

Short Term Courses

COURSES FOR DIPLOMA/DEGREE IN MECHANICAL ENGG. OR EQUIVALENT		
COURSE NAME	DURATION	COURSE FEE
Auto CAD (Mechanical)	1 Month	₹7,000/-
CATIA	1 Month	₹8,000/-
Creo	1 Month	₹8,000/-
UNIGRAPHICS	1 Month	₹8,000/-
SOLIDWORKS	1 Month	₹8,000/-
MASTER CAM	1 Month	₹8,000/-
CNC Milling & Turning	1 Month	₹8,000/-
ANSYS	2 Weeks	₹8,000/-
3D Printing & Additive Manufacturing	2 Weeks	₹8,000/-
COURSES FOR DIPLOMA/DEGREE IN ELECTRICAL/ ELECTRONICS ENGG. OR EQUIVALENT		
COURSE NAME	DURATION	COURSE FEE
PLC	1 Month	₹8,000/-
VLSI	1 Month	₹8,000/-
SCADA	1 Month	₹8,000/-
Advanced Embedded System	1 Month	₹8,000/-
ROBOTICS	1 Month	₹8,000/-
Lab View	1 Month	₹8,000/-
E.CAD	1 Month	₹7,000/-
COURSES FOR DIPLOMA/DEGREE IN CIVIL ENGG.		
COURSE NAME	DURATION	COURSE FEE
Auto CAD (Civil)	1 Month	₹7,000/-
STAAD PRO	1 Month	₹8,000/-
3Ds Max	1 Month	₹8,000/-
REVIT	1 Month	₹8,000/-
COURSES FOR ANY GRADUATE		
COURSE NAME	DURATION	COURSE FEE
MAT LAB	2 Weeks	₹8,000/-
Hardware Networking	1 Month	₹5,500/-
.NET	1 Month	₹5,500/-
Core JAVA	1 Month	₹5,500/-
Advanced JAVA	1 Month	₹5,500/-
C	1 Month	₹3,500/-
C++	1 Month	₹3,500/-
Entrepreneurship Skill Development Program	2 Weeks	₹2,500/-
Internet of Things	2 Weeks	₹8,000/-

ALL THE ABOVE SHORT TERM COURSE START ON 1ST WORKING DAY OF EVERY MONTH

ADVANCED EMBEDDED TECHNOLOGY (AET)



MSME TOOL ROOM, BHUBANESWAR

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CENTRAL TOOL ROOM & TRAINING CENTRE Bhubaneswar, Odisha

NSQF Complied Long Term Courses

COURSE NAME		DURATION	COURSE FEE
COURSES FOR 10TH PASS OUT			
Diploma in Tool & Die Making	DTDM	4 Year	₹19,000/- (per Semester)
Diploma in Mechantronics	DIM	3 Year	₹19,000/- (per Semester)
ITI Machinist	ITIM	2 Year	₹28,000/- (per Year)
ITI Fitter	ITIF	2 Year	₹28,000/- (per Year)
ITI Electrician	ITIE	2 Year	₹28,000/- (per Year)
Condensed Course in Tool & Die Making	CTDM	1 Year	₹66,000/-
Certificate Course in CNC Turning & Milling	CCTM	1 Year	₹32,000/-
COURSES FOR UNDER MATRIC			
Certificate Course in Machine Operation	CCMO	1 Year	₹18,000/-
COURSES FOR ITI STUDENTS			
Certificate Course in Advance Machining	CCAM	1 Year	₹32,000/-
Advance Certificate Course in Machine Maintenance	ACCMM	1 Year	₹32,000/-
Advance Certificate Course in CNC Machining	ACCCM	1 Year	₹34,000/-
Advance Certificate Course in Welding Technology	ACCWT	1 Year	₹50,000/-
Certificate Course in Machining	CCM	6 Months	₹22,000/-
Certificate Course in Fitting & Rigging	CCFR	6 Months	₹32,000/-
Suryamitra	-----	1.5 Months	₹10,000/-
COURSES FOR DIPLOMA IN MECHANICAL ENGG. OR EQUIVALENT			
Post Diploma in Tool & Die Manufacturing	PDTDM	1 Year	₹54,000/-
Post Diploma in CAD/CAM	PDCC	1 Year	₹54,000/-
Advance Diploma in CNC Programming Techniques & Practice	ADCNC	6 Months	₹34,000/-
COURSES FOR DEGREE IN MECHANICAL ENGG. OR EQUIVALENT			
Post Graduate Diploma in Tool Design & CAD/ CAM	PGTD	1 Year	₹60,000/-
Post Graduate in Aerospace Manufacturing	PGAM	1 Year	₹60,000/-
Master Certificate course in CAD / CAM	MCC	6 Months	₹36,000/-
COURSES FOR DIPLOMA IN ELECTRICAL/ELECTRONICS ENGG. OR EQUIVALENT			
Advanced Diploma in Machine Maintenance & Automation	ADMMA	6 Months	₹34,000/-
Advanced Embedded Technology	AET	6 Months	₹34,000/-
Certificate Course in Electrical Equipment Repair & Maintenance	CCERM	6 Months	₹34,000/-
Post Diploma in Industrial Automation & Robotics	PDIAR	1 Year	₹60,000/-
COURSES FOR DEGREE IN ELECTRICAL/ELECTRONICS ENGG. OR EQUIVALENT			
Master Certificate Course in Automation & Process Control	MCCAPC	6 Months	₹36,000/-
COURSES FOR DIPLOMA IN MECHANICAL/ ELECTRICAL/ELECTRONICS ENGG. OR EQUIVALENT			
Post Diploma In Mechatronics	PDIM	1 Year	₹54,000/-
COURSES FOR DIPLOMA/DEGREE IN CIVIL ENGG.			
Post Diploma in Structural Design & Analysis	PDSDA	1 Year	₹54,000/-
Advance Diploma in Structural Design & Analysis	ADSDA	6 Months	₹34,000/-
COURSES FOR ANY GRADUATE			
Advance Certificate Course in Inspection & Quality Control	ACCIQ	6 Months	₹22,000/-
Advance Diploma in Computer Hardware & Networking Management	ADCHNM	6 Months	₹34,000/-
Advanced Certificate Course in Software Application	ACCSA	6 Months	₹22,000/-

