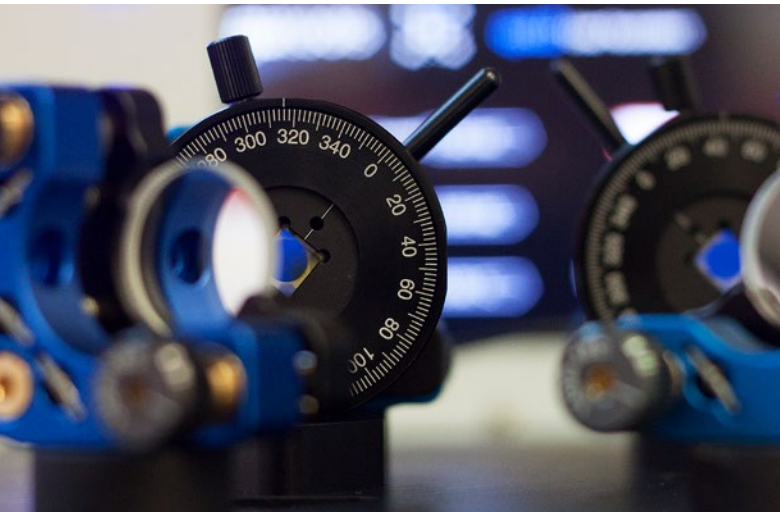# quED Sample Lab Course

Course Schedule with quED and its Add-Ons

qutools' Entanglement Demonstrator is designed with educators in mind. It's the easiest and most reliable way to explain the complex phenomena of quantum mechanics by generating and analyzing polarization-entangled photon pairs.

The following tables show sample lab courses with different experiments and add-ons of the quED. Two example courses over 12 days are presented. These courses are feasible with a minimum of Add-Ons and enable up to 3 groups to experiment simultaneously.

quED Add-Ons

quED-MI	Michelson Interferometer
quED-HBT	Hanbury Brown Twiss
quED-HOM	Hong–Ou–Mandel Effect
quED-QKD	Quantum Cryptography
quED-TOM	Quantum State Tomography

Course Schedule with quED and its Add-Ons

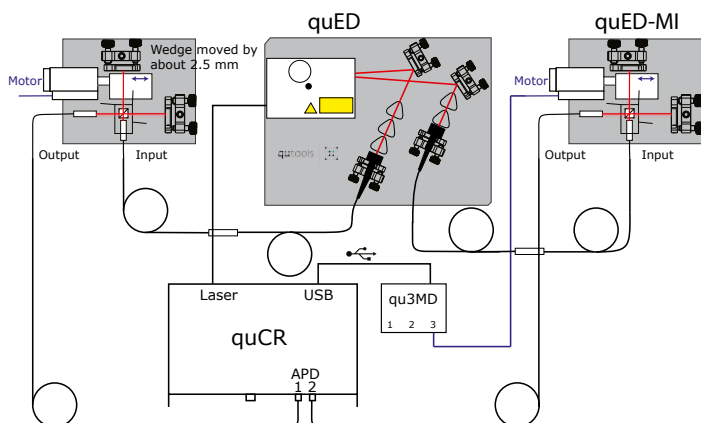|	Experiment	quED	MI	HBT	HOM	QKD	TOM
1	Alignment of quED	1					
2	Particle Nature of Photons (HBT)	1		1			
3	QKD	1				1	
4	Quantum Random Numbers	1		1			
5	Visible Light Interference, Central Wavelength, Coherence Length		1				
6	Michelson Interferometer, Quantum Eraser, optionally with HBT	1	1	1			
6b	Wave-particle Duality in a single Experiment	1	1	1			
7	CHSH	1					
8	Polarisation Correlations	1					
9	HOM, optionally with HBT	1		1	1		
9b	Photon number statistics: HOM + HBT	1		1	1		
10	Franson	1	2				
11	Single Photon State Tomography	1					1
12	Two-Photon State Tomography	1					1

Example Schedules

The following tables show two example schedules with two and three groups in 12 days. The left columns show the experiment number from the first page. The right columns show the number of quEDs or add-ons needed.

Schedule with two groups

Day	Exp Group 1	Exp Group 2	quED	MI	HBT	HOM	QKD	TOM
1	1	2	2		1			
2	2	3	2		1		1	
3	3	4	2		1		1	
4	4	5	1	1	1			
5	5	6	1	2				
6	6	1	2	1	1			
7	7	11	2					1
8	8	12	2					1
9	9	10	2	2	1	1		
10	10	9	2	2	1	1		
11	11	7	2					1
12	12	8	2					1

Schedule with three groups

Day	Exp Group 1	Exp Group 2	Exp Group 3	quED	MI	HBT	HOM	QKD	TOM
1	1	2	1	3		1			
2	2	3	5	2	1	1		1	
3	3	4	6	3	1	1		1	
4	4	5	3	2	1			1	
5	5	6	2	2	2	1			
6	6	7	7	3	1	1			
7	7	11	10	3	2				1
8	8	12	4	3		1			1
9	9	10	11	3	2	1	1		1
10	10	9	12	3	2	1	1		1
11	11	8	9	3		1	1		1
12	12	1	8	3					1

Entangled photon source with two motorized Michelson add-ons in each arm, connected to the control and read-out unit quCR via polarization-maintaining fibers.