Internship Competency Planning Form

Note: Throughout this document, the masculine gender is used generically to refer to any person, regardless of their gender.

Student: Last Name: ..... First Name: .....

Year - Spec: **5th year Materials** **Internship Dates**: ..... to .....

Host Organization: .....

Internship Subject: .....

.....

POLYTECH LYON
Service des Stages
Phone: +33 (0)4 72 43 17 77
entreprise@polytech-lyon.fr

Supervisor: .....

Dept. / Position: .....

Email: ..... Phone: .....

Academic Advisor: .....

Email: ..... Phone: .....

Date:	Student's Signature:	Host Org. Supervisor's Signature:	Academic Advisor's Signature:

Please return this form by email to the Academic Advisor by the end of the 1st month of the internship

This document is designed to enable the intern and their host organization supervisor to **jointly define, on a provisional basis at the very beginning of the internship, the elements of the educational Competency Framework (competencies and associated key learnings**, see Appendix on the last page**) that will be utilized and assessed during the work placement.**

For each competency developed during the internship (a minimum of one out of the 4 competencies in the framework), the tables should be completed as follows:

- **Table 1**: *Competency addressed during internship*: in the left-hand column, please check the box only if the competency will be utilized and developed during the internship. *Student's Self-Perceived Competency*: in the right-hand columns, the student should indicate their current self-assessment regarding this competency and its key components. A guide to help with positioning across the different levels is available in the appendix, on the last page of this document.
- **Table 2** - *Key learnings for the internship*: for each selected competency, also check the associated key learnings that will be utilized during the internship to allow the competency to be exercised in context, based on the missions and tasks constituting the internship program.

Example - If the internship aims to develop, among others, Competency C1 "Develop an innovative material or process": ➔ Table 1: The competency is checked in the left-hand column. - The student indicates their current self-perceived competency regarding C1 and its key components in the right-hand columns. Table 2 - The student and the supervisor jointly select the key learnings for Competency C1 that are planned to be utilized during the internship

Table 1: Competencies and Key Components

		Student's Self-Perceived Competency			
	↓ *Check this box if the competency will be developed during the internship*	Highly Capable	Capable	Partially Capable	Not Capable
X	Competency **C1**: **Develop** an innovative material or process		X		
Key Components	... by analyzing stakeholder needs, considering their various technical, economic, and strategic aspects		X		
	... by leveraging relevant scientific and technical documentation		X		
	... by complying with applicable regulations (safety, environment) and technical standards of the domain		X		
	... by integrating environmental considerations, as well as lifecycle and recyclability aspects			X	
	... by ensuring rigorous quality management (validation of methodologies, compliance with standards and testing conditions, verification of uncertainties and repeatability, etc.)			X	
	... by documenting their actions and results concisely and adaptively for stakeholders		X		

Table 2: Key Learnings

	Key Learnings for Competency **C1**
	↓ *Check the boxes corresponding to the key learnings utilized during the internship*
	Implement material elaboration processes, in bulk or on surface, at the labo
X	**Implement material property measurement and characterization techniqu**
X	**Define an experimental protocol** for elaboration or characterization
	Use simple physical models to predict the behavior of a material or process
X	**Analyze experimental or simulation results** using quantitative tools (statistic
X	**Analyze methodically the interdependence between elaboration proce resulting properties**, based on data from theoretical and experimental approa
	Use advanced modeling and simulation tools (numerical, multiphysics, mu the influence of material characteristics on its behavior and properties
X	**Design a plan of experiments (DoE)** to quantify the effect of several materia properties
	Define the parameters of the material or process to be developed, in resp analyses

		Student's Self-Perceived Competency			
↓ *Check this box if the competency will be developed during the internship*		Highly Capable	Capable	Partially Capable	Not Capable
	Competency **C1**: **Develop** an innovative material or process				
Key Components	… by analyzing stakeholder needs, considering their various technical, economic, and strategic aspects				
	… by leveraging relevant scientific and technical documentation				
	… by complying with applicable regulations (safety, environment) and technical standards of the domain				
	… by integrating environmental considerations, as well as lifecycle and recyclability aspects				
	… by ensuring rigorous quality management (validation of methodologies, compliance with standards and testing conditions, verification of uncertainties and repeatability, etc.)				
	… by documenting their actions and results concisely and adaptively for stakeholders				

