GUJARAT TECHNOLOGICAL UNIVERSITY

(Established Government of Gujarat under Gujarat Act No. : 20 of 2007)

(Accredited with A+ Grade by NAAC)

ગુજરાત ટેકનોલોજિકલ યુનિવર્સિટી

(ગુજરાત સરકારના ગુજરાત અધિનિયમ ક્રમાંક : ૨૦/૨૦૦૭ દ્વારા સ્થાપિત)

GTU/ITAP/Open Elective by Micron / 29   Date: 03/01/2025

Circular
Introduction of "Fundamentals of Semiconductor Package Manufacturing & Test" subject for 6th Semester engineering students in GTU curriculum as an open elective
(Subject Code: 3160004)

To,

All Principals,

Bachelor of Engineering Colleges of GTU.

In-line with the recent developments w.r.t set up of Semiconductor Facilities by reputed organizations in Gujarat, GTU is enthusiastically working on developing an ecosystem which can cater the skilled manpower to this emerging industry of the state.

Taking an initial stride to become a pioneer institute in terms of equipping the students with required knowledge and skills in said domain, GTU is going to offer an elective course on "Fundamentals of Semiconductor Package Manufacturing and Test" into the **6th semester of the Bachelor of Engineering curriculum of GTU, commencing from January 2025."** in relevant branches of the Bachelor of Engineering program jointly with Micron Technology. In the process of implementing this open elective, GTU has organized a Faculty Development Program jointly with Micron Technology in May-June 2024.

Operation methodology for introducing "FUNDAMENTALS OF SEMICONDUCTOR PACKAGE MANUFACTURING AND TEST" as an Open Elective in GTU curriculum:

1. The subject of **"FUNDAMENTALS OF SEMICONDUCTOR PACKAGE MANUFACTURING AND TEST" (Subject Code:-3160004)** will be offered as **an Open Elective** in GTU curriculum from January 2025 (AY 2024-25) in the **undergraduate engineering to the 6th semester** students of various branches.

2. Link for the **syllabus for Subject Code(3160004):** -.

   FUNDAMENTALS OF SEMICONDUCTOR PACKAGE MANUFACTURING AND TEST:-3160004

3. **Micron industry experts** will teach the course through **virtual live and recorded sessions.**

Winner of : "4 Star rating in GSIRF (Gujarat State Institutional rating Framework) Published by KCG, Dept. of Education Govt. of Gujarat" ❖ "GTU Ranked 71 in Pharmacy Category in NIRF-2023" ❖ "Green University Acceduation in Platinum Ranking for 2021-2023" ❖ "1st rank Among All Universities in Gujarat 2020 by Uni Rank"

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4. **Micron will share the zoom invitation to course coordinator** from respective colleges. So, it is **mandatory to have a dedicated course coordinator at the institute**, if the student of the institute is willing to choose the elective.

5. Online lectures by Micron Experts will be scheduled for **every Monday, Tuesday and Wednesday from 4-5PM each week**. (i.e. 3 hrs. a week)

6. The detailed schedule of the lectures with comprehensive course execution plan by Micron Technology is enclosed as **Annexure:-1**

Key points for consideration at Institute level:

1) Nomination of Course Coordinator as SPOC:

1.1. It is **mandatory to nominate one faculty from the institute to act as course coordinator & SPOC** to coordinate the delivery of the program.

1.2. The institute from **which the faculty had already undergone the Faculty Development Program**, the faculty who was nominated as Course Coordinator will act as SPOC whereas for the **institutes from which no faculty have undergone FDP, concerned higher authorities from the respective institutes are required to nominate one faculty as SPOC** for execution of the open elective at the institute level as per his/her preference.

Nomination of Faculty Member from Institute as Single Point of Contact
Google form link for faculty nomination as SPoC
https://forms.gle/PEnUVHaLTp6HFZkWA

Note: It is to bring to the notice of respected principals that as this open elective is only going to be offered in the institutes from which a dedicated faculty is designated as SPOC, therefore considering the importance of this open elective it is recommended to provide the details for the benefits of the students from your institutes.

1.3 As designated SPOC from respective institutes will act as bridge between GTU, Micron Technology and students, GTU is going to provide all required assistance to the designated faculty in every possible way, but nominated SPOC should also proactively strive to build network with the other faculties who had already completed their faculty development program jointly organized by GTU and Micron Technology for effectively catering the institute level needs of students.

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2) Course Coordinator as SPOC (Single Point of Contact) for facilitating the offerings:-

2.1 Course coordinators from respective institutes are expected to facilitate the Students of 6th semester from Bachelor of Engineering Program who wish to opt for *"FUNDAMENTALS OF SEMICONDUCTOR PACKAGE MANUFACTURING AND TEST"* (Subject Code: 3160004)

3) Roles and Responsibilities of Course Coordinator and Institute heads with respect to managing seamless delivery:-

3.1 The course coordinator will serve as the Single Point of Contact (SPOC) for communication between the institute, GTU, and Micron Technology, overseeing all matters related to the implementation of the elective course on "Fundamentals of Semiconductor Package Manufacturing & Test."

3.2 Course coordinators at the respective institutes are expected to provide the necessary infrastructure and audiovisual support for lecture delivery, set up Zoom webinar live streaming in classrooms, organize students into classrooms, arrange doubt-clearing sessions, and assist with the evaluation process.

3.3 Course coordinators in coordination with course mentors nominated at institute level are expected to be actively involved in managing the student's attendance, organizing online lectures in the classrooms, periodic assessments and grading, conducting semester-end exams and student's doubts clarification.

