PULSE PROGRAMMING SYLLABUS

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Lecture 1 Imaging Sequence Elements (1 hour)

- What are you programming?: Overview of MR Hardware
- Gradient Pulses
- Gradient Moments
- Dephasing and Refocusing
- K-space trajectories
- Phase encode ordering
- Segmented trajectories
- RF Pulses
- RF waveform design
- Volume Selection
- Crushers and Spoilers
- Auxilliary Waveforms

Lecture 2 Pulse Programs (1 hour)

- Gradient echo sequences
- Steady State Free Precession
- Early Echo SSFP – FISP, FLASH, GRASS
- Late Echo SSFP – PSIF, CE-FAST
- Balanced SSFP – TrueFISP, FIESTA
- Spin Echo
- RARE, U-FLARE
- Echo Planar Imaging
- Magnetization Preparation

Lecture 3 Corrections and Compensations (1 hour)

- Ideal vs Actual Waveforms
- Pulse sequence imperfections
- B_0 and B_1 inhomogeneities
- Eddy currents
- Phase errors
- Gating and Triggering
- Motion
- Signal suppression
- Relaxation Traps