GOVERNMENT OF ANDHRA PRADESH

OFFICE OF THE
DIRECTOR OF TECHNICAL EDUCATION
ANDHRA PRADESH :: MANGALAGIRI

Circular Memo. No:H/Circulars/2024 **Dated:05.08.2024**

Sub: Technical Education – Add-on Skill Courses – Immediate Commencement – Instructed - Regarding

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It is to inform that Add-on courses were designed to impart additional skills beyond the core academic curriculum, providing students with industry-relevant expertise and ensuring they stay abreast of the latest developments in their respective fields.

Approximately 240 faculty members from various Government Polytechnics were trained in identified add-on courses listed hereunder through eight Professional Development Programs organized by the Department of Technical Education (DTE) in collaboration with NITTTR, Chennai, earlier this year.

List of Add-on Courses in which faculty trained:

S. No	Add-on Course	Branch
1	Electrical CAD	Electrical
2	Programmable Logical Control - PLC	
3	Solid Edge	Mechanical
4	Computer Numerical Control Programming	
5	Revit Architecture	Civil
6	Internet of Things (IoT)	ECE, Electrical, Mechanical, Civil

It is now crucial to offer these Add-on courses to the students of Polytechnics and other interested candidates using the trained resource persons available. Further, standard operating procedure for conducting Add-on Skill Courses is formulated and attached herewith.

In this connection, Principals of all Government Polytechnics with faculty trained in the said add-on courses are instructed to commence add-on courses for students of Government Polytechnics and other interested candidates immediately.

Further, student enrolment details shall be furnished to this office and to SBTET, AP, by the end of August 2024 for taking further necessary action.

The Regional Joint Directors of Technical Education, AU and SVU region are informed to foresee the successful execution of enrolment of students and commencement of add-on courses.

Receipt of this memo shall be acknowledged.

Sd/-G.GANESH KUMAR
DIRECTOR

To

The Principals of all Government Polytechnics,
To RJDs AU & SVU regions
To the Secretary, SBTET,. AP.

// F.O.B //

B. Ramakrishna
SUPERINTENDENT

Standard Operating Procedure (SOP) for Add-on Courses

1. Introduction

The Department of Technical Education, AP, is introducing Add-on courses for enhancement of skills, employability, and overall educational experience of students. Add-on skill courses will provide enriched learning experience, empowering students with a combination of theoretical knowledge and practical skills. Currently, 240 faculty members from Government Polytechnics across Andhra Pradesh have been trained in these Add-on courses. These trained faculty members will, in turn, impart these skills to students who are enrolled to add-on courses at Government Polytechnics. The courses are designed to offer additional skills that go beyond the core academic curriculum, providing students with industry-relevant expertise and ensuring they stay up-to-date with the latest developments in their respective fields.

2. Objectives

a) To impart additional skills to students and other interested individuals.
b) To ensure our students stay updated with the latest developments.
c) To make students industry-ready.
d) To attract more recruiters and increase placement opportunities.

3. Eligibility/Target Group

a) Students in their 2nd or 3rd year of Diploma.
b) Alumni of Polytechnics across Andhra Pradesh.
c) Any interested candidates who have completed ITI, Intermediate, B.Tech, or higher qualifications.

4. Focus Areas/ Courses:

a) Solid Edge
b) CNC Machining
c) Revit Architecture (BIM)
d) Internet of Things
e) Electrical CAD
f) PLC programming

This list is not exhaustive; other courses can be included with prior permission from the Director of Technical Education.

5. Establishment of required infrastructure:

a) All institutions offering these courses shall establish necessary infrastructure, including machinery, tools, equipment, laboratory equipment, computer labs, and other requisites. This can be funded by the institution, SBTET, or in collaboration with industry partners.

b) Continuous maintenance and calibration of all machinery and equipment shall be ensured.

6. Faculty/ Trainer

The courses shall be delivered by faculty trained in the respective Add-on courses.

Any practitioner in the respective discipline relevant to the Add-on course may be engaged as a skill instructor for hands-on training. The skill instructor must have substantial hands-on experience in the subject matter of the Add-on course.

