



Courses on
Photonic Integrated Circuits Design, Fabrication & Packaging

The **Integrated Photonic Technologies Center INPHOTEC**, part of the **TeCIP Institute** of the **Scuola Superiore Sant'Anna**, in collaboration with **CNIT** (National Inter-University Consortium for Telecommunications), announces a **comprehensive training program on photonic integrated circuits design and fabrication, and on photonic/electronic packaging and characterization**.

INPHOTEC makes available during the courses to the enrolled trainees its **700 sqm highly professional fabrication facility and technology platforms for clean room live sessions**.

Target candidates are coming from the academia and the industry with a master of science in the area of Electronic or Telecommunication Engineering or Physics, or professionals with adequate background who want to pursue intensive specialization courses with practical sessions in the complete line of design, fabrication, packaging and characterization.

The number of admitted trainees is limited to 20 units.
A certificate of attendance will be released to participants.

Courses

- A. Photonic Integrated Circuit Design and Fabrication (PIC D&F)**
[2 weeks]
- B. Photonic and Electronic Integrated Circuit Packaging (PEIC Pack)**
[1 week]

A **Characterization and Testing (C&T) session** [up to 1 week] is offered to trainees after realization of the chip by INPHOTEC.

A. PIC D&F (2 weeks)	Pisa
Mask layout development (approx 2 months)	Homework
B. PEIC Pack (1 week)	Pisa
Chip fabrication and packaging (approx 4 months)	by INPHOTEC
C&T session (up to 1 week)	Pisa



Course A PIC D&F

Day	Morning	Afternoon
Mo	Introduction to PICs; waveguides and passive devices	Passive devices
Tue	Active devices (modulators & photodetectors)	Software installation; introduction to mode solver and propagator
Wed	Simulation of passive devices	Circuit simulation: theory and software description
Thu	Introduction to mask design: design rules and PDK overview	PIC fabrication & technology steps (photolithography, e-beam lithography, etching, depositions, metallizations, planarization)
Fri	PIC packaging techniques and design constraints	PIC Characterization
Mo	INPHOTEC fabrication platforms/Mask design with a tutor	Mask design with a tutor
Tue	Characterization and metrology, reliability (theory + lab tour)/Mask design with a tutor	Mask design with a tutor
Wed	Clean Room live session / Mask design with a tutor	Clean Room live session / Mask design with a tutor

Course B PEIC Pack

Day	Morning	Afternoon
Mo	Introduction to PEIC Packaging, overview of players in photonic/electronic packaging Technologies: Dicing, Polishing	Technologies: Wire `Bonding, Die Attachment, Flip Chip
Tue	Lab Session 1	Technologies: Alignment, Pigtailling, Assembly
Wed	Lab session 2	Advanced Packaging Technologies and Reliability Lab session 3
Thu	Lab session 4	Lab session 5

1 st batch	1	• PIC D&F (September 5, 2016)
	1	• PEIC Pack (November 14, 2016)
	1	• C&T (March 20, 2017)
2 nd batch	2	• PIC D&F (March 2017)
	2	• PEIC Pack (May 2017)
	2	• C&T (September 2017)

Schedule

INTRODUCTORY OFFER
1st batch at NO-Charge!

It's FREE!

Registration by June 24, 2016
at www.inphotec.it



Course programme

14-17 November 2016

B. Photonic and Electronic Integrated Circuit Packaging

Day	Morning (4 hours, e.g. 9-13)	Afternoon (4 hours, e.g. 14-18)
Mo NOV 14	<p>Introduction to PEIC Packaging Overview of players in photonic/electronic packaging Technologies: Dicing, Polishing (4 hours)</p> <p>GIANNI PREVE (2 h) DAVIDE ROTTA (2 h)</p>	<p>Technologies: Wire Bonding, Die Attachment, Flip Chip (3 hours)</p> <p>MARCO CHIESA (2 h) GIANNI PREVE (1 h)</p>
Tue NOV 15	<p>Lab Session 1 (2 hours) – group A and B</p> <p>MARCO CHIESA (2 h) VERONICA TOCCAFONDO (2 h)</p>	<p>Technologies: Alignment, Pigtailling, Assembly (4 hours)</p> <p>DAVIDE ROTTA (2 h) VERONICA TOCCAFONDO (2 h)</p>
Wed NOV 16	<p>Lab Session 2 (4 hours): Group A : Assembly Group B : Alignment Bench</p> <p>Group A: MARCO CHIESA (4 h) Group B: VERONICA TOCCAFONDO (4 h)</p>	<p>Advanced Packaging Technologies and Reliability (2 hours)</p> <p>GIANNI PREVE (2 h)</p> <p>Lab session 3 (2 hours): Group A : Assembly Group B : Alignment Bench</p> <p>Group A: MARCO CHIESA (2 h) Group B: VERONICA TOCCAFONDO (2 h)</p>
Thu NOV 17	<p>Lab Session 4 (4 hours): Group A : Alignment Bench Group B : Assembly</p> <p>Group A: VERONICA TOCCAFONDO (4 h) Group B: MARCO CHIESA (4 h)</p>	<p>Lab Session 5 (2 hours):</p> <p>Group A : Alignment Bench Group B : Assembly</p> <p>Group A : VERONICA TOCCAFONDO (2 h) Group B: MARCO CHIESA (2 h)</p>