

**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**

**POST GRADUATE DIPLOMA IN TOOL DESIGN & CAD/CAM (PGDTD&CC)**



**MSME TOOL ROOM, BHUBANESWAR**  
 Micro, Small & Medium Enterprises, A Govt. of India Society  
 B-36, Chandaka Industrial Area, Near Infocity  
 Bhubaneswar-751024, Odisha, India  
 Phone : 0674-3011755, 3011733/734, Fax: 0674-3011706, 2743061  
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**CENTRAL TOOL ROOM & TRAINING CENTRE**  
 Bhubaneswar, Odisha

## NSQF Complied Long Term Courses

COURSE NAME		DURATION	COURSE FEE
<b>COURSES FOR 10TH PASS OUT</b>			
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/-
<b>COURSES FOR UNDER MATRIC</b>			
Certificate Course in Machine Operation	CCMO	1 Year	₹18,000/-
<b>COURSES FOR ITI STUDENTS</b>			
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/-
<b>COURSES FOR DIPLOMA IN MECHANICAL ENGG. OR EQUIVALENT</b>			
Post Diploma in Tool & Die Manufacturing	PD'TDM	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/-
<b>COURSES FOR DEGREE IN MECHANICAL ENGG. OR EQUIVALENT</b>			
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/-
<b>COURSES FOR DIPLOMA IN ELECTRICAL/ELECTRONICS ENGG. OR EQUIVALENT</b>			
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/-
<b>COURSES FOR DEGREE IN ELECTRICAL/ELECTRONICS ENGG. OR EQUIVALENT</b>			
Master Certificate Course in Automation & Process Control	MCCAPC	6 Months	₹36,000/-
<b>COURSES FOR DIPLOMA IN MECHANICAL/ ELECTRICAL/ELECTRONICS ENGG. OR EQUIVALENT</b>			
Post Diploma In Mechatronics	PDIM	1 Year	₹54,000/-
<b>COURSES FOR DIPLOMA/DEGREE IN CIVIL ENGG.</b>			
Post Diploma in Structural Design & Analysis	PDSDA	1 Year	₹54,000/-
Advance Diploma in Structural Design & Analysis	ADSDA	6 Months	₹34,000/-
<b>COURSES FOR ANY GRADUATE</b>			
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/-

## POST GRADUATE DIPLOMA IN TOOL DESIGN & CAD/CAM (PGDTD&CC)

### 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:

- Create, evaluate Tool design & Describe tool Design procedure.
- Describe elements of tool with their functions, tool construction & List different tooling standards.
- Describe Manufacturing Processes, process plan & Different heat treatment processes
- Confident enough to program and operate the CNC machines & can generate CNC machining program while working on CAM softwares.
- Confident enough for the Design and Development of Die Casting, Moulds, Jigs and Fixtures.
- Know how to lead a team & handle manpower in industries & can take responsibilities for own work and others work while learning.

### Who can avail this opportunity:

Degree in Mechanical/Production/Automobile Engineering or equivalent is eligible for taking admission. The company sponsored candidates will be preferred. Unemployed /Fresh Degree holders and those students who have appeared Final year & awaiting result can also apply.

**NSQF Qualification:** Level – 8

**Duration:** 1 Year (8 hours per day & 6 days in a week)

**Occupation of Qualification:** Tool Designer

**Progression of Occupation from Qualification:** After completion of course and after 2 years of field experience the trainee can work as a Sr. Tool Designer and after that 5 years of experience, the person can work as Manager (Tool Design) and has vertical progression up to Sr. Manager (Tool Design).

### Fee:

₹ 60,000/- per participant to be paid in the following instalments.

At the time of registration -	₹ 1,000/-
First Instalment -	₹ 14,000/- (At the time of admission)
Second Instalment -	₹ 15,000/- (After completion of two month)
Third Instalment -	₹ 15,000/- (After completion of six month)
Fourth Instalment -	₹ 15,000/- (After completion of nine month)
Insurance Fee -	₹ 300/- (At the time of admission)
NSQF Assessment Fee -	₹ 800/- (At the time of admission only for general)

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.

