Louisiana Tech (**SPARC**) Student Program for Accelerating Real-world Care-tech

Academic–industry collaboration is at the heart of the **SPARC** program, empowered through the Biomedical Engineering Program at Louisiana Tech. Within the academic setting, faculty mentors will guide early-stage medical technology development with active student involvement and access to in-kind resources that build student competencies. Each partnership will be anchored by a committed sponsor who provides, at minimum, an identified unmet need in the clinical or health and wellness product space. A key requirement for success is the identification of a technology subject to regulation by the U.S. Food and Drug Administration.

The **SPARC** program (2025-2026) allows for different project embodiments, including those integrated into specific classes such as Capstone/Senior design (a three-course sequence) or *Medical Technology Innovation & Commercialization (Fall or Spring)*, and those that progress independently of specific classes and continue through the Summer.
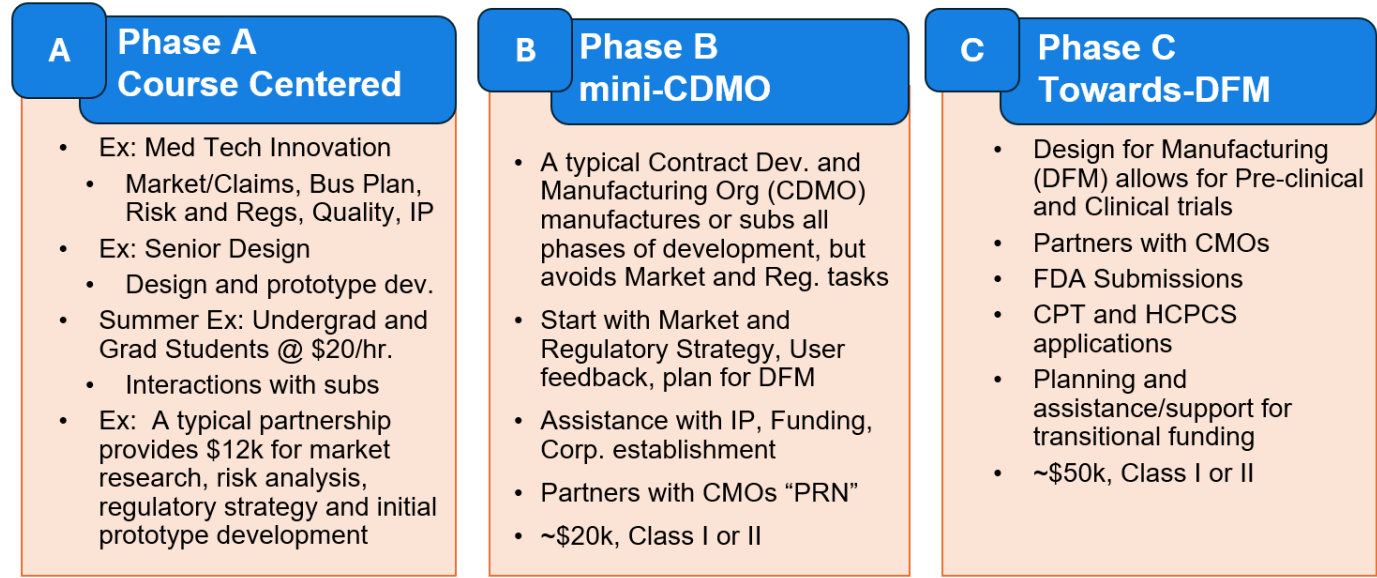
A Phase A Course Centered	B Phase B mini-CDMO	C Phase C Towards-DFM

• Ex: Med Tech Innovation
  • Market/Claims, Bus Plan, Risk and Regs, Quality, IP
• Ex: Senior Design
  • Design and prototype dev.
• Summer Ex: Undergrad and Grad Students @ $20/hr.
  • Interactions with subs
• Ex: A typical partnership provides $12k for market research, risk analysis, regulatory strategy and initial prototype development
	• A typical Contract Dev. and Manufacturing Org (CDMO) manufactures or subs all phases of development, but avoids Market and Reg. tasks
	• Start with Market and Regulatory Strategy, User feedback, plan for DFM
	• Assistance with IP, Funding, Corp. establishment
	• Partners with CMOs "PRN"
	• ~$20k, Class I or II
		• Design for Manufacturing (DFM) allows for Pre-clinical and Clinical trials
		• Partners with CMOs
		• FDA Submissions
		• CPT and HCPCS applications
		• Planning and assistance/support for transitional funding
		• ~$50k, Class I or II

Figure 1. The Biomedical Engineering program at Louisiana Tech is structured to participate in the early stages of medical device development by leveraging in-house manufacturing, engineering, and scientific expertise, together with active student engagement. The program then transitions innovators toward collaborations with external medical device manufacturers. This pathway promotes entrepreneurship by enabling the identification of business opportunities and supporting the creation, management, and scaling of ventures to generate value and profit. Critically, the program strengthens students' STEM foundations by cultivating essential technical and project management skills.

The **SPARC** program delivers substantial in-kind matching resources through the College of Engineering and Science, aligned with Louisiana Tech's mission to prepare students for a technologically advanced workforce. Available resources include additive and subtractive manufacturing capabilities (e.g., FDA/GMP-ready 3D printers, CNC machining), micro- and macro-imaging systems for development and quality assessment, testing equipment, simulation software, high-performance computing, and CAD/CAE licenses. In addition, significant matching funds will be allocated to support new projects when technologies beyond current capabilities are required.