

**Ankara Üniversitesi**  
**Kütüphane ve Dokümantasyon Daire Başkanlığı**  
**Açık Ders Malzemeleri**

PHYS 438 Int. to High Energy Physics II - Çalışma Planı (Çalışma Takvimi) Prof.Dr.A.Ulvi Yilmazer

Haftalar	Haftalık Konu Başlıkları
1.Hafta	<b>Quantum Electrodynamics (QED) -1</b> 1. Dirac equation o Bilinear covariants
2.Hafta	<b>Quantum Electrodynamics (QED) -2</b> o Spinors, Dirac, Weyl and Majorana spinors o Helicity and chirality of electrons and neutrinos
3.Hafta	<b>Quantum Electrodynamics (QED) -3</b> o Photons o Basic notions quantum electrodynamics o Feynman rules for quantum electrodynamics o Electron-muon scattering, Bhabba scattering and Compton scattering o Renormalization concept
4.Hafta	<b>Quantum Electrodynamics of Quarks and Hadrons - 1</b> o Electromagnetic interactions of quarks o Hadron production in electron-positron collision o Elastic electron-proton scattering o Today's present situation.
5.Hafta	<b>Quantum Electrodynamics of Quarks and Hadrons - 2</b> o Inelastic electron-proton scattering o Parton model o Quark distribution functions
6.Hafta	<b>Quantum Chromodynamics -1</b> o Feynman rules for quantum chromodynamics o Quark-quark interaction
7.Hafta	<b>Quantum Chromodynamics -2</b> o Color factors o Pair annihilation in quantum chromodynamics o Asymptotic freedom
8.hafta	<b>Weak interactions - 1</b> o Charged leptonic weak interactions o Inverse muon decay o Decay of the muon
9.Hafta	<b>Weak interactions - 2</b> o Decay of the neutron o Pion decay o Charged weak interactions of quarks
	<b>Weak interactions - 3</b> o Neutral weak interactions

Haftalar	Haftalık Konu Başlıkları
	<ul style="list-style-type: none"> <li>Electroweak unification</li> </ul>
11.Hafta	<p><b>Neutrinos -1</b></p> <ul style="list-style-type: none"> <li>Flavors, interactions of neutrinos, masses and mixings</li> <li>Flavor oscillations</li> <li>Two and three flavor cases of the oscillations</li> </ul>
12.Hafta	<p><b>Neutrinos -2</b></p> <ul style="list-style-type: none"> <li>Solar neutrino problem, oscillations, MSW effect</li> <li>Atmospheric neutrino oscillations</li> <li>Results of SNO, Kamiokande, KamLAND etc.</li> </ul>
13.Hafta	<p><b>Basics of Gauge Theories -1</b></p> <ul style="list-style-type: none"> <li>Internal symmetries</li> <li>Local and global symmetries</li> <li>U(1) gauge theory</li> </ul>
14.Hafta	<p><b>Basics of Gauge Theories -2</b></p> <ul style="list-style-type: none"> <li>Non abelian gauge theories, weak and strong interactions</li> <li>Higgs mechanism</li> <li>Grand unification</li> </ul>