# VIRTUAL LAB

Virtual labs in B.Tech education offer simulated or remote-access laboratory experiences for students. Here are key points about virtual labs:

1. **Remote Access:** Virtual labs enable students to access experiments and laboratory simulations online from anywhere, allowing flexibility in learning without the constraints of physical lab availability.
2. **Hands-On Experience:** They provide a hands-on experience where students can perform experiments virtually, manipulate equipment, and observe outcomes, mimicking real lab scenarios.
3. **Cost-Effective and Scalable:** Virtual labs reduce the need for physical infrastructure and equipment, making them cost-effective and scalable for educational institutions, while still providing practical learning opportunities.
4. **Safety and Accessibility:** Students can explore experiments without safety concerns associated with physical labs. Additionally, these labs offer accessibility to students with disabilities or those facing geographical limitations.
5. **Repeatable and Customizable:** Virtual labs allow students to repeat experiments multiple times, explore different scenarios, and adjust parameters, enhancing understanding through experimentation and repetition.
6. **Supplement to Traditional Labs:** They complement traditional lab sessions, especially when physical access is limited or not feasible, offering a comprehensive learning experience.
7. **Interactivity and Feedback:** Virtual labs often include interactive elements, feedback mechanisms, and guidance to help students navigate experiments and understand scientific principles.

Overall, virtual labs serve as innovative tools in B.Tech education, providing students with practical exposure to experiments and fostering a deeper understanding of theoretical concepts within their field of study.

# VIMAL JYOTHI ENGINEERING COLLEGE, CHEMPERI

# DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

## *Virtual Lab*

## *Lab List*

### Academic Year 2020-21 ODD

| CLASS | SUBJECT NAME WITH CODE |
|-------|------------------------|
| S1AEI | EST120 Basics Of Civil & MechanicalEngineering |
| S1AEI | CYL120 Engineering Chemistry Lab |
| S3AEI | ECL201 Scientific Computing Laboratory |
| S3AEI | ECL203 Logic Design Lab |
| S5AEI | AE331Microprocessors &Microcontrollers Lab |
| S5AEI | EE337 Electrical Engineering Lab |
| S7AEI | AE431 Control System & Signal Processing Lab |
| S1 .MTECH | 10EI6111 Industrial Instrumentation Lab |

### Academic Year 2020-21 EVEN

| CLASS | SUBJECT NAME WITH CODE |
|-------|------------------------|
| S2AEI | ESL130 Basic Electric & Electronics Lab |
| S2AEI | PHL120 Engineering Physics Lab |
| S4AEI | AEL204 Transducers and measurements lab |
| S4AEI | ECL202 Analog circuits and simulation lab |
| S6AEI | AE332 Process Control Lab |
| S6AEI | AE 334 Power Electronics Lab |
| S2 .MTECH | 10EI6112 Process Control Lab |

# ECL202: Analog circuits and simulation lab

## Execution plan with video links

| Date of conduction of lab | Experiment no. | Name of experiment done | Video link of class with demonstrations | Link of demonstration used | Viva google form link |
|---|---|---|---|---|---|
| | 1 | RC integrating and differentiating circuits (Transient analysis with different inputs and frequency response) | https://drive.google.com/file/d/16TiqDIMV0ZKKI9_mfwOMkHnDT3_Aqx9V/view?usp=drive_link | http://vlabs.iitkgp.ac.in/be/exp14/ http://vlabs.iitkgp.ac.in/be/exp14/rc_hpf.html http://vlabs.iitkgp.ac.in/be/exp14/rc_lpf.html | https://docs.google.com/document/d/1mBNORU3TNCWEHdGIaBoKEyjjAytkZsbT/edit?usp=drive_link&ouid=103136525517175308753&rtpof=true&sd=true |
| | 2 | RC coupled CE amplifier - frequency response characteristics | https://drive.google.com/file/d/1Ux2-6ulsNHatzGOeBRDESyoO1K9H21CI/view?usp=drive_link | http://vlabs.iitkgp.ac.in/be/exp13/index.html# | https://docs.google.com/document/d/1SKj3k109V7xlKEtmrjA5sQzdLeYMrhzo/edit?usp=drive_link&ouid=103136525517175308753&rtpof=true&sd=true |
| | 3 | Clipping and clamping circuits (Transients and transfer characteristics) | https://drive.google.com/file/d/1rs_QX6sc8WcylPVbKRz4TSdlvQ1iTHR7/view?usp=drive_link | http://evalidate.freehostia.com/diode/diodeClamper/clamperTheory.html http://evalidate.freehostia.com/diode/clipper/clipperTheory.html http://vlabs.iitb.ac.in/rec-bootathon/innovationgeeks-clipper-clamper-skit/index.html | https://docs.google.com/document/d/1guz9U5Ziza0V8lEsVDLJZO47HvQwfZ9P/edit?usp=drive_link&ouid=103136525517175308753&rtpof=true&sd=true |
| | 4 | RC integrating and differentiating circuits (Transient analysis with different inputs and frequency response) | https://drive.google.com/file/d/1qadRi4KM9QsWiifXgfHvYKk4RXuKdlH-/view?usp=drive_link | https://sourceforge.net/projects/qucs/files/latest/download | https://docs.google.com/document/d/18UdsqpUPhoJbcXaYcMUvIwqOIxjw2bMf/edit?usp=drive_link&ouid=103136525517175308753&rtpof=true&sd=true |
| | 5 | Clipping and clamping circuits (Transients and transfer | https://drive.google.com/file/d/181EgvtqGRB9pGcBU | https://sourceforge.net/projects/qucs/files/latest/download | https://docs.google.com/document/d/1l4z8ezuuAnThKhT7n |

