EASA
European Union Aviation Safety Agency

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ATP(A) INTEGRATED COURSE MANUAL

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Disclaimer

This manual is designed to provide guidelines for the ATP integrated course - Aeroplanes. Its content is not intended to be legally binding. The applicable provisions of Regulation (EU) No 2018/1139, Regulation No (EU) 1178/2011 and Regulation (EU) No 965/2012, as amended, shall be deemed as legally binding.

References to implementing rules, acceptable means of compliance and guidance material should be understood as being those referred to in the amendments of Regulation (EU) No 1178/2011 and Regulation (EU) No 965/2012 reported in the References section of this manual.

Examples included in this manual are not meant to be exhaustive or complete, but rather to clarify the principles herein illustrated. They should not be used as main or sole reference when designing and delivering a training course.

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List of Acronyms

AMC	Acceptable Means of Compliance
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATO	Approved Training Organisation
CFI	Chief Flight Instructor
CTKI	Chief Theoretical Knowledge Instructor
EASA	European Union Aviation Safety Agency
FSTD	Flight Simulation Training Device
GM	Guidance Material
HT	Head of Training
ICAO	International Civil Aviation Organisation
KSA	Knowledge, Skills and Attitude
LO	Learning Objective
MCC	Multi Crew Cooperation
PF	Pilot Flying
PFD	Primary Flight Display
PM	Pilot Monitoring
RT	Radiotelephony
TEM	Threat and Error Management
UPRT	Upset Prevention and Recovery Training

Glossary of terms

Assessment	The determination by an instructor, assessor or evaluator as to whether a student meets a required standard under given conditions.
Final standard	The level of competency expected of a student at the end of the training course.
Formative assessment	The evaluation of the way a student is learning to monitor the learning progress by providing ongoing feedback and to identify the training areas needing improvement.
In-person classroom	A physical, appropriate location where learning takes place.
Interim standard	The level of competency expected of a student at predetermined points in a training programme.
Milestone	A predetermined point in a training programme to which specific training objectives are associated and expected to be met.
Module	A subdivision of a training course consisting in the combination of closely related training tasks.
Oral assessment	The evaluation of the knowledge and the competencies of a student in oral form.
Phase	A subdivision of a training programme to which a high-level objective is associated.
Summative assessment	The evaluation performed at predefined points of a training programme to determine the performance of a student with respect to established performance indicators and to ensure that the objectives associated with a milestone and the required interim standard are reached.
Virtual classroom	A virtual environment, not physical, location where synchronous learning takes place.
Word picture	An assessment tool used to describe and assess a student's performance, and to standardise pilot core competencies in the Area 100 KSA.
Written assessment	The evaluation of the knowledge and the competencies of a student in written form.

1. Introduction

1.1. Scope

The scope of this manual is to provide guidelines on the design and implementation of ATP(A) integrated training courses, with the purpose of improving the quality of ab-initio pilot training and having competent pilots.

1.2. Objectives

This manual has been prepared with the aim of:

- explaining the meaning of "integration" of theoretical knowledge instruction and practical flight training;
- providing guidance on the design, implementation and assessment of the training course through the illustration and explanation of instructional system design principles;
- providing detailed guidance on the prerequisites for training;
- clarifying the scope of Area 100 KSA and providing guidance on the importance of the integration of theoretical knowledge topics from different subjects through practical examples;
- explaining how theoretical knowledge instruction can be retained and reinforce during practical flight training;
- clarifying the order of flying phases and the flexibility allowed to some elements of a training programme to achieve pedagogical efficiency.

1.3. Applicability

The information of the manual should be understood as being mainly addressed to ATOs.

Useful information for national competent authorities and students can also be found.

2. Integrated Training

2.1. Background

The provisions for ATP integrated training and, in particular, the contents to be included in such training, have historically been described in IEM No. 3 to JAR-FCL 1.055 "Training Manual" Part 2, Chapter: 'Integration of the syllabi into the course structure'. Particular emphasis was placed to the importance of the integration between theoretical knowledge, synthetic flight training and flight training. The training manual had to be developed in such a way that the student could apply the knowledge acquired during the theoretical training and synthetic flight training to the associated flight training exercises.

Later, the MPL training introduced in the JAR-FCL system was developed using the "footprint" of the ATP integrated training concept, with emphasis on the integration of the theoretical and flight training elements. The integration element was further explained in Appendix 1 to JAR-FCL 1.520 & 1.525 'MPL(A) – Integrated Multi-Crew Pilot Licence training course' Chapter 12, where it was stated that: 'Each phase of training in the flight instruction syllabus shall be composed of both instruction in the underpinning knowledge and in particular training segments. Training in the underpinning knowledge requirements for the MPL(A) shall therefore be fully integrated with the training of the skill requirements.' The aforementioned provisions have been further incorporated into the Part-FCL requirements – Appendix 3, AMC1 ORA.ATO.230, and Appendix 5 to Part-FCL point 9. It is worth mentioning that the same approach was introduced by Amendment 176 to ICAO Annex I, Point 2.5.1.2.1.2, in the context of competency-based training and assessment (CBTA) stating that: 'The training in the underpinning knowledge requirements shall be fully integrated with training of the underpinning skill requirements'.

2.2. Explanation of the meaning of integration

The integrated training programme incorporates multiple types of training into a single programme, with the aim of achieving pedagogical efficiency.

As such, integration is to be regarded as a continual process of theoretical knowledge instruction and practical training to enable students to assimilate the knowledge, skills and attitude required to operate an aircraft safely and efficiently. The student's performance should be determined by the demonstration of a satisfactory level of theoretical knowledge, skills and attitude determined through progressive assessment by the ATO during theoretical knowledge and flight training and the successful completion of theoretical knowledge examinations and practical skill tests.

The training programme should be designed, developed and implemented in a such way that students are encouraged to acquire and apply relevant theoretical knowledge, skills and attitude to the specific practical training according to the complexity of each stage of the training.

The training programme should, to the largest practicable extent, integrate theoretical knowledge instruction and practical flight training so that the students can benefit from the direct practical application of the theoretical knowledge notions learnt in classroom and vice versa. Therefore, theoretical knowledge instruction should not be considered as an independent, self-standing part of the course but is to be regarded as one of the essential elements that enables students to become competent pilots.

2.3. Regulatory framework for training integration

The regulatory requirements for the integration of a training programme are laid down in Regulation (EU) No 2018/1139 and in Regulation (EU) No 1178/2011.

In Regulation (EU) No 2018/1139, Annex IV – Essential requirements for aircrew, clear reference is given to the demonstration and maintenance of theoretical knowledge.

According to paragraph 1.3 - Demonstration and maintenance of theoretical knowledge:

1.3.1. The acquisition and retention of theoretical knowledge must be demonstrated by continuous assessment during training and, where appropriate, by examinations.

1.3.2. An appropriate level of competence in theoretical knowledge must be maintained. Compliance must be demonstrated by regular assessments, examinations, tests or checks. The frequency of examinations, tests or checks must be proportionate to the level of risk associated with the activity.

In Regulation (EU) No 1178/2011, Annex VII (Part-ORA), the following implementing rules provide information regarding relevant tasks approved training organisations are to comply with.

ORA.GEN.115 – Application for an organisation certificate

(a) The application for an organisation certificate or an amendment to an existing certificate shall be made in a form and manner established by the competent authority, taking into account the applicable requirements of Regulation (EC) No 216/2008[1] and its Implementing Rules.

(b) Applicants for an initial certificate shall provide the competent authority with documentation demonstrating how they will comply with the requirements established in Regulation (EC) No 216/2008[1] and its Implementing Rules. [...]

ORA.GEN.135 – Continued validity

(a) The organisation's certificate shall remain valid subject to:

(1) the organisation remaining in compliance with the relevant requirements of Regulation (EC) No 216/2008[1] and its Implementing Rules, taking into account the provisions related to the handling of findings as specified under ORA.GEN.150;[...]

ORA.ATO.130 – Training manual and operations manual

(a) The ATO shall establish and maintain a training manual and operations manual containing information and instructions to enable personnel to perform their duties and to give guidance to students on how to comply with course requirements.[...]

ORA.ATO.230 – Training manual and operations manual

(a) The training manual shall state the standards, objectives and training goals for each phase of training that the students are required to comply with and shall address the following subjects:

- training plan,
- briefing and air exercises,
- flight training in an FSTD, if applicable,
- theoretical knowledge instruction.

[...]

AMC1 ORA.ATO.230(a) – Training manual and operations manual

TRAINING MANUAL

Training manuals for use at an ATO to conduct integrated or modular flight training courses should include the following:

(a) The training plan:

[...]

1 Regulation (EC) No 216/2008 has been amended and repealed by Regulation (EU) No 2018/1139. Where the regulatory text of Regulation (EU) No 1178/2011 refers to Regulation (EC) No 216/2008, it is should be understood as being referred to Regulation (EU) No 2018/1139.

(b) Briefing and air exercises:

[...]

(3) Course structure: phase of training	*A statement of how the course will be divided into phases, indication of* ***how the above air exercises will be divided between the phases and how they will be arranged to ensure that they are completed in the most suitable learning sequence*** *and that essential (emergency) exercises are repeated at the correct frequency. Also, the syllabus hours for each phase and for groups of exercises within each phase should be stated and when progress tests are to be conducted, etc.*
(4) Course structure: integration of syllabi	***The manner in which theoretical knowledge and flight training in an aircraft or an FSTD will be integrated so that as the flying training exercises are carried out students will be able to apply the knowledge gained from the associated theoretical knowledge instruction and flight training.***

[...]

According to the provisions of the applicable implementing rules, ATOs are required, in order to receive and to maintain an organisation certificate, to comply with the requirements of the Basic Regulation. Additionally, ATOs are required to have a training programme which states the manner in which theoretical knowledge and flight training in an aircraft or an FSTD are integrated and how pedagogical efficiency is reached by organising air exercises in the most suitable learning sequence.

3. Threat and Error Management

3.1. Introduction to TEM

Threat and Error Management is an overarching safety concept regarding flight operations and human performance and conceived to improve the margins of safety in flight operations through the practical integration of human factors knowledge.

Introduced by ICAO, TEM was developed as a result of collective aviation industry experience, taking into consideration the interaction between people and the operational context within which operational duties are performed.

Within the context of ATP integrated training, TEM principles should be always applied at any stage of training. ATOs should always pay the utmost attention to the application of TEM principles during the design, the implementation and the evaluation of the training course.

Students should be exposed to TEM principles from the very beginning of the training course. In this way, they are given the opportunity to familiarise, understand and apply the principles at an increasing level of complexity throughout the training course, up to the point at which they autonomously apply TEM principles as an integral part of the decision-making process and are able to analyse the outcome of the actions taken.

