areola

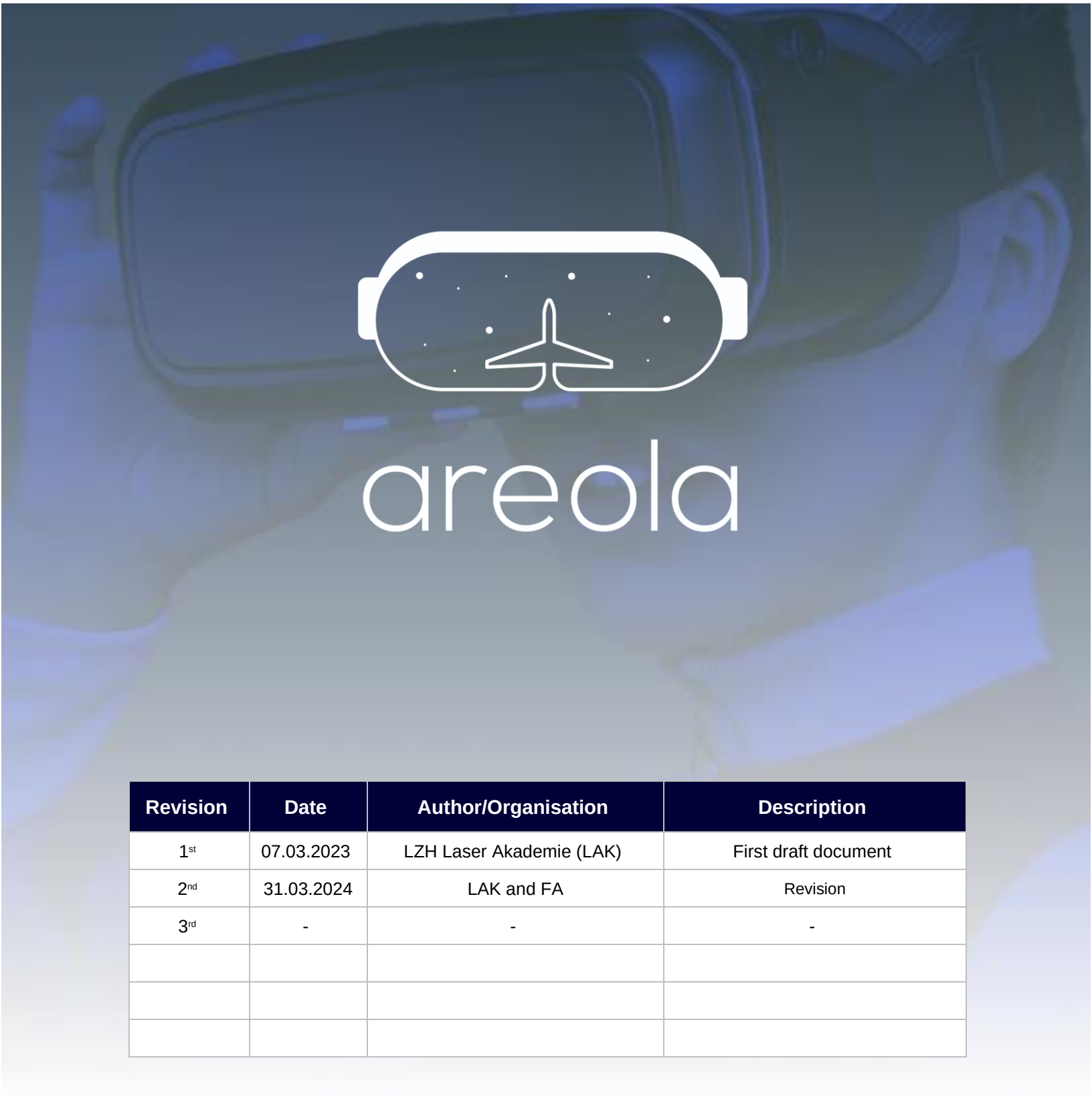
Lesson Plan Development

Project Nr: *2021-1-PT01-KA220-VET-000034876*

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Commission. Neither the European Union nor the European Commission can be held responsible for them. The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

