9. MODERN APPROACH TO SYMMETRIES. MATHEMATICAL MODELS IN BIOMATHEMATICS

Dates: June 12 nd-16 th

The objectives of this course is to focus the attention of students on symmetry methods to search for exact solutions of nonlinear models in Physics, in Engineering Science, and in Biology as well as to show recent developments of the theoretical tools of the Lie group methods applicable to the study of differential equations. Additionally, we present a brief introduction to the Mathematical Biology. This is one of the most exciting modern applications of the Mathematics. We focus in the mathematical modelling of tumour growth and the mathematical tools to understand this process.

SHARE

REGISTRATION

Students interested in taking part in the course must register via the website and pay the course fee (200 €) before June 1st, 2017. The fee covers admission to the sessions and the activities included in the final programme of the course.

APPLY NOW

PROGRAMME

Monday June 12 nd

9.00 - 10.00 Presentation
(Dr. Stephen Anco, Brock University; Dra. Mª Luz Gandarias and Dra. Mª Santos Bruzón, University of Cádiz).

10.00 - 11.00 Modern approach to symmetries: theory and computation.
(Dr. Stephen Anco, Brock University).

11.00 – 11.30 Break.

11.30 – 13.30 Integration of ordinary differential equations using symmetries
(Dra. Mª Luz Gandarias, University of Cádiz).

Tuesday June 13 th

9.00 - 11.00 Invariant solutions of partial differential equations (Dra. Mª Santos Bruzón, University of Cádiz).

11.00 – 11.30 Break.

11.30 – 12.30 General elements about models in interacting population dynamics: Balance equations, constitutive equations. (Dr. Mariano Torrisi, University of Catania).

12.30 – 13.30 General elements of invertible point transformations, symmetries and equivalence transformations (Dra. Rita Traciná, University of Catania).

Wednesday June 14 th

9.00 - 11.00 Symmetry reduction and solutions. Examples (Dr. Masood Khalique, South Africa North-West University).

11.00 – 11.30 Break.

11.30 – 12.30 Modern formulation of Noether's theorem: theory and computation
(Dr. Stephen Anco, Brock University).

12.30 – 13.30 Generalization of Noether's theorem to non-variational equations: theory and computation of conservation laws
(Dr. Stephen Anco, Brock University).

Thursday June 15 th

Course Director:
Dra. Mª Santos Bruzón Gallego
Departament of Mathematics, Faculty of Sciences, University of Cádiz, Spain

Speakers:
Dra. Mª Santos Bruzón
Department of Mathematics, University of Cádiz

Dr. Stephen Anco
Department of Mathematics, Brock University, Canada

Dr. Mariano Torrisi
Department of Mathematics and Informatic, University of Catania, Italy

Dr. Masood Khalique
Department of Mathematical Sciences, North-West University, South Africa

Dra. Rita Traciná
Department of Mathematics and Informatic, University of Catania, Italy

Dr. Juan Belmonte
Department of Mathematics, University of Castilla-La Mancha

Dra. María Rosa Durán
Department of Mathematics, University of Cádiz

Dra. Mª Luz Gandarias
Department of Mathematics, University of Cádiz

IV UCA INTERNATIONAL
Summer school

9.00 - 10.00 Symmetries, adjoint-symmetries,
conservation laws, and Ibragimov's theorem
(Dr. Stephen Anco, Brock University).

10.00 - 11.00 Reaction diffusion models and their
symmetries. Two cases (Dr. Mariano Torrisi, University of
Catania).

11.00 – 11.30 Break.

11.30 – 12.30 General elements of differential invariant
of equivalence transformation
(Dra. Rita Traciná, University of Catania).

12.30 – 13.30 Applications of differential invariants
to diffusion equations.
(Dr. Mariano Torrisi, University of Catania).

Friday June 16 th

9.00 - 10.00 Classical symmetries for a type of Fisher
equation. Reductions and some exact solutions for a type of
Fisher equation (Dra. Mª Rosa Durán, University of Cádiz).

10.00 - 11.00 Conservation laws for a generalized Fisher
equation (Dra. Mª Rosa Durán, University of Cádiz).
(Dr. Stephen Anco, Brock University).

11.00 – 11.30 Break.

11.30 – 12.30 Mathematical Models in Biomedicine
with applications in tumor growth I
(Dr. Juan Belmonte, University of Castilla-La Mancha).

12.30 – 13.30 Mathematical Models in Biomedicine with
applications in tumor growth II
(Dr. Juan Belmonte, University of Castilla-La Mancha).

Contact us
International Relations Office
Edificio Constitución 1812
Paseo Carlos III nº 3 - 2ª planta
11003 · Cádiz · Spain
Tel:+34 956 015 883
E-mail: iss.uca-ceimar@uca.es

Summer School
Courses
Registration
Scholarships
Summer in Cádiz

Share your experience