3.2. The components of the TEM framework

There are three basic components in the TEM framework. From the perspective of their users, they have slightly different definitions: threats, errors and undesired (aircraft) states.

The framework proposes that threats and errors are part of everyday aviation operations that must be managed by the aviation professionals, since both threats and errors carry the potential to generate undesired states. The undesired states carry the potential for unsafe outcomes thus undesired state management is an essential component of the TEM framework, as important as threat and error management. Undesired state management largely represents the last opportunity to avoid an unsafe outcome and thus re-establish safety margins in flight operations.

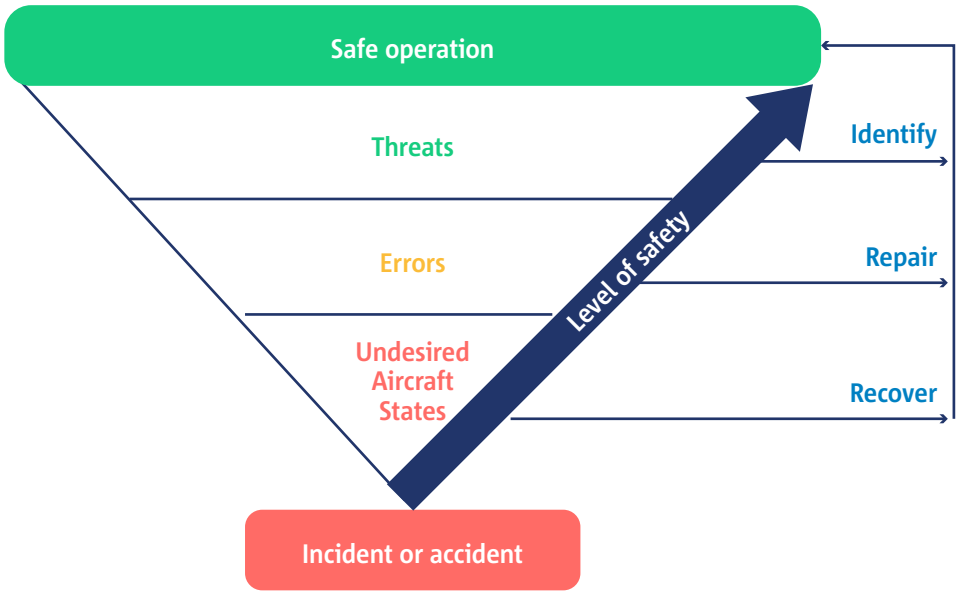


Figure 1: Threat and Error Management model scheme.

3.2.1. Threats

Threats are defined as events or errors that occur beyond the influence of flight crew, increase operational complexity, and which must be managed to maintain the margins of safety.

To achieve and maintain a high level of safety during flight operations, it is important to be able to identify and counteract threats.

Threats can be classified on the basis of expectation by the flight crew as expected (e.g. low visibility in the proximity of a controlled airport), unexpected (e.g. engine failure) or latent (e.g. equipment design issues).

Threats can also be classified considering their nature. In this case, threats are normally divided in two categories: environmental threats (weather, air traffic control (ATC), airport, terrain) and organisational threats (operational pressure, aircraft, cabin, maintenance, ground, dispatch, documentation).

Threat management, consisting in the application of countermeasures to avoid that threats turn into errors and/or undesired aircraft states, should always be applied. Examples of threat management include the analysis of expected threats during the pre-flight briefing with the decision on the necessary actions to be taken, checklist execution, compliance with SOPs and briefings on the required actions in case of unexpected threat manifestation such as, for example, an engine failure during take-off.

3.2.2. Errors

Errors are defined as actions or inactions by the flight crew that lead to deviations from organisational or operational intentions or expectations. Unmanaged and/or mis-managed errors frequently lead to undesired states. Errors in the operational context thus tend to reduce the margins of safety and increase the probability of an undesirable event.

The TEM model classifies errors based upon the primary interaction of the pilot or flight crew at the moment the error is committed. Three error categories are identified:

- aircraft handling errors;
- procedurals errors;
- communication errors.

Identification and correct response to errors is important to avoid a degradation of flight crew performance potentially leading to undesired aircraft states.

3.2.3. Undesired aircraft states

Undesired aircraft states are defined as operational conditions where an unintended situation results in a reduction in margins of safety. Undesired aircraft states that result from ineffective threat and/or error management may lead to compromised situations and reduce margins of safety aviation operations. Undesired aircraft states are often considered the last stage before an incident or accident.

The flight crew response to undesired aircraft states can lead to a restoration of safety margins, or induce additional errors, leading to an incident or accident.

Further information can be found in ICAO Doc 9868, Chapter 6 and in Regulation (EU) No 1178/2011, GM1 to Appendix 5, paragraph (o).

4. Instructional System Design

4.1. Introduction to instructional system design

Instructional system design is a methodology which provides a systematic and iterative process for course design based on educational needs.

Its purpose is to facilitate the students' efficient and effective acquisition of knowledge, skills and attitude based on training needs.

Instructional system design methodology is applicable for the design and integration of theoretical knowledge instruction and practical training courses. Furthermore, this methodology is applicable to both task-based and competency-based training and assessment training courses.

Hereinafter, the principles of ADDIE model, an ISD framework used by many instructional designers and training developers, are explained and suggested as guidance to be used for the design, development and implementation of effective training courses.

4.2. ADDIE model

ADDIE model is a generic and comprehensive framework that any ATO can use to design, develop, implement and evaluate the outcome of a training course, consisting of five workflows:

1) **Analysis** of the training needs and the requirements
2) **Design** of the training course
3) **Development** of the training and assessment material
4) **Implementation** of the training course
5) **Evaluation** of outcome of the training course

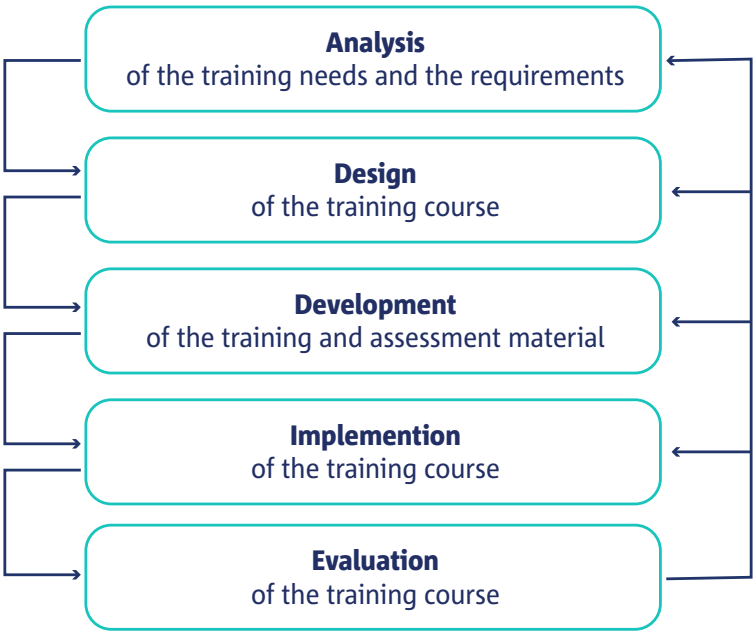


Figure 2: ADDIE model scheme.

4.2.1. Analysis

The analysis workflow of the ADDIE model consists in the analysis of the training needs and the requirements.

As first step, it is recommended to perform a thorough analysis of the training needs of the students, taking into consideration the purpose of the training and the level of competence that students have at the beginning and are required to have at the end of the training course.

The definition of the set of knowledge, skills and attitude required to safely conduct a set of training tasks defines the competency required in the execution of those tasks.

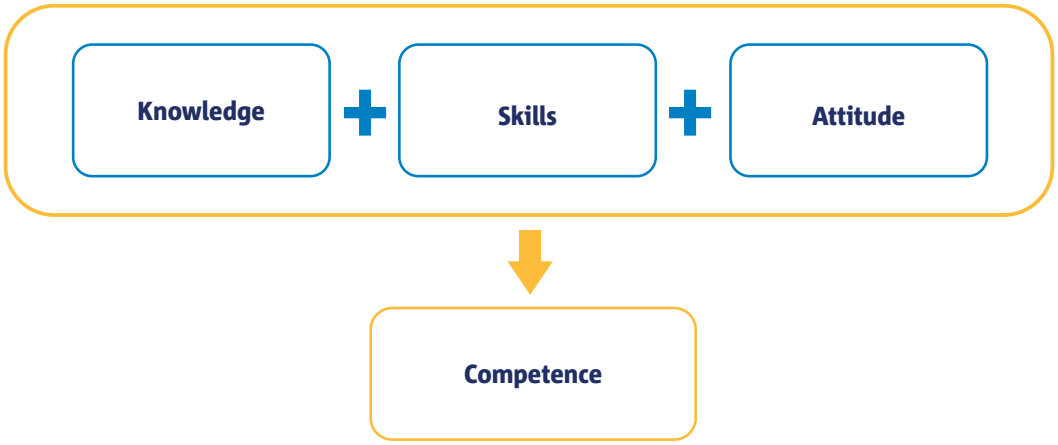


Figure 3: Competence as combination of knowledge, skills and attitude.

The overall combination of the set of competencies allows to build the competence required to safely operate an aircraft in commercial operations.

As second step, ATOs should analyse a set of requirements, which comprises the following:

1) regulatory requirements;
2) operational requirements;
3) technical requirements;
4) organisational requirements;
5) additional requirements.

Regulatory requirements

Regulatory requirements are defined in Regulation (EU) No 2018/1139 and in Regulation (EU) No 1178/2011.

The analysis of regulatory requirements should include, as minimum, the elements of the entire training course and their allocation within the course, the duration of training phases, the required assessments and examinations and the qualification that the ATOs' personnel is required to have.

Operational requirements

The analysis of operational requirements should include the environment in which the training is to take place with respect to the purpose of the training and the training tasks. For example, an analysis should be made with regard to the proper configuration of the working environment or the stages of the training in which abnormal and emergency situations will be introduced.

Technical requirements

The analysis of technical requirements should take into consideration the equipment required to deliver the course, such as the available aircraft and the required certifications, the FSTDs and their qualification, the training platforms, the training material for theoretical knowledge instruction and any other tools deemed important.

Organisational requirements

The analysis of organisational requirements should include all those requirements that may have an impact on the training course, which can be national, local or even specific to the training organisation.

Examples of factors affecting the organisational requirements include the use of alternate training bases or the way theoretical knowledge examinations are organised.

Additional requirements

Additional requirements may be defined by the ATOs such as, for instance, requirements related to the language of instruction.

