

Rapport for emne FYS5180

Stadiuminfo:	Utkast (S1)
Sist endret:	26.01.2026 Christian Thorn (chrthorn)
Opprettet i EpN:	Ja

Generelt

Emnekodeforslag	FYS5180
Versjonskodeforslag	1
Tilknyttede campuser	UIO
Studienivå	Høyere grads nivå (500)
Administrativt sted	185.15.04.00 Fysisk institutt
Studieansvarlig sted	185.15.04.00 Fysisk institutt
Vekting	10.0
Vektingstype	Studiepoeng
Navn - bokmål	Feltteori i kondenserte fasers fysikk
Navn - nynorsk	
Navn - engelsk	Condensed Matter Field Theory
Første undervisningstermin	2026 HØST
Siste undervisningstermin	
Første eksamenstermin	2026 HØST
Siste eksamenstermin	
Språk	Engelsk

Rapportering

Tilknyttede studieprogram	MND-KURS Forskerkurs ved Det matematisk-naturvitenskapelige fakultet
	PHD-MN Ph.d. ved Det matematisk-naturvitenskapelige fakultet

Vurdering

Antall forsøk lovlig	3
Gjelder fra termin	
Oppgave/avhandling	N
Vekt. på kar.utskrift	J
Kar. på kar.utskrift	J
Krev und.oppt første	N
Krev und.oppt alltid	N

Undervisning

Antall forsøk lovlig	
Gjelder fra termin	
Påkrevd Ja-svar	J
Beregn kval undervisningsmelding	J
Påkrevet akt.ønske	N
Ventelistenr	N

Aut. undervisningsmelding	N
Påkrevd fremmøte	N
Venteliste	J
Etteranmelding	Direktepåmelding via StudentWeb
Påmelding	Påmelding via StudentWeb - søknad
Undervisningstermin beskrivelse	Høst Vår
Undervisningstermin	Starter vår og høst, varer 1 semester

StudentWeb

Oppmelding	N
Privatistmelding	N
Kontroll Fkrav	J
Enkeltemneopptak i Studentweb	N
Vurd.meld språk	J
Merknad Studentweb	
Merknad Studentweb - nynorsk	
Merknad Studentweb - engelsk	

Emneinfo

Kort om emnet

Engelsk:

The course gives an introduction to the application of field theory in condensed matter systems. In particular, the study of quantum phase transitions, the renormalization group, response functions and topological properties using quantum field theory. The course gives an introduction to the application of field theory in condensed matter systems. In particular, the study of quantum phase transitions, the renormalization group, response functions and topological properties using quantum field theory.

Hva lærer du?

Engelsk:

After completing the course, the students:

- will know the basic structure of a field theory and how it can be applied to condensed matter systems.
- will know the path integral formulation of quantum mechanics and the application of this to field theories.
- will know about quantum phase transitions and symmetry breaking.
- will know how the theory can be used to calculate response functions, and how these relate to different experimental probes.
- will know the concept of the renormalisation group and flow of coupling constants, including the understanding of relevant and irrelevant operators, and how this is applied to the study of universality in magnetic systems and the superconducting instability in fermionic systems.
- will know about the existence of topological terms and the consequences, in particular how this relates to the quantum Hall effect.

Opptak til emnet

Engelsk:

Students admitted at UiO must apply for courses in Studentweb. Students enrolled in other Master's Degree Programmes can, on application, be admitted to the course if this is cleared by their own study programme.

Nordic citizens and applicants residing in the Nordic countries may apply to take this course as a single course student.

If you are not already enrolled as a student at UiO, please see our information about admission requirements and procedures for international applicants.

Anbefalte forkunnskaper

Engelsk:

- emne:FYS4430
- emne:FYS4110 or similar courses

Overlappende emner

Bokmål:

- 10 credits overlap with emne:FYS9180

Undervisning

Engelsk:

The course is offered as a self study.

Eksamen

Engelsk:

- Final oral exam which counts 100 % towards the final grade.

Hjelpemidler til eksamen

Engelsk:

No examination support material is allowed.

Karakterskala

Engelsk:

Grades are awarded on a scale from A to F, where A is the best grade and F is a fail. Read more about the grading system.

Adgang til ny eller utsatt eksamen

Engelsk:

This course offers both postponed and resit of examination. Read more:

- Illness at exams / postponed exams
- Withdrawal during an examination / Resitting an examination