

Industry-Ready Semiconductor Teaching Lab Solutions



Noah Schmitz

ASO Regional Education Business Development Manager
Keysight Technologies



Raphael Brown

EMEA Regional Education Business Development Manager
Keysight Technologies



Yong-Hui Zhang

Greater China Education Business Development Manager
Keysight Technologies



Danny Tan

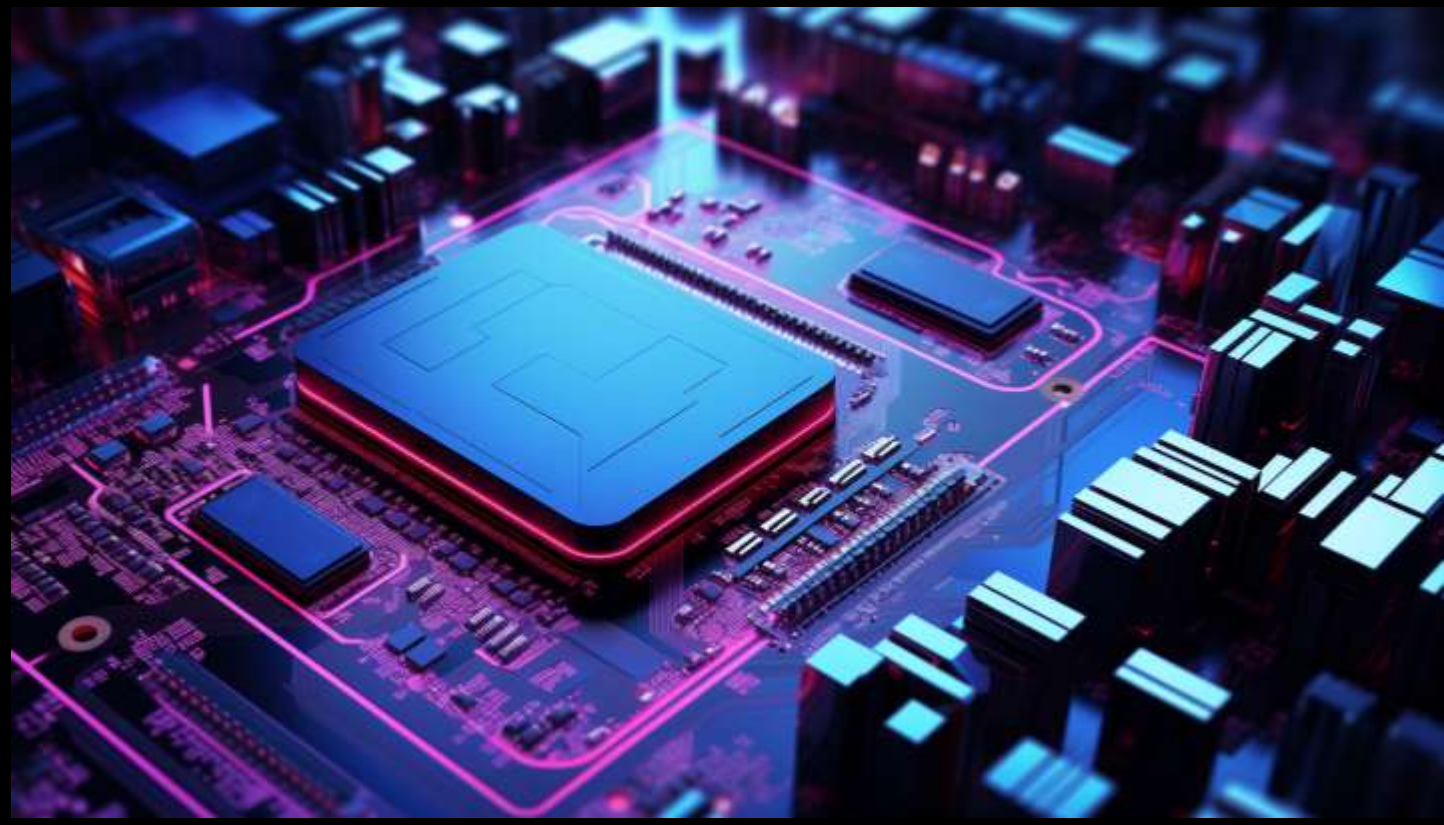
APS Regional Education Business Development Manager
Keysight Technologies