The analysis workflow ultimately provides the training specifications to be used in the next step, the design workflow.

4.2.2. Design

Starting from the training specifications defined in the analysis workflow, the design workflow of ADDIE model provides the training and the assessment plans of the training course as output of the process.

The design workflow can be divided into two parts:

1) the division of the training course, the definition of interim and final training standards and associated performance indicators;
2) the setup of the training and assessment plans.

Division of the training course

In accordance with AMC1 to Appendix 3 of Regulation (EU) No 1178/2011, the ATP(A) integrated course is defined by six phases, for each of whom a training objective is defined.

Phase	Objective
Phase 1	First solo flight
Phase 2	First solo cross-country
Phase 3	VFR navigation progress check
Phase 4	Instrument rating
Phase 5	Advanced UPRT
Phase 6	MCC[2]

Table 1: ATP(A) integrated course phases and objectives.

2 With the introduction of the APS MCC in ED Decision 2017/022/R, AMC2 FCL.735.A has been introduced to allow an alternative to the conventional MCC course and to provide a stronger bridge between the award of initial licences and familiarisation with airline operations. For this reason, when this manual refers to MCC, it should be understood that the APS MCC is an acceptable mean of compliance with respect to the provisions of point FCL.735.A.

For long, complex training courses such as the integrated training course, in addition to the six phases, it is advisable to divide the course into training modules that include a set of training tasks.

A training module may include one or more training tasks and is not to be seen as confined within a phase, but it may extend through different phases.

The training course should include clearly identified milestones, which are training objectives for which interim standards are defined. The number of milestones may exceed the number of objectives defined by the regulatory requirements. For instance, milestones may be identified when one or more training modules are completed.

As an example, we consider Phase 1 of the training course. Phase 1 may be divided into training modules that include a set of training tasks, as illustrated in *Figure 4*.

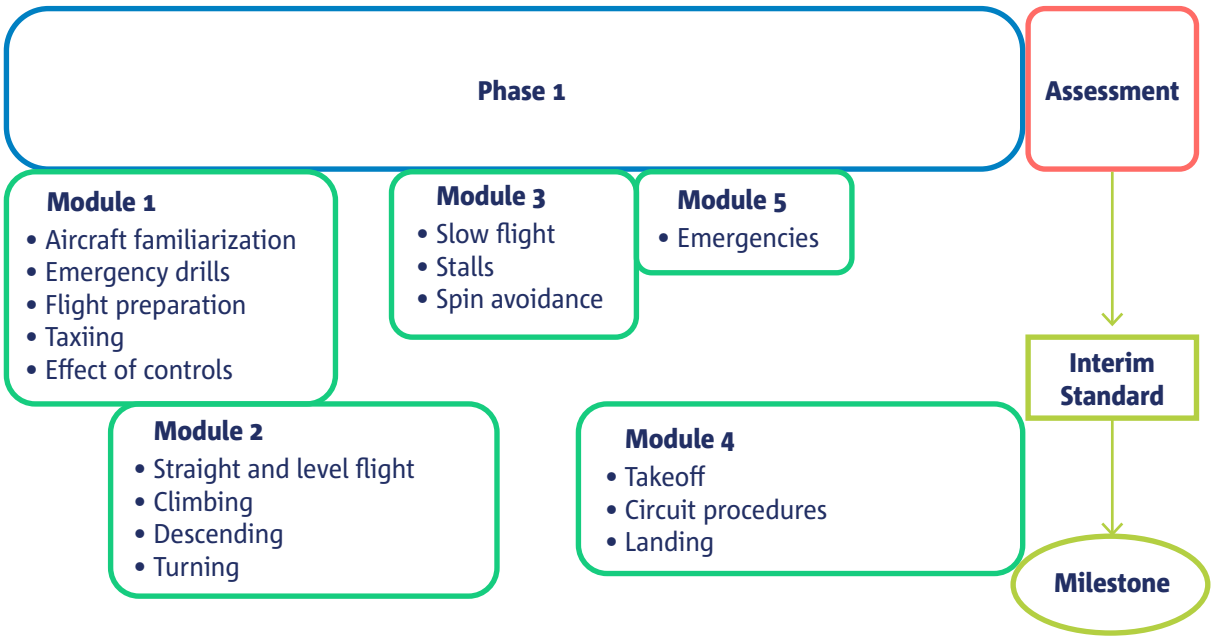


Figure 4: Example of training modules within one phase.

Training tasks can be further split into training subtasks.

For example, focusing on the landing training task, it is possible to identify the following training events:

1) Landing with flaps
2) Flapless landing
3) Crosswind landing
4) Short field landing
5) Soft field landing

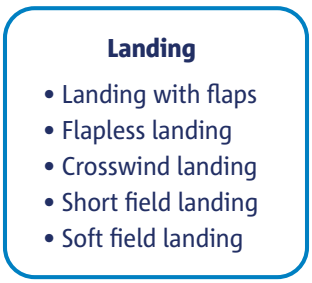


Figure 5: Example of the landing training task with the associated subtasks.

Training tasks and subtasks should be organised in flight lessons in a way that the students can progressively acquire the competency to execute those tasks in a progressive pedagogical training sequence. Furthermore, the operative conditions under which the flight lessons are delivered should be well identified.

For each flight lesson, a set of required knowledge, skills and attitude can be defined. Additionally, TEM elements associated to each flight lesson should be determined.

An example of a flight lesson is provided in *Appendix II*.

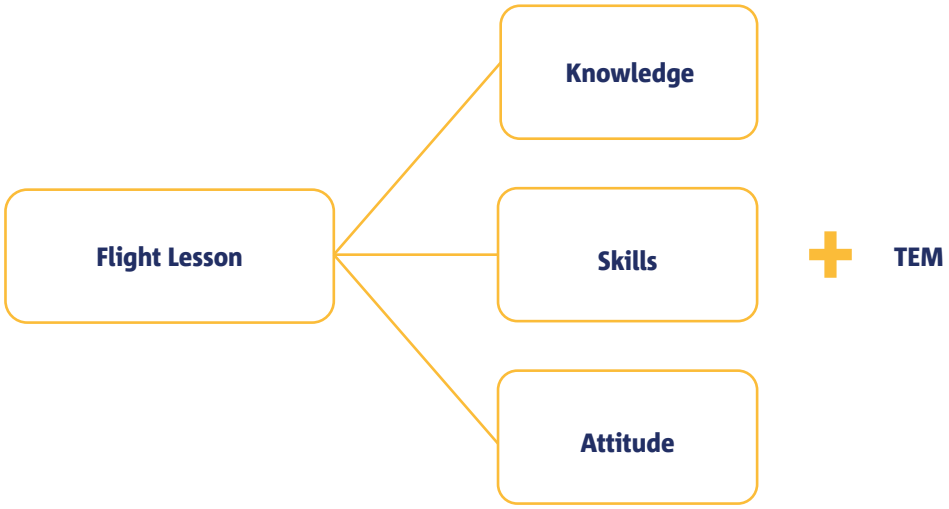


Figure 6: Flight lessons comprise knowledge, skills and attitude and TEM elements to execute tasks and subtasks.

For theoretical knowledge instruction, a clear identification of when and how the applicable theoretical knowledge will be delivered is required. This may happen, for example, during classroom instruction, long briefings or through self-study/familiarisation material. The applicable elements of theoretical knowledge required for a specific lesson should always be reviewed and refreshed during the pre-flight briefing.

In case theoretical knowledge instruction required for a specific training task has been provided a long time before the flight training lesson or has not been provided yet during classroom instruction, it should be delivered in specific long briefings. Further information on long briefings can be found in *Section 6.3*.

The definition of the set of knowledge, skills and attitude required during each flight lesson contributes to the determination of the set of KSA for each module and phase.

Definition of standards and performance indicators

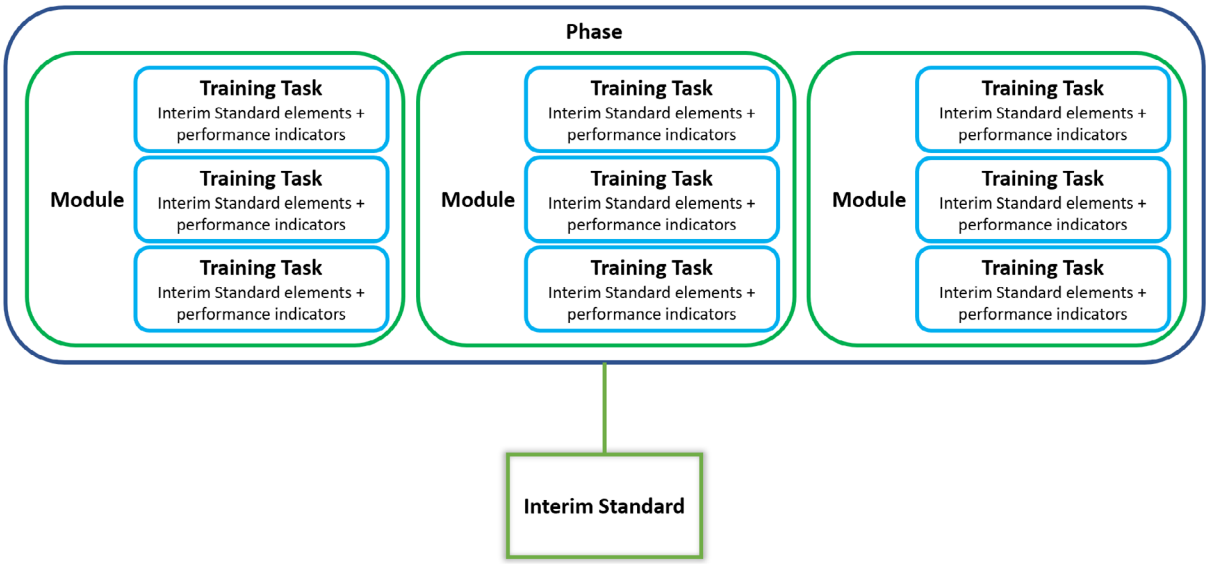
In order to assess whether training objectives are met, specific interim standards should be defined for each training task and measurable associated performance indicators should be clearly formulated.

In *Table 2*, an example of interim standard elements and associated performance indicators for the landing task is provided.

Interim Standard elements	Performance Indicators
Aircraft configuration	• Flap setting • Landing lights on
Energy management	• Airspeed on final approach • Altitude on final approach • Flare at touchdown
Aircraft orientation	• Aircraft CG aligned with the runway centerline • Aircraft heading aligned with the runway orientation at touchdown
RT communication procedures	• Use of standard RT procedures

➨ **Table 2:** Example of interim standard elements and associated performance indicators.