ADVANCED EMBEDDED TECHNOLOGY (AET)

Introduction to CTTC:

MSME Tool Room Bhubaneswar (Central tool Room & Training Centre) established in the year 1991, Today stands as the premier Tool Room & Training Centre in India. Under the Technical Co-operative programme between Government of India and Govt. of Denmark the Centre was established as a Govt. of India Society. The management of affairs of the Centre rests with the Governing Council constituted by Govt. of India. Additional Secretary & Development Commissioner (MSME), Govt. of India, is the President of the Society & Chairman of the Governing Council.

MSME Tool Room –Bhubaneswar is on the way of achieving its set goal with its extension Centre at Rayagada and Kalinga nagar, Odisha. It believes its bench marking its standards not only against the tool room and training centers in India and the world. The zeal and experience and commitment of employees has been pushing the Centre to achieve the greater height of quality industry oriented training programs for different levels and different discipline students and production of highly precision components for tool and die making, automobile and aerospace components.

Objectives of this course

Upon completion of this course, Participants will be able to:

- Work as an embedded software or hardware developer.
- Work as a PCB designer
- Design printed circuit board design, and product based on embedded systems.

Who can avail this opportunity:

Diploma or Degree in Electrical/ Electronics/Computer /Biomedical /IT/Instrumentation. B.Sc. /M.Sc. in (I.T./Electronics/Physics)

NSQF Qualification: Level – 6

Duration: 6 months

Occupation of Qualification: Tool Designer

Progression of Occupation from Qualification: Work as a Junior Embedded Engineer after 2 year of experience he/she get Senior Embedded Engineer and according to performance the candidate will work as a Manager.

Fee:

₹ 34,000/- per participant to be paid in the following instalments.

At the time of registration	:	₹ 1,000/-
First Instalment	:	₹ 16,000/- (At the time of admission)
Second Instalment	:	₹ 17,000/- (After completion of two month)
NSQF Examination Fee	:	₹ 800/- (At the time of admission)

22.5% seats are reserved for SC/ST candidates for whom no course fee will be charged subject to production of two photocopies of caste certificate dully attested by Greeted Officer. However, all other fees/deposits is to be paid in case of admission. Caste Certificate in Original from competent authority is to be produced for verification at the time of admission which may be revived from the issuing authority.

