

GTL S43-b & MSc. KIMP

Methods, models and tools for integration :
Manufacturing process, Product modeling, Process
planning, Manufacturing resources



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Who I am ?



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Research topics can be summarized by : “***Model to Process***” :

- Product and Process Modeling
- Processes (manufacturing, service, supply chain) generation, selection and performances evaluations
- Optimization and, classification and clustering algorithms
- Risk and robustness assessment, failure detection
- Human factors and safety

Projects performed in the field of this course :

- USIQUICK (Generation of machining plans of complex borings) – 2 years
- Thesis Project dealing with the Geometrical Tolerances optimization considering the machining capacities and capabilities – 3 years
- More than 17 PhD thesis supervised in these topics



Prerequisite courses & Learning Outcomes

➤ In order to clearly and easily understand all figures and explanations, some prerequisites are needed, mainly :

- Knowledge of conventional manufacturing processes (mainly machining and forging processes not necessary in details),
- Understanding of IDEFo Diagram and UML models, especially : Class Diagram, Activity Diagram and Sequence Diagram.
- Knowledge of Python programming language (base + classical libraries + understanding of OOP)

If these prerequisites are not mastered, please try to improve your skills in these domains.

➤ The objectives of this courses are:

- Being able to identify the data and information needed to solve manufacturing issue,
- Being able to choose the fittest tool and method,
- Being able to use and adapt these tools or methods to a particular (industrial) case

Terms of course


These 30 hours course are assessed thanks to projects and test. The global mark of S43-b is calculated from:

➤ A **final exam** of one hour

30%  *Personal*

➤ **Projects**

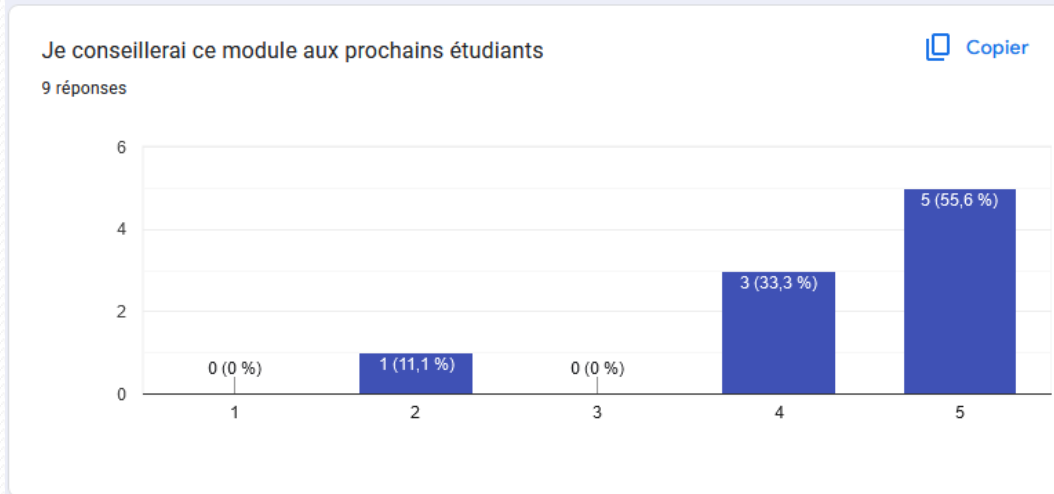
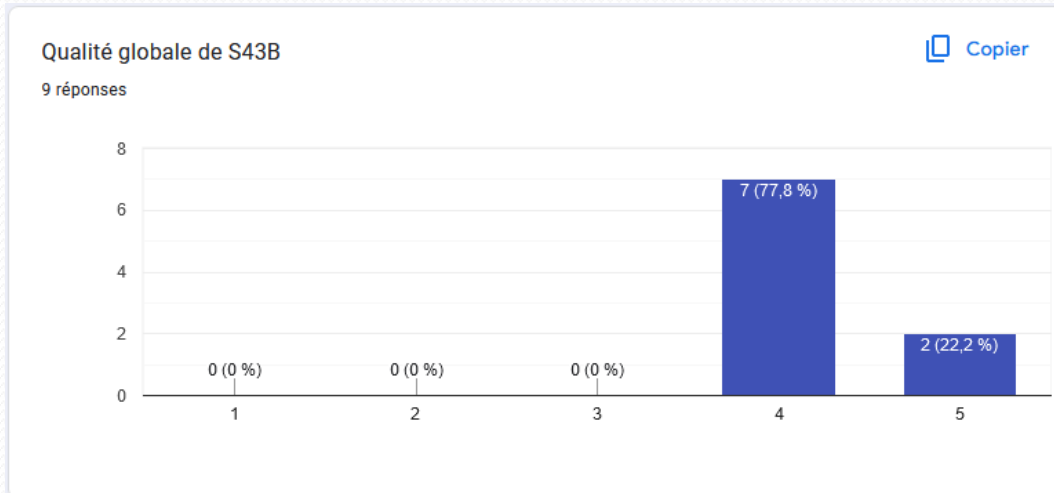
- Fuzzy logic
- Constraint Satisfaction Problem
- Expert System
- Neural network

70%  *Team of max 2 students*
(20%)
(20%)
(10%)
(20%)

If I deem necessary, I can modify the way of performing these evaluations.

