

TIMETABLE & LEARNING OUTCOMES

The summer school aims to decipher the strategies that have been developed to **identify and exploit stress responses** and to **manage the growing practices that tackle abiotic and biotic stress**. Course content will focus on major challenges encountered by the agricultural industry, such as confronting climate change and maintaining both the yield and quality of agro-food productions. A variety of crops will be studied, such as tomatoes, strawberries, grapevines, carrots, leeks, pine and oak trees etc.

Teaching will be based on the flipped classroom principle: participants and speakers will co-design laboratory experiments in response to current queries and demands faced by farmers and customers. Students and professors will then collect the resulting data and determine the most efficient data mining methods to process the results. The analyses and experimental conclusions will be presented at the end of the summer school.

Participants will be familiarised with academic research, thus preparing them for future studies within doctoral schools and also for the workforce. This international experience will allow students to gain a deeper understanding of other cultures, make lifelong friends from a wide variety of backgrounds and benefit from world-renowned academic excellence.

Tentative programme

Week 1: from the laboratory...

The first week will be devoted to exploring the existing links between climate change, agricultural production and biotechnology.

Via practical and group work, students will understand the role of fundamental research when testing innovative solutions for agriculture. The aim is to provide students with a comprehensive toolbox that will allow them to carry out a needs analysis of modern agricultural practices. This is achieved through an overview of the main challenges of French agriculture and the links between fundamental research and biotechnological agricultural solutions.

Topics to be explored:

- Pollen in high ambient temperatures and development consequences (by use of cellular and molecular biology and functional genomics);
- The impact of climate change on the composition of tomato fruit (approaches for the study of central, specialised and redox metabolisms will be considered for this topic);
- Mildew: how to predict and fight this biotic threat (investigation by bioassays of strategies to study plant-pathogen interactions and control pathogen development).

In order to prepare the inverted class, quizzes will be provided to introduce each topic.

Week 2: ...to the field!

During the second week, in order to combine theory with the practice and reality of the professional world, specific theme days are organised. The days are based on the agricultural sectors listed below.

Participants will discover the research laboratories and experimental facilities available at the University of Bordeaux, discuss with researchers who are active within chosen themes and visit agricultural and industrial facilities in New Aquitaine to exchange with professionals from each industry.

- Day 1: Forest and Arcachon Bay
Laboratory (Pierotton INRAE), Oyster House at Gujan Mestras and the Dune of Pyla, Sturgeon rearing for caviar

production (Mios).

- Day 2: Corn production
“Maisadour” factory (Mont-de-Marsan).
- Day 3: Tomato and carrot
Pot au Pin farm (Cestas) and 10 hectare tomato greenhouse (Parentis-en-Born).
- Day 4: Strawberry
“Invenio” - center for the selection of strawberry varieties (Douville).
- Day 5: Vine and wine
Laboratories at the Institute of Vine and Wine Science (ISVV) and the vineyard of Château Couhins.

In addition to the lectures and practical/group work, the two week summer school programme is balanced with many cultural events and excursions (e.g. historical sites of Bordeaux and the Museum of Aquitaine, Montaigne Tower, Roquetaillade Castle, the Dune of Pilat, the town of Saint-Émilion and its vineyards, Gujan Mestras harbour on the Arcachon bay, renowned for its oysters, Château Couhins and its wine cellar).

Week 1

Sunday July 16 th	Monday July 17 th	Tuesday July 18 th	Wednesday July 19 th	Thursday July 20 th	Friday July 21 st	Saturday July 22 nd
French breakfast Dr. Frédéric Delmas, Prof. Michel Hernould	French agriculture, climate changes Prof. Valérie Schurdi-Levrau	Tomato heat stress topics Dr. Frédéric Delmas, Prof. Michel Hernould	Grape culture and wine production Prof. Eric Gomes, Dr. Kentaro Mori	Strawberry culture and production Dr. Beatrice Denoyes, Dr. Amelia Gaston	Forestry and climate change Dr. Didier Bert	Free time
Introduction Prof. Michel Hernould	Stress and plant response Dr. Frédéric Delmas, Prof. Michel Hernould	RedOx status in tomato Dr . Pierre Petriacq	Visit of the Institute of Vine and Wine Science – Interview regarding the description of research topics Prof. Eric Gomes, Dr. Kentaro Mori	Visit of INVENIO (strawberry selection/IVC lab) Dr. Justine Perrotte	Visit of INRAe Pierroton Dr. Didier Bert	

	<p>Plant improvements to meet the major challenges of responding to stress: examples from New Aquitaine crops</p> <p>Prof. Valérie Schurdi-Levrau</p>	<p>INRAE Bordeaux Metabolome platform visit - Interview of Dr . Pierre Petriacq</p>	<p>Visit of Château Couhins</p> <p>Pierre Marazanof</p>	<p>Visit of Montaigne tower</p>	
Bordeaux city tour	<p>Student presentations</p>	<p>Visit of tomato greenhouses at Tom d'Aqui and labwork presentation</p> <p>Thomas Chadeleaud</p>	<p>Labwork n°2</p>		<p>Visit of the dune of Pilat/view of the Pine forest</p> <p>Dr. Frédéric Delmas, Prof. Michel Hernould</p>
		<p>Labwork n°1</p>			

