

Course Outline

585.743: Modeling Approaches to Cell and Tissue Engineering

This outline provides an overview of the course and assignments by week. Please remember to check the calendar for specific due dates. Each course module runs for a period of seven (7) days, i.e., one week. Unless otherwise noted in Canvas, due dates for assignments are the last day of the module week. It is recommended that you complete the readings and lectures at the beginning of each module week, then quickly jump into the discussion and assignment(s) for that week.

Module	Dates	Module Title	Assignments
Module 1	Tue 01/21/2025– Mon 01/27/2025	Introduction to the Modeling Approaches to Cell and Tissue Engineering	<ul style="list-style-type: none"> Module 1 - Discussion Module 1 - Assignment
Module 2	Tue 01/28/2025– Mon 02/03/2025	Cancer Stem Cells Models	<ul style="list-style-type: none"> Module 2 - Assignment
Module 3	Tue 02/04/2025– Mon 02/10/2025	Cancer Stem Cells Treatment Strategies	<ul style="list-style-type: none"> Module 3 - Discussion Module 3 - Assignment
Module 4	Tue 02/11/2025– Mon 02/17/2025	Migration of Tumor Cells and Self-Metastases	<ul style="list-style-type: none"> Module 4 - Quiz
Module 5	Tue 02/18/2025– Mon 02/24/2025	Introduction to the Modeling of Bone Regeneration	<ul style="list-style-type: none"> Module 5 - Discussion
Module 6	Tue 02/25/2025– Mon 03/03/2025	Modeling of Bone Fracture Healing Taking into Account Vascularization	<ul style="list-style-type: none"> Module 6 - Assignment
Module 7	Tue 03/04/2025– Mon 03/10/2025	Bone Regeneration after the Use of an Implant. Modeling that Takes into Account Vascularization	<ul style="list-style-type: none"> Module 7 - Assignment
Module 8	Tue 03/11/2025– Mon 03/17/2025 *Spring Break 03/18/2025– 03/24/2025	Regeneration of Skeletal Muscle. The Use of Biomimetic Scaffolds	<ul style="list-style-type: none"> Module 8 - Quiz
Module 9	Tue 03/25/2025– Mon 03/31/2025	Modeling Stem Cell Myogenic Differentiation	<ul style="list-style-type: none"> Module 9 - Quiz
Module 10	Tue 04/01/2025– Mon 04/07/2025	Stem Cell Interaction with Extracellular Matrix	<ul style="list-style-type: none"> Module 10 - Quiz
Module 11	Tue 04/08/2025– Mon 04/14/2025	Modeling Cell Interaction with Viscoelastic Extracellular Matrix	<ul style="list-style-type: none"> Module 11 - Assignment
Module 12	Tue 04/15/2025– Mon 04/21/2025	Stem Cell Differentiation and Polarization vs. the Stiffness of the Substrate	<ul style="list-style-type: none"> Module 12 - Quiz
Module 13	Tue 04/22/2025– Mon 04/28/2025	Poroelastic (Biphasic) Tissues	<ul style="list-style-type: none"> Module 13 - Discussion (Optional) Module 13 - Assignment



Module	Dates	Module Title	Assignments
Module 14	Tue 04/29/2025– Mon 05/05/2025	Concluding Module	<ul style="list-style-type: none"> Module 14 – Assignment: Modeling Project

