

Labex INTERACTIFS (<https://labex-interactifs.pprime.fr/>)
2026-2027 Proposition d'un module de cours à destination des doctorants
I. Informations générales :

Employeur de l'intervenant <i>Employer</i>	☒ UP ☐ ENSMA ☐ CNRS
TITRE du cours en français <i>French title</i>	Bases avancées de MATLAB
TITRE du cours en anglais <i>English title</i>	Advanced MATLAB Foundations
Adéquation avec les thèmes du Labex <i>Adequacy with Labex Research project topics</i>	☒ 1 - COUPLAGE ENTRE LES MATERIAUX ET DES CONDITIONS SPECIFIQUES D'ENVIRONNEMENT ☒ 2 - FONCTIONNALISATION DES SURFACES ☒ 3- FLUIDES ET PHENOMENES ELECTRIQUES AUX INTERFACES
Enseignant <i>Teacher</i>	Nom : Shaaban Prénom : Mahmoud Tel : Email : Mashaaban@nu.edu.eg
Modalités <i>Terms and conditions</i>	Date limite de candidature : 15/12/2026 Envoi du formulaire à l'adresse : philippe.traore@univ-poitiers.fr

II. The course objectives :

- Formulate and Vectorize Engineering Computations**
 Students will transcend basic "calculator-style" scripting by mastering MATLAB's matrix-based architecture. You will learn to translate complex engineering governing equations into highly optimized, vectorized code—drastically reducing execution time for large data sets and iterative loops.
- Implement Numerical Methods for Linear and Nonlinear Systems**
 Students will apply numerical techniques to model, simulate, and solve algebraic and differential equations governing engineering systems. Using core matrix operations, root-finding functions (like `roots` and `fzero`), and optimization routines (such as `fminbnd`), you will compute and validate the stability of physical models.
- Data Acquisition, Processing, and Advanced Visualization**
 Students will develop automated pipelines to import raw experimental or simulation data, filter out noise, and execute statistical analysis. Furthermore, you will learn to synthesize this data into publication-quality 2D/3D plots and animations that effectively communicate complex physical phenomena for journals or theses.

- **AI-Assisted Coding & Agentic AI in MATLAB**

This module introduces students to intent-driven programming ("vibe coding") using modern Generative AI ecosystems built for MATLAB. Students will learn how to shift from manual syntax drafting to high-level system orchestration. The session balances rapid AI-assisted prototyping with rigorous engineering validation to ensure generated scripts are accurate, optimized, and secure.

III. Calendrier

Jours	Horaire	Salle
4/2/2027	de 9h à 12h	salle 104 - ENSIP
11/2/2027	de 9h à 12h	salle 104 - ENSIP
18/2/2027	de 9h à 12h	salle 104 - ENSIP
25/2/2027	de 9h à 12h	salle 104 - ENSIP