

<b>Module title</b>		<b>Abbreviation</b>
Relativistic Quantum Field Theory		11-RQFT-161-mo1
<b>Module coordinator</b>		<b>Module offered by</b>
Managing Director of the Institute of Theoretical Physics and Astrophysics		Faculty of Physics and Astronomy
<b>ECTS</b>	<b>Method of grading</b>	<b>Only after succ. compl. of module(s)</b>
8	numerical grade	--
<b>Duration</b>	<b>Module level</b>	<b>Other prerequisites</b>
1 semester	graduate	--
<b>Contents</b>		
<ol style="list-style-type: none"> <li>1. Symmetries</li> <li>2. Relativistic single-particle states</li> <li>3. Lagrange formalism for fields</li> <li>4. Field quantisation</li> <li>5. Scattering theory and S-matrix</li> <li>6. Gauge principle and interaction</li> <li>7. Perturbation theory</li> <li>8. Feynman rules</li> <li>9. Quantum electrodynamic processes in Born approximation</li> <li>10. Radiative corrections</li> <li>11. Renormalisation (optional)</li> </ol>		
<b>Intended learning outcomes</b>		
<p>The students have mastered the principles and underlying mathematics of relativistic quantum field theories. They know how to use perturbation theory and how to apply Feynman rules. They are able to calculate basics processes in the framework of quantum electrodynamics in leading order. Moreover, they have a basic understanding of radiative corrections and renormalisation.</p>		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
<p>V (4) + R (2) Module taught in: German or English</p>		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: German and/or English</p>		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Master's degree (1 major) Mathematics (2016)		

Master's degree (1 major) Physics (2016)  
Master's degree (1 major) Mathematical Physics (2016)  
Master's degree (1 major) Computational Mathematics (2016)  
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)  
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)  
Master's degree (1 major) Computational Mathematics (2019)  
Master's degree (1 major) Mathematics (2019)