7. Course Structure

- Batch Size: 30 students
- Number of Batches: 1 or more
- Duration of the Course: 90 hours, with 70% dedicated to practical/hands-on experience
- Timings: Before or after Polytechnic working hours
- Course Nature: Optional, not mandatory for students
- Certification: The State Board of Technical Education and Training will issue a certificate upon successful completion of the course and award credits as per norms

8. Assessment

The assessment process for the Add-on courses will be comprehensive and continuous to ensure students achieve the desired learning outcomes. The assessment criteria will include:

Practical Assignments: Students will be given regular practical assignments to demonstrate their understanding and application of skills learned.

Mid-term Evaluations: There will be periodic evaluations to track the progress of students.

Final Examination: A comprehensive final exam, consisting of both theoretical and practical components, will be conducted by SBTET to evaluate the overall proficiency of the students.

Attendance: Regular attendance will be mandatory and will contribute to the overall assessment.

9. Fee structure

The course fee is set at ₹**1500** per student/candidate, with the allocation as follows:

- 50% allocated as an honorarium for the trainer/resource person.
- 20% allocated to other supporting staff.
- 20% earmarked for consumables/ Maintenance.
- 10% earmarked to Miscellaneous expenditure.

Payment Schedule: Students shall pay course fee in full during the enrolment of add-on course(s).

10. Documentation and Records

Maintaining accurate and comprehensive records is crucial for the effective management of the Add-on courses. The following documentation/records shall be maintained mandatorily:

Admission Register: A register to record the details of all enrolled students, including personal information and course details. Separate leaf shall be maintained for each add-on course.

S. No.	Batch No. (20YY-0X)	Admission No.	PIN (Current Student)	Name of the Students	Name of the Parent & Contact Details	Date of Birth	Year/ Semester of Study/ Previous Qualifications	Address	Mobile Number	Email Address	Aadhaar Number	Name of the Add-On Course Opted/ Enrolled	Course Fee Paid (Yes/No)	Date of Admission	Date of Completion	Certification Status (Issued/Not Issued)

Fee Register: A detailed register to track fee payments, including dates and amounts paid by each student.

Batch No.	Name of the Add-on Course	Name of the Candidate	PIN	Course Fee Paid (Yes/No)	Date of Payment	Signature of the Principal

Attendance: Daily attendance records to monitor student participation and eligibility for certification.

Logbook: A logbook to document the day-to-day activities and progress of each course.

Assessments: Records of all assessments, including assignments, exams, and project evaluations, to track student performance.

Feedback: Collection of feedback from students, faculty, and industry partners to continuously improve the quality and relevance of the courses.

11. Responsibilities:

Directorate of Technical Education:

- Overall implementation and monitoring
- Training of Trainers (ToT)
- Introduction of Add-on courses aligned with industry standards

SBTET

- To conduct evaluation of the candidates
- Issue of certificate with credits

Principals of Polytechnic Colleges:

- Implementation and regular monitoring

Faculty Members:

- Attend capacity building/ professional development programs on Add-on courses
- Train students in the respective courses at Polytechnics

CNC
Manufacturing Process and work holding devices
Introduction and elements of CNC machines
Introduction to turning NC programming
Co-ordinate system and program structure
G-codes and M- codes
Introduction to Turning controller
Operating modes
Basic turning operations and Turning canned cycles
Machining basics and Controller Introduction
Tool setting
Datum and Work setting
Manufacturing Process and work holding devices
Introduction and elements of CNC machines
Introduction to Milling NC programming
Co-ordinate system and program structure
G-codes and M- codes
Introduction to Milling controller
Operating modes
Basic turning operations and Milling canned cycles
Machining basics and Controller Introduction
Tool setting
Datum and Work setting
Revit
Introduction to Building Information Modeling & Revit Architecture
Placing Walls, Doors & windows, Family Files (Components), Modify Tools & Managing Views by Project Browser
Properties Palette, Creating New Materials, Roof, Floor
Different Types of Openings, Staircase, Ramp, Railing, Annotations
Creating Section Views, 3-D Views, Model Text, Paint, Massing & Site
Schedules, Page Layout, Documentation, Project Submission
Introdcution to HVAC and Plumbing in REVIT
Introdution to AR & VR using REVIT
IOT
Industry 4.0 & IoT Applications
Introduction to Embedded systems
latest IC’s Technologies, and designing
Introduction to different controllers of 8051,ARM7-LPC2148 –IC’s
Present trending companies using these latest technologies
What is IoT? & Introduction to IoT
Industry 4.0 and the fourth industrial revolution explanation

