Lam Research India – CeNSE, IISc Semiconductor Skills Development through SEMulator3D®

Supported by

इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी मंत्रालय
MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY

इंडिया सेमीकंडक्टर मिशन
India Semiconductor Mission
Catalyzing India's Semiconductor Ecosystem

FAQ

1. Who will come for the workshop, student or faculty?
    a. The workshops are for faculty. Once introduced to the curriculum, the faculty are expected to launch new courses in their respective institutes to train students.
2. Where can faculty apply?
    a. Please apply at http://www.cense.iisc.ac.in/lam_training/
3. Is there any cost for the Participating Universities?
    a. No. The ISM and Lam Research fund the complete program. There is no cost for Participating Universities.
4. How long is the faculty workshop?
    a. A 2-week hands-on semiconductor fabrication workshop at IISc Bengaluru. The hands-on workshop can be skipped by faculty who have already gone through this training in some other program like INUP or are CeNSE alumni.
    b. A 2-week online session with 20 hours of lectures and demonstration on the CMOS process and SEMulator3D®.
    c. Dates and schedules of upcoming workshops will be posted on our website, http://www.cense.iisc.ac.in/lam_training/
5. After attending workshops, will faculty need refreshers or can they keep teaching the course perpetually?
    a. For next 2 years we don't see a need for a refresher. This might change when MeitY renews the program with different objectives.
6. Will faculty get any certificates?
    a. IISc will issue a certificate of participation for the hands-on workshop. The certificate is assigned by Chair, CeNSE.
7. Will IISc or Lam Research provide any certificates to students?
    a. No. Students must be training by Universities.
8. The new course should be targeted at UG or PG students?
    a. Both. We especially encourage UG programs with large batch sizes.
9. Do we have to launch new programs, or can we integrate the material into an existing course?
    a. Either. We have also mandated minimum learning outcomes and use of SEMulator3D. You can achieve these mandates by integrating SEMulato3D in an existing course or a new course.
10. What type of courses is IISc and Lam Research expecting?
    a. Your choice. The mandate is that you launch an academic course that appears on the transcript with a grade. We have also mandated minimum learning outcomes and use of SEMulator3D. Name, number of credits, etc. are your choice.
11. Is there a standard curriculum? Is there a standard name of the course? Does the "SEMulator3D" need to appear on the transcript of students??
    a. No. We are mandating minimum learning outcomes and SEMulator3D assignments as a tool to achieve those outcomes. Rest is up to the teaching faculty. The section above provide an overview of what IISc does.

    b. No. Our mandate is that you launch an academic course that appears on the transcript with a grade.
12. What should be the number of credits for the new course?
    a. At IISc, this would be a 3 credit course for Masters students with a "lab" where SEMulator3D assignment are discussed. However, the participating Universities are free to decide this, based on student levels, curriculum and teaching hours.
13. Is this a theory or lab course?
    a. Depends on the Universities. We are mandating minimum learning outcomes and SEMulator3D assignments as a tool to achieve those outcomes. Rest is up to the teaching faculty. At IISc, we have a course with both lectures and lab. Assignments are discussed in the lab.
14. What must be the pre-requisites of the course?
    a. Depends on the curriculum being covered in the course. If you start from unit-process, 3rd year engineering students should be able to grasp the material with effort.
15. Is there an enrolment target?
    a. Yes. To justify the investment, we have projected a target of 100 students per year on average to the Govt. We give extra marks to institutes who can promise larger batches. So please try to reach that goal.
    b. Please highlight the involvement of industry; minimise pre-requisites; allow students from multiple departments; and target both UG and PG students.
16. Why should students take this course?
    a. Because it makes them more employable. This is a unique skilling initiative where Lam Research is involved. Semiconductor Mission is in full swing. Fabs are coming up. We need people with advanced integration knowledge.
17. What can use to market this course to students?
    a. Participating Universities get A3 sized posters that they can post on notice boards.
    b. You can also use this video on IISc experience with the course: https://www.youtube.com/watch?v=p5R8XzLXjao
18. Which semester should be launch this course - odd, even or both?
    a. Your choice. Our target is 100 students per year on average.
19. Can this course be launched as MOOC or online degree program?
    a. No. Currently, this program is only available for typical in-person academic degree programs.
20. Can this course be offered for vocational, ITI, or diploma programs?
    a. No. We are only targeting UG and above degree programs at Universities and Colleges
21. Can this course be offered in non-EE departments?
    a. Absolutely. We encourage the participation of non-EE departments. In fact we recommend the course be available as elective so non-EE students can benefit.
22. Are there any reporting requirements for Participating Universities?
    a. Every semester, we need a short report describing the course, a list of students with names and emails, and student feedback (if any). You will get a excel template which must be filled.