Once interim standard elements are defined for each training task, the interim standards for each module and phase can be determined, as shown in *Figure 7*.



➨ **Figure 7:** Phase interim standard as combination of module and training tasks interim standard and performance indicators.

The training standards, once identified, can be used as a guidance for the definition of training and assessment plans.

The definition of detailed standards and performance indicators allows the gathering of precise information regarding the performance of the students and the areas of improvement.

Furthermore, well-determined training standards with measurable performance indicators allow the CTKI and the CFI to better standardise instructors and the HT to monitor the progress of individual students.

Training standards will differ, based on the stage of the training course, as a higher standard is expected as a student progresses. When defining training standards for a particular stage, this should be taken into consideration. For each particular stage, a positive assessment of the performance of the student, based on the defined indicators, should lead to allowing a student to progress to the next stage of the training course.

Training plan

The purpose of the training plan is to detail the structure of the training course. When designing the training plan, ATOs should consider pedagogical efficiency, progression from simple to complex training tasks and scenarios, as well as the required learning rate to achieve proficiency.

When introducing new exercises, it should be considered that a sufficient number of repetitions should be performed before a student will achieve the expected performance level.

The training plan should include:

- the content and the structure of the training syllabus, including both theoretical knowledge instruction and practical flight training;
- the division into training phases, modules, flight lessons, training tasks, and subtasks and their planned delivery sequence, taking into consideration the analysis of the requirements (*Section 4.2.1)* and the applicable flexibility provisions (*Section 8.2*);
- the training objectives (milestones) associated to the phases and modules, as applicable, and the position of the assessments;
- the course schedule.

Content and structure

This is the description of what is to be trained and how the various training elements relate to each other, with special emphasis on the way the applicable elements of theoretical knowledge instruction and practical flight training are integrated within the course.

Training phases, modules, flight lessons, training tasks and subtasks

Training phases should be clearly stated and their position well defined. The training modules should be determined and the training tasks and subtasks clearly identified and detailed within the relevant flight lessons.

The delivery sequence should be logical and adequately supported by theoretical knowledge instruction.

Position of assessments

The position of the assessments should be clearly identified in the training plan. Assessment should be linked to training milestones.

Course schedule

The course schedule indicates how the training events and assessments fit together into the total duration of the course. This should include any anticipated flexibility provisions resulting from operational and organisational requirements.

Assessment plan

The purpose of the assessment plan is to complement the training plan by defining the number, the position and the scope of the assessments.

The assessment plan should include:

- the number of the assessments;
- the position of the assessments within the training course;
- the type of assessments;
- the interim standards;
- the associated performance indicators;
- the grading system, as applicable.

4.2.3. Development

The training and assessment material is developed during this phase. This should include training notes, presentations, manuals, theoretical and practical exercises and videos for the instructional part, as well as instructions for the assessment and examination and documents for the assessment and evaluation of the performance of students.

The developed material should encompass the principles laid down in *Section 4.2.2* emphasising the integration of theoretical knowledge stemming from the various ATPL(A) subjects.

4.2.4. Implementation

The training course should be conducted in accordance with the training plan. Throughout the course, the progress of the students should be monitored to verify the achievement of interim and final standards. Assessments should be made in accordance with the assessment plan to identify deficiencies and provide remedies in a timely manner, if needed.

4.2.5. Evaluation

The training course should include an appropriate evaluation of the performance of the students, with a process formed by two parts: the assessment and the grading.

Through such evaluations and the feedback received from students, instructors and, where possible, from air operators, ATOs should continuously strive to improve the quality of the course and make the proper adjustments to the relevant elements of the course, as required.

Assessment

Assessments should serve to evaluate the performance of students with respect to the applicable performance indicators and ensure that the interim standards are met.

When making an evaluation, the assessor should integrate objective data with subjective impressions collected during the training session.

Assessments are applicable to both theoretical knowledge instruction and practical flight training and should take place in a live environment where overall performance is evaluated in the execution of a set of tasks related to a training scenario.

Assessment principles

The following principles should be applied during assessments:

- validity;
- reliability;
- repeatability.

Validity

All the performance indicators associated to every training task have been evaluated and there is evidence that the relevant standard has been achieved.

Reliability

All assessors should reach the same conclusions when performing an assessment. To this end, ATOs should define clear and measurable performance criteria.

Repeatability

Multiple observations should be taken when deciding whether an interim standard has been achieved.

Demonstrating performance in one assessment event might not suffice to establish that student performance is continuously meeting the required standards in an effective and lasting way. Consistent performance should be demonstrated.

Types of assessment

Four main types of assessments can be identified:

- Formative assessments
- Summative assessments
- Oral assessments
- Written assessments

Formative assessments

Formative assessments are a range of assessment procedures for identifying strengths and weaknesses and increase to the motivation of students and the training effectiveness. Guidance and feedback from instructors will enable the students to progress towards the required training objectives.

Formative assessments should serve to:

- motivate students;
- identify strengths and weaknesses;
- promote learning.

Examples of formative assessments are Area 100 KSA formative assessments and flight lessons.

Summative assessments

Summative assessments are assessments to be carried out at well-defined points during the training course, typically at the end of a phase or module, that enable assessors to evaluate the performance of a student with respect to established performance indicators and ensure that the objectives associated with a milestone and the required interim standard are achieved.

In case students do not demonstrate a satisfactory performance during a summative assessment, the areas of deficiency should be determined and additional training should be provided.

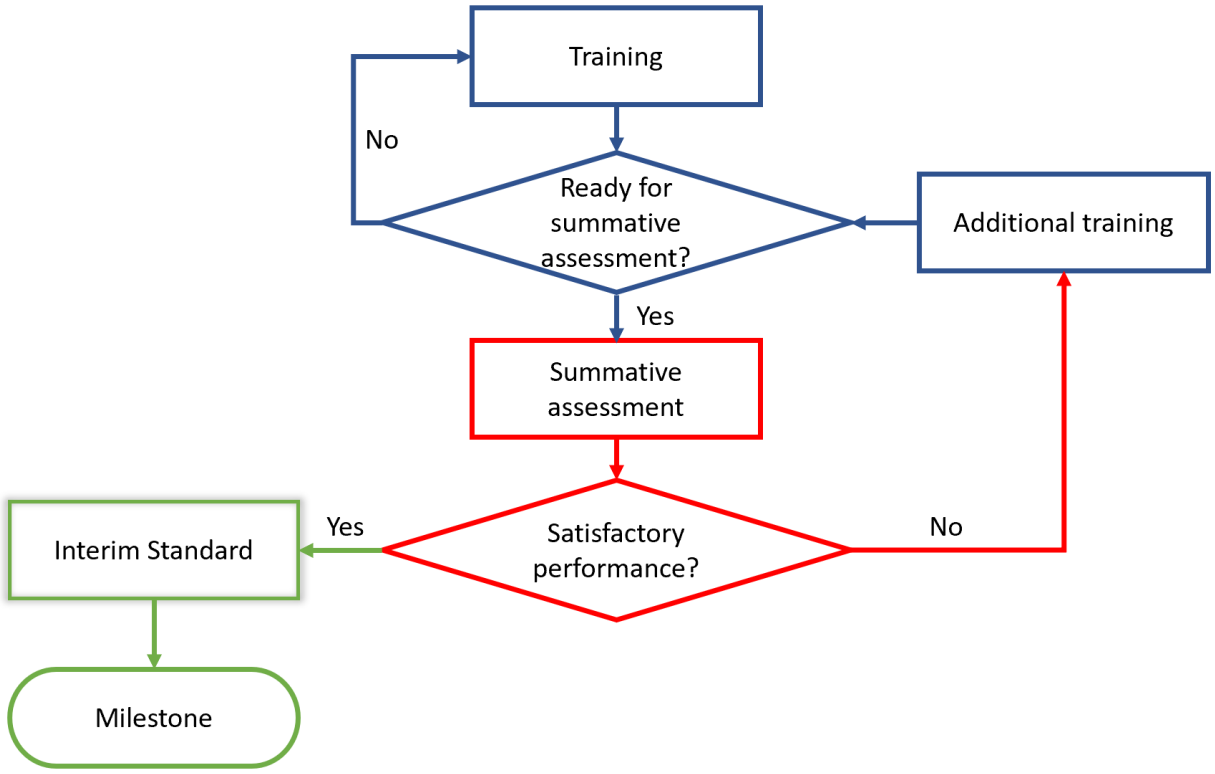


Figure 8: Workflow to determine the achievement of a milestone.

During the assessment, the decision is either "competent" or "not competent" to the defined standard.

Predefined grading criteria should be used to collect standardised data to provide feedback to students and for the evaluation of the effectiveness of the training programme.

In order to ensure unbiased evaluation of students, the assessment should be planned to be conducted by an instructor either not connected with the student's training or who has not been instructing during the previous training sessions.

Examples of summative assessments are Area 100 KSA summative assessments and progress checks during practical flight training.

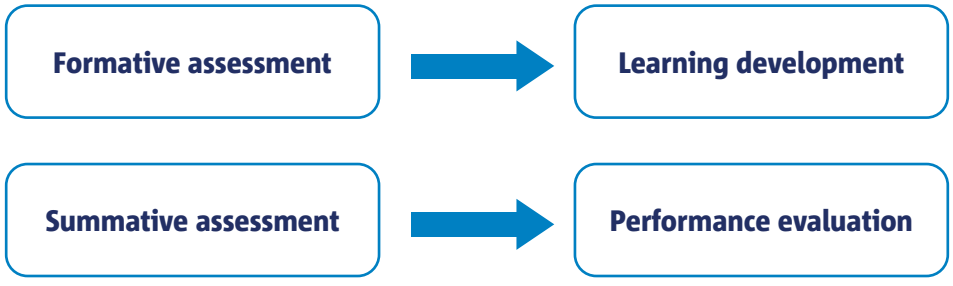


Figure 9: Objectives of formative and summative assessments.

Oral assessments

Oral assessments should be used by assessors with the opportunity to target those areas of performance that could not realistically be observed in the practical environment. These assessments are usually scenario-based situations explained to students which are then asked to describe what actions they would take.

Written assessments

Written assessments are usually used to evaluate theoretical knowledge. They may be completed with the aid of digital equipment and/or online applications. They are usually closely related to the prerequisites of a particular part of the training phase and/or module.

Examples of written assessments include ATPL(A) theoretical knowledge multiple choice tests, aircraft knowledge tests and/or multidisciplinary open question tests.

Theoretical knowledge instruction should include an adequate number of assessments to evaluate the progressive acquisition and understanding of the relevant theoretical knowledge for the relevant stage of the training course and meet the applicable training milestones.