Semiconductor Industry Growth & Market Overview

US $975 B

2026 global semiconductor revenue (forecast)

+26% YoY



2026 growth drivers (high level)

- Memory and Logic lead the cycle.
- AI-related compute & data-center demand continues to pull leading-edge supply chains.
- Broad-based expansion expected across regions; America, Europe and Asia-Pacific contribute most.
- Equipment investment remains elevated into 2026,reflecting leading-edge logic, memory and advanced packaging.

Source: WSTS (Dec 2025 forecast).

Challenges in Education



Rapidly Growing Demand for semiconductor skilled graduates



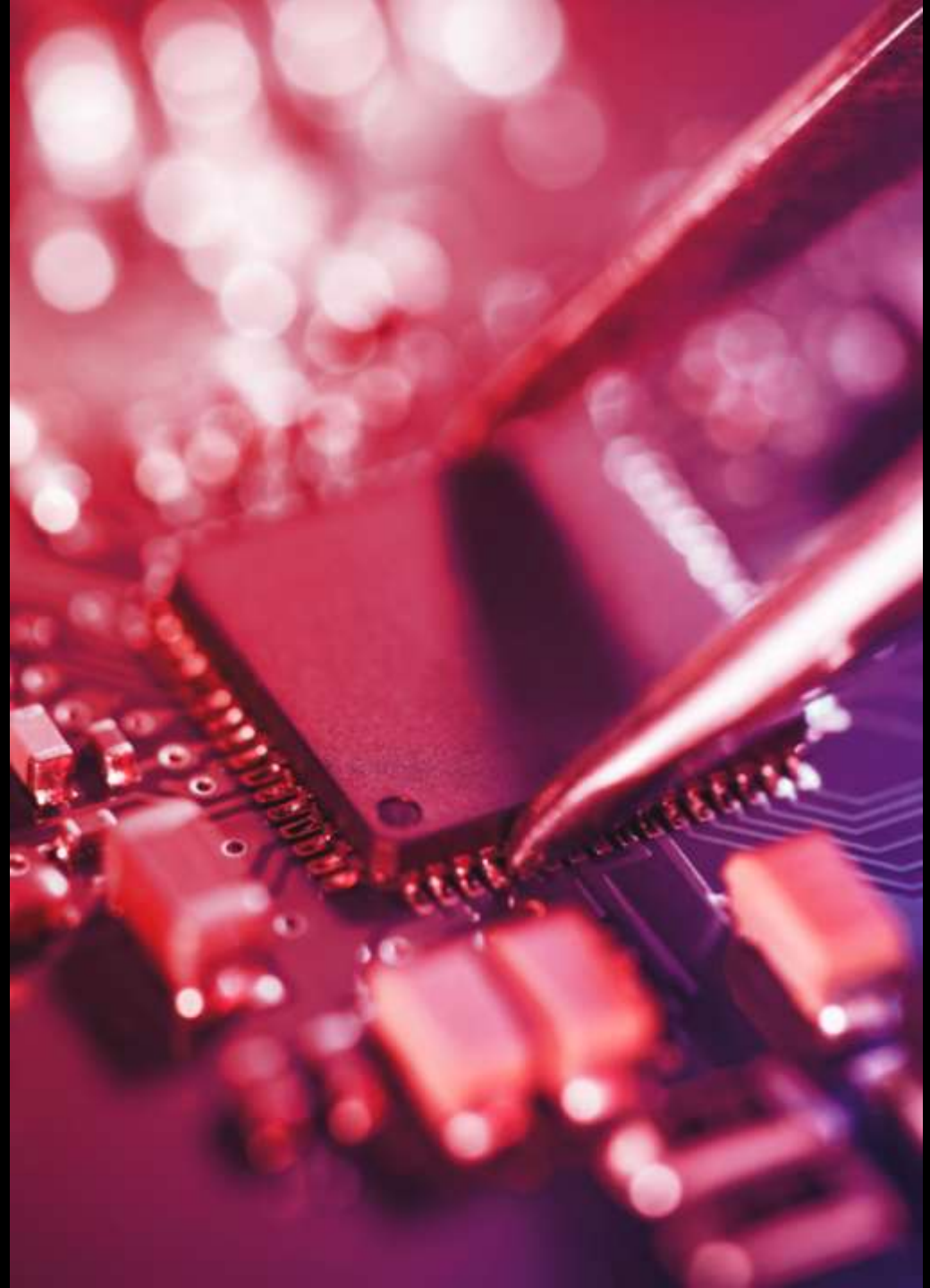
Delivering hands-on training that keeps pace with latest semiconductor practices.