Week 2

<p>Sunday</p> <p>July 23rd</p>	<p>Monday</p> <p>July 24th</p>	<p>Tuesday</p> <p>July 25th</p>	<p>Wednesday</p> <p>July 26th</p>	<p>Thursday</p> <p>July 27th</p>	<p>Friday</p> <p>July 28th</p>
<p>Visit of a fresh food market</p> <p>Prof. Michel Hernould, Dr. Kentaro Mori</p>	<p>Aquaculture</p> <p>Dr. Benoît Sautour</p>	<p>New breeding techniques</p> <p>Prof. Michel Hernould</p>	<p>Visit of an orchard at Bourran and/or Toulonne</p> <p>Dr. Gérard Barroso</p>	<p>Visit of Planet Vegetal (carrots and leeks)</p> <p>Christian Letierce</p>	<p>Student feedback presentations</p>
<p>Visit of Saint Emilion</p>	<p>Visit of an Oyster House at Gujan Mestras and a Sturgeon rearing farm for caviar production at Mios</p>	<p>Visit of the Maïsadour production center</p> <p>Antoine Gaillard</p>	<p>Preparation of student feedback presentation 1 - group project</p> <p>Prof. Philippe Gallusci, Prof.</p>	<p>Preparation of student feedback presentation 2 - group project</p> <p>Dr. Frédéric Delmas, Prof.</p>	

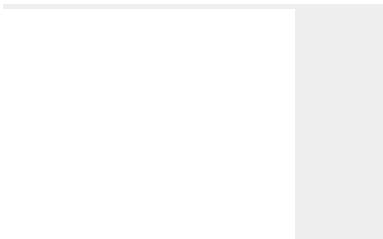
	<i>Prof. Valérie Schurdi-Levrau</i>		<i>Michel Hernould</i>	<i>Michel Hernould</i>
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Expertise upon completion

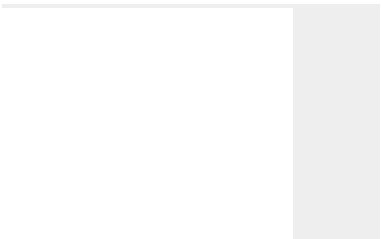
Upon completion of the course, participants will be able to translate socioeconomic and ecological demands into scientific questions and build a project proposal describing the work-packages, project management and financial support. Students and speakers will collaborate within project teams, thus allowing participants to develop their project management and communication skills.

A certificate of participation will be awarded to students upon completion of the course.

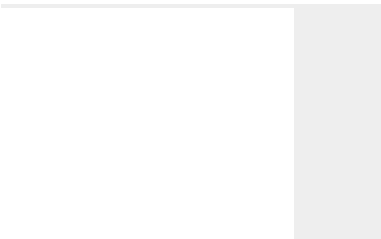
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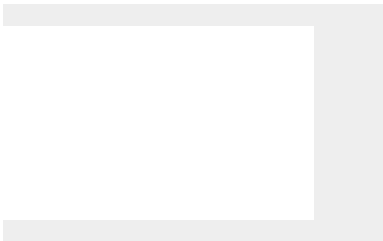
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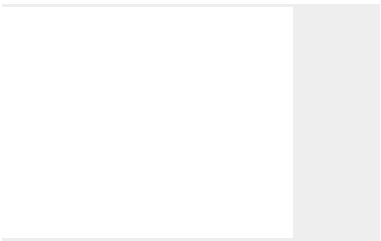
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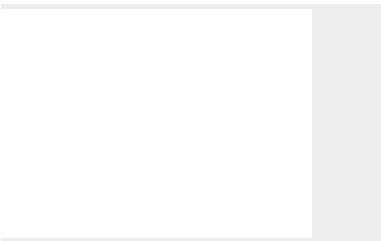
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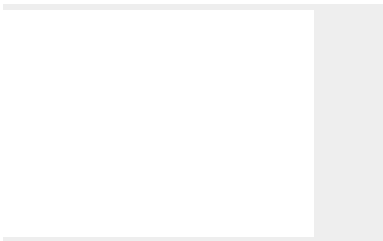
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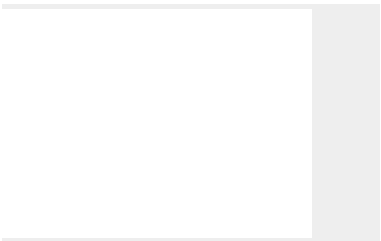
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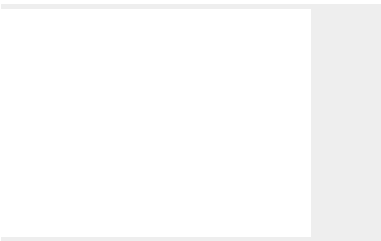
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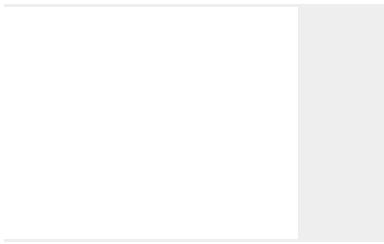
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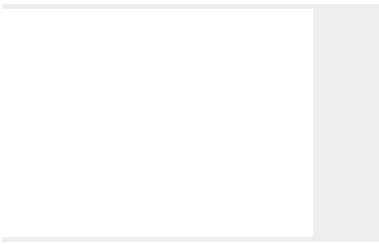
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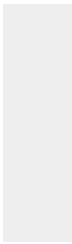
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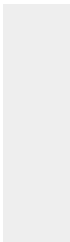
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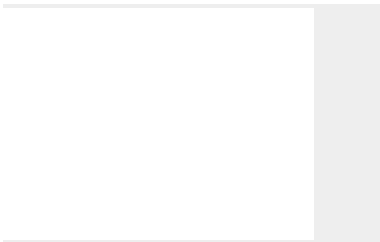
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