Wadhwani Electronics Lab (WEL)

M.Tech. RA admissions 2021

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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

**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
- 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 Introductory 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., Pranev A.)
  - 2 finalist teams in 2019 edition

- 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 IIT lab courses, and provided to IIT-B, IIT-G, and used in workshops

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

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

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

Semiconductor device fabrication and characterization using low cost instrumentation

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)
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.

**Note**: Due to uncertainties posed by the Covid-19 pandemic, the role of RAs will be suitably modified as necessary. The bullet points listed above were followed pre-Covid-19.