Lecture 7 (May 19) (See [4, pp.75–83])

1. Introduction to entropy.
2. Partitions and subalgebras, Entropy of a partition.
3. Conditional entropy.
4. Entropy of a measure-preserving transformation with respect to a finite (or countable) partition.
5. $h(T) = \sup\{h(T, \alpha) : \ \alpha \text{ finite}\}$. Entropy is an invariant of measure-theoretic isomorphism.

Lecture 8 (May 21) (See [4, pp.84–94 and 8–9])

1. Properties of the entropy.
2. Conditional expectation, conditional entropy $H(\alpha|\mathcal{F})$ where α is a finite partition and $\mathcal{F}$ is any sub-σ-algebra.
3. Convergence theorem: $\mathcal{F}_n \uparrow \mathcal{F} \ \Rightarrow \ H(A|\mathcal{F}_n) \to H(A|\mathcal{F})$.

Lecture 9 (May 23) (See [1, pp.29–32] and [2, pp.239–246])

1. Martingale convergence theorem.
2. Generators and the Kolmogorov-Sinai Theorem.
3. Examples: systems with zero entropy, Bernoulli systems.

References (these books are on 24-hour reserve at the Math Library):

1. William Parry, *Topics in ergodic theory*, Cambridge University Press, 1981.
2. Karl Petersen, *Ergodic Theory*, Cambridge University Press, 1989.
3. Mark Pollicott, *Lectures on Ergodic Theory and Pesin Theory on compact manifolds*, Cambridge University Press, 1993.
4. Peter Walters, *An Introduction to Ergodic Theory*, Springer, 1981.