**COURSE CONTENT :**

Sl. No.	Title and Identification code of component	Estimated Time
1	CNC Programming & CNC Machining	160
2	Computer Aided Design (Auto CAD/Solidworks)	140
3	Computer Aided manufacturing (Master CAM & NX CAM)	120
4	Design of Jigs, Fixtures & Gauges	120
5	Design of Press Tools	160
6	Design of Moulds	160
7	Design of Die Casting Dies	120
8	Advance Metrology	80
9	Advanced-CAD-I (NX & CATIA)	120
10	Manufacturing Process-process planning and Heat Treatment	40
11	Advanced CAD- II (CREO)	120
12	Computer Aided Engineering (ANSYS)	80
13	Entrepreneurship	40
14	Quality Assurance	40
15	Project	800
<b>TOTAL HOURS</b>		<b>2300</b>

**ELIGIBILITY TO APPEAR IN THE EXAM:**

Minimum 80% 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 Performance, viva or oral exam, module test, class test, practical exam and final exam.

Minimum Marks to pass practical exam – 50%, Minimum Marks to pass final exam – 50%, Minimum Marks to class test – 50%, Minimum Marks to pass viva / oral exam – 50%, Minimum Marks to pass Project report and presentation exam – 50%

**DETAILED COURSE PLAN FOR 1 YEAR:**

**CNC Programming & CNC Machining**

Unit Name	Contents (chapters/topics)
<b>CNC Programming &amp; CNC Machining</b>	Introduction to CNC technology and CNC programing, CNC Programing, CNC Machining – Turning, NCMachining– Milling, CNC Machining – EDM & WEDM

**Computer Aided Design**

Software	Contents (chapters/topics)
<b>AutoCAD</b>	INTRODUCTION To AutoCAD, DRAFTING & DETAILING using various tools. SOLID MODELING: solid creation commands, UCS movements, 3D visualization, photo realistic, rendering and customization.
<b>SolidWorks</b>	Introduction to solid works, sketch using tools, Solid modeling, Introduction to Drafting, Generative drafting, Layout preparation, Assembly design, Sheet metal Design.

**Computer Aided manufacturing- (Master-CAM & NX CAM)**

Software	Contents (chapters/topics)
<b>Master-CAM</b>	INTRODUCTION: master CAM environment. To understanding 2D drawing. Creation of basic geometry. Modification of geometry. Transformation of object - Mirror, Rotate, Translate, Scale. Selection Methods. PLANE CONCEPTS, Concepts of machining: CNC control basics, & coordinate systems. Selection of tool, tool parameters, Program Manager, Drilling parameters, 3D contour machining surface roughing. Various 3D machining surface finishing methods. Post Processing: Generating NC/Nci Files/Editing NC Files / Verification and Program generation for actual machining / verification / post processing/Job machining on CNC machines.
<b>NX CAM</b>	INTRODUCTION TO NX CAM ENVIRONMENT, Work piece & MCS Setting. 2D Tool path Generation, Various Milling & Turning Operations (Roughing, Semi Finishing, Finishing). Simulation with Machine, Post Process Generation, Milling & Turning with IPW. INTRODUCTION TO WIRE EDM: Wire EDM operation, creating Wire EDM Operation. Internal & External Trim operation.

**Design of Jigs, Fixtures & Gauges**

Unit Name	Contents (chapters/topics)
<b>JIGS</b>	INTRODUCTION TO JIGS: Production Devices, Locating Principle, Locating methods and devices. CLAMPING DEVICES: Introduction, types of clamping, Analysis of clamping force. DESIGN OF JIGS: Introduction, drill bushes, elements of jig, construction, material for jig elements, different types of jigs-plate.
<b>FIXTURES</b>	DESIGN OF FIXTURES: Introduction, Design principles of fixtures, types of fixture, principals of different types of fixtures.
<b>GAUGES</b>	DESIGN OF GAUGES: Introduction, Types of gauges, plug gauge, snap gauge, profile gauge, Gauge design Practices. Design principles of gauges.