Key Learnings for Competency **C1**	
↓ *Check the boxes corresponding to the key learnings utilized during the internship*	
	Implement material elaboration processes, in bulk or on surface, at the laboratory scale
	Implement material property measurement and characterization techniques, in bulk or on surface
	Define an experimental protocol for elaboration or characterization
	Use simple physical models to predict the behavior of a material or process
	Analyze experimental or simulation results using quantitative tools (statistics, graphs, etc.)
	Analyze methodically the interdependence between elaboration process parameters, material structure, and resulting properties, based on data from theoretical and experimental approaches
	Use advanced modeling and simulation tools (numerical, multiphysics, multi-constituent, multi-scale, etc.) to analyze the influence of material characteristics on its behavior and properties
	Design a plan of experiments (DoE) to quantify the effect of several material elaboration or structure parameters on its properties
	Define the parameters of the material or process to be developed, in response to the need and based on conducted analyses
	Prepare a review of the current state-of-the-art
	Identify innovation or improvement opportunities for existing materials or processes based on available data
	Evaluate the benefits and limitations of identified innovation opportunities, considering technical, economic, or environmental criteria
	Develop a methodology integrating experiments and modeling to evaluate an innovative solution
Comments	

↓ *Check this box if the competency will be developed during the internship*		**Student's Self-Perceived Competency**			
		Highly Capable	Capable	Partially Capable	Not Capable
	Competency **C2**: **Design** a technical solution integrating materials				
Key Components	… by considering client needs and the technical, economic, and strategic requirements of the project				
	… by adopting an integrated approach based on product - manufacturing process - material interactions				
	… by complying with applicable regulations (safety, environment) and technical standards of the domain				
	… by considering existing solutions, expertise, and constraints of other actors involved in the project				
	… by integrating eco-design and sustainable development principles				
	… by rigorously justifying technical choices made				
	… by documenting their actions and results concisely and adaptively for internal (project team, management) or external (clients, partners) stakeholders				

Key Learnings for Competency **C2**	
↓ *Check the boxes corresponding to the key learnings utilized during the internship*	
	Identify key material properties for a given function
	Create 3D models and technical drawings of a part or assembly using Computer-Aided Design (CAD) software
	Pre-dimension a solution using simple physical models
	Define or implement testing protocols, standardized or not, to characterize or validate the properties of a component or product
	Select or implement prototyping techniques
	Select materials, formulations, and treatments (in bulk and on surface)
	Design a part or sub-assembly
	Model and simulate the behavior of a part or system under solicitations (mechanical, thermal, chemical, etc.)
	Identify manufacturing and shaping processes adapted to the designed solution
	Collaborate within a design team in an active and structured manner
	Prepare technical specifications
	Conduct technology and industrial property monitoring
	Specify surface and interface properties for the integration of the technical solution into its environment
	Conduct an optimization approach (performance, cost, or other criteria) based on tests and/or simulations
	Ensure liaison and coordination with the various project stakeholders
Comments	

↓ *Check this box if the competency will be developed during the internship*		**Student's Self-Perceived Competency**			
		Highly Capable	Capable	Partially Capable	Not Capable
	Competency **C3**: **Industrialize** the production or transformation of materials				
Key Components	… by considering client needs in their technical, economic, and strategic dimensions				
	… by integrating the process-structure-property interdependence				
	… by integrating performance objectives in terms of cost, quality, and time				
	… by ensuring rigorous quality management (development of operating procedures, specifications, implementation of controls, etc.)				
	… by complying with safety and environmental regulations as well as domain-specific standards				
	… by documenting their actions and results concisely and adaptively for stakeholders				

Key Learnings for Competency **C3**	
↓ *Check the boxes corresponding to the key learnings utilized during the internship*	
	Use simple models to determine the operating parameters of a process
	Select an appropriate production equipment or tooling for process implementation
	Choose the characteristics of a process based on the material and the final properties of the product to be obtained
	Identify the physical quantities to measure for process monitoring
	Evaluate the adequacy of a process based on product characterizations
	Identify the processes necessary for product manufacturing
	Sequence the steps of a production process rationally
	Model and simulate the material transformation during different stages of a production process
	Specify adequate means and protocols for conformity and quality control
	Collaborate with the production team to integrate its constraints and feedback
	Conduct technology and regulatory monitoring in the field of production processes*
	Implement quality and performance indicators for the evaluation of a production process*
	Conduct a parametric study on one or more steps of a production process*
	Implement a global process optimization approach based on tests and/or simulations*
	Collaborate with other departments (R&D, Quality, etc.) to identify and integrate innovations into production processes*
Comments	