23. What is the assessment methodology?
    a. Whatever you use in your University. We will not impinge on your academic freedom and mandates.
    b. We will however, conduct a separate test with multi-choice questions for the participating students. This test has nothing to do with grades they will get. The test is only a quality assurance exercise to ensure the minimum learning outcomes are being met.
24. Will IISc or Lam conduct any exam for students?
    a. We conduct a online test with multi-choice questions for the participating students. This test has nothing to do with your internal evaluation or grading. The test is only a quality assurance exercise to ensure the minimum learning outcomes are being met.
    b. For grading, please conduct your own internal exams and evaluations as you see fit.
25. Can TAs be trained?
    a. Yes. TAs are encouraged to participate in the online lectures and demonstrations.
26. Will Participating Universities need extensive IT infrastructure?
    a. No. Typical laptops or desktops are sufficient to run SEMulator3D®. A central computing server is not needed. The license server will be hosted at IISc. Details are in the section above.
    b. More details are at https://www.coventor.com/support/system-requirements/
27. How long is the commitment to provide the licenses?
    a. MeitY has funded the program till Dec 2026. Provided the funding is renewed, IISc and Lam Research will continue the program for 10 years or till 60000 students are trained.
28. What materials will IISc and Lam provide?
    a. Learning outcome document to define the curriculum
    b. 10 Assignments and solutions to introduce advanced CMOS FINFET process flow.
    c. Lecture handouts and videos on process integration of an advanced CMOS FINFET process flow.
    d. Lecture notes and videos on semiconductor unit-process. This course is available on NPTEL.
29. Will Participating Universities be able to use the tool for research?
    a. Not automatically. The licenses are provided for academic use in courses only. Universities can approach Lam Research for a deeper engagement, which includes R&D, workshops, projects, etc.
30. Will Participating Universities be able to use the tool for short-term trainings, workshops or industry training?
    a. No. These are very expensive licenses that Lam Research is giving away for free. Please don't use them for commercial purposes. If you are really keen, send a request. This is a very unique skilling initiative between industry, academia and government. We should behave responsibly to make it a success.
31. What legal documents need to be active?

    a. NDA and MOU will be signed between IISc, Lam Research, and University.
32. Are Universities responsible for fair-use of SEMulator3D?
    a. Yes. Please read the MoU terms carefully. They will be strictly followed in letter and spirit.
33. Can Universities use Lam and IISc logo?
    a. Only with permission on a case-by-case basis. Participation in the program does not give you right to the branding. We understand your need to create banners, and promotions. Please send the design to
34. Will IISc or Lam Research provide any jobs to students? Can students expect any internships?
    a. No. We are making an honest effort to improve employability. However, we can't promise jobs. We will invite 100 meritorious students from each year for an all-expense paid visit to CeNSE.
35. How many licenses will Lam Research provide to each University?
    a. As many as your need to teach students. Availability of licenses will not be a bottleneck.
36. What is the tenure of licenses?
    a. They will last for the semester. They will be renewed every semester, based on need in that semester.
37. Do Universities need fresh approval to launch the course every semester?
    a. No. However, you will need project the number of licenses you need each semester. You will also need to provide a report every semester.
38. Can SEMulator3D replace the need for hands-on training?
    a. Not completely. Hands-on training is needed for employees working in a fab, but such training is terribly expensive and available at very few places in India. SEMulator3D allows you to get very close to the end goal, at a fraction of the cost. Think of this as a 80% solution that costs only 10%.
39. What is the need for jobs in the semiconductor industry?
    a. We recommend the SemiCon Talent Committee Report: https://indianinstituteofscience-my.sharepoint.com/:b:/g/personal/savasthi_iisc_ac_in/EexzgPAMpyVNk-0H7JesdAEBha9N5pV0HQK0vVBjiL4QMA?e=xGRZDY