# MANNAM MEMORIAL NSS COLLEGE, KOTTIYAM

## STUDENT ENROLMENT LIST

Name of department : Physics

Name of course : Microprocessor and Embedded Systems

| Sl No | Name of Student | Signature |
|---|---|---|
| 1 | AMRITHA VJ | |
| 2 | ANANDHU A | |
| 3 | ANANDHU M S | |
| 4 | ANANDHU PRASAD | |
| 5 | ANANDU S | |
| 6 | ANJALI S | |
| 7 | ANOOP S | |
| 8 | APARNNA B | |
| 9 | ARYA CHANADRAN S | |
| 10 | DEVIKA J R | |
| 11 | JIJO GEORGE | |
| 12 | JAYALEKSHMI M S | |
| 13 | KAILAS NATH R | |
| 14 | KRISHNA DEV O | |
| 15 | MIDHUN KRISHNAN B M | |
| 16 | NIJIL U | |
| 17 | PRAVEEN M | |
| 18 | SARATH P S | |
| 19 | SRADHA J S | |
| 20 | VARSHA S KUMAR | |
| 21 | ABHIRAMI R S | |
| 22 | ADITHYA KRISHNAN S | |
| 23 | AKHILA S | |
| 24 | AMAL R S | |
| 25 | AMAL SHAJI | |
| 26 | AMINA B | |
| 27 | AMRITHA J LEKSHMI | |
| 28 | ANJU KRISHNAN S | |
| 29 | ATHIRA B S | |
| 30 | BHAGYALEKSHMI G | |
| 31 | BIPIN B | |
| 32 | DANI BENZIGAR | |
| 33 | D R NANDANA | |
| 34 | GANGA S | |

| | | |
|---|---|---|
| 35 | GOPIKA RANI S | |
| 36 | ABHIJITH P | |
| 37 | AMULYA RS | |
| 38 | ANANDHU V S | |
| 39 | ANJALI DEVI S J | |
| 40 | ANOOP R | |
| 41 | ANUPAMA R S | |
| 42 | ARCHA S ANIL | |
| 43 | CHITHRA V S | |
| 44 | G R MEGHA | |
| 45 | GOKUL PRADEEP | |
| 46 | GOURI T S | |
| 47 | LEKSHMI B | |
| 48 | MEGHA M | |
| 49 | PRASIDH P S | |
| 50 | REVATHY R | |
| 51 | SARAN RAJ R G | |
| 52 | SNEHA P S | |
| 53 | SONA VASANTHAN | |
| 54 | SUPARNA AJITH | |
| 55 | SYAM G CHANDRAN | |
| 56 | VAISHNAV V B | |
| 57 | VARSHA RAJAN | |
| 58 | AARSHA UNNITHAN R J | |
| 59 | AASHIK SAFAR | |
| 60 | ABHISHEK S | |
| 61 | ADERSH J | |
| 62 | AKASH A | |
| 63 | ALSHIFA U | |
| 64 | AMAL LAL L | |
| 65 | AMAL PRASAD | |
| 66 | AMAL R | |
| 67 | AMRITHA MANIKANDAN | |
| 68 | ANUPAMA G | |
| 69 | ANUSHA MOHAN | |
| 70 | ATHIRA R NAIR | |
| 71 | | |
| 72 | No: of students enrolled - 70. | |
| 73 | | |
| 74 | | |
| 75 | | |
| 76 | | |

Course Cordinator

DEPARTMENT OF PHYSICS
M. M. N. S. S. COLLEGE
KOTTIYAM.

DEPARTMENT OF PHYSICS 2018-19

## MICROPROCESSOR AND EMBEDDED SYSTEMS

**Curriculum:**

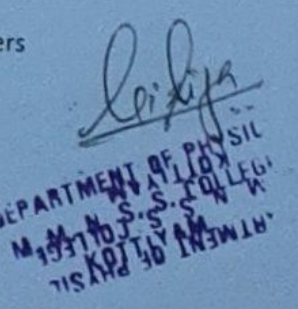
Evolution of Microprocessor, System Architecture, Basics of Intel 8085 processor, Instruction set, Assembly language programming- addition, subtraction. Embedded System Hardware: Input, Processor units, Memories, Communication, Output, System software

Arduino methodology- Prototyping, Tinkering, Patching, Circuit Bending, Hacking Toys Arduino Hardware, The software IDE, Anatomy of an Interactive Device, Sensors and Actuators, Blinking an LED Installing IDE, Setting up Arduino board, Using Arduino, simple projects with Arduino UNO - Controlling Light with PWM

Advanced projects with Arduino UNO- Light sensor instead of Push button, Serial Communication, Analog input. -Make an LED Blink at different rates, set a Traffic Lights Pattern