DETAILED COURSE PLAN FOR 6-MONTHS

SL. NO.	Title and identification code of component.	Estimated Time
1	PIC Microcontroller	70
2	Embedded C/C++	70
3	Communication protocol & Implementation	70
4	Robotics- Interfacing with Motors and Sensors	70
5	ARM-Advanced RISC Machine(LPC2148)	70
6	Concept of RTOS	70
7	VLSI Design with FPGA/CPLD	70
8	PCB Designing	70
9	Python Programming on Raspberry Pi	70
10	Project	150
TOTAL HOURS		780

EVALUATION PATTERN:

SL NO.	SUBJECT	THEORY	PRACTICAL	TOTAL
1	PIC MICROCONTROLLER	40	60	100
2	Embedded C/C++	40	60	100
3	Communication protocol & Implementation	40	60	100
4	Robotics- Interfacing with Motors and Sensors	40	60	100
5	ARM-Advanced RISC Machine(LPC2148)	40	60	100
6	Concept of RTOS	40	60	100
7	VLSI Design with FPGA/CPLD	40	60	100
8	PCB Designing	40	60	100
9	Python Programming on Raspberry Pi	40	60	100

ELIGIBILITY TO APPEAR IN THE EXAM:

Minimum 75% attendance is compulsory for the students to appear for the assessments.

PASSING MARKS:

Passing criteria is based on marks obtain in attendance record, term works, assignments, practical's performance, viva or oral exam, module test, practical exam and final exam

Minimum Marks to pass practical exam – 60%, Minimum Marks to pass final exam –40%, Minimum Marks to pass viva/oral exam – 60%, Minimum Marks to pass Project report and presentation exam – 60%

DETAILED COURSE CONTENT

Course Name	Contents (chapters/topics)
PIC Microcontroller	Introduction to 8-bit PIC microcontroller, Architecture of PIC MCU Series, Application of PIC Microcontroller, Introduction to PIC MCU Series, Introduction to PIC18f4550 Family, Architecture of PIC18f4550, Understanding the instruction set used for programming. Interfacing with Peripherals, concept and types of Peripherals. Introduction to internal peripherals of PIC microcontroller, Interfacing with internal peripherals such as Timer/Counter, Serial Communication, Interrupt, CCP, EEPROM memory, ADC etc. Interfacing with external peripherals such as LED, LCD (Liquid Crystal Display),
Embedded C/C++	Introduction to Programming Language, Concept of C/C++, Use of Decision Making Statement, Use of structure and pointer, Use of Arrays and Functions. Introduction to MPLABX Compiler, Methods of Compiling and Debugging and execution of program file on hardware. Introduction to Embedded C/C++, Initialization of program using microcontroller registers, Understanding the concept of port programming and providing delay method. Understanding the concept of peripherals, Types of Peripherals. Introduction to internal peripherals of PIC microcontroller. Programming the peripherals with Embedded C/C++.
Communication Protocol & Implementation Total	Introduction to Communication Protocol, I2C - Interfacing with micro controller using bit-banking method, I2C devices – RTC, Memory, ADC-DAC, Port-Expander, SPI (Serial Peripheral Interface), Bluetooth, Wi-Fi and RFID. Understanding Serial, Communication, Bluetooth Communication, SPI Interface ZigBee, Wi-Fi, I2C, Infrared, RFID, GSM, GPS, PDH/SDH/Ethernet
Robotics-Interfacing With Motors and Sensors	Introduction to Robotics, Concept of robotics and their mechanism, Application using robot, Types of motors & sensors, Interfacing of motors & sensors with microcontroller, Application of motors & sensors in robotics field, Usage of motors & sensors in robotics vehicle and product. Introduction to Stepper Motor, Types and operation of Stepper Motor Applications of Stepper motor, hardware interface for driving Stepper motor, Software driver for Stepper motor. Introduction of servo motor, concept and Use of servo motor, Stepper vs. servo Working principle and application of servo motor Hardware interface for driving servo motor, Software driver for servo motor.
ARM-Advanced RISC Machine (LPC2148)	Introduction to ARM Processor, Architecture of ARM7TDMI Processor, Advantages of 32-bits over 8-bits controller ARM-7 TDMI Core architecture: Application and Architecture of ARM7TDMI Processor, Interfacing with various peripherals, Peripherals of ARM processor for different applications, LPC 2148 ARM with in built peripherals, SPI based programming LCD interfacing, Introduction to LPC1768 (Cortex-M3 series) and different series of ARM Processor. Introduction to LPC1768 (Cortex-M3 series), Application and Architecture of LPC1768 (Cortex-M3 series) core. Interfacing with peripherals of LPC1768(Cortex-M3 series)
Concept of RTOS	Introduction of real time operating system, concept and application of RTOS. Kernel: Introduction of Kernel, Architecture and Execution of Kernel. Programming in RTOS: Building block policies used in RTOS, Programming Concept used to execute task, Different task scheduling while programming for RTOS.