3.4 It is highly anticipated from course coordinators to respond to the communication and act proactively for ensuring smooth implementation, therefore for ensuring uninterrupted delivery of the course it is mandatory for that institutes to nominate alternative person from existing pool of Course Mentors to discharge the duties in the absence of course coordinator.

CONTACT FOR GTU coordination for course execution		
GTU ITAP	itap@gtu.edu.in	079-23267550
GTU SKILLS	skills@gtu.edu.in	079-23267672
CONTACT FOR QUERIES PERTAINING TO Academic Matters		
GTU Academic Section	be_syllabus@gtu.edu.in	079-23267578/609

Registrar

Head Office : GTU Campus, Nr. Visat Three Road, Visat-Gandhinagar Road, Chandkheda, Ahmedabad-382424. Gujarat, India.
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Annexure-1

Fundamentals of Semiconductor Package Manufacturing and Test Course Execution Plan

Fundamentals of Semiconductor Package Manufacturing and Test (Schedule of Lectures by Dates)
Course (Open Elective-II) : Fundamentals of Semiconductor Package Manufacturing & Test
Course Type : One Semester Open Elective-II
Duration : 40Hrs; 14 Weeks (3Hrs/Week) 20thJan 2025 -23rdApr 2025; 4-5PM (Mon, Tue, Wed)
Eligible Participants : Bachelor of Engineering 6th Semester Students from affiliated colleges and schools from Gujarat Technological University

Week	S.NO	Proposed Dates	Course	Chapter
Week-1	Day1	20-Jan-25	Introduction to Memory Packaging and NPI Fundamentals	Chapter-1
	Day2	21-Jan-25	Introduction to Package Manufacturing (assembly processes)	
	Day3	22-Jan-25	Die Preparation Step	
Week-2	Day4	27-Jan-25	Die Attach Step	
	Day5	28-Jan-25	Wire Bond Step	
	Day6	29-Jan-25	Flip-Chip & Underfill Process	
Week-3	Day7	3-Feb-25	Encapsulation &Laser Marking	
	Day8	4-Feb-25	Solder Ball Attach & Reflow	
	Day9	5-Feb-25	Singulation & assembly Challenges	
Week-4	Day10	10-Feb-25	IC Package Backend Test – Part 1	Chapter2
	Day11	11-Feb-25	IC Package Backend Test – Part 2	
	Day12	12-Feb-25	IC Package Backend Test – Part 3	
Week-5	Day13	17-Feb-25	Tester Introduction	
	Day14	18-Feb-25	Test Firmware & Test programs debugging	
	Day15	19-Feb-25	Burn In	
Week-6	Day16	24-Feb-25	ATE Flow	
	Day17	25-Feb-25	FQMON	
	Day18	26-Feb-25	Aging	

Week-7	Day19	3-Mar-25	Package Materials Part-1	Chapter-3
	Day20	4-Mar-25	Package Materials Part-2	
	Day21	5-Mar-25	Package Materials Part-3	
Week-8	Day22	10-Mar-25	Package Quality & Reliability Part-1	
	Day23	11-Mar-25	Package Quality & Reliability Part-2	
	Day24	12-Mar-25	Package Quality & Reliability Part-3	
Week-9	Day25	17-Mar-25	Package Design for Reliability	Chapter-3
	Day26	18-Mar-25	EFA and PFA Part-1	Chapter-4
	Day27	19-Mar-25	EFA and PFA Part-2	
Week-10	Day28	24-Mar-25	Inspection Part-1	
	Day29	25-Mar-25	Inspection Part-2	
	Day30	26-Mar-25	SI Failures (Thermal Emission/ Hot Spot Detection)	
Week-11	Day31	1-Apr-25	Etching/Decapsulation & Dye & Pry	
	Day32	2-Apr-25	Electrical Failure Analysis – Fault Isolation (Component Level)	
	Day33	7-Apr-25	EFA - TDR (Time Domain Reflectometry)	
Week-12	Day34	8-Apr-25	Introduction to Industrial Quality in ATMP	Chapter-5
Week-13	Day35	9-Apr-25	Failure Mode and Effects Analysis (FMEA)	
	Day36	15-Apr-25	Production Control Plan	
	Day37	16-Apr-25	Calibration & Measurement Systems Analysis (MSA)	
Week-14	Day38	21-Apr-25	Statistical Process Control	
	Day39	22-Apr-25	Fault Detection Control (FDC) and Run-to-Run Control (R2R)	
	Day40	23-Apr-25	Importance of QMS and Industrial Quality Standards (ISO 9001/IATF)	

Course Execution Plan:

Lectures Webinar Link	Micron will share the Zoom Webinar Link to GTU Course Co-coordinator (SPOC)
	A demo session will be scheduled with the course in-charges to demonstrate how to use the Zoom webinar link.

Webinar Setup in Classroom	The course in-charge needs to arrange a Zoom webinar setup in the classroom and ensure that all students are called to the Classroom to join the sessions.

Assignments and Exams	As per GTU norms {Internal Exam Marks(M)- 30 Marks} and {External Marks(E) -70 Marks}

Study Material for Students	Micron will share the lecture slides (softcopy) and lectures video recordings Micron learning portal access to course registered students for full 6th semester

Note: The Zoom webinar link will be accessible from 3:45 PM onwards for each lecture session. This 15-minute window allows for setup trials and ensures all students are gathered before the lecture begins at 4:00 PM.