Complex and longer time to set up lab and develop lab tutorials

Introducing:

Keysight Semiconductor Teaching Lab Solutions



Semiconductor Teaching Lab Solutions

1. UU101LAB



Basic Design and Measurement

- **B2902C SMU**
- **Digital Learning Suite SW**
- **ADS Software**
- **3 Lab Sheets**

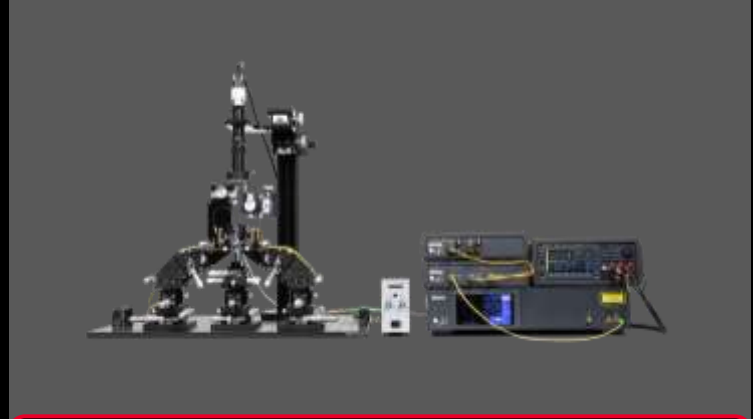
2. UU102LAB



Parametric Test and On-Wafer Measurement

- **B1500A**
- **UU102LAB-DUT** Teaching Lab DUT
- **MSTECH Probe Station**
- **7 Lab Sheets**

3. UU103LAB



Photonics IC Measurement

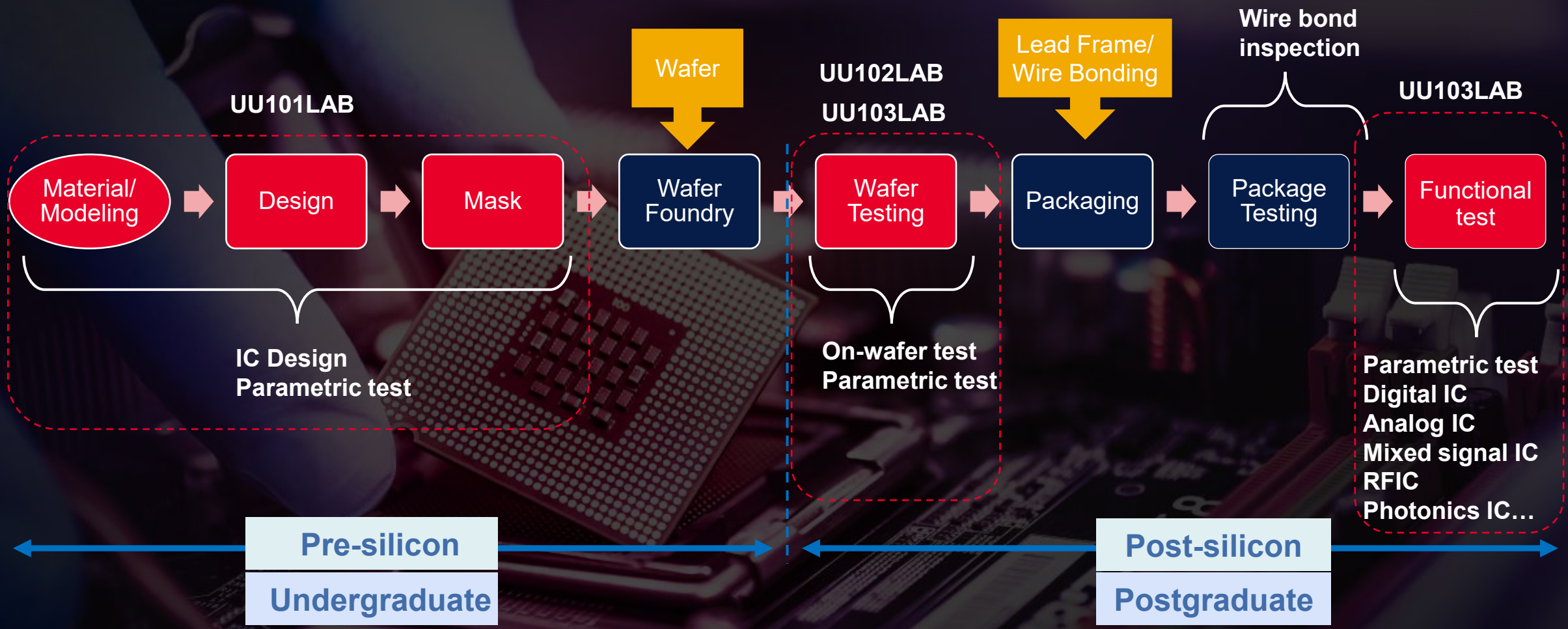
- **N7778C** Tunable Laser Source
- **N7788/6C** Component Analyzer / Polarization Synthesizer
- **N77742C** Optical Multiport Power Meter
- **B2901CL** Precision Source/Measure Unit
- **N7700100/2C** Lambdascan Measurement Software
- **UU103LAB-DUT** Photonic IC Measurement DUT
- **Photonic Probe Station**
- **6 Lab Sheets**