Grading

A way to gather data to evaluate the effectiveness of the training course is to grade theoretical knowledge tests and practical training sessions and checks. If grading is applied, a grading system should be developed with descriptive grading criteria.

Examples of grading criteria can be found in GM2 ORA.ATO.230(a) and GM3 FCL.735.A of Regulation (EU) No 1178/2011.

Data

As output of the grading process, data on the performance of each student is available. This data can be used to:

1) monitor the progression of the students throughout the training course and identify relevant root causes for the individual development of each student by analysing performance trends;
2) improve the quality and the effectiveness of the training course.

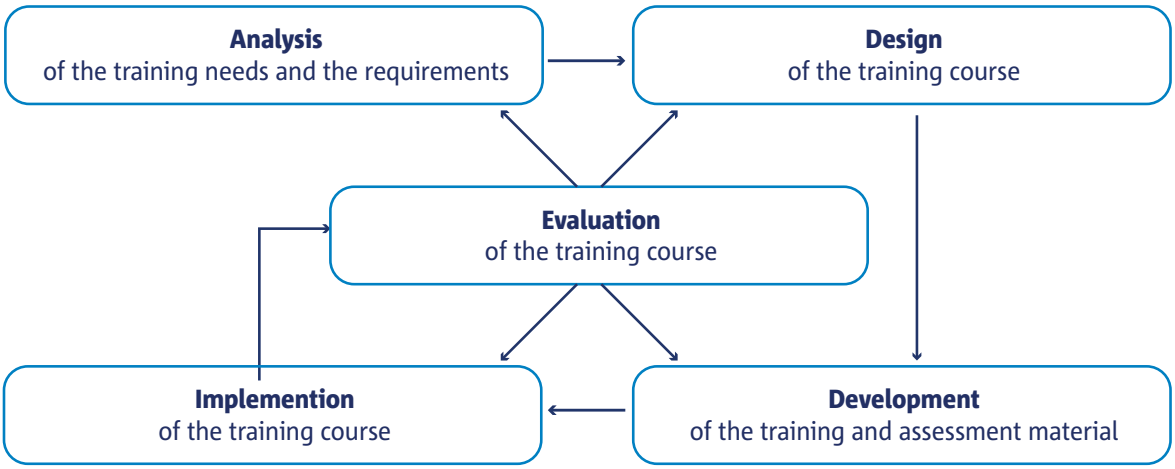


Figure 10: ADDIE model seen from an ATO feedback-centric perspective.

Aggregated data should first be de-identified before being used to support course design improvements.

When collecting data, it is recommended to use digital tools as they represent a simple way to handle, elaborate and analyse information. In this instance, a data management process should be in place and proper training on how to create, elaborate, interpret and use data should be given to instructors.

Human judgement is very important in understanding elaborated data and deciding the best use.

Standardisation

Standardisation is a paramount activity, consisting in an ongoing and repetitive process with the aim of developing, promoting and mandating predefined standard-based processes within a training organisation.

In accordance with point ORA.ATO.210(b) and point ORA.ATO.210(c) of Regulation (EU) No 1178/2011, the CFI and CTKI are responsible, respectively, for the standardisation of flight instruction and flight simulation instruction, and for the standardisation of all theoretical knowledge instruction.

The CFI may delegate standardisation and supervision to flight instructors. In all cases, the CFI and the CTKI are responsible for ensuring quality and standards.

Standardisation should affect both implementation and evaluation workflows. Indeed, common teaching standards and training area of emphasis should be identified, and assessment and grading processes should be as homogeneous and evidence-based as possible.

5. Prerequisites for Training

ATOs should identify and communicate the essential prerequisites for mathematics, physics and English to candidates wishing to start an ATP integrated course, to ensure that they have adequate fundamental knowledge to succeed.

Additionally, they should provide clear indications to potential students regarding the training standards required during the course.

According to AMC1 to Appendix 3(a) to Annex I of Regulation (EU) No 1178/2011, an assessment should be performed before starting the training course to verify the knowledge of mathematics, physics and the English language.

The assessment should be based on the identified prerequisites stemming from the 'Analysis' workflow of ADDIE model (*Section 4.2.1*) and on the minimum level of knowledge that should be held and measured. When the assessment shows a lack of knowledge, remedial courses should be provided before starting the training course.

Knowledge of English language is an essential prerequisite before the start of the training course. Candidates should demonstrate good understanding of information in both written and oral form. Fluent oral communication skills should also be demonstrated.

While it is essential to assess that the candidates can speak fluently beyond the exchange of generalities, due attention should be paid to checking that candidates are able to grasp technical concepts and able to understand complex content of theoretical knowledge instruction.

It should be noted that failure to achieve a solid level of English proficiency may seriously jeopardise the possibilities of a newly qualified commercial pilot to succeed in selections with air operators.

Knowledge of the principles of mathematics and physics should be at the level required for succeeding in the training course. ATOs should identify the essential requirements by evaluating each subject for formulas and laws needed to solve the given tasks.

Mathematics are included in most subjects, such as:

- 031 Mass and Balance;
- 032 Performance;
- 033 Flight Planning and Monitoring;
- 050 Meteorology;
- 061 General Navigation;
- 062 Radio Navigation;
- 081 Principle of Flight.

Knowledge of physics is needed for:

- 021 Airframe, Systems and Powerplant;
- 022 Instrumentation;
- 032 Performance;
- 040 Human Performance and Limitations;
- 050 Meteorology;
- 081 Principle of Flight.

The assessment should be conducted by checking the general ability of the student to perform calculations according to the rule of three, rearranging of equations, fractional calculations, angular functions and trigonometry. Furthermore, the assessment should prove the knowledge of physical laws in the area of mechanics, thermodynamics and electricity. Indicatively, the assessment should have a duration of at least 45 minutes, allowing a minimum of 30 minutes for testing on mathematics and 15 minutes for testing on physics. The test should be in written form, not allowing the use of supporting documents.

In case of lack of knowledge in some areas, an ATO may decide to admit the student into the course. However, it is highly recommended that the ATO organises an ad-hoc pre-entry course focused on the weaknesses shown by the candidate during the screening and that those weaknesses are resolved before the start of theoretical knowledge instruction.

Although not required by the Regulation, a psychological assessment and a psychomotor test are recommended as they provide good indications of candidates' ability to perform and succeed throughout the training course. Feedback of the screening process should be transparently shared with the candidate who should be informed of the outcome. Strengths, weaknesses and areas of improvement should be highlighted.

Professional psychologists, preferably with aviation testing experience, should take the assessment.

Furthermore, it should be noted that it is in the interest of candidates to understand their potential to succeed in a demanding training course before committing to it as they will also need to pass similar assessments while applying to job positions for commercial air transport operators, as required by point CAT.GEN.MPA.175 of Regulation (EU) No 965/2012.

6. Theoretical Knowledge Instruction

6.1. Introduction

The purpose of theoretical knowledge instruction is to educate students with little aeronautical knowledge to the level of knowledge required to become competent commercial pilots who are able to apply the relevant knowledge to the different scenarios they may encounter in their professional flying career.

Theoretical knowledge instruction has to cover all the applicable learning objectives laid down in AMC1 FCL.310, FCL.515(b), FCL.615(b), and FCL.835(d) of Regulation (EU) No 1178/2011, including those of Area 100 KSA.

Theoretical knowledge instruction can be delivered in different ways, mainly through classroom instruction and long briefings.

At the commencement of the theoretical knowledge training, all the subjects should be taught at a basic theoretical knowledge level. This basic level should be delivered in no less than 100 hours of instruction time, during a period of no less than four weeks duration. Once this basic theoretical knowledge instruction has been completed, the students should have to pass basic subject tests, produced and managed by the ATO, before commencing any further, more advanced ATPL(A)-level theoretical knowledge instruction training.

6.2. Classroom instruction

Classroom instruction should be interactive and encourage the active participation of students to develop their aviation-related theoretical knowledge. Where possible, classroom instruction should include practical examples and scenario-based exercises to highlight aviation relevance and aid student pilot competence development.

Classroom instruction should be integrated with practical flight training to the largest possible extent. In this way, students have the possibility to retain and consolidate the theoretical knowledge concepts they learnt in classroom through practical application.

Classroom instruction should include active learning, which has been shown to increase engagement, encourage the processing of ideas, drive deeper understanding, increase retention, improve critical thinking, develop problem solving and build confidence.

In-person classroom instruction is highly recommended, as the interaction between instructors and students enables deeper learning, reduces misunderstanding and enables the TKI to develop the students' pilot competencies.

Following the Covid pandemic, virtual classroom instruction has become an acceptable way of delivering theoretical knowledge instruction. However, it should be noted that reduced non-verbal communication between instructors and students limits the interactions that normally happen in a live in-person environment. For example, it is unlikely to be suitable as a tool in lessons with practical exercises and calculation questions, when the instructor needs to observe the students' workings and to work with an individual student whilst managing the class. Similarly, the virtual classroom is generally unsuitable for Area 100 KSA assessment, due to the limited ability to remotely observe and thereby assess observable behaviours/performance indicators.

For this reason, ATOs should therefore carefully consider the appropriateness of virtual classroom in relation to the theoretical knowledge topics to be taught or assessed and use it as a tool to complement in-person classroom instruction.

Further guidelines on virtual classroom instruction can be found in EASA's 'Guidance for allowing virtual classroom instruction'.

6.3. Long Briefings

Long briefings are operational briefings strongly recommended to improve the integration between theoretical knowledge and practical instruction while ensuring that the applicable knowledge is present at the right time during flight training and that students know when and how to apply this knowledge.

The purpose of these briefings is threefold:

- introduce or refresh the applicable theoretical knowledge with a practical focus, filling the gaps not covered or yet to be covered by ATPL theoretical knowledge;
- ensure that the students have the skills needed to apply the theoretical knowledge to flight training scenarios;
- develop the students' attitude towards threat and error management and emphasise the importance of theoretical knowledge in detecting, assessing and managing threats and errors.

To successfully fulfil these purposes, it is of the utmost importance that the students are shown or facilitated to discover the links between theoretical knowledge and threats and errors they might encounter during the specific phase of flight they are currently in or embarking upon. This also includes the discussion on how to manage these situations to further instil in the student an awareness of the importance of the proper application of decision-making and threat and error management.

ATOs should emphasise in this context applicable meteorological hazards, aircraft performance and the characteristics of the training environment.

ATOs should adapt the topics of each long briefing that are detailed in these guidelines, considering operational needs, the training environment and training devices.

The long briefings should be scheduled when the students reach the prescribed experience level indicated in the explanation of each briefing. At the ATOs' discretion, the long briefings may be delivered to groups or individual students.