Introduction to Arduino and Node MCU
Programming Concepts
Digital Input And Digital Output
Introduction to DHT11 Sensor and library installation
Temperature and humidity monitoring with DHT11 sensor
Blynk App introduction and working
Blynk App virtual pins interfacing with node MCU
Controlling digital inputs pins from Blynk App
IOT Based Home Automation With The Node MCU
IOT Based Waste Collection Management System For Smart Cities
IoT Based Weather Monitoring System Using Nodemcu and Thingspeak, Blynk Cloud
An IOT Based Automatic Irrigation System
PLC Programming
Automation Overview
Introduction of PLC
Engineering Software- TIA portal Device & Network View
Digital Fundamentals
Digital Fundamentals and Combinational Circuits
PLC Tags
Elementary Data Types & Clock Memory
Set/Reset, Flip-Flop and Signal Edge Detection
Timers
Practice Session for Timer Based examples
Digital Operations
Organization Blocks
Program Blocks and Program Editor
Program Blocks and Program Editor
Data Blocks
Analog Fundamentals in PLC
Solid Edge Course Content
Introduction
Introduction about Design
Classification of Design
Role of modeling in the Design
Introduction to the Computer Aided Design
Benefits of Computer Aided Design
Softwares used for CAD
Benefits of Solid Edge over other CAD Tools
Part Modelling (Ordered Environment)
Soild Edge Interface and its tools
Sketching
Dimensioning Tools
Constructing Base Features (Solid Modeling Commands)
Patterening Tools
Modifying Tools
Part Modelling (Synchronous Environment)

Constructing Base Features (Solid Modeling Commands)
Working With Face Relationships
Practicing the different types of Face relation commands on the parts to alter it.
Moving And Rotating Faces
Constructing Treatment Features
Constructing Functional Features
Detach & Attach
Solid Edge Assembly (Bottom-Up)
Placing Parts In Assemblies
Pathfinder In Assemblies
Assembly Relationships
Capture Fit Command
The Assemble Command
Assembly Relationships
Assembly Features
Solid Edge Assembly (Bottom-Up) cont.
Assembly Patterning
Inspecting Assemblies
Replacing Parts In An Assembly
Revising Assemblies
Assembly Reports
Exploding Assemblies
Animating Assemblies
Solid Edge Drafting
Production Drawing Overview
Principal Views
Auxiliary Views
Detail Views
Section Views
Broken Views
Create a Part Drawing
Create an Assembly Drawing
Overall Practise session
Electrical CAD
Introduction To Computers
Introduction to CAD
Point Locating Methods
Introduction to Drawing tool - Line
Basic Drawing Tools
Line, Circle
Standard Utilities
Save, Saveas, Open, Close, New
CAD Drawing Utilities
Units, Function Keys, Setting Drawing Limits, Zoom
Modify tools
Erase, Move, Copy, Break, Offset
Drafting Settings
Snap & Grid , Polar Tracking, OSnap,Otrack
Drawing Tools

Arc, Polygon, Ellipse, Filled Objects, Solid, Donut
Editing Tools
Object Methods of Selection, Mirror, Scale, Array, Rotate
Object Properties
Color , Linetype, Lineweight, Layers
Adding Text Information to Drawing
Text, Style , Text Edit, MText, Find, Spell
Advanced Draw & Editing Tools
Pline, Pedit, Explode, Hatch, Hatch Edit, Xline.
Changing Object Properties
Matching Properties Advanced Modifying Tools
Trim,Extend, Stretch, Lengthen, Chamfer, Fillet
Inquiry Commands
ID, List, Dist, Area
Working With Dimensions
Adding Dimensions, Editing Dimensions, Creating Dimension Styles
Basic Plotting Techniques
Advanced Tools in CAD
Blocks, WBlocks, Insert, Minsert, Divide, Measure, DDPtype
Basic Concepts of Layout
Arranging & Creating View Ports
Printing & Plotting
Practice of Electrical Engg., Drawings