- **Quantum states & entanglement as a resource** (about 24h)

- Density matrices (pure and mixed) [LN2.3; NC2.4]; Complements on the theory of measurements: PVM, POVM [NC2.2.3, 2.2.5, 2.2.6]; Preliminary notions of quantum operations [NC 8.2.1, 8.2.2]
- Separable and entanglement states; Schmidt decomposition [LN2.4; NC2.5], entanglement entropy [LN3; NC11.1, 11.3]
- Qubits [LN1; NC 1.2]; Bloch sphere [LN 2.5]
- Entanglement-based Protocols: EPR and Bell inequalities [LN2.1, 2.2, 2.4.1; NC2.6]; teleportation [LN 2.6, 2.7; NC 1.3.7]; Fidelity of two states and threshold for genuine quantum correlations [LN 2.6, 3.4.2]

Suggested (minimal) reading:

[LN]: Lecture Notes (current version april 2019)

[NC]: M.A. Nielsen & I.L. Chuang "Quantum Computation & Quantum Information - 10th anniversary edition", Cambridge University Press, 2010