↓ *Check this box if the competency will be developed during the internship*		**Student's Self-Perceived Competency**			
		Highly Capable	Capable	Partially Capable	Not Capable
	Competency **C4**: **Manage** a Materials Engineering project				
Key Components	… by analyzing client needs in their various technical, economic, and strategic aspects				
	… by integrating cost, quality, and time objectives through rigorous planning, monitoring, and management of resources and priorities				
	… by complying with regulations (safety, environment) and the legal framework of economic activities				
	… by integrating technical, human, and financial resources coherently				
	… by prioritizing and considering information feedback provided by project stakeholders				
	… by documenting their actions and results concisely and adaptively for stakeholders				

Key Learnings for Competency **C4**	
↓ *Check the boxes corresponding to the key learnings utilized during the internship*	
	Identify precisely the objectives, input data, and deliverables
	Develop the detailed schedule of a task
	Manage the utilization of resources (physical, time, human) allocated to the task
	Ensure communication between participants effectively and adaptively to technical and organizational context
	Report on the progress of an individual task to project stakeholders
	Conduct project feedback analysis (achievements, areas for improvement, lessons learned)
	Use project management tools to plan a multi-task and multi-resource project
	Coordinate the project team through adapted management actions
	Report synthetically on the overall progress of the project
	Evaluate potential project risks (technical, financial, regulatory, etc.)
	Identify opportunities and propose a project strategy
	Identify potential partners for a collaborative project
	Research and contribute to securing funding
	Structure a project in line with a defined framework (technical, financial, time, legal) and specific requirements
	Conduct promotional activities (communication, content creation, etc.) to increase project visibility and impact

Comments

APPENDIX

Competency-Based Approach and Competency Framework: The Essentials

This Competency Planning Form is part of the **Competency-Based Approach** (in French: *Approche par Compétences, APC*), an educational methodology designed to assess a future engineer's ability to act effectively in real-world professional situations. This approach relies on a **Competency Framework**, a structured guide defining the key "complex abilities to act" that students must master by the end of their program.

For the Polytech Lyon Materials program, this framework consists of **4 Competencies** (C1 to C4), which are representative of a Materials Engineer's activities and are linked to the Competency Blocks of the RNCP fiche 39916. The internship offers a prime opportunity for students to mobilize and develop one or more of these competencies in a professional setting.

The main elements of this framework fall into 3 categories:

- **Competency**: this is a "complex ability to act" that enables an individual to perform effectively in a given situation by appropriately mobilizing and combining various resources (knowledge, know-how, soft skills/attitudes). Unlike a simple skill, a competency involves adapting to the specifics of situations and contexts by making justified choices.
- **Key Components**: also known as "performance criteria for a competency," these are the specific criteria that describe the expected quality of action when the competency is implemented. They generally specify the resources to be mobilized, the rules or constraints to be respected, the methodological approaches, communication methods, and the quality of the outcome.
- **Key Learnings**: these are the essential learnings absolutely necessary for the exercise of a competency. They involve mobilizing multidisciplinary resources of various kinds (knowledge, know-how, soft skills/attitudes).

Self-Perceived Competency (*Sentiment de compétence*)

This refers to the **student's subjective feeling**, at a given point in their program, regarding their mastery of a competency and its key components.

Guide to Assessing Self-Perceived Competency	
Highly Capable	*"I feel very comfortable with this competency. I believe I can act autonomously and even take initiative in most situations, including new or complex ones. I generally have a good idea of the knowledge and skills needed to achieve excellent results."*
Capable	*"I think I have a good grasp of this competency. In typical situations, I feel I can act mostly autonomously using the right resources. I should be able to adapt, justify my choices, and achieve the expected results."*
Partially Capable	*"I'm currently in the process of acquiring this competency. I think I can act in certain situations, but I know I might face difficulties in fully mobilizing the necessary resources or adapting to specific contexts. I'll likely need frequent guidance to perform well and justify my actions."*
Not Capable	*"At the moment, I don't feel comfortable with this competency at all. I would find it very difficult to act in the relevant situations or to mobilize the necessary knowledge and skills. I think I would need major help to accomplish anything in this area."*

Additional Advice for Students:

- **Be honest with yourself:** the goal is to establish a starting point to better assess your progress.
- **Think about your past experiences:** previous internships, academic projects, and personal experiences can offer guidance.
- **Don't overestimate or underestimate yourself; try to find a fair balance.** It's perfectly normal not to feel "Capable" (let alone "Highly capable") in all areas at the beginning of your internship.
- **If you have significant doubts, your Academic Advisor can help you reflect on your self-assessment**.