National Institute of Electronics and Information Technology, Calicut

COURSE PROSPECTUS

Name of the Group: *Product Engineering GROUP*

Name of the Course: Certificate Course on Electronics Board design and Bring up

Course Code: *PD 503*

Starting Date: 13*/04/2020*

Duration: *4 Weeks*

Course Coordinator: Mr. Manoj Kumar MK, Senior Technical Officer

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Preamble: *Emergence of India as a global economy has opened up a huge demand for electronic products. National Policy on Electronics and Make in India initiative of Government of India has resulted in setting up of many industries in the Electronics sector and has led to a huge demand for trained man power in Electronics Board Design.*

Objective of the Course: *Certificate Course on Electronics Board design and Bring up is offered t0 bridge the major gap in competencies required to design state-of-the art PCB and electronics products.*

Outcome of the Course: *On successful completion of the Course, the Participants shall*

- *Analyze customer requirement and interpreting user needs*
- *Verify to check if design is feasible to develop within the framework of the specification*
- *Able to make an efficient Chip design which give the best performance, uses optimal power and in minimal area.*

Expected Job Roles: *High Speed PCB Designer in Electronic Hardware Development Industry.*

Course Structure:

Sl. No	Module Title	Duration (Hours)			Credit	
		Theory	**Lab**	**Total**	**Theory**	**Lab**
1	*Electronics Board Design Basics*	*10*	*25*	*35*		
2	*Multilayer PCB Design*	*10*	*25*	*35*		
3	*Introduction to High Speed Signaling*	*10*	*25*	*35*		
4	*Semiconductor Packages*	*12*	*25*	*35*		
	Total Duration/Credit	*42*	*100*	*140*	*6*	

Other Contents

I. **Course Fees**:

General Candidates: *Rs 13090/- (Rs. 11,000/- + 18% GST + 1%KFC)*

SC/ST Candidates : Tuition Fees are waived for SC/ST students admitted under SCSP/TSP. However they are required to remit an amount of **Rs. *1000/- as Advance caution/security deposit**. This amount will be considered as caution/security deposit and will be refunded after successful completion of the course. If the student fails to complete the course successfully, this amount along with any other caution/security deposits by the student will be forfeited.

Module wise Course Fee: Not applicable for this course

II. **Registration Fee:** An amount of Rs.1000/- (including all taxes as applicable) (nonrefundable) should be paid at the time of registering for the course.

This fee shall be considered as part of course fee, if the student joins the course. If a student register and pay for more than one course and join for any one course, all such amount will be adjusted against the course fee payable.

If the student does not join for the registered course / any of the registered courses, fee paid shall be forfeited.

For SC/ST candidates, the registration fee is Rs.500/- and will be considered as part of caution/security deposit and will be refunded after successful completion of the course. If the candidate does not join or fails to complete the course the amount will be forfeited

However above the registration fee shall be refunded on few special cases as given below

➢ Course postponed and new date is not convenient for the student
➢ Course cancelled in advance, well before the admission date

III. **Course Fee Installment Structure**: Not applicable for this course

IV. **Eligibility:** B.E./B.Tech in Electronics/Electronics & Communication/Electrical/ Electrical and Electronics/Instrumentation/ Biomedical/ Computer Science/ Information Technology or MSc in Electronics/ Instrumentation/ Computer Science/ Information Technology or Diploma in Electronics/ CS/IT/EEE/EI.

V. **Number of Seats** : *20*

VI. Selection of candidates : *Selection is based on the marks in qualifying degree*

VII. Test/Interview : *Not applicable*

VIII. Counseling/Admission : on 13/04/2020

IX. Important Dates :

Last Date for Registration	01/04/2020
Publication/Intimation of selection via website/email:	03/04/2020*
Counseling Date:	13/04/2020
Class Commencement Date:	13/04/2020

  *Those who have not received the selection information by email as on the dates mentioned may contact the course coordinator.

X. Course Timings : *This program is a practical oriented one and hence there shall be more lab than theory classes. The classes and labs are from 9.30 am to 12.45 pm and 1.30 pm to 5.00 pm Monday to Friday. The theory to lab proportion is 30:70*

XI. Placement : Students can register with Model Carrier Centre

XII. Lab Facilities DSOs, DPOs, SMD Rework station, High Precision Digital Multimeters, PCB design tools such as OrCAD Capture, OrCAD / Allegro PCB Editor, OrCAD Digital Simulator, Hyper Lynx PCB Design Tool(Signal Integrity, Power Integrity, Thermal and EMC Analysis for High-Speed PCB Design) etc.

XIII. Course Contents

PD 503 A: Electronics Board Design Basics (1 Week)

Evolution and Classification of Printed Circuit Boards, Challenges in Morden PCB, Design and Manufacturing, PCB fabrication, methodologies(SSB, DSB and multilayer board), PCB design considerations/ design rules for analog, digital and power applications, Electromagnetic interference in electronic systems and its impact Analysis of electronic circuit from noise emission point of view (both conducted and radiated emission) cross talk and reflection behaviour of the circuit in time domain, Thermal management of electronic devices and systems.

PD 503 B: Multilayer PCB Design (1 Week)
Multilayer PCB design guide lines, Design of Multilayer PCB Stackup, Differential pair routing, Length matching, Generation of different types of reports.
PD 503 C: Introduction to High Speed Signalling (1 Week)

Introduction to high speed PCB design, Signal Integrity, Power Integrity and Thermal Analysis, Power distribution and noise, Signalling convention, termination

PD 503 D: Semiconductor Packages (1 Week)
Single chip packages or modules. (SCM) Commonly used packages and advanced packages; Materials in packages, Current trends in Packaging, Multichip modules (MCM) - types; System-in package (SIP); Packaging roadmaps; Hybrid circuits.

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