**Design of Press Tools**

Unit Name	Contents (chapters/topics)
<b>Press Machines</b>	CLASSIFICATION OF MACHINES: Mechanical, Hydraulic, and pneumatic presses, Press Characteristics, safety devices in presses. Principles of forming machines, principles of feeding equipment
<b>Dies</b>	DESIGN OF DIES: Introduction to dies, types of dies, analysis process shearing clearance, size and tolerances of die opening and punch, different force, power energy in shearing, loading center, shearing with inclined edge, strip layouts. ELEMENTS OF SHEARING DIES: Die plates, split dies, rules for split dies, inserts, types of punches, punch holders, strippers, calculation of springs and rubber ejector, shedders, stops, pilots, stock guides, alignment system design for press tools.
<b>Types of Dies</b>	INTRODUCTION: Compound & Progressive dies. Different types of dies, Theory of bending development of blank, spring back, curling, flanging and press brake dies, bending on press brake. M DRAWING AND FORMING DIES: Theory of drawing, blank development, construction of drawing and drawing dies, Drawing of rectangular components (development, stages draw beads), Ironing (application of rubber and hydraulic system), and Defects in deep drawing.

**Design of Moulds**

Unit Name	Contents (chapters/topics)
<b>Molds</b>	Introduction To Molds, Parting Surface, Splits Mould For Thread Components, Designing An Injection Mould.

### Design of Die Casting Dies

Unit Name	Contents (chapters/topics)
Die Casting	Die Casting Machines, Design of Die Casting. Die Steels, Die Casting Alloys, Inspection of Die Casting. Cost of Die Casting.

### Advanced-CAD-I (NX & CATIA)

Software	Contents (chapters/topics)
NX	Part Modeling, Assembly, Drafting.
CATIA	Sketcher, Solid Modeling, Generative Surface Design, Assembly, DMU Kinematics: Drafting, Sheet Metal Design, NC Manufacturing Core And Cavity.

### Advanced CAD- II (CREO)

Software	Contents (chapters/topics)
CREO	CREO MODELLING, ADVANCED SOLID MODELING Creo Photo Renders Creating Photo Render Image Of Creo/Engineering Parts , Assembly Modeling, Creo Mechanism , CREO, DETAILING , ADVANCED CREO SHEET METAL DESIGN , Core Cavity Extraction ,CREO-WEB PUBLISH

### Computer Aided Engineering (ANSYS)

Software	Contents (chapters/topics)
ANSYS	STRUCTURAL: Linear. Nonlinear: material, geometric and contact, Dynamics: modal, transient dynamic, random vibration, explicit dynamic THERMAL: Steady state & Transient COUPLED FIELD: (structural & thermal).

### Technical Subjects

Subject	Contents (chapters/topics)
Manufacturing Process-process Planning	Types of structures, Strain hardening, Plastic range, Fracture, Fatigue, Creep and Creep properties. Mechanism of strengthening in metals. Selection and specification of carbon and alloy steels for general engineering purpose, Specification of materials as per various standards (IS, BS, AISI, APS etc.), Types of modern Cutting Tool material. Properties and applications of Carbon and alloy Steels. Powder Metallurgy.
Heat Treatment	Introduction to heat treatment, types of heat treatment process. Different types of tempering process. Tool failures due to improper heat treatment. Heat treatment of non-ferrous materials-Aluminum Alloys.
Advance Metrology	Introduction to metrology, definition of Metrology, difference between precision and accuracy. Limits, Fits & Tolerance and its theory and application, gauges and Inspection by Gauging, types of gauges. Surface Roughness parameters, Screw Thread Measurement, Gear Measurement and parameters.
Quality Assurance	Introduction to Quality Assurance: Need & Aspects of quality, Quality specification, and Quality function, operating characteristics curves, Sampling inspection, single double and multiple sampling plan.
Entrepreneurship	Entrepreneurship and the entrepreneurial process, start-up factors, organizational planning and women Entrepreneurship, organizational structure and forms of ownership, stages of growth and strategic management process, intellectual property concept and innovation.

### 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 ₹1500.00 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.