| | | characteristics) | uEpGdCUMedYua29u/view?usp=drive_link | | N7x3ICr_EFMdNfx/edit?usp=drive_link&ouid=103136525517175308753&rtpof=true&sd=true |
|---|---|---|---|---|---|
| | 6 | Cascade amplifier – gain and frequency response | https://drive.google.com/file/d/1qAzVLrVP4XsRgA_cKWnYYLEVmPCdNrbB/view?usp=drive_link | https://sourceforge.net/projects/qucs/files/latest/download | https://docs.google.com/document/d/1lBNALijjMQnOU4DbISPkXRNeRjkXLmAl/edit?usp=drive_link&ouid=103136525517175308753&rtpof=true&sd=true |
| | 7 | Low frequency oscillators –RC phase shift or Wien bridge | https://drive.google.com/file/d/1wmpbc_1dcswIa-stOsDYsTUIpgBs8xgV/view?usp=drive_link | https://sourceforge.net/projects/qucs/files/latest/download | |
| | 8 | Transistor series voltage regulator (load and line regulation) | https://drive.google.com/file/d/1zN3XjM9yGsz60xeJzOoyIVFvqD_uvZ_P/view?usp=drive_link | https://sourceforge.net/projects/qucs/files/latest/download | |
| | 9 | RC coupled CE amplifier - frequency response characteristics | https://drive.google.com/file/d/1zN3XjM9yGsz60xeJzOoyIVFvqD_uvZ_P/view?usp=drive_link | https://sourceforge.net/projects/qucs/files/latest/download | |

# EEL 201: Circuits and Measurements Lab Execution plan with video links

| Date of conduction of lab | Exper iment No | Name of experiments done | Video link of class with demonstrations | Link of demonstrations used | Viva google form links |
|---|---|---|---|---|---|
| 19/8/2020 | 1 | Verification of Superposition theorem and Thevenin's theorem | https://drive.googl e.com/file/d/1fKjy5 E6NEkAQAyXpIG aZ4s-Yhuf5KvAR/view? usp=sharing | http://vlab.amrita.edu/ind ex.php?sub=1&brch=75&s im=313&cnt=1<br><br>https://youtu.be/CXXicLk B54k | https://forms.gle/wKxa5 yWzSsqB32yZA<br><br>https://forms.gle/kMAF5 md3dYRruQ427 |
| 26/8/2020 | 2 | Determination of impedance, admittance and power factor in RLC series/ parallel circuits. | https://drive.googl e.com/file/d/1zNM F2q6BKnXF27fOx 2kv-t-7mfl3Cjea/view?u sp=sharing | http://vlab.amrita.edu/in dex.php?sub=1&brch= 75&sim=330&cnt=1<br><br>http://vlab.amrita.edu/in dex.php?sub=1&brch= 75&sim=325&cnt=1 | https://forms.gle/QtqC mfJ3We2VxBHLA<br><br>https://forms.gle/xG6K C7NiaUsQ5H4W8 |
| 9/9/2020 | 3 | measurement of three phase power using 1 wattmeter and 2 wattmeter method | https://drive.googl e.com/file/d/1RD7 EJLq6jOYGH52kc hI4kwhfFnN_e8IQ/ view?usp=sharing | https://youtu.be/OpZnn 1Wsy2g | https://forms.gle/MQZz JYZBjRuNJ5tr9 |
| 16/9/2020 | 11& 12 | determination of characteristics by LVDT,strainga uge and Load cell VERIFICATI ON OF LOADING EFFECT IN AMMETERS AND VOLTMETER S WITH CURRENT MEASUREM | https://drive.googl e.com/file/d/1kQwl r2bepbITYvZIaKR NXRUTeZa2fVWN /view?usp=sharing | https://youtu.be/FeoKB gf_wcA | https://forms.gle/ENr8 Mkmodfjiwg3Q8<br><br>https://forms.gle/YFd6j P6m9ZptoLPE8 |