**Objectives:**

- Understand the evolution of microprocessor
- Describe the architecture of microprocessor
- Execute programs using assembly level programming
- Understand the Embedded system design
- Distinguish between Microprocessor based and Microcontroller based electronics
- Design simple circuits using Arduino controllers
- Understand Arduino methodology
- Demonstrate practical applications using Arduino controllers
- Demonstrate interfacing between Arduino boards and computers
- Describe Arduino hardware



# DEPARTMENT OF PHYSICS

# MICROPROCESSOR AND EMBEDDED SYSTEMS

## Course schedule

| | | | |
|---|---|---|---|
| 27.09.18 | Thursday | 3.30 - 4.30 | Introduction to Microprocessors |
| 28.09.18 | Friday | 3.30 - 4.30 | Understanding the architecture of microprocessor |
| 29.09.18 | Saturday | 9.30-12.30 | Embedded system designed |
| 01.10.18 | Monday | 3.30 - 4.30 | understanding difference between microprocessor based & microcontroller based electronics |
| 03.10.18 | Wednesday | 3.30-4.30 | What is Arduino |
| 05.10.18 | Friday | 3.30-4.30 | Understand Arduino methodology |
| 06.10.18 | Saturday | 9.30-12.30 | Prototyping, Tinkering, Patching |
| 08.10.18 | Monday | 3.30-4.30 | Circuit Bending, Hacking Toys |
| 11.10.18 | Thursday | 3.30-4.30 | Understanding Arduino hardware |
| 12.10.18 | Friday | 3.30-4.30 | The software IDE, Anatomy of an Interactive Device |
| 13.10.18 | Saturday | 9.30-12.30 | Sensors and Actuators, Blinking an LED |
| 15.10.18 | Monday | 3.30-4.30 | How to build Arduino circuits. |
| 18.10.18 | Thursday | 3.30 - 4.30 | Design simple circuits using Arduino controllers |
| 19.10.18 | Friday | 3.30 - 4.30 | Design simple circuits using Arduino controllers |
| 20.10.18 | Saturday | 9.30-12.30 | Understand Arduino methodology using these simple circuits |
| 22.10.18 | Monday | 3.30 - 4.30 | Controlling light with PWM |
| 24.10.18 | Wednesday | 3.30-4.30 | Introduction to Advanced application with Arduino controllers |
| 25.10.18 | Thursday | 3.30-4.30 | Light sensor instead of push button |
| 26.10.18 | Friday | 3.30-4.30 | Serial communication |
| 27.10.18 | Saturday | 9.30-12.30 | Analog input. -Make an LED Blink at different rates, Set a Traffic Lights Pattern |
| 29.10.18 | Monday | 3.30-4.30 | End Course evaluation |

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**Microprocessor and Embedded Systems**
**Add On-Course 2018-19, PG Department of Physics**
**MM NSS College, Kottiyam**

**Total Marks: 50** **Duration: 2 Hours**

**Section A: 1-Mark Questions** *Answer all questions. Each question carries 1 mark.*

1. What does the acronym CPU stand for in microprocessor terminology?
2. Name the primary function of the ALU (Arithmetic Logic Unit) in a microprocessor.
3. What is the role of a microcontroller in an embedded system?
4. What type of memory is typically used to store the firmware in an embedded system?
5. Which register in a microprocessor holds the address of the next instruction to be executed?

**Section B: 2-Mark Questions** *Answer all questions. Each question carries 2 marks.*

1. Briefly explain the difference between a microprocessor and a microcontroller.
2. What is an interrupt in the context of microprocessors, and why is it important?
3. Describe the function of a Timer/Counter in a microcontroller.
4. Explain the concept of 'polling' and 'interrupt-driven' I/O in embedded systems.
5. What is the significance of the stack pointer in a microprocessor?

**Section C: 15-Mark Questions** *Answer all questions. Each question carries 15 marks.*

1. **Microprocessor Architecture:** a. Describe the basic architecture of a microprocessor, including key components such as the CPU, memory, and I/O ports.
   b. Explain the role and interaction of the control unit, ALU, and registers in the CPU.
   c. Draw and label a simple block diagram of a microprocessor architecture, highlighting the major components.
2. **Embedded Systems Design:** a. Explain the key characteristics of embedded systems, including real-time operation, resource constraints, and dedicated functionality.
   b. Discuss the typical components of an embedded system, such as the microcontroller, sensors, actuators, and communication interfaces.
   c. Provide an example of an embedded system application, describing its components and how they work together.
3. **Instruction Set and Assembly Language:** a. Describe the role of an instruction set in a microprocessor and how it affects programming and performance.
   b. Write and explain a simple assembly language program that performs basic arithmetic operations, such as addition and subtraction.
   c. Discuss how assembly language programming is different from high-level programming languages.
4. **Interrupts and Timers in Microcontrollers:** a. Explain the concept of interrupts in microcontrollers and how they are handled. Include the types of interrupts and their priorities.
   b. Describe how timers and counters are used in microcontrollers for tasks such as generating time delays and measuring time intervals.
   c. Provide an example of how an interrupt can be used in an embedded system application.

