

Summer 2020

Nanoscience and Nanotech Industrial Application and Transformation 2020.06

Day 1: Intro and Context

AM:

- A brief introduction to nano: surprisingly familiar yet ripe for discovery
- Nanoscience: new behaviors in physical systems
- Nanotechnology: applying insights across disciplines

PM:

- ▣ Survey of current applications and their supporting toolsets
- Tour of fabrication and metrology toolsets inside new MIT.nano facility
- At the end of Day 1, begin collaborative design and analysis group exercise based on one of the problems presented.

Day 1:	Intro and Context	Instructor(s)	Readings/ Assignments
10:00 - 11:10am	Brief introduction to the course and nano Nanoscience: new behaviors in physical systems	Brian Anthony, Vladimir Bulović Vladimir Bulović	N/A None
11:10 - 11:20am	Break		
11:20 - 12:30pm	Nanotechnology: applying insights across disciplines	Brian Anthony, Vladimir Bulović	Yes, will provide
12:30 - 1:00pm	Break		
1:00 - 2:10pm	Survey of current applications and their supporting toolsets Tour of fabrication and metrology toolsets inside new MIT.nano facility (virtual)	Anna Osherov Anna Osherov	Yes, will provide None
2:10pm	Class Ends		
At home	At home exercise	Annie Wang	Yes, will provide

Day 2: Materials, Sensors, and Biology

AM/PM

- Case studies of MIT-based research and/or commercialized applications in nanoscience and nanoengineering, interspersed with facilitated active group work on the design exercise and interactive discussions about participants' existing and planned use of nanoscale systems.

Day 2:	Topics	Instructor(s)	Readings/ Assignments
9:00 - 10:00am	Exercise - review and discuss	Annie Wang, Brian Anthony, Vladimir Bulović	
10:00 - 11:10am	Nano case - Energy: PV, Battery Nano case - Materials and Displays	Vladimir Bulović Marc Baldo	
11:10 - 11:20am	Break		
11:20 - 12:30pm	Nano case - Sensors part 1	Brian Anthony +	
12:30 - 1:00pm	Break		
1:00 - 2:10pm	Nano case - Biology Part 1 Nano case - Biology Part 2	Thomas Schwartz Moungi Bawendi or Polina Anikeeva	
2:10pm	Class Ends		
At home	At home exercise	Annie Wang	Yes, will provide

Day 3: The Data side of Nano

AM:

- Case studies of MIT-based research and/or commercialized applications in nanoscience and nanoengineering, interspersed with facilitated active

PM:

- Conclude design exercise with brief presentations by each group
- The data side of nano: managing, processing, and visualization
- Final Q&A and wrap-up: what next?

Day 3:	Topics	Instructor(s)	Readings/ Assignments
9:00 - 10:00am	Exercise review and discuss	Annie Wang, Brian Anthony, Vladimir Bulović	
10:00 - 11:10am	The data side of nano - managing, processing, The data side of nano - visualization - IL	Brian Anthony Megan Roberts	Yes Yes
11:10 - 11:20am	Break		
11:20 - 12:30pm	Nano case - Memory and Compute - Quantum	Will Oliver	Yes
12:30 - 1:00pm	Break		
1:00 - 2:00pm	Discussion Q&A and wrap-up: what's next	All	
2:00 - 2:30pm	Closing and recognition to all	All	