

5.0 crédits

30.0 h + 30.0 h

Enseignants:	Vanwambeke Sophie ; Deleersnijder Eric ;
Langue d'enseignement:	Anglais
Lieu du cours	Louvain-la-Neuve
Thèmes abordés :	<p> Differential models Introduction State variables, parameters Initial conditions, boundary conditions, etc Linear ordinary differential problems General solutions Equilibrium points (stability, instability, oscillations) Conservation/dissipation of energy (in a broad sense) Example (Mururoa Lagoon) Non-linear ordinary differential problems Equilibrium points (stability, instability, oscillations) Conservation/dissipation of energy (in a broad sense) Qualitative notions of bifurcation Qualitative notions on chaos and predictability Examples (logistic model, prey-predator model, etc.) Space- and time-dependent models Partial differential problems Integral properties Box-model approximations Example (Exxon Valdez oil spill, Alaska) Parameter optimisation, validation and sensitivity analysis </p> <p> Spatial modelling Self-organisation in systems Cellular automata Agent-based models Examples are taken in physical geography, natural resource management and use, spatial epidemiology, history of land use </p> <p> Modelling techniques UML as an aid to conceptual modelling Model evaluation: sensitivity, uncertainty, validation Measuring landscape structure </p>
Acquis d'apprentissage	<p> Objectives Extend knowledge of modelling techniques focusing on geographical processes. More specifically, models based on: -spatio-temporal analysis -dynamic approaches that use differential equations -landscape indices and fractals </p> <p> The competences to be acquired during the course include: -complex spatial analyses -use of softwares for modelling dynamic systems -mathematical methods in geography </p> <p> <i>La contribution de cette UE au développement et à la maîtrise des compétences et acquis du (des) programme(s) est accessible à la fin de cette fiche, dans la partie « Programmes/formations proposant cette unité d'enseignement (UE) ».</i> </p>
Autres infos :	<p> Prerequisites GEO1342 - Geographical Information Systems GEO1341 - Statistical modelling Mathematics </p>

<p>Cycle et année d'étude: :</p>	<p>> Master [120] en sciences géographiques, orientation générale > Master [120] en sciences géographiques, orientation climatologie > Master [60] en sciences géographiques, orientation générale</p>
<p>Faculté ou entité en charge:</p>	<p>GEOG</p>