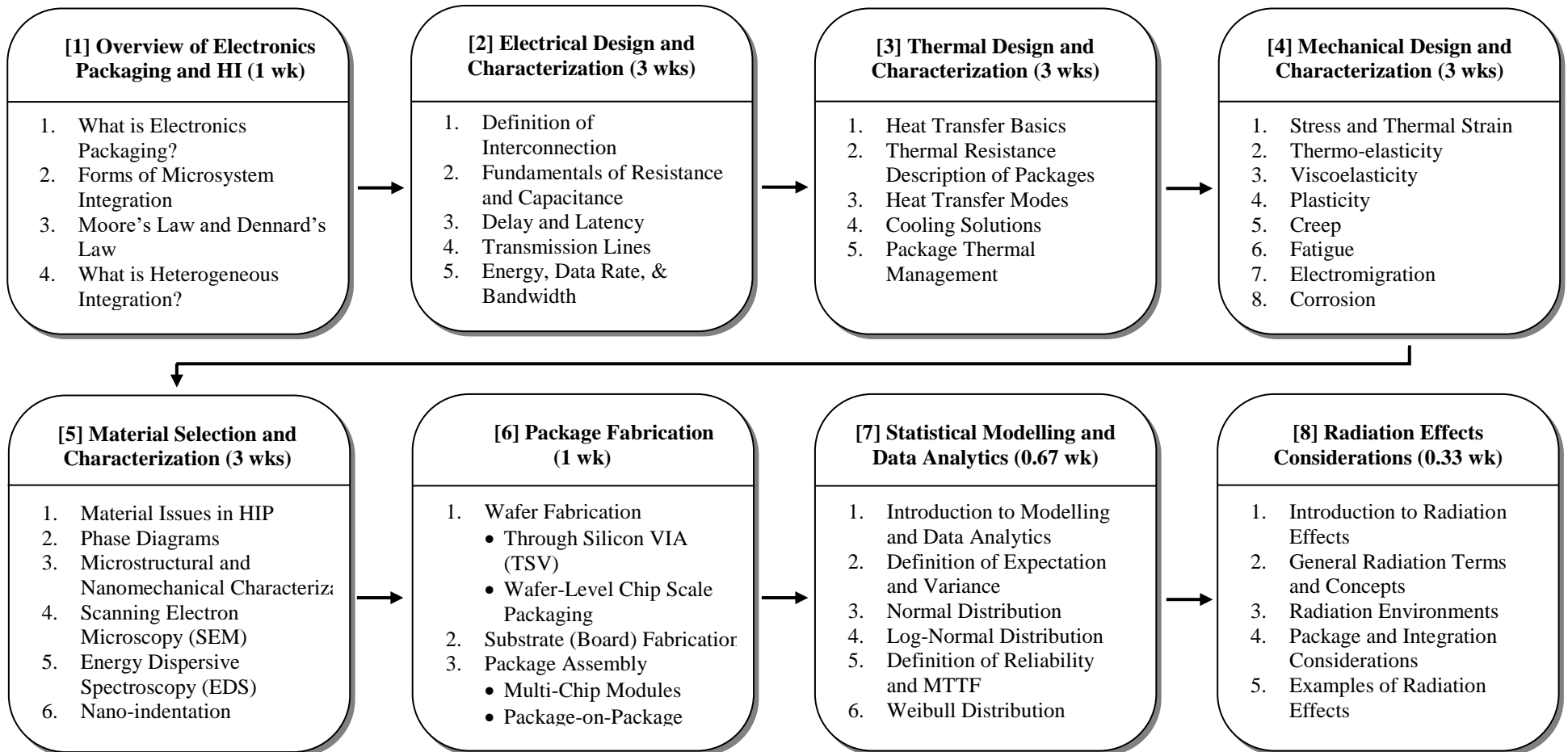


ME 496
Introduction to Electronics Packaging and Heterogeneous Integration

Course Outcomes

1. Understand design and construction of electronic systems, assemblies, and components. [1,6]
2. Learn basics of electrical, thermal, mechanical, and material characterization of modern electronic systems. [2,3,4,5,8]
3. Learn methods of modern semiconductor fabrication. [6]
4. Learn to statistically model failures in microelectronic systems. [7]



COURSE NUMBER: ME 496

COURSE TITLE: Introduction to Electronics Packaging and Heterogeneous Integration

REQUIRED COURSE OR ELECTIVE COURSE: Elective

TERMS OFFERED: Spring 2021.

TEXTBOOK/REQUIRED MATERIAL: R. Tummala, Fundamentals of Microsystems Packaging, McGraw-Hill Publishing Company, 2001. ISBN13: 9780071371698.

PRE-REQUISITES:

- Junior (or higher) level standing in an ABET approved Engineering Program

COORDINATING FACULTY: G. Subbarayan

COURSE DESCRIPTION: This course provides a broad, hands-on introduction to principles and practices of electronics packaging. The course is broadly divided into four major modules as well as other smaller modules. The major modules provide a practical background (as it relates to electronic packaging) electrical, thermal, mechanical and materials characterization. Design considerations as well as materials selection in the above topics will also be addressed. The minor modules include package fabrication and assembly, radiation hardening, and statistical modeling and data analysis. The class will be primarily a lab-oriented with 1 lecture and 4 hours of hands-on lab each week.

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ASSESSMENTS TOOLS:

- Approximately (10) Lab-based Projects
- (1) Comprehensive Final Project

PROFESSIONAL COMPONENT:

Engineering Topics: Engineering Science – 1.5 credit (70%)
Engineering Design – 1.5 credits (30%)

NATURE OF DESIGN CONTENT:

- Understanding of connections between materials choice, geometric parameters, and failure modes in electronic systems.
- Understanding of electrical design of circuits

COMPUTER USAGE:

- Course Material will be distributed via NanoHub
- Electrical design automation tools
- Commercial FEA programs

COURSE STRUCTURE/SCHEDULE:

- Lecture – 1 days per week at 50 minutes.
- Labs – 2 days per week at 2 hours each.

RELATED ME PROGRAM OUTCOMES:

1. Engineering fundamentals
2. Engineering design
3. Communication skills
4. Teamwork skills
5. Experimental skills
6. Knowledge acquisition

PREPARED BY: G. Subbarayan

REVISION DATE: November 06, 2020