Long briefings are not a substitute for the pre-flight briefings provided by the qualified flight instructor before every single flight. The pre-flight briefings are related to the specific exercises, student progress, the actual and operative conditions, the characteristics and the performance of the aircraft used.

The duration of the long briefings is decided by ATOs considering the aforementioned elements and taking into account the structure of the theoretical knowledge instruction programme.

To ensure the relevance to the flight training phase, it is important that these briefings be conducted by suitably qualified personnel. The instructor should have sufficient experience with flight instruction and the flight conditions, threat and errors that are relevant to the briefing and the associated real-life flight training scenarios.

The number of long briefings may vary depending on the structure of the training course. For example, considering Phase 1 of the training course, long briefings may be provided for the following topics:

- aircraft-specific characteristics, operation and performance;
- effect of controls;
- traffic circuit;
- emergencies.

An example of a traffic circuit long briefing lesson plan can be found in *Appendix III*.

A list of examples of recommended theoretical knowledge topics to be considered during long briefings, divided by relevant training stages, is presented for each relevant ATPL theoretical knowledge subject in *Appendix IV*.

The training stages considered are:

- Solo flight training
- Navigation flight training
- Basic instrument training
- Procedural instrument training

6.4. Assessments, tests and examinations

Throughout the theoretical knowledge instruction, progress assessments should be implemented to ensure that any problems with the acquisition and/or retention of knowledge are identified and can be resolved in a timely manner prior to continuing to build on this knowledge. Incorporating an adequate number of progress tests for every subject depending on the complexity of each subject, allows the instructors to assess the students' understanding of new topics and ability to make adequate links among them, as well as provides them with an indication of topics that require additional attention for individual students, whole classes and the training programme in general.

Providing the students with tests that are unique and confidential will result in the most effective manner of testing knowledge. Using oral assessments and/or open questions in some stages of the progress assessment will further enhance the ability to distinguish between a student's ability to apply knowledge to the question asked, and the ability to recognise an answer as being correct. When remedial training is needed, any related progress testing should also provide the students with unique assessments of their newly gained knowledge to ensure the remedial training is successful.

The questions used for assessing the level of knowledge should be analysed and reviewed on a regular basis. Additionally, anonymised results of tests can be used for feedback to detect any training deficiencies inherit in the training programme.

Prior to recommending a student to attempt an examination paper, the ATO should ensure the student has a sufficient level of consolidated knowledge and is ready to attempt the examination paper. An in-house school examination, based on the TKE requirements in point ARA.FCL.300 of Regulation (EU) No 1178/2011, may be used to this end. When using unique questions in the style of the theoretical knowledge examination, students can be tested both on their ability to successfully handle the examination environment, as well as enabling an overall assessment of the student's level of knowledge.

Theoretical knowledge examination papers should be taken as soon as practicable, after a student has been assessed as having completed the appropriate elements of the theoretical knowledge course to a satisfactory standard. However, it is also important to allow the student sufficient time to prepare for the examination papers. If, for practical reasons, theoretical knowledge examinations cannot be taken shortly after the student has been assessed to be at a satisfactory standard, additional assessments/tests should be considered prior to letting a student take the examination papers.

Beyond the requirement for procedures to monitor for unsatisfactory progress, procedures should be in place to ensure that any student requiring a retest, or retake of an examination, receives refresher training, as appropriate to the student's needs.

7. Area 100 KSA

7.1. Introduction

Area 100 KSA was introduced into the professional licence theoretical syllabus in response to the airlines' view that the student's pilot competencies, threat and error management, resilience and mental maths skills should be developed alongside and within theoretical knowledge subjects through the development and assessment of the attitude and skills required to apply this knowledge in cooperative and controlled scenarios.

Area 100 KSA is based on the ICAO Core Competencies that do not require the direct control of an aircraft, namely:

- Communication
- Leadership and teamwork
- Problem-solving and decision-making
- Situation awareness
- Workload management
- Application of knowledge

Additionally, students are required to demonstrate threat and error management across subjects, resilience, and a good knowledge of aviation related mental maths.

7.2. Importance and benefits of Area 100 KSA

The importance of a proper understanding of the need to implement Area 100 KSA and of its benefits is of paramount importance for ATOs.

Three main needs can be identified:

- allow students to apply the theoretical knowledge learnt during classroom lessons to effectively use threat and error management principles and make informed decisions;
- develop strong competencies with resilience to safely and efficiently manage both predictable and unpredictable situations;
- improve the students' understanding of what is being learnt during theoretical knowledge instruction and why.

A good application of Area 100 KSA results in students benefiting from:

- improved soft skills;
- improved attitude;
- improved motivation;
- better personal growth;
- improved problem solving abilities;
- greater big picture thinking;
- reinforced memory;
- strengthened mental maths calculation abilities.

7.3. Requirements for Area 100 KSA

In accordance with AMC3 ORA.ATO.230(a) of Regulation (EU) No 1178/2011, Area 100 KSA should comprise at least two summative assessments and one formative assessment covering the learning objectives of Subject Area 100 – Knowledge, Skills and Attitudes. Furthermore, written or oral mental maths tests should be organised with aviation related scenario-based mathematical problems. Further information can be found in AMC4 ORA.ATO.230(a) and subsequent GMs of Regulation (EU) No 1178/2011.

7.4. Learning process

The learning process is to be defined by considering inputs, defining development steps and assessing the outputs of the system.

7.4.1 Inputs of the learning process

To implement Area 100 KSA, ATOs should take into consideration the following input elements:

- the students' aptitudes as result of the selection process;
- the organisation of the training course with regard to the integration of theoretical instruction and practical flight training;
- the training tools used to deliver theoretical knowledge instruction;
- the training locations;
- the number of students;
- the required and the available resources.

A thorough analysis of these elements should be conducted with the aim of defining:

- the starting level of training to build competencies;
- the final level of training which depends on the level of knowledge, skills and attitude that trainees are expected to have at the end of their final summative assessment.

By determining the starting and the final levels, the learning process to build pilot competencies can be defined. The process should be spread across the entire theoretical knowledge instruction course and be progressive.

7.4.2 Steps to define the learning process

In defining the learning process, ATOs are recommended to follow some sequential steps.

1) Define which competencies are to be built at each stage of the training course and the expected level students should achieve.
2) Define how to develop competencies throughout the training course.

   This activity requires an adequate identification of the most suitable training tools for the scope of the planned activities. A non-exhaustive list of tools includes assignments, group exercises, written assessments, presentations and visits to aeronautical stakeholders.
3) Define how to observe the acquisition of competencies by defining the proper performance indicators for formative and summative assessments.
4) Define how to assess the competencies against the performance indicators for formative and summative assessments.

The observation and the assessment of competencies requires:

- a good and robust standardisation process of instructors and assessors;
- the preparation of an assessment plan that includes all the tasks that trainees are expected to execute during a specific assessment, their sequence, and the relation of the task sequence with the competencies to be observed;
- the analysis of the relevant threat and error management principles in the assessment of competencies.

Assessments should be designed so that they reflect the level of progress within the training course. The assessments may be different depending on the stage of the training course during which the assessment is conducted.

At the end of the final summative assessment, the student should have demonstrated a satisfactory level in all the required competencies.

7.4.3 Outputs of the learning process

At the end of process, ATOs should have robust and standardised data on the students' performance and experience during the course.

This set of data can be used for the purposes illustrated in *Section 4.2.5*.

7.5 Summative assessments

The content of a summative assessment is herewith illustrated and a practical example of a summative assessment is provided.

7.5.1 Content of a summative assessment

It is recommended that a summative assessment includes, as minimum, the following elements:

- the objective;
- the description of the assessment;
- the assessment of the observable competencies;
- the grading method;
- the feedback provided.

Objective	Summative assessments should collectively give students the opportunity to demonstrate competence in all the LOs in 100 02 and 100 03 of Area 100 KSA, as defined in AMC1 FCL.310; FCL.515(b); FCL.615(b); FCL.835(d). A clear statement of the competencies to be evaluated during a summative assessment is expected. An indication of the total length of the assessment is suggested.
Description of the assessment	The content and the elements of the assessment have to be described. The competencies to be demonstrated are combination of knowledge, skills and attitude and not necessarily to be related to the direct operation of an aircraft. Different tools and aviation related scenario-based cases should be used.

Assessment of observable competencies	The assessment should be objective, transparent and scenario-based. The way competencies are assessed during the execution of the summative assessment should be clearly indicated to achieve an effective evaluation and to pinpoint potential performance indicators. To this aim, it is suggested to follow the guidance provided in GM2 ORA.ATO.230(a). Assessors evaluating ICAO core competencies should be proficient in: • Learning styles • Teaching methods • Facilitation techniques • Threat and error management (TEM) • The applicable competencies • Content of the subjects • Exercises to be delivered Assessors should create an environment to trigger certain reflections and reactions from students in order to evaluate and provide feedback based on the competencies to be assessed.
Grading	Grading should be developed using table 2 of GM2.ORA.ATO.230(a) or equivalent in order to achieve effective means of measurement. If performance indicators not included in table 2 are to be used, such indicators have to be defined in an approved training manual. Grading should only be conducted by assessors standardised to achieve inter-rater reliability and according to the specific ATO grading system.
Feedback	A debriefing with the students should be provided as shortly after the assessment as possible, to ensure that each student receives proper feedback on his or her performance and areas of improvement. During the debriefing, the assessor should act as a facilitator and let the students initially provide their own feedback. The feedback from the assessor should emphasise areas of and opportunities for improvement, preferably with actionable suggestions on how to improve, as well as areas of excellence. Feedback should, whenever possible, be aimed to motivate the students to improve and enlighten the students with where to improve, rather than informing a student of what they are not doing right. Observed examples may, of course, be useful in illustrating the areas of improvement, but should come with suggestions for improvement. Providing feedback should be standardised, as any part of the assessment. For the summative assessment the feedback should also be recorded and added to the student's training records. With regard to standardisation for feedback, it is important for the CTKI to instil in the assessors the aim of the subject and the aim of each individual assessment to ensure that feedback, areas of emphasis and the expected level of students, all align with the aim of the particular assessment and the training organisation as a whole. For each assessment the areas to be covered in the assessment and subsequent feedback, should be defined. Feedback of students may prove to be very useful in evaluating and improving the assessments, the subject and the training course, but should always be de-identified before being used.

7.5.2 Practical example of a summative assessment

Objective

This summative assessment consists of a scenario-based exercise to be performed in teamwork simulating real-world aviation-based situations. The exercise permits to evaluate the following students' competencies:

- Application of knowledge
- Leadership and teamwork
- Workload management
- Communications
- Problem-solving and decision-making
- Situation awareness

Additionally, UPRT elements and resilience are evaluated.