areola

Co-funded by the European Union



Revision	Date	Author/Organisation	Description
1st	07.03.2023	LZH Laser Akademie (LAK)	First draft document
2nd	31.03.2024	LAK and FA	Revision
3rd	-	-	-

areola

Co-funded by the European Union

Content

Overview

The following document was developed within AREOLA project in Project result 2 “Development of materials to deliver PBF-LB Operator Theoretical”. It gives hints to consider when developing a lesson plan or lecturer timetable. The lesson plan is a document for trainers, it will not be provided to the participants of the course. The participants can receive an agenda with content, date, time, and lecturer which is based in the lesson plan developed before.

1. Preliminary considerations

As a first step when developing a lesson plan, the trainer should do preliminary considerations concerning the following items:

a. Own competences and prior knowledge
b. Learning group
c. Other conditions

Regarding one's own competences, check what might have to be refreshed, what should be researched. Information about the learning group should also be collected, e.g., the existing prior knowledge, the skills of the participants or also their sector / workplace. Under "other conditions", information on the learning location, the facilities to be used or the equipment available should be collected.

2. Learning outcomes of the competence unit

In the second step of lesson planning, the trainer should look at the main learning objectives and competences of the unit. Depending on the starting point, the learning objectives can be just looked at, identified, or recalled.

3. Structuring the CU into individual learning units

The next step is to structure the overall competence unit into smaller individual learning sequences (macro sequence). This compilation can also be done in table form. Please see a possible template for this lesson plan or macro sequence below or in the Annex.

Project: AREOLA	areola
Lesson plan template	Project Nr: 2021-1-PT01-KA220-VET-000034876 Co-funded by the Erasmus+ Programme of the European Union
Subject:	
Venue:	

Date	Time schedule / Duration	Content / Subjects	Learning outcome / objective	Resources (material and methods)	Lecturer / responsible
28.07.2023	*2'*	*Basics*		Classroom / Teams	

4. Planning of individual learning units

After having structured the CU into individual learning units or sequences (see section 3, lesson plan / macro sequence), these sequences will be planned in detail. For each individual unit/sequence of the lesson plan (macro sequence), a (lesson) progression plan is prepared. A template for this planning can be found in the Annex. The trainer can use the following approach:

a) Formulate lesson learning objectives and sub-objectives,
b) Make methodological decisions,
c) Develop a schedule for the unit or lesson (this can be done in tabular form).

Under point b, consider which methods can be used to achieve the objectives of point a. Possible methods are, for example, a teacher-student discussion, group work or a reflection discussion. The required material will be collected. The planning of the individual learning units is followed by the holding of the lesson.

5. Reflection

After the lesson, the teacher reflects on the lesson what worked well and why and what could have been done differently. This can be based, for example, on the questions "Did I achieve my learning goals?" and "If not, what do I have to change to get there?".

Annex

Lesson plan template

Project: AREOLA – Lesson plan template	areola Co-funded by the Erasmus+ Programme of the European Union Project Nr: 2021-1-PT01-KA220-VET-000034876
Subject:	
Venue:	

Date	Time schedule / Duration	Content / Subjects	Learning outcome / objective	Resources (material and methods)	Lecturer / responsible
28.07.2023	*2'*	*Basic*		*Classroom / Teams*	

Lesson plan for CU48

Project: AREOLA – Lesson plan template	areola Co-funded by the Erasmus+ Programme of the European Union Project Nr: 2021-1-PT01-KA220-VET-000034876
Subject:	CU48: Powder Handling
Venue:	Virtual / Teams

Date	Time schedule / Duration	Content / Subjects	Learning outcome / objective	Resources (material and methods)	Lecturer / responsible
28.03.2023	13:00 –13:45	Powder handling introduction Considerations of traceability Link to QMS and AS9100 Powder specification Powder production methods Powder acceptance; -Certificate of Conformance -Powder testing methods -Powder record sheets	Understand critical importance of powder handling, particularly for aerospace part production; Appreciate the importance of powder specification and its impact on powder cost and testing time. Understand impact of powder production methods on suitability for PBF-LB. Appreciate the approach for ensuring powder meets the specification set.	Classroom / Teams	D.Wimpenny

