

CMOS RF Course Sets New Global Record

The inaugural online course of 2025, [*"The Art of CMOS RF Design & Layout"*](#), featured the highly anticipated return of renowned lecturer, Prof. Patrick Reynaert (KU Leuven), who brought circuits to life through his trademark enthusiasm and profound command of RF design principles.

This highly sought-after course drew a global audience comprising 100 design engineers from a record number of 29 countries, reflecting its strong international appeal. Represented nations included Japan, China, South Korea, Singapore, India, Türkiye, Saudi Arabia, Egypt, Israel, Greece, Italy, Austria, Germany, Poland, Finland, Switzerland, Netherlands, Belgium, France, Spain, Portugal, England, Scotland, Ireland, Canada, United States, Brazil, Argentina and Chile.

The RF circuit insights and methodologies presented throughout this specialised course were drawn from extensive experience in mm-Wave research, offering highly practical guidance for designing robust, real-world RF products operating both below and beyond 20 GHz. The course consistently presented alternative circuit implementations across these frequency bands, highlighting different design approaches and shedding light on the common challenges faced when working at RF versus mm-Wave frequencies.

The primary topics covered in the course included RF IC Design Fundamentals, CMOS Actives and Passives, Broadband Tuning and Matching, RF and mm-Wave Power Amplifiers, System-Level and Circuit-Level PA Design, Advanced Layout Techniques, RF and mm-Wave Circuit Design Case Studies and Analysis of Non-Working Chips.

RF-PAs in CMOS: low voltage

Large output power? →

1. Transform 50 Ohm load to a **very small** resistor R_{in}
2. Make transistor W **very large** to deliver large output current

$V_{oc} = V_{DD}$

$2V_{DD}$

R_{in}

R_{Lm}

R_L

Efficiency of this network?

50Ω

$P_{OUT} = \frac{V_{DD}^2}{2R_{in}} = \frac{V_{DD}^2}{2R_L r}$

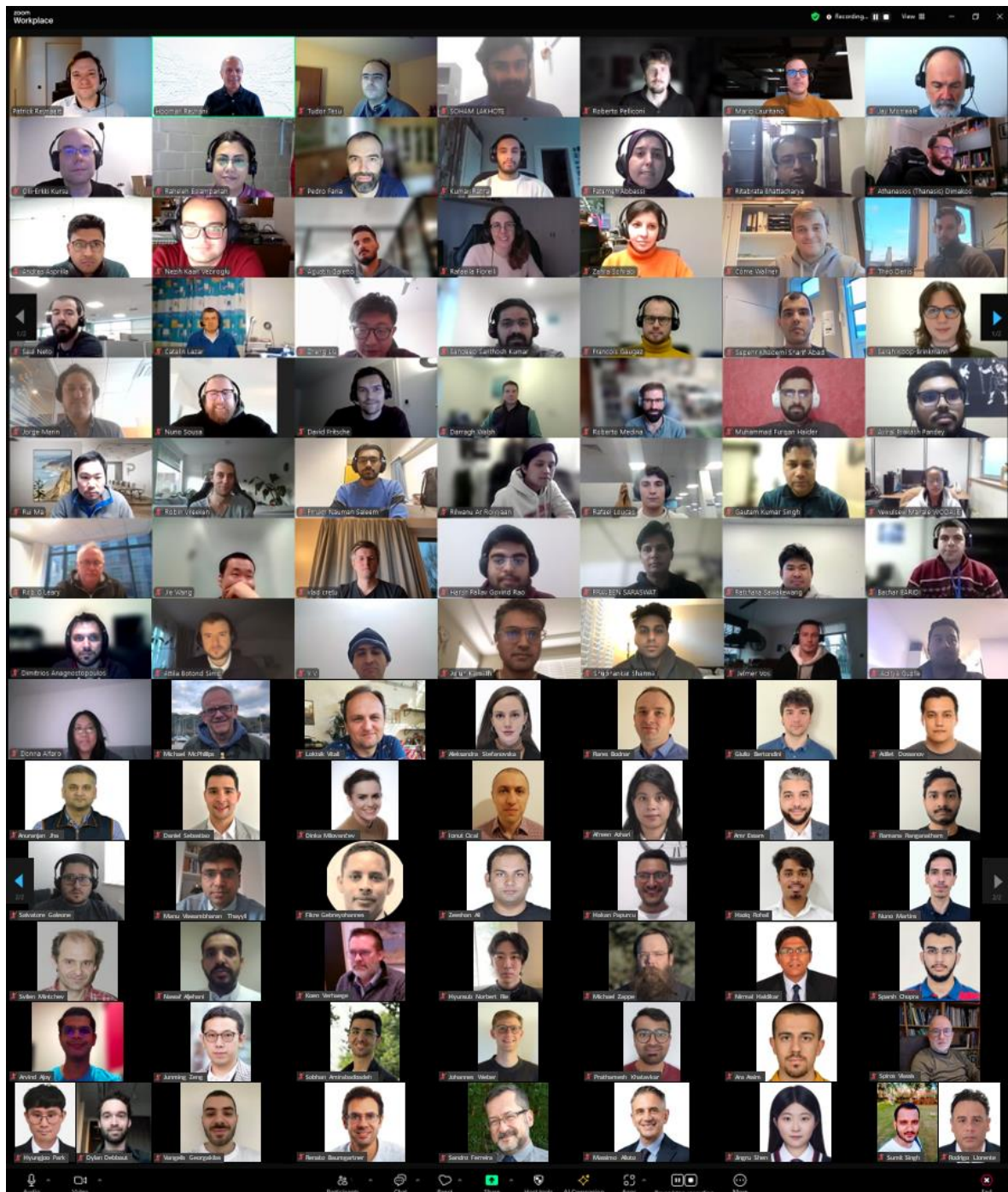
$r = \frac{R_L}{R_{in}}$

Prof. Patrick Reynaert

KU LEUVEN

Prof. Patrick Reynaert (KU Leuven), course presenter, talked about *"The Art of CMOS RF Design & Layout"*, at an online course hosted by Hooman Reyhani, Ireland.

Prof. Reynaert is a Professor at the University of Leuven (KU Leuven), department of Electrical Engineering (ESAT-MICAS), since 2007. His main research interests include mm-Wave and THz CMOS circuit design, high-speed circuits and RF power amplifiers, with 300+ IEEE publications. Dr. Reynaert serves on the TPC of ISSCC, ESSCIRC, RFIC, PRIME and IEDM. He has served as Associate Editor for TCAS-I, and as Guest/Associate Editor for the JSSC.



The lecturer, organiser and participants of the *“The Art of CMOS RF Design & Layout”* online course, January 2025.

The sample lecture ([here](#)) and homework assignment ([here](#)) provide a representative glimpse into the high-calibre material presented throughout this RF course. The participants had the opportunity to engage in real-time Q&A during the live sessions, with further discussion and support facilitated through the course forums.

The course was an outstanding success, receiving overwhelmingly positive feedback from participants:

“Excellent course, by far the best I have attended. Prof. Reynaert is so clear, eloquent, knowledgeable and always available to answer our questions.”

“Well-structured and conducted course. Great flexibility and access to the course resources. One of the best courses available on the internet in this domain.”

“Really happy I could take this course thanks to all the recordings, both of the lectures and the homework. Following the live sessions didn’t fit my personal schedule. Great learning opportunity.”

Full access to [this course content](#), as well as [our previous courses](#), may be requested (subject to payment). For more information, [please see here](#).

— Hooman Reyhani