IC Product Lifecycle

IC Product Lifecycle

From design to manufacturing



UU101LAB- Basic Design and Measurement

keysight.com/find/uu101lab

Solution Overview

The **UU101LAB** is designed for universities and workforce development programs targeting **entry-level undergraduate** students. It enables institutions to equip students with hands-on skills in **circuit simulation and device characterization.**

What's inside the Solution?

- B2902C Source Measure Unit
- Digital Learning Suite Software
- Advanced Design System Software
- 3 Structured Lab Sheets (12 hours)

Learning Outcomes

Lab No	Lab Outcomes
Lab 1 (3 hrs)	**Understand Semiconductor Devices:** Students will learn to measure the IV curve of LEDs, BJTs, MOSFETs to obtain traces such as IV curve, gummel plot and output characteristic curve
Lab 2 (3 hrs)	**Understand Active Mixer Design:** Students follow a comprehensive process that includes bias network design, large-signal verification, matching circuit design, creating layout for mixer design and more
Lab 3 (6 hrs)	**Understand FET Amplifier Design:** Students will learn to build the FET amplifier schematic and symbol, perform DC and AC simulations, design matching network, conduct stability analysis, optimize/fine tune the amplifier



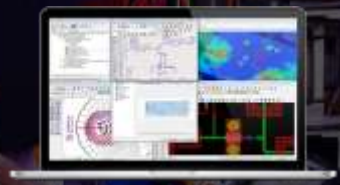
B2902C SMU



Digital Learning Suite



Lab sheets



Advanced Design System

UU102LAB- Parametric Test and On-Wafer Measurement

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Solution Overview

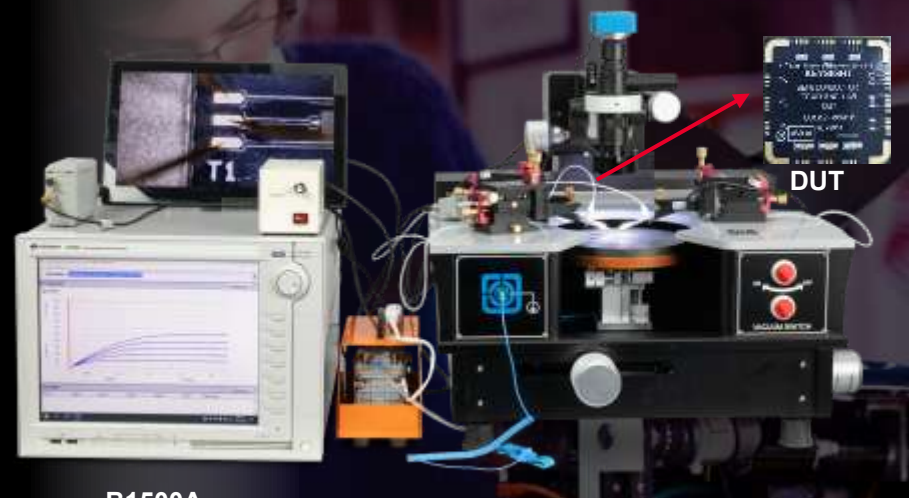
The **UU102LAB** is designed for universities and workforce development programs targeting **undergraduate and post graduate** students. It enables institutions to equip students with hands-on skills in **parametric testing, on-wafer probing and advanced measurement techniques.**

What's inside the Solution?

- B1500A Semiconductor Device Parameter Analyzer
- Semiconductor Teaching Lab DUT x3
- 7 Structured Lab Sheets (13 hours)
- MST8500CL MS Tech Probe Station

Learning Outcomes

Lab No	Lab Outcomes
Lab 1 (3 hrs)	**Hardware & Software Basics:** Students learn to set up the B1500A system, operate the probe station, and use EasyEXPERT to recall, run, and analyze measurements.
Lab 2 (1 hr)	**Id–Vd Application Test:** Students perform Id–Vd sweeps and understand MOSFET output characteristics using guided Application Test mode.
Lab 3 (2 hrs)	**Vth Measurement :** Students execute an Id–Vg sweep and extract threshold voltage (Vth) using tangent-line and gm-based analysis in classic test mode.
Lab 4 (2.5 hrs)	**C–V Measurement:** Students learn C–V measurement methodology, execute C-V measurement and perform open/short/phase calibration.
Lab 5 (2.5 hrs)	**Ultra-Low Current Measurement:** Students learn how to measure low current using ASU, perform zero-cancel, and understand noise-reduction best practices.
Lab 6 (1 hr)	**Sampling Measurement:** Students capture time-domain current/voltage behavior and analyze transient responses using sampling mode
Lab 7 (1 hr)	**Id–Vg Tracer Test:** Students use tracer test mode for quick, interactive characterization, implementing pulse sourcing for self-heating reduction, setting stop conditions, and Vth extraction via regression line