Penalties can be applied if you don't meet deadlines, expectations, terms or if your work **is not personal (plagiarism, copy/paste...)**.

Feedbacks 2022-23

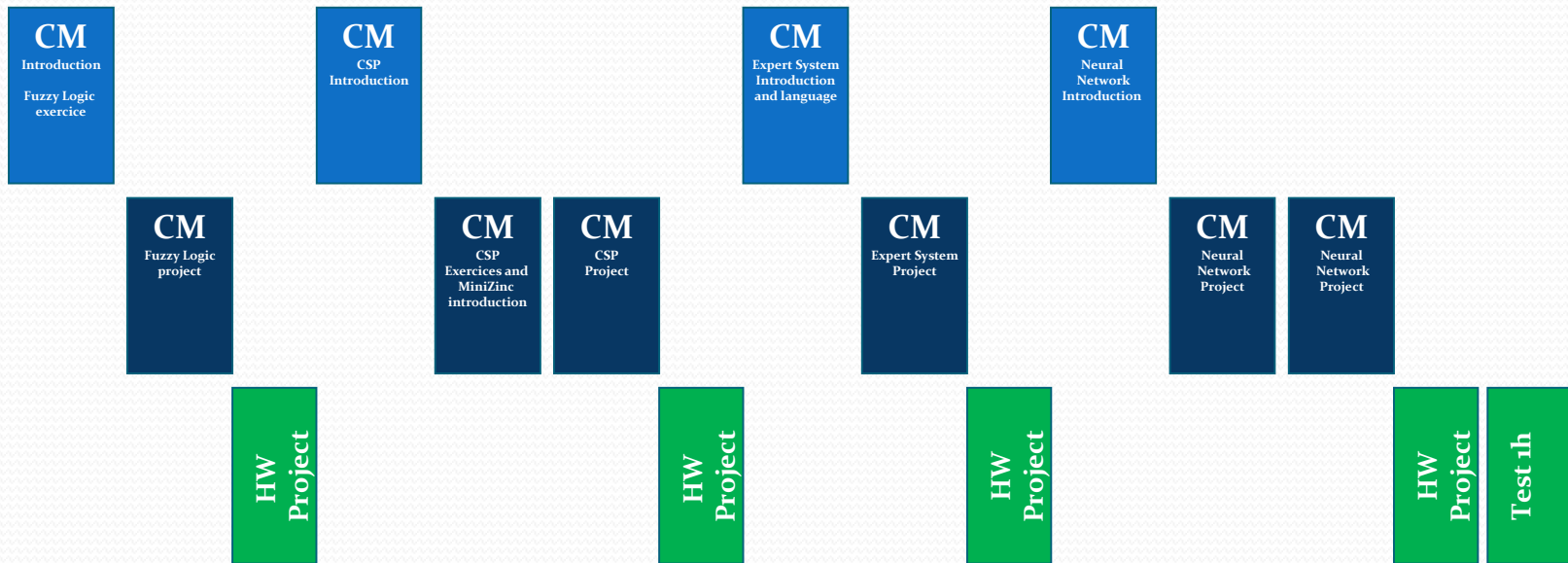


The complete Survey is available by following this link:

[Link to google Form](#)

Learning Process

These 30 hours course are split in 4 main parts, focused on a specific approach or tool:



Schedule 2024

Week	Semaine	Date du lundi de la semaine	Schedule GTL-ENSAM Fall 2024																heures				
			Lundi				Mardi				Mercredi				Vendredi matin					Vendredi après-midi			
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1
1	34	19-août									First Day of Class												
2	35	26-août	S43 - WZ												S43 - RB								
3	36	02-sept	S43 - WZ												S43 - AE		S43 - RB						
4	37	09-sept	S43 - WZ												S43 - AE		S43 - RB						
5	38	16-sept	S43 - WZ												S43 - AE		S43 - EB						
6	39	23-sept	S43 - WZ												S43 - AE		S43 - LL						
7	40	30-sept	S43 - WZ												S43 - AE		S43 - LL						
8	41	07-oct	S43 - WZ												S43 - AE		S43 - LL						
9	42	14-oct	S43 - WZ												S43 - AE		S43 - EB						
10	43	21-oct																	S43 - EB				
11	44	28-oct	Vacances scolaires ENSAM Metz																				
12	45	04-nov													S43 - AE		test LL, EB, RB						
13	46	11-nov	11/11/2024												S43 - AE								
14	47	18-nov													S43 - AE								
15	48	25-nov													test								
16	49	02-déc									Reading day				Examen à GTL								
17	50	09-déc																					

The sessions start at **9:00!**

The lectures are be organized in **face to face manner** (no TEAMS meeting).

Resource Materials

Several literature resources (articles or websites) are available to help you in your work (understanding of the concepts handled in this course, performing the project works or doing exercises...):

- Online resources, stored in a Moodle workspace called SAVOIR:

[Link to SAVOIR workspace](#)

- All scientific and technical articles on which is based the course are quoted and ordered in the end of the document. They are easy to find through www.sciencedirect.com.

- The Project runs on software tools which are:

- ✓ Free: in the case of CLIPS Software (Expert System), MiniZinc (CSP Framework), or Python and its libs (Neural Network, Fuzzy Logic...)
- ✓ Provided by ENSAM: Excel 365...

Course - Mind mapping

This course is composed of two main parts. It is factorized as detailed in this mind map:

