


MATH2392 Théorie des catégories (2ème partie)

[22.5h] 2.5 credits

This course is taught in the 2nd semester

Teacher(s): Francis Borceux, Enrico Vitale (coord.)
Language: french
Level: 2nd cycle course

Aims

This is an option course in first and second masters' year. It can be taken in both of them as the content will change every year.

Main themes

One or more arguments in the following list:

- Category theory and commutative algebra: classification of module categories, faithfully projective modules, Eilenberg-Watts theorem, Morita theorem; exact categories, regular projective objects, equivalence between exact categories with enough regular projective objects.
- Category theory and universal algebra: monads, algebras for a monad; monads over Set, finitary monads, algebraic categories, characterization of varieties and quasi-varieties.
- Category theory and algebraic geometry: sheaves on a topological space; Grothendieck topos, elementary topos.
- Category theory and homological algebra: exact and abelian categories, localisations; monoidal categories, categorical groups, group extensions.
- Category theory, knot theory and quantum groups: monoidal categories, braid groups, braided categories, Hopf algebras, invariants.
- Category theory and algebraic topology: groups, groupoids and fundamental groups of a topological space, exact sequence of groups and groupoids associated with a fibration, Van Kampen theorem.

Other credits in programs

MATH21/G	Première licence en sciences mathématiques (Général)	(2.5 credits)
MATH22/E	Deuxième licence en sciences mathématiques (Economie mathématique)	(2.5 credits)
MATH22/G	Deuxième licence en sciences mathématiques	(2.5 credits)
MATH22/S	Deuxième licence en sciences mathématiques (Statistique)	(2.5 credits)