Wadhwani Electronics Lab (WEL)

M.Tech. RA admissions 2025

SIDDHARTH TALLUR

MAY-JUNE 2025

http://www.ee.iitb.ac.in/~stallur/index.php/ https://www.ee.iitb.ac.in/~wel_iitb/

Brief overview of WEL

❖ **Long-term WF-IITB association:** WEL symbolizes the long standing association of Electrical Engineering department at IIT Bombay with the Wadhwani Foundation

❖ **>15,000 student beneficiaries:** Facilitates lab courses for more than 600 undergraduate and 200 postgraduate students (per semester), and has done so for over 18 years

❖ **Vibrant DIY community:** WEL cultivates a vibrant community of highly capable and passionate engineers and research assistants that continually demonstrate excellence through developmental activities

❖ **Enabling innovators:** WEL alumni (RAs) have broad impact through start- ups, impactful   industry and academic positions, and numerous awards and recognition

❖ **Nation-wide outreach:** Continues to enable countless students, faculty and lab assistants to   learn hardware engineering through workshops and internships

Highlights
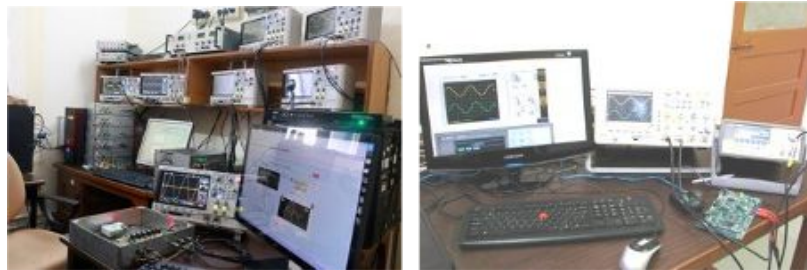
e-Prayog Virtual labs (MHRD)

Project by students from a engineering college in Mumbai

Boards distributed

Workshops conducted

Electronics workshops for school teachers and students

Outreach

WEL RA achievements

M. P. Date et al., **e-Prayog: A New Paradigm in Electronics Laboratories**, IEEE International Conference on Technology-Enhanced Education (ICTEE), Trivandrum 2012

S. Shelke et al., **A Remote Lab For Real-Time Digital Signal Processing**, in EDERC2012: Amsterdam, Sep. 2012

J. Jinu et al., **An Approach to Complement Electronics Courses using Virtual Environment**, IEEE Global Engineering Education Conference (EDUCON), Berlin 2013

D. Ghosh et al., **A Portable Solution for Microcontroller Laboratories**, IEEE Global Engineering Education Conference (EDUCON), Berlin 2013

S. Agrawal et al., **An Introducory Lab Course in Digital Design- Onsite and Online Laboratory**, IEEE Global Engineering Education Conference (EDUCON), Berlin 2013

J. Joy et al., **Capacitance-voltage profiling of MOS capacitors: A case study of hands-on semiconductor testing for an undergraduate laboratory**, American Journal of Physics 86, 787 (2018). (Featured on journal cover)
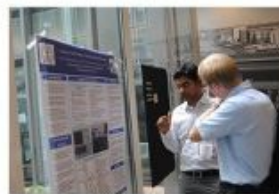
Awards at **Analog Devices Anveshan Fellowship**
2014 – 1st prize (Vineesh V.S. et al.)
2018 – 3rd prize (Girish O., Pranav A.)
2 finalist teams in 2019 edition

Award at **TI Analog Design Contest**
2013 – Debapratim G. and Srinivas R.

ACPAD – World's First Wireless MIDI Controller for Acoustic Guitar
1 million hits on YouTube channel in first week of launch

WeCare: Wearable Emergency Assistance Solutions for senior citizens. The team is supported by seed grant from DBT BIRAC (under IIPME scheme) and is incubated at SINE (IIT Bombay Technology Incubation Center). **Finalists for 2015 Ericsson Innovation Award**

New activities

Helium: CPLD board designed and in use since 2009
Also provided to IIT-Goa and IIT-DH, IIT-D, and used in workshops

Krypton: Higher-end CPLD board
Currently used for IITB lab courses, and provided to IIIT-B, IIT-G, and used in workshops

Aurum: PIC microcontroller developer board
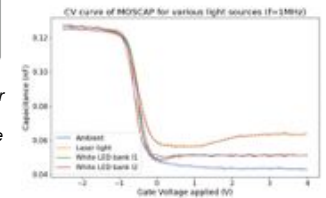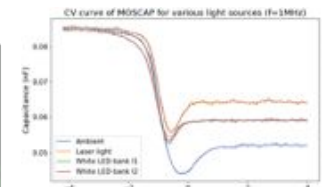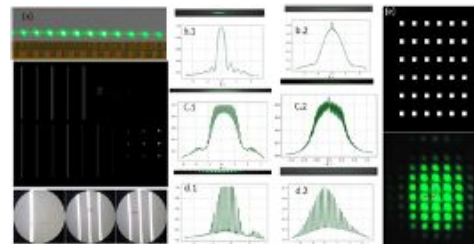Currently used for IITB EDL lab course, and used in workshops

I-Q modulator board: used for IIT Bombay communications lab course

Lab kits designed in WEL – to be used for novel lab MOOCs on NPTEL platform

New board designs (FPGA dev board and data acquisition board) designed by WEL RAs in 2019-20

Group: PB, AS, MR, SJ. Study of impact on C-V due to optically generated carriers (Left) Automated measurement setup for C-V characterization under light; (Middle) MOSCAP sample excited using green laser; (Right) HFCV measurements obtained on 100nm thermal oxide (top) and 20nm ALD oxide (bottom)

Semiconductor device fabrication and characterization using low cost instrumentation
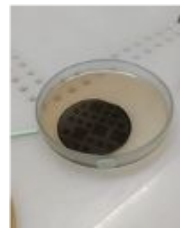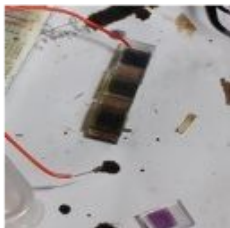
Pilot MOOC on embedded systems

Online lecture and tutorial videos

On-boarding workshop at WEL, Dec 2017

Mid-sem exam at VIIT Pune, supervised by WEL RAs (Harsh and Harshal) March 2018

End-sem exam at VIIT Pune, supervised by WEL RA (Rahul) July 2018

Role of RAs

❖ WEL caters to 12 lab courses every year (6 per semester, with support to other courses as necessary)

❖ Every RA will be assigned one course per semester for lab teaching assistant (TA) duty

❖ As teaching assistants, you are expected to help students perform the experiments, assess their performance and help in maintaining the overall discipline in the lab

❖ In addition to lab TA duty, RAs also contribute to developmental and lab building activities, designing new experiments, preparing lab manuals etc.

❖ Tasks may be assigned by lab in-charge, or course instructors

❖ You are expected to contribute a minimum of 20 hours of effort every week towards lab duty (apart from TA duty during semester). It is your responsibility to manage your time to ensure that your lab duties are not compromised.