movement patterns during sleep to track rest quality.

109. Design a Touchless Sanitizer Dispenser

Dispense sanitiser automatically with infrared presence detection.

110. Build a UV Exposure Meter

Warn users about dangerous UV radiation levels with a simple meter.

111. Create a Wheelchair Sensor

Detects obstacles and provides audio warnings for wheelchair users.

112. Design a Glucose Monitor

Connect a glucose monitoring system to a phone app via Bluetooth.

113. Build an Exercise Counter

Track repetitions during exercise using motion sensors.

114. Create a Breathing Monitor

Measure respiratory rate with a pressure sensor to monitor breathing.

115. Design a Vision Testing Device

Use an eye chart and responses to test vision accuracy.

116. Build a Color Blindness Detector

Use RGB LED test patterns to detect colour blindness.

117. Create a Reaction Timer

Measure response speed to visual stimuli with a simple timer.

118. Design a Muscle Activity Sensor

Track muscle activity using EMG signal processing.

119. Build a Balance Assessment System

Use a pressure sensor array to assess and improve balance.

120. Create a Hearing Test Device

Generate tones at different frequencies for a simple hearing test.

121. Design a Mobility Assistance Robot

Build a robot that follows users to help carry items.

122. Build a Pill Sorting System

Organise medication by schedule with an automated sorting system.

123. Create a Fall Detection Device

Use an accelerometer to detect falls and send emergency alerts.

124. Design a Smart First Aid Kit

Track supplies and expiration dates to ensure readiness.

125. Build a Health Logger

Record vital signs and connect the data to a smartphone.

Transportation and Mobility

126. Create an Automated Bicycle Parking System

Design a secure bike parking system with tracking features.

127. Design a Traffic Light Countdown Timer

Show remaining time with an LED display for better traffic flow.

128. Build a Vehicle Speed Detector

Use radar sensor technology to measure and display vehicle speeds.

129. Create a Parking Space Finder

Detects and displays available parking spaces with occupancy sensors.

130. Design a Collision Warning System

Warn drivers about potential collisions using ultrasonic distance sensors.

131. Build an Electric Skateboard

Control speed wirelessly with a remote for an electric skateboard.

132. Create a Solar-Powered Model Car

Design a model car powered by solar energy with an efficient motor.

133. Design a Bus Tracking System

Use GPS to track bus locations and predict arrival times.

134. Build a Smart Bike Lock

Control and monitor a bike lock remotely with a smartphone.

135. Create a Pedestrian Crossing Signal

Include countdown and audio cues for safer pedestrian crossings.

136. Design a Fuel Consumption Calculator

Track fuel efficiency and display real-time consumption data.

137. Build a Smart Helmet

Detects impacts and sends emergency alerts for bike riders.

138. Create a Tire Pressure Monitoring System

Monitor tyre pressure wirelessly to ensure vehicle safety.

139. Design a Bike Sharing Station

Automate bike locks and tracking for a shared bike system.

140. Build a Vehicle Emissions Analyzer

Measure and analyse exhaust gases to check vehicle emissions.

141. Create a Road Safety System

Detects hazards and alerts drivers using sensor arrays.

142. Design a Traffic Counter

Count passing vehicles with an infrared beam detection system.

143. Build a Crash Detector

Automatically send emergency notifications after a vehicle crash.

144. Create a Navigation System

Use GPS to calculate and display optimal routes for travellers.

145. Design a Railway Crossing Model

Include gates and warning signals to demonstrate railway safety.

146. Build a Smart Traffic Light

Adjust traffic light timing based on real-time traffic conditions.

147. Create a Parking Assistant

Use distance sensors to guide vehicles into parking spaces.

148. Design a Road Condition Monitor

Detect ice and water on roads to improve driving safety.

149. Build a Vehicle Tracker

Track vehicle locations using GPS and cellular data.

150. Create a Smart Street Light System

Control street lights with motion detection for energy efficiency.

Agriculture and Food Technology

151. Design an Automated Irrigation Controller

Monitor soil moisture and weather to water crops automatically.

152. Build a Crop Health Detector

Analyse leaf colour to assess the health of crops.

153. Create a Greenhouse Controller

Automatically manage temperature and humidity in a greenhouse.