28.03.2023	13:45 – 14:00	Coffee break	-	-	-
28.03.2023	14:00-14:45	Reuse of unfused powder Health & safety considerations AM7301 – standard for powder reuse Overview of standard Key technical considerations embodied in standard Recap & discussion with students	Understand powder reuse Be aware of the health & safety implication of powder handling. Understand the content and intent of the AM7301 standard on powder reuse for the aerospace sector.	Class room/Teams	D.Wimpenny
28.03.2023	14:45-15:00	Coffee break			
28.03.2023	15:00 -15:45	CU48 Case studies Failed aeroengine parts (25mins) Health & safety investigation (20mins) Template Instructions for case studies and practical exercises for the IMAM PBF-LB Operator (?)	Understand impact of powder handling on part quality and aircraft safety. Awareness of impact of powder handling problems on H&S of employees and how to conduct and root cause investigation.	Class room /Teams	D.Wimpenny

Lesson plan for CU21

Project: AREOLA – Lesson plan template	areola Co-funded by the Erasmus+ Programme of the European Union Project Nr: 2021-1-PT01-KA220-VET-000034876
Subject:	CU21: Maintenance of PBF-LB systems
Venue:	Virtual / Teams

Date	Time schedule / Duration	Content / Subjects	Learning outcome / objective	Resources (material and methods)	Lecturer / responsible
28.03.2023	08:30 – 09:30 60’	General maintenance aspects (A: theoretical training)	Assess the need to perform maintenance operations in PBF-LB system; Report the need to execute specific maintenance; Monitoring and calibration status	Classroom / Teams	Y. Johannsen
28.03.2023	09:30 – 10:30 60’	General maintenance aspects (B: assigned projects/exercises)		Case study / Teams	Y. Johannsen
28.03.2023	10:30 – 10:45 15’	Coffee break	-	-	-
28.03.2023	10:45 – 11:15 30’	Optical elements (B: assigned projects/exercises)	Change protective lens; Verify the cleanliness of the optic system;	Case study / Teams	Y. Johannsen

			Verify if the optical system is working correctly		
28.03.2023	11:15 – 12:45 90’	Parts maintenance (B: assigned projects/exercises)	Clean the nozzle; Identify the consumables for the different machine parts; Verify the level of wear of a mechanical component; Verify the system gas flow	Case study / Teams	Y. Johannsen
28.03.2023	12:45 – 13:30 45’	Lunch break	-	-	-
28.03.2023	13:30 – 14:30 60’	Auxiliary elements maintenance (B: assigned projects/exercises)	Verify the condition of vacuum cleaner	Case study / Discussion / Teams	I. Zajons
28.03.2023	14:30 – 15:00 30’	Application driven material change (A: theoretical training)	Adequate maintenance routines to the material type	Classroom / Teams	I. Zajons
28.03.2023	15:00 – 15:30 30’	Application driven material change (B: assigned projects/exercises)		Case study / Teams	I. Zajons
28.03.2023	15:30 – 15:45 15’	Coffee break	-	-	-
28.03.2023	15:45 – 16;45 60’	HSE Procedures (B: assigned projects/exercises)	Verify the condition and make use of the personal protective equipment; Following applicable HSE procedures	Case study / walk around / Teams	I. Zajons

Template for planning individual learning units

Project: AREOLA – Planning of individual learning units	areola Co-funded by the Erasmus+ Programme of the European Union Project Nr: 2021-1-PT01-KA220-VET-000034876
Trainer / Teacher:	
Date:	
Time:	
Module:	
Topic / subject:	
Venue:	
Learning objectives / outcomes:	

Stage:	Starting Time/ Duration (min)	Topic/ Content/ Subject/ Activity	Teaching and learning methods/ social type	Media/ Tools/ Resources	Learning outcome	Student evaluation
Introduction: …..						
Body/ Development: …..	*10´*	*Michael explains basics with the help of the materials*	*Teacher-student discussion;* *Method: expert learning: social type: group work*	*PPT*	*LO 1*	*e.g. final assessment*
Saving results/ Summary: …..						