VLSI Design with FPGA / CPLD	Introduction to CPLD / FPGA architecture, Types of designing e.g. Digital design or analog design and their respective design flow. Partitioning the design into different blocks, design type such as application specific integrates circuit (ASIC), Field-programmable gate arrays (FPGA) and complex programmable logic device (CPLD). Design languages such as hardware design language (HDL), e.g. Verilog, VHDL, High level language such as C, the codes required for design. Creation of code, verification, testing software, Testing various examples on the system. VHDL programming Programming through JTAG on Xilinx Spartan 3 Board
PCB Designing	Developing schematic and PCB layout, converting them to Gerber format using CAD and other software tools, suitable for production and assembly process. Systems analyst on the customer requirement and get inputs. Develop schematics, Convert schematics to PCB layout, Conversion of Gerber file and sending to manufacturer, Detailed instructions and information to be sent to manufacturer, achieve productivity and quality standards framing the circuit specifics before drawing, designing schematics for the circuit. Creating a new project schematic on the designing software Adding components, component values, connection between components and power connection on it, wiring diagram, Illustration of flow of connections from input to output.
Python Programming on Raspberry Pi	Introduction to Raspberry Pi, Comparison with Microcontroller and Raspberry Pi, Architecture of ARM11 processor, Pipelining method to execute the instruction. Introduction to Python programming, Basic concept of Programming, Method of decision making, looping, branching, Declaration of functions, array, pointer, Python programming using Raspberry Pi, Format code related to application Raspberry Pi with different peripherals, Port Programming, Led and LCD Interfacing, UART, Bluetooth Interfacing of Sensors: Ultrasonic Sensor, IR Sensor etc. Interfacing with Motors: DC Motor, Stepper Motor, Servo Motor etc. Remote login method to interlink Raspberry Pi with laptop. Debugging and executing programs using Raspberry Pi.
Soft Skills	Preparing job-oriented resume communication skills (verbal and non-verbal), Public speaking, personality (types and attributed), Personality test, Interview techniques (FAQ, HR and Telephone) and Presentation Skills, Group Discussion and Introduction to ISO 9001 Problem Solving and Feedback.

How to apply:

Application form attached with the broacher be filled up & mailed to Sr. Manager (Training) along with a D/D of ₹1000.00 on or before. In the event of selection this money will be adjusted in the course fee otherwise refund will be given on or before one week of course starts. Admission notification will be issued immediately after the last date of receipt of application and selected candidates will be required to pay fees within 15 days on or before and report for training from _____

Hostel Accommodation:

Dormitory accommodations can be arranged in the CTTC guest house which can be booked on advanced request. The accommodation charges will be ₹1200.00 per month per bed.

Uniform:

The candidates will have to get uniforms, dress stitched at their own cost as per the colour & design specified by the center.

Certification:

After successful completion of training main certificate with grade, mark sheet & project certificate will be issued separately to the trainees.

Placement Help:

CTTC placement cell will make efforts to contact & invite companies to conduct campus interviews; however, no guarantee can be given for placement/employment. Interested trainees can be registered by paying ₹3,000/- each towards placement registration at start of the programme and in case of trainee is not successful from getting placement he/she may be refunded ₹2,000/-.

GENERAL RULES & REGULATIONS FOR TRAINEES:

- CTTC reserves the right to reject any application without assigning any reason. Incomplete applications are liable to be rejected.
- Registration Fee is Non Refundable, in case any candidate cancels his admission for any reason.
- Course Fee once paid will not be refunded & Registration/ Course Fee is not transferrable.
- Insurance & other charges as specified for the course to be paid but the trainee in addition to the course fee as applicable.
- All the trainee will be ensure discipline within the campus.
- Trainee shall be required to wear uniform & shoes as prescribed by the institute and possess I-Card compulsory during training.
- Mobile Phones, Pen Drives, CD any other related items are not permitted inside CTTC premises.
- Regular attendance will have to be maintained by the trainee as per course schedule & 80% attendance is compulsory in all subjects individually.
- Trainees will abide by the examination rules and regulations displayed on Notice Board of CTTC and as amended.
- Leave without information/ permission will not be entertained.
- Trainees going on leave or home during vacation should inform course coordinator compulsorily.
- No trainee shall be organize/ conduct any meeting within the campus.
- The Machines/ Equipment/ Furniture must be handled carefully. No act of damage to CTTC property shall be carried out by the trainee, any loss or damage to property, including water & electricity usage.
- Smoking & chewing tobacco, possessing or drinking alcoholic beverages in any form is strictly prohibited within CTTC premises.
- Ragging is strictly prohibited in the premises.
- Writing any Comment/ Remarks/ Name on doors, walls, toilet, and notice board is strictly prohibited. Violation of above & any other Rules, Regulations, Disciplines and Conduct are liable for disciplinary action.