154. Design a Soil Moisture Tracker

Use a wireless sensor network to track soil moisture levels.

155. Build a Plant Disease Identifier

Identify plant diseases with a camera and image analysis.

156. Create a Seed Sorting Machine

Sort seeds by size and weight with a simple machine.

157. Design a Weather Station

Measure temperature, humidity, and wind speed for farm management.

158. Build a Crop Yield Estimator

Estimate crop yields using growth pattern analysis.

159. Create a Smart Compost Bin

Monitor compost temperature and moisture for optimal decomposition.

160. Design a Farm Equipment Tracker

Use GPS to track the location of farm equipment.

161. Build a Pest Detection System

Detects pests with ultrasonic and infrared sensors to protect crops.

162. Create a Food Freshness Monitor

Measure gas emissions from produce to check freshness.

163. Design a Vertical Farm Controller

Manage light and nutrient delivery in a vertical farm automatically.

164. Build a Hydroponic System

Monitor pH and nutrient solution levels for hydroponic farming.

165. Create a Livestock Feeding System

Dispense food for livestock automatically on a set schedule.

166. Design a Water Calculator

Calculate irrigation needs based on crop requirements and weather data.

167. Build a Fertilizer Dispenser

Control fertiliser application based on soil nutrient analysis.

168. Create a Farm Data Logger

Record environmental conditions on a farm over time.

169. Design an Electronic Scarecrow

Detect and scare away birds using motion sensors.

170. Build a Solar Crop Dryer

Dry crops using solar power with controlled temperature and humidity.

171. Create a Beehive Monitor

Track colony health and honey production with a beehive monitor.

172. Design a Farm Security System

Use cameras and motion detection to secure farm property.

173. Build a Crop Storage Monitor

Control and monitor temperature and humidity in crop storage areas.

174. Create a Smart Sprinkler

Adjust water flow for crops based on real-time conditions.

175. Design a Livestock Tracker

RFID tags are used to monitor the location and status of livestock.

Education and Learning Tools

176. Build a Voice-Enabled Calculator

Help students by providing spoken results for math problems.

177. Create an Interactive Periodic Table

Display element information with an interactive table for learning chemistry.

178. Design a Math Game

Use LED lights to create a fun, interactive math problem-solving game.

179. Build a Language Learning Device

Incorporate speech recognition for practising new languages.

180. Create a Moving Solar System Model

Show orbital periods with a model of the solar system.

181. Design a Geography Quiz Machine

Use an interactive world map to quiz users on geography knowledge.

182. Build a Spelling Checker Device

Provide feedback on spelling using voice input and electronic scoring.

183. Create a Science Kit

Include experiments and components to teach basic electronics and physics.

184. Design a Reading Assistant

Highlight and read text aloud to learn new languages or assist in reading.

185. Build a Historical Timeline Display

Show important historical events with an interactive display.

186. Create a Music Theory Learning Tool

Teach music theory concepts with an electronic keyboard and visual aids.

187. Design a Circuit Learning Board

Help students learn electronics with a hands-on circuit building board.

188. Build a Math Formula Display

Use an interactive display to help students learn and practice formulas.

189. Create a Virtual Dissection Table

Show internal organs and systems with an interactive touchscreen.

190. Design an Astronomy Viewer

Display real-time star maps and celestial events with an interactive viewer.

191. Build a Chemistry Reaction Simulator

Simulate chemical reactions and visualise molecular interactions.

192. Create a Physics Experiment Kit

Demonstrate physical principles like gravity and inertia with simple experiments.

193. Design a Programming Learning Board

Teach coding concepts with a visual and interactive programming board.

194. Build a 3D Model Viewer

Show and manipulate 3D models of biological and mechanical systems.

195. Create a Historical Artifact Display

Include interactive content to explore historical artefacts.

196. Design a Math Puzzle Board

Challenge students with interactive math puzzles.

197. Build a Language Pronunciation Guide

Provide correct pronunciation feedback with a language learning device.

198. Create a Quiz Buzzer System

Host quiz games with a buzzer system for answering questions.

199. Design a Science Fair Display

Showcase scientific concepts and experiments with an interactive display.

200. Build an Educational Game Console

Include educational games to teach various subjects interactively.