

**Course Name:** Signals and Systems

**Course Number:** 31420

**Lecturer:** Dr. Amir Adler

**Teaching Assistant:** Mr. Albert Profis

**Grading Policy:** 80% final exam + 20% home assignments

**Literature Sources:**

1. Signal & Systems, By Oppenheim, Willsky and Hawab, Prentice-Hall, 1997.
2. Schaum's Outlines, Signals and Systems, By Hwei P. Hsu, McGraw-Hill.

Topic	Week
Course intro, Signals space	<b>1</b>
Generalized signals, Operations on signals	<b>2</b>
Systems – properties and classification: causal, linear, time-invariant.	<b>3</b>
Linear Time-Invariant (LTI) systems: impulse and step responses, convolution.	<b>4</b>
Differential equations with constant coefficients: Mathematician's solution – homogeneous, particular, general.	<b>5</b>
Impulse response and an alternative solution. Zero-input and zero-state responses, BIBO stability	<b>6</b>
Laplace transform: Review of properties and transforms	<b>7</b>
LTI state equations: State differential and output equations from differential equations Solution of state differential equations – transition matrix	<b>8</b>
Application to differential equations – transfer function, poles, zeros	<b>9</b>
Application to state equations – obtaining differential equations Pole-zero cancellation and order of system (stability differences)	<b>10</b>
Fourier transform	<b>11</b>
Impulse response and Frequency response	<b>12</b>
Review of Fourier series, Sampling and reconstruction	<b>13</b>