The assessment lasts about 1 hour.

Description of the assessment

In this example, a working group composed of two students represents the flight crew of a commercial aircraft. The composition of the group is defined by the ATO and, in case the number of students and assessors permits, two working groups can be assessed at the same time.

During the assessment one student simulates the role of pilot flying (PF) and the other one the role of pilot monitoring (PM). Roles are switched during the exercise.

The exercise includes one main activity to be done in teamwork (e.g. building with bricks, solving a puzzle), with the addition of the following activities to be carried out in parallel to the main one once an input from the assessor is received.

1) ATC standard communications addressed to the crew

   The assessor acts as ATCO simulating a real operative environment and instructs the crew requesting to perform a sequence of actions.

   The PM replies to the relevant communications. The PF has autopilot mode cards with selectable values representing simplified autopilot functions and manages the aircraft autopilot by choosing the correct mode cards and values to comply with the required ATC instructions.

2) Autopilot management

   The PF passes the mode card confirming the action to perform. The PM checks the PF input correcting him or her if necessary.

3) UPRT situations using pictures representing the PFD

   The PF recognises the situation declaring the recovery actions to perform. The PM checks the PF decisions correcting him or her if necessary.

4) Unusual or emergency situations

   The assessors present to the flight crew real-world situations using relevant pictures of flight displays. After an evaluation of relevant information, the students consider the available options and make a shared decision. The actions are communicated by the PM to the ATCO and performed by the PF who selects the correct autopilot mode cards and values.

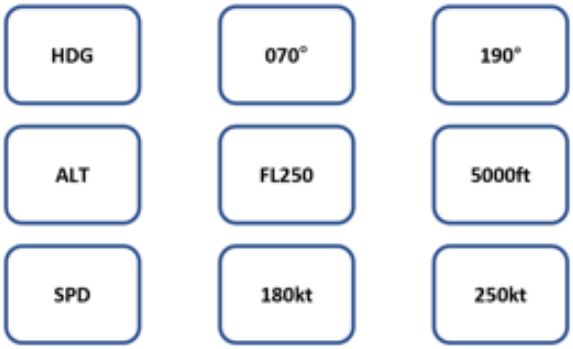


Figure 11: Example of autopilot mode cards and selectable values.

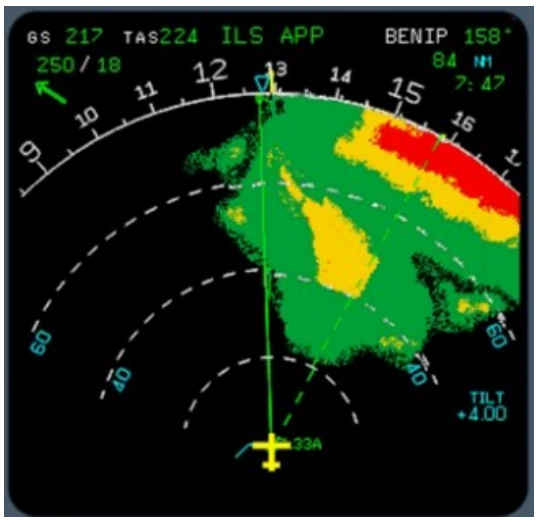


Figure 12: Example of a picture showing a thunderstorm on a flight display.

Assessment of observable competencies

Hereafter, an explanation of how competencies are identified for the assessment is provided.

"Application of knowledge" competency is assessed considering the relevant theoretical knowledge requested using the autopilot, and in the recognition and management of upsets and abnormal/emergency situations.

"Leadership and teamwork" competency is assessed considering the level of cooperation in the practical activities, in error management, and in applying a shared decision-making.

"Workload management" competency is assessed considering how the flight crew has managed and divided the work during the different activities proposed in the exercise.

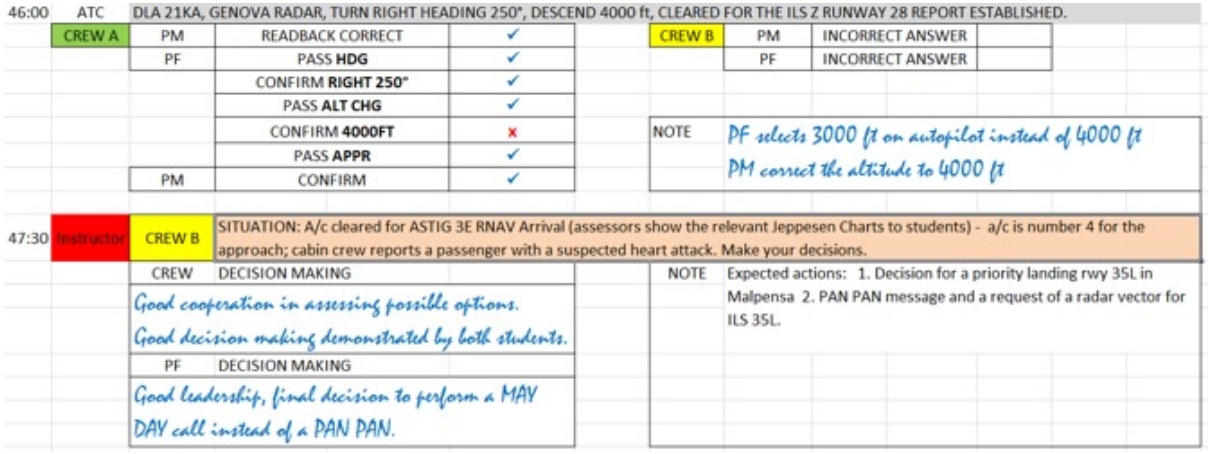
"Communications" competency is assessed considering the use of standard radiotelephony techniques and procedures, the exchange of information and the level of communication shown by the flight crew.

"Problem-solving and decision-making" competency is assessed considering the students' process of acquiring the information, assessing the situation, rating the possible options available, making decisions during abnormal and emergency situations.

"Situation awareness" competency is assessed considering the students' knowledge of task-related events and phenomena. In particular, the students need to demonstrate to have the mental picture of the existing interrelationship between position, flight conditions, configuration and energy state of aircraft as well as any other factors that could affect safety such as proximate terrain, obstructions, airspace characteristics and weather systems throughout the exercise.

"UPRT and resilience" are assessed considering the application of the correct sequence of recovery actions in the proposed upsets and the capacity to withstand and to recover from unexpected emergency situations.

An example of the exercise script is reported below. The script is used by the assessors and it provides detailed information regarding the conduct of the exercise and expected actions. During the assessment, the students' actions are reported on the script. In this way, the assessors can take notes about the students' decisions and performance according to the specifically proposed situation.



46:00	ATC	DLA 21KA, GENOVA RADAR, TURN RIGHT HEADING 250°, DESCEND 4000 ft, CLEARED FOR THE ILS Z RUNWAY 28 REPORT ESTABLISHED.						
	CREW A	PM	READBACK CORRECT	✓		CREW B	PM	INCORRECT ANSWER
		PF	PASS **HDG**	✓			PF	INCORRECT ANSWER
			CONFIRM **RIGHT 250°**	✓				
			PASS **ALT CHG**	✓				
			CONFIRM **4000FT**	x		NOTE	PF selects 3000 ft on autopilot instead of 4000 ft PM correct the altitude to 4000 ft	
			PASS **APPR**	✓				
		PM	CONFIRM	✓				
47:30	Instructor	CREW B	SITUATION: A/c cleared for ASTIG 3E RNAV Arrival (assessors show the relevant Jeppesen Charts to students) - a/c is number 4 for the approach; cabin crew reports a passenger with a suspected heart attack. Make your decisions.					
		CREW	DECISION MAKING			NOTE	Expected actions: 1. Decision for a priority landing rwy 35L in Malpensa 2. PAN PAN message and a request of a radar vector for ILS 35L.	
			Good cooperation in assessing possible options. Good decision making demonstrated by both students.					
		PF	DECISION MAKING					
			Good leadership, final decision to perform a MAY DAY call instead of a PAN PAN.					

Figure 13: Abstract of an assessment script.

The use of the script during the exercise permits to register all the relevant situations that happened, enhancing the precision of the evaluation of the related performance indicators. It also helps the assessors to explain to the students the reasons of the specific grading in the de-briefing phase.

Grading

Following the exercise, without the presence of any students, the assessors discuss students' performance deciding the overall grading on the competencies established for the assessment. Area 100 KSA assessors fill in the related assessment report.

Word pictures are constructed by assessors according to Venn methodology considering the behavioural indicator associated for each competency. Examples of word pictures can be found in GM2 ORA.ATO.230(a) of Regulation (EU) No 1178/2011.

To achieve a 'Satisfactory' grade a student must:

- have an overall positive effect on the outcome or completion of the exercise without any external input from the assessors, or where the assessment requires the assessor to facilitate the exercise, without the assessor providing any knowledge or corrective input to assist in the completion of the exercise;
- show a satisfactory performance in relation to the expected competencies' levels for the relevant stage of training.

Feedback

After the grading discussion, the assessors proceed to debrief the students.

The debriefing should commence with a statement of the outcome, so that the students know immediately whether the assessment has been completed successfully, or if additional training is required. The assessors should state the reason for additional training required.

The debriefing comprises a fair and unbiased review based on observed actions and facts. It consists of a facilitated discussion during which the student is encouraged to provide feedback on his or her performance. The assessors provide complementary feedback to the students to encourage changes needed and to improve the individual student performance through specific recommendations.

8. Practical Flight Training

8.1. Introduction

Practical flight training should be aimed at developing the competencies that a student is required to have to become a professional pilot. The training course shall comply with the requirements of Appendix 3, Section A to Annex I of Regulation (EU) No 1178/2011.

According to AMC1 to Appendix 3, paragraph (d), the flying instruction is divided into six phases:

- Phase 1 - Exercises up to the first solo flight
- Phase 2 - Exercises up to the first solo cross-country flight
- Phase 3 - Exercises up to the VFR navigation progress test
- Phase 4 - Exercises up to the instrument rating skill test
- Phase 5 - Advanced UPRT
- Phase 6 – Multi Crew Cooperation training course

8.2. Flexibility

The phases of flight training should not be regarded as fixed, stand-alone blocks which have to be carried out in a predetermined sequence. Instead, ATOs are encouraged to design the training course in a logical and progressive manner to develop the set of knowledge, skills, attitude and competencies that students are required to have at the end of the training course.

To this aim, the following provisions are recommended when referring to flexibility considerations for some training elements.

8.2.1. Phase 1 and Phase 2

Phase 1 and Phase 2 should be in sequential order.

The practical part of the training course should always begin with Phase 1, which should be successfully completed in its entirety before a student is able to progress to Phase 2.