UU103LAB- Photonics IC Measurement

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Solution Overview

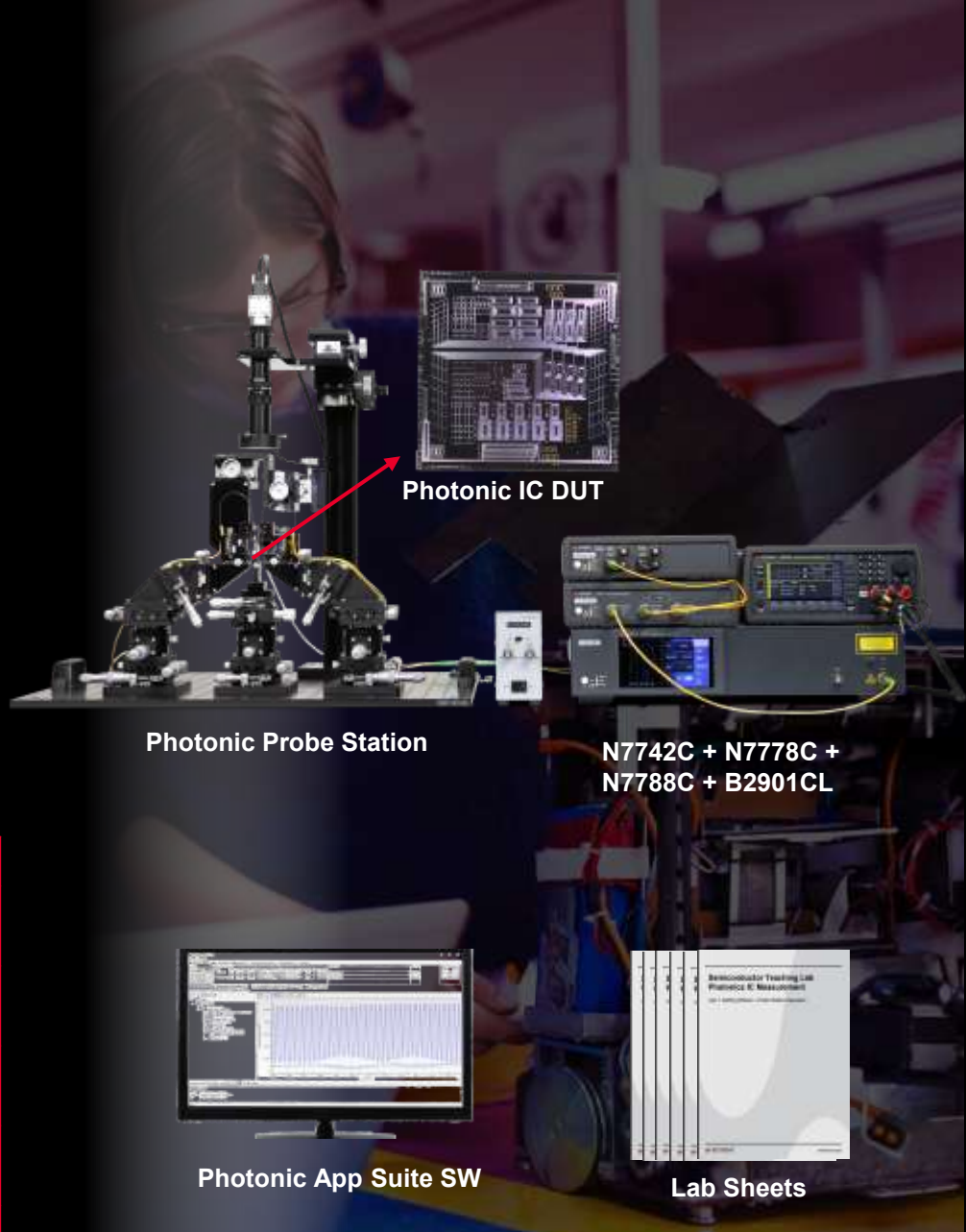
The **UU103LAB** is designed for universities and workforce development programs targeting **undergraduate and post graduate** students. It enables institutions to equip students with **foundational expertise required for advanced photonic device testing and optical coupling optimization.**

What's inside the Solution?

- N7778C Tunable Laser Source
- N7742C Optical Power Meter
- N7788/6C Polarization Controller and Analyzer
- B2901CL Source Measure Unit
- Photonic IC Measurement Teaching Lab DUT x3
- N770010xC Photonic App Suite Software
- 6 Structured Lab Sheets (18 hours)
- Photonic Manual Probe Station

Learning Outcomes

Lab No	Lab Outcomes
Lab 1 (3 hrs)	**Probe Station Operation:** Students learn to set up and operate photonic measurement instruments, handle and prepare optical fibers, and safely mount and align photonic dies on a probe station.
Lab 2 (3 hrs)	**Fixed Wavelength Power & Insertion Loss:** Students learn to perform fixed-wavelength optical measurements, including absolute power and insertion loss, while accounting for detector responsivity.
Lab 3 (3 hrs)	**Swept Wavelength Insertion Loss:** Students learn to configure and perform swept wavelength insertion loss measurements, including reference and device sweeps.
Lab 4 (3 hrs)	**Polarization Control & Measurement:** Students develop skills in controlling and analyzing the state of polarization (SOP), Poincare sphere visualization, and measuring polarization-dependent loss (PDL).
Lab 5 (3 hrs)	**Swept Wavelength IL & PDL Measurements:** Students learn to perform swept wavelength IL/PDL measurements, analyze polarization data, and apply advanced optical characterization techniques..
Lab 6 (3 hrs)	**OE PIN Diode Responsivity:** Students learn to integrate electrical and optical measurements by using SMUs to calculate photodiode responsivity (A/W) and evaluate dark current performance.



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