|  |  |  |  |
| --- | --- | --- | --- |
| **8051 training module** | | | |
| S.no | topic | learning resources (Theory) | Task list (practical’s) |
|  | Microprocessor and microcontroller,  Criteria for choosing a micro controller | <https://www.tutorialspoint.com/microprocessor/microcontrollers_overview.htm>  <https://www.guru99.com/difference-between-microprocessor-and-microcontroller.html>  <https://circuitdigest.com/article/what-is-the-difference-between-microprocessor-and-microcontroller#:~:text=1.,compact%20while%20microprocessor%20is%20bulky>.  <https://www.youtube.com/watch?v=n6onhhIL6gM&vl=en>  <https://www.microcontrollertips.com/key-factors-consider-choosing-microcontroller/>  <https://circuitdigest.com/article/how-to-select-the-right-microcontroller-for-your-embedded-application>  Topics covered:  Difference between Microprocessor and Microcontroller, Types of Microcontrollers, Applications of Microcontrollers, Key factors to consider when choosing a microcontroller. | Compare 8085, 8086, 8051 and summarize the points. |
|  | Introduction to 8051 microcontroller | <https://www.tutorialspoint.com/microprocessor/microcontrollers_8051_architecture.htm>  <https://www.robomart.com/blog/introduction-to-8051-microcontroller/>  <https://www.electronicwings.com/8051/introduction-to-8051-controller>  Topics covered:  Introduction to 8051 Controller, 8051 Architecture & Pin diagram, FEATURES OF 8051. | * Observe the 8051 development board and learn the pin out and features of it. * Learn about Keil IDE program structure, Data types, Variables &constants, operators, control statements, loops, functions, strings, string object, time, arrays. |
|  | Basic embedded programs in keilv3 software & wilpro software | <https://embetronicx.com/tutorials/microcontrollers/8051/how-to-install-keil-for-8051/>  <https://embetronicx.com/tutorials/microcontrollers/8051/how-to-create-project-in-keil/>  <https://embetronicx.com/tutorials/microcontrollers/8051/8051-gpio-tutorial-led-interfacing/>  <https://www.youtube.com/watch?v=5WA6__CZ104>  <https://circuitdigest.com/electronic-circuits/rf-home-automation>  Topics covered:  Install Keil IDE, Project Creation in Keil, GPIO Tutorial, DTMF, RF module | * Write a program for Led interfacing with 8051 in keil and test the simulation output in proteus and physical output in 8051 development board. * Write a program for switch & led interfacing with 8051 in keil and test the simulation output in proteus and physical output in 8051 development board. * Write a program for water level indicator by using with 8051 in keil and test the simulation output in proteus and physical output in 8051 development board. * Write a program for DTMF based home automation by using with 8051 in keil and test the physical output in 8051 development board. * Write a program for RF based door control by using with 8051 in keil and test the physical output in 8051 development board. |
|  | Timers/counters | <https://embetronicx.com/tutorials/microcontrollers/8051/8051-timer-counter-tutorial/>  <https://exploreembedded.com/wiki/index.php?title=5.8051%20Timer%20programming>  Topics covered:  Timers | * Write a program for create delay of 5 sec with timer0 on 8051 with keil and test the simulation output in proteus and physical output in 8051 development board. |
|  | Interfacing sensors with 8051 | <https://embetronicx.com/tutorials/microcontrollers/8051/ir-sensor-interfacing-with-8051/>  <https://embetronicx.com/tutorials/microcontrollers/8051/pir-sensor-interfacing-with-8051/>  <https://embetronicx.com/tutorials/microcontrollers/8051/sound-sensor-interfacing-with-8051/>  <https://embetronicx.com/tutorials/microcontrollers/8051/flame-sensor-interfacing-with-8051/>  <https://embetronicx.com/tutorials/microcontrollers/8051/lpg-gas-sensor-interfacing-with-8051/>  <https://embetronicx.com/tutorials/microcontrollers/8051/rain-sensor-interfacing-with-8051/>  Topics covered:  IR Sensor, Flame Sensor, Sound Sensor, PIR Sensor, Gas Sensor ,Rain Sensor Interfacing With 8051 | * Write a program for IR Sensor Interfacing with 8051 and check the physical output. * Write a program for PIR Sensor Interfacing with 8051 and check the physical output. * Write a program for Sound Sensor Interfacing with 8051 and check the physical output. * Write a program for flame Sensor Interfacing with 8051 and check the physical output. * Write a program for mq2 Sensor Interfacing with 8051 and check the physical output. * Write a program for rain drop Sensor Interfacing with 8051 and check the physical output. |
|  | How to transmit/receive a character using serial port | <https://embetronicx.com/tutorials/microcontrollers/8051/8051-uart-tutorial-serial-communication/>  <https://exploreembedded.com/wiki/index.php?title=A4.8051%20Communication%20Protocols:UART,%20RS232>  <https://circuitdigest.com/microcontroller-projects/bluetooth-controlled-home-automation-using-8051>  Topics covered:  Transmit/receive a character & String using 8051 | * Write a program for transmitting a char and receive a char and check the physical output. * Write a program for transmitting a string and receive a string and check the physical output. * Write a program for home automation using Bluetooth |
|  | LCD 4 bit Interfacing | <https://embetronicx.com/tutorials/microcontrollers/8051/lcd-4-bit-interfacing-with-8051-microcontroller/>  <https://exploreembedded.com/wiki/index.php?title=Interfacing%20LCD%20in%204-bit%20mode%20with%208051>  Topics covered:  LCD interfacing with 8051 | * Write a program for Interfacing LCD in 4-bit mode with 8051 |
|  | Introduction to the GSM | <https://embetronicx.com/tutorials/microcontrollers/8051/gsm-interfacing-with-8051/>  <https://www.electronicwings.com/8051/sim900a-gsm-interfacing-with-8051>  Topics covered:  GSM interfacing with 8051. | * Write a program for Interface GSM Module to 8051 Micro Controller-Send and Receive SMS and calling. |
|  | Introduction to the GPS | <https://embetronicx.com/tutorials/microcontrollers/8051/gps-interfacing-with-8051/>  <https://www.engineersgarage.com/8051-microcontroller/how-to-interface-gps-with-8051-microcontroller-at89c51-part-36-45/>  <https://www.electronicshub.org/interfacing-gps-8051-microcontroller/>  Topics covered:  GPS interfacing with 8051. | * Write a program for Interface GPS Module to 8051 Micro Controller and observe the longitude and latitude values. |
|  | Embedded projects with 8051 | <https://www.youtube.com/watch?v=AtfjtQ1sKw8>  <https://www.youtube.com/watch?v=DC9MSnZRrjU>  <https://www.youtube.com/watch?v=-r5GfE8QUyY> | * Women safety system using 8051 * GSM based single phase motor control * Density based home automation * Smart parking system |