Annexure - II

INDIVIDUAL COURSE DETAILS

A. Name of the Institute	**NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH TARAMANI, CHENNAI – 600 113**
B. Name / Title of the Course	**ADVANCED CERTIFICATE COURSE ON "Skill Development in Electronics for TVET Trainers and Planners"**
C. Course Dates with Duration in weeks	**From 27.02.2019 To 27.03.2019** **4 weeks**
D. Eligibility Criteria for participants 1. Educational Qualifications 2. Work Experience required, if any 3. Age Limit [note: ITEC norms is 25-45 years] 4. Target Group *[Level of participants and target ministries / departments etc. may be indicated]*	Diploma or Degree in Electrical & Electronics Engg & Allied Branches / Physics Minimum of two years experience in teaching / training / industry in the field of Electronics. Have a good proficiency in English which is the medium of instruction
E. Aims & Objectives of the Course	▪ Use PLC for electrical control applications ▪ Apply graphical programming tool LabVIEW for solving industrial instrumentation problems ▪ Understand the working of sensors and instruments in Industry ▪ Use pneumatic systems for automation ▪ Utilize effectively solar energy sources ▪ Understand the factors involved in the design of Wind Power Plants ▪ Design a project work
F. COURSE CONTENTS / Syllabus *[please attach course details / profile in word Format for uploading on ITEC website*	**I Scope of the Programme:** Electronic Circuits and Systems have applications in a wide range of products including audio and video entertainment, home appliances, medical instruments, automobile Renewable Energy and industrial applications.

	The human resource requirements include installation, servicing and maintenance personnel. The TVET institutions provide the needed human resource to meet these requirements. The trainers and planners of TVET progammes in electronics need practical skills and theoretical knowledge in modern electronic system. This program aims at providing these skills for TVET personnel. The PLC, SCADA, Industrial Instrumentation, LabVIEW Programming, different boards like arduino form the basis of today's electronic system. Renewable Energy systems are implemented in every country. With this background, this programme is designed with the following objectives. **II Objectives of the Programme:** • On completion of the Programme, the participants will be able to • Understand TVET and Qualification Framework • Use PLC for electrical control applications • Apply graphical programming tool LabVIEW for solving industrial instrumentation • Understand the working of sensors and instruments • Use pneumatic systems for automation • Utilize effectively solar energy sources • Understand the factors involved in the design of Wind Power Plants • Design a project work

	III Eligibility Criteria /Participants: Educational Qualifications: Certificate / Diploma / Degree in Physics, Electrical, Electronics & Communication Engineering, Instrumentation & Allied disciplines. Age Limit: 25-45 years Target Group: Practicing Teachers / Trainers / Engineers / Polytechnic and Engineering College Teachers and Administrators / in the above field. The participants should have good knowledge in reading, writing and spoken English. The instructions will be in English. **IV Curriculum of the Programme:** CAPSULE 1: TVET AND QUALIFICATION FRAMEWORK Qualification levels in various countries – Curricular requirements in electronics for each level – trainee evaluation schemes for electronic related courses – Laboratory, Workshop and training facility requirements – instructional strategies. CAPSULE – 2: RUDIMENTS OF ELECTRONICS Electronic Components – Resistors – Capacitors – Inductors – Diodes – Transistors – MOSFET - Opto electronic devices (LDR, photo diode, photo transistor, solar cell, opto coupler) - Identifying ICs – Soldering. CAPSULE – 3: PLC AND ITS APPLICATIONS Components of PLC - External devices (I/Os) - Memory organization - Instruction set of Allen Bradley PLC - Bit logic - Timers -Counters - Program control - Ladder diagram Programming for specific applications -

	Interfacing PLC with working models –Basics of SCADA system -Features of RS View SCADA software -Memory Tags- Device tags - Interfacing PLC with SCADA software CAPSULE 4: APPLICATIONS IN MATLAB & LABVIEW Graphical System Design – Virtual Instrumentation - LabVIEW Basics – Structures, loops, arrays, cluster, graphs, charts – SubVIs – Data acquisition with LabVIEW – MATLAB – Electrical & Electronic Applications - Simulink CAPSULE 5: INDUSTRIAL INSTRUMENTATION Transducers and Sensors – Measurement and Control - P, PI and PID Controllers- Arduino - Measurement of temperature, pressure and Strain – Servo Motors -Temperature and flow control CAPSULE 6: INDUSTRIAL AUTOMATION Pneumatics –Electro pneumatics - PLC based Pneumatics CAPSULE 7: USING RENEWABLE ENERGY SOURCES Wind & Solar energy – Components & Types of Wind Power Plants (WPP) - Power Electronics for WPP - Induction generators - Solar energy - photovoltaic materials & characteristics - Maximum Power Point Tracking (MPPT) and Charge Controller. CAPSULE 8: PROJECT WORK Broad suggestive Areas for Project Work: • Develop a working model and interface it with PLC. • Develop a real time system and interface it with LabVIEW • Projects using solar and wind energy

	applications. • Projects using pneumatics or electro pneumatics • Real time projects using Arduino board INSTRUCTIONAL STRATEGIES: Lecture Discussions - Demonstrations - Assignments - Seminar - Video lessons - Field visits - Out station field visit - Project work - Evaluation INDUSTRIAL VISITS PLANNED • Load dispatch centre, Chennai • Orchid Chemicals & Pharmaceuticals Ltd Chennai • Vi Microsystems Pvt Ltd Chennai • CETP power solutions Chennai • Fortran Cirkits, Perungudi • Timken bearings Pvt Ltd • Solar power plant • National Institute of Wind Energy ASSESSMENT: Attainment of programme objectives will be periodically reviewed by internal assessment and project work. At the end of the programme, candidates will be awarded Certificate on "**Skill Development in Electronics for TVET Trainers and Planners**". OUTCOME: The participants will gain the knowledge and skills in latest technologies to meet the challenges of TVET.
G. Mode of evaluation of performance of the participants	Tests, Assignments, Practical sessions