8.2.2. Phase 3 and Phase 4

Night VFR

Night VFR training as part of Phase 3 and Phase 4 may be performed during Phase 2, provided that:

- the Basic Instrument Flight part of training has been successfully completed;
- the student has sufficient navigation autonomy;
- no new training exercises are introduced.

When designing the training course, ATOs are recommended to minimise the time between dual instruction at night and the night solo flight.

Instrument Training

The training elements of Phase 4 may be delivered towards the end of Phase 2 (Basic Instrument Flight part) and in parallel with Phase 3 (Basic Instrument Flight part and Procedural Instrument Flight part), provided that students have already received adequate theoretical knowledge instruction on the elements trained during the instrument rating part of the course.

Furthermore, performing Phase 4 elements, especially those related to Basic Instrument Flight part, in earlier stages of training, and integrating them to complement Phase 2 and Phase 3 elements, is beneficial for a more complete development of the knowledge and skills that students need to achieve.

Multi-engine training

Depending on the design of the training course, multi-engine aircraft training should take place during Phase 3 and/or Phase 4.

8.2.3. Phase 5

Advanced UPRT may be delivered from the end of Phase 2 onwards, provided that:

- the students have an adequate understanding of advanced flight manoeuvres and human performance and limitations experienced in such manoeuvres;
- basic UPRT exercises in accordance with AMC2 to Appendix 3; AMC1 to Appendix 5 have been successfully completed, with the relevant exercises demonstrated in both VMC (Phase 2) and simulated IMC conditions (Basic Instrument Flight part).

However, it is recommended that advanced UPRT training is delivered when the capability to proficiently perform basic UPRT manoeuvres at the desired standards has been demonstrated by the student and consolidated by training repetitions.

8.2.4. Phase 6

The Multi Crew Cooperation training course is to be regarded as the bridge between single-pilot and multi-pilot operations and should be delivered at the end of the entire training course when all the in-aircraft training has been completed.

8.3. Assessments, skill tests and licensing

All the training flights should be assessed by the flight instructor who has been flying with the student. The instructor should also help the student to facilitate his or her own assessment of their solo flights. Feedback on the performance of the student should always be provided, emphasising the areas of improvement. The progress of students should be continuously monitored and, in case some deficiencies are noted, a suitable personal plan should be organised to address the deficiencies found.

Successful completion of a training phase should be assessed by an adequately qualified flight instructor.

To complete the training course, students are required to successfully pass a CPL(A) and a ME/IR(A) skill test. The skill tests should be carried out when all the training phases, with the exception of Phase 6, have been completed.

Upon discretion of each national competent authority, the two skill tests may be combined, provided that all the mandatory items of Appendix 4 and Appendix 7 to Annex I of Regulation (EU) No 1178/2011 are complied with. The total time of the combined skill tests should never be less than 2 hours and 30 minutes.

After the completion of the entire training course (Phase 6 included), upon evidence that all the regulatory requirements have been met, the national competent authority should issue the licence with the appropriate ratings.

Appendix I

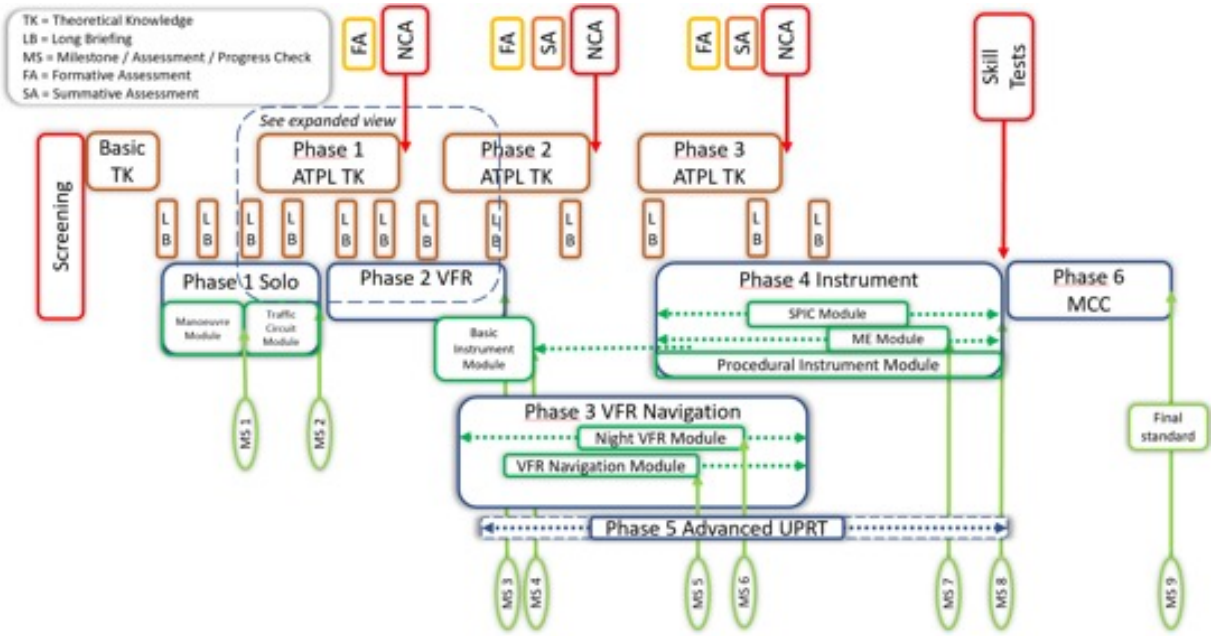


Figure 14: Example of an ATP(A) integrated course structure.

Figure 15: Expanded view: example of integration with training blocks.

Figure 16: Expanded view: example of continuous integration.

Appendix II

Traffic circuit flight lesson

Planned block time	1:00 hr:min
Allowed training aid	DA40
Flight rules	VFR
Mandatory student preparation	OM-B Traffic circuit profile

Objectives

*(**K**)nowledge* - Student pilot knows applicable speeds, key-points and parameters for stabilised concept.

*(**S**)kills* - With room for improvement and in normal wind conditions, student pilot should be able to perform safe take-off and landings at the controls without instructor assisting with control inputs.

*(**A**)ttitude* - Student pilot shows understanding of situational awareness and workload management.

Briefing items

Previous air exercises
Objectives
Air exercises as below (incl short reference to principles of flight)
Common errors
Airworthiness & flight planning
TEM

- Increased risk of pilot error due to high workload
- Traffic density close to airport/traffic circuit
- Unstable approach

In-flight

Take-off and climb to downwind position:

- Pre-take off checks
- Into wind take-off
- Safeguarding the nose wheel
- Drills during and after take-off
- Noise abatement procedures

Circuit, approach and landing:

- Circuit procedures, downwind and base leg
- Powered approach and landing
- Stabilised approach concept
- Effect of wind on approach and touchdown speeds and use of flaps

- Safeguarding the nose wheel
- Go-around
- Noise abatement procedures

Emergencies / non-normals:

- Abandoned take-off
- Mislanding and go-around
- Unstabilised approach

De-briefing

Self assessment

Lesson objectives
Strengths and areas of improvement
Next air exercise

Appendix III

Traffic circuit long briefing

Time allocated	3:00 hr:min
Teaching materials & training aids	Classroom, internal presentation material, OM-B Traffic circuit profile
Progress testing	Not applicable
Interconnection	010 05 Rules of the air Annex 2 and Part SERA 010 09 Aerodromes 040 03 Basic aviation psychology 081 01 Subsonic aerodynamics Local Airport Regulations, AR Flight lesson ATP(A)106-108
Mandatory student preparation	OM-B Traffic circuit profile

Lesson content

Take-off and climb to downwind position:

- Pre-take off checks
- Into wind take-off
- Safeguarding the nose wheel
- Crosswind take-off
- Drills during and after take-off
- Short take-off and soft field procedure/technique including performance calculations
- Noise abatement procedures

Circuit, approach and landing:

- Circuit procedures, downwind and base leg
- Powered approach and landing
- Stabilised approach concept
- Safeguarding the nose wheel
- Effect of wind on approach and touchdown speeds and use of flaps
- Crosswind approach and landing
- Glide approach and landing
- Short landing and soft field procedures/techniques
- Flapless approach and landing
- Go-around
- Noise abatement procedures

Emergencies:

- Abandoned take-off
- Engine failure after take-off
- Mislanding and go-around

TEM topics

- High workload leading to increased stress
- Lookout in the traffic circuit - VFR principles

Appendix IV

Solo flight training

Subject	Topics
010 - AIR LAW	• Applicable Rules of the Air, including applicable national Regulation; • Part-NCO (Documents required for flying) • Air Traffic Services as applicable (Airspace, ATC, FIS, Alerting Service); • ATC clearence; • Communication failure as applicable; Aeronautical Information Services (AIP, NOTAM, AIC); • Visual aids for navigation as applicable.
021 - AIRCRAFT GENERAL KNOWLEDGE – AIRFRAME, SYSTEMS AND POWER PLANT	• Technical knowledge for the first solo, as applicable.
022 - AIRCRAFT GENERAL KNOWLEDGE – INSTRUMENTATION	• Pitot static system and related instruments.
031 - FLIGHT PERFORMANCE AND PLANNING – MASS AND BALANCE	• Mass and balance calculations.
032 - FLIGHT PERFORMANCE AND PLANNING – PERFORMANCE – AEROPLANES	• Variables influencing performance.
033 - FLIGHT PERFORMANCE AND PLANNING – FLIGHT PLANNING AND MONITORING	• Fuel/energy planning and monitoring.
040 - HUMAN PERFORMANCE AND LIMITATIONS	• Threat and error management as applicable; • Physiological and psychological aspects related to local flight.
050 - METEOROLOGY	• Local weather and weather-related threats and hazards, including the ability to assess current and developing weather phenomena based on briefing information and in-flight observation.
061 - NAVIGATION – GENERAL NAVIGATION	-
062 - NAVIGATION – RADIO NAVIGATION	• Transponder operation (modes and codes) as applicable.
070 - OPERATIONAL PROCEDURES	• Operational procedures applicable to the flight and associated hazards including wake turbulence and contaminated runway operations.
081 - PRINCIPLES OF FLIGHT – AEROPLANES	• Aeroplane subsonic aerodynamics (emphasising stalls, spins and recovery, ground effect, effects of ice and contamination). • Theoretical knowledge of control, propellers and limitations, stability and flight mechanics.
090 - RADIO COMMUNICATIONS	• General communication procedures and applicable VFR phraseology for normal and non-normal operations.

Table 3: Theoretical knowledge content for first solo flight training.

Navigation flight training

Subject	Topics
010 