| | | ENT USING CLAMP ON METER. | | | |
|---|---|---|---|---|---|
| 23/9/2020 | 10 & 8 | measurement of self inductance mutual inductance and coupling coefficient calibration of 3 phase energy meter using standard wattmeter | https://drive.google.com/file/d/1zAw5GPTQhX14Dm9ANirEnptgLMbs9oba/view?usp=sharing | | https://forms.gle/NpoxVdSv3fpmVtjV7<br><br>https://forms.gle/3fqQV7uF3zUKsJ9d8 |
| 14/10/2020 | 7 | Calibration of 1-phase Energy meter at various power factors (minimum 4 conditions) | https://drive.google.com/file/d/1s_Bzsmm9XCKn2ecWdOuBmk9N258Usy8S/view?usp=sharing | | https://forms.gle/Yzte4fRXUGgWws397 |
| 21/10/2020 | 4 | Resistance measurement using Kelvin's Double Bridge and Wheatstone's Bridge and extension of range of voltmeters and ammeters | https://drive.google.com/file/d/1ajw54o9W3sJOrYe_fpLoaLAyRppta-Qv/view?usp=sharing | https://drive.google.com/file/d/1QJeLGxzU3KUSdgSWaBWEcwzcGXmYg3Co/view?usp=sharing<br>https://drive.google.com/file/d/19KqrqSGp93qWRdRyqI5olV31F9hbkZVz/view?usp=sharing | https://forms.gle/ARsGnEoCkwvJk8gg9<br><br>https://forms.gle/hK4oeiY6QPHw1fZg8 |
| 28/10/2020 | 9 | Determination of B-H curve, $\mu$-H curve and $\mu$-B curve of a magnetic specimen | https://drive.google.com/file/d/1ZA25eb0OMdFr8vSZ9Ax-hXEME0ifL527/view?usp=sharing | https://drive.google.com/file/d/1Q5P4mgDWnLtSPck-tYmPjpBVPt3aCvsT/view?usp=sharing | https://forms.gle/Np1DxmCjineHyr6r5 |
| 11/11/2020 | 5 | Extension of instrument range by using | https://drive.google.com/file/d/1Hkyi_r4kSlzMxndz4QjFqU9PCCvqkxf6/v | https://drive.google.com/file/d/1TPjzqWa_drqQjjgld71UtjsigwMTdU0u/view?usp=sharing | https://drive.google.com/file/d/1Hkyi_r4kSlzMxndz4QjFqU9PCCvqkxf6/view?usp=sharing |

| | | Instrument transformers( CT and PT) | iew?usp=sharing | | https://drive.google.co m/file/d/1_0s4HKfVO5 0amfOTgnYWT1dpallf Ppsi/view?usp=sharing |
| --- | --- | --- | --- | --- | --- |
| 26/11/2020 | 6 | Calibration of ammeter using slidewire potentiometer | https://drive.googl e.com/file/d/1ZZYi KpFmYARK0xqTd P3UaTVHpkUBF6 2_/view?usp=shari ng | https://drive.google.co m/file/d/1VjAqupeUe4v OSwC9bDSQ4P9voZrx LaFA/view?usp=sharin g | https://drive.google.co m/file/d/19yfCqMHolgB OXq9qs3q0r- 8PJGxS3RY4/view?us p=sharing<br><br>https://drive.google.co m/file/d/1ETzg5y7zzF C3q6FhA2HJafH0toX NfDdw/view?usp=shari ng |