(Course Coordinator)

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## MANNAM MEMORIAL NSS COLLEGE, KOTTIYAM

### END COURSE EVALUATION

Name of department : Physics

Name of course : Microprocessor and Embedded Systems

Duration of exam : 2h

Total Marks : 50

| Sl No | Name of Student | Marks Obtained |
|---|---|---|
| 1 | Amritha V.J | 41 |
| 2 | Anandhu A | 38 |
| 3 | Anandhu M.S | 37 |
| 4 | Anandhu Prasad | 44 |
| 5 | Anandhu S | 36 |
| 6 | Anjali S | 42 |
| 7 | Anoop S | 35 |
| 8 | Aparna B | 44 |
| 9 | Arya Chandran S | 43 |
| 10 | Devika J.R | 47 |
| 11 | Jijo George | 28 |
| 12 | Jayalekshmi M.S | 36 |
| 13 | Kailas Nath R | 34 |
| 14 | Krishna Dev O | 41 |
| 15 | Midhun krishnan B.M | 40 |
| 16 | Nijil U | 36 |
| 17 | Praveen M | 31 |
| 18 | Sarath P.S | 37 |
| 19 | Sindha J.S | 48 |
| 20 | Varsha S Kumar | 42 |
| 21 | Abhirami R.S | 40 |
| 22 | Adithya Krishnan S | 43 |

| | | |
|---|---|---|
| 23 | Akhila.S | 41 |
| 24 | Amal R.S | 39 |
| 25 | Amal Shaji | 47 |
| 26 | Amina.B | 39 |
| 27 | Amritha.J Lekshmi | 35 |
| 28 | Anju Krishnan S | 48 |
| 29 | Athira.B.S | 42 |
| 30 | Bhagya lekshmi.G | 47 |
| 31 | Bipin.B | 46 |
| 32 | Dani Benzigar | 41 |
| 33 | D R Nandana | 43 |
| 34 | Ganga.S | 39 |
| 35 | Gopika Rani.S | 45 |
| 36 | Abhijith.P | 47 |
| 37 | Amulya.R.S | 43 |
| 38 | Anandhu V.S | 40 |
| 39 | Anjali Devi S.J | 45 |
| 40 | Anoop.R | 37 |
| 41 | Anupama R.S | 42 |
| 42 | Archa S Anil | 43 |
| 43 | Chithra.V.S | 38 |
| 44 | G.R Megha | 32 |
| 45 | Gokul Pradeep | 28 |
| 46 | Gouri T.S | 48 |
| 47 | Lekshmi.B | 44 |
| 48 | Megha.M | 31 |
| 49 | Prasidh P.S | 40 |
| 50 | Revathy.R | 33 |
| 51 | Saran Raj R.G | 38 |
| 52 | Sneha.P.S | 40 |
| 53 | Sona Vasanthan | 42 |
| 54 | Suparna Ajith | 39 |

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|---|---|---|
| 55 | Syam G Chandran | 40 |
| 56 | Vaishnav V.B | 42 |
| 57 | Varsha Rajan | 31 |
| 58 | Adarshacunnithan R.J | 33 |
| 59 | Aasbik Safar | 28 |
| 60 | Abhishek.S | 44 |
| 61 | Adersh J | 42 |
| 62 | Akash A | 43 |
| 63 | Alphifa.U | 40 |
| 64 | Amal lal.L | 44 |
| 65 | Amal Prasad | 39 |
| 66 | Amal R Amrithe | 41 |
| 67 | Manikandan | 39 |
| 68 | Anupama G Anushma | 40 |
| 69 | Mohan | 38 |
| 70 | Athira R Nair | 41 |

No: of students: 70

(Course Coordinator)

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M. M. N. S. S. COLLEGE
KOTTIYAM.

Department of Physics 2018-19

# MICROPROCESSOR AND EMBEDDED SYSTEMS

## Report

In order to develop digital competence this course was designed so as to use techniques, skills and modern information technology tools at their study and workplace.. This course was to bring about the relevance of industry based courses and to attain hands on training on experimental skills. In this course the course outcome was to understand microprocessors and microcontrollers, embedded systems, to understand Arduino and to give hands on training on applications of Arduino. The classes were of 30 hours duration and were conducted after regular classes and on Saturdays. Both theory and practical sessions were given to the students. This course was highly beneficial for the students.

## Feedback analysis

This Add on course imparted valuable skills and was very knowledgeable. It showcased the efficiency and productivity of the students. Students provided a positive response about the course offered. It provided them with a strong foundation on Microprocessors and embedded system.

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KOTTIYAM, KOLLAM

Principal
M.M.N.S.S.COLLEGE
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