

## **(SP21) MCB 480 – MOLECULAR BASIS OF EUKARYOTIC CELL SIGNALING**

Time: TR 11:00 am - 12:20 pm

Credit hours: 3

Instructor: Jie Chen ([jiechen@illinois.edu](mailto:jiechen@illinois.edu))

### **Course objectives:**

- Emphasis on principles and molecular mechanisms of mammalian cell signaling
- Coverage of major classes of transmembrane receptors and signaling pathways
- Contemporary methods of investigation and the principles of identifying and solving problems related to signal transduction
- Importance of understanding cell signaling illustrated by examples of targeted anti-cancer therapies

January 26	Lecture 1: Introduction and overview
January 28	Lecture 2: RTK
February 2	Lecture 3: RTK; modular domains
February 4	Lecture 4: Ras; small G protein superfamily
February 9	Lecture 5: MAPK; protein phosphorylation
February 11	Lecture 6: Logic of signaling; regulation of MAPK signaling
February 16	In-class presentations by graduate students
February 18	Attendance optional – Q&A on lectures and assignments
February 23	Lecture 7: Scaffold in signaling
February 25	Lecture 8: Kinases – regulation and drug targets
March 2	In-class presentations by graduate students
March 4	Lecture 9: Kinases and cancer therapy continued
March 9	Lecture 10: Phosphatases; protein-protein interaction methods
March 11	Lecture 11: Cytokine receptor signaling and TGF $\beta$ receptor signaling
March 16	Lecture 12: T cell receptor signaling
March 18	Lecture 13: Common downstream signaling pathways; Lipid signaling
March 23	In-class presentations by graduate students
March 25	Attendance optional – Q&A on lectures, assignments, exam
March 30	Lecture 14: Methodologies in deciphering spatial and temporal regulation I
April 1	Lecture 15: Methodologies in deciphering spatial and temporal regulation II
April 6	Lecture 16: G protein couple receptor signaling I
April 8	Lecture 17: G protein couple receptor signaling II
April 13	No class
April 15	Lecture 18: Signaling into the nucleus
April 20	Lecture 19: Signaling pathways regulating cell growth and proliferation I
April 22	Lecture 20: Signaling pathways regulating cell growth and proliferation II
April 27	Lecture 21: Signaling pathways regulating cell death I
April 29	Lecture 22: Signaling pathways regulating cell death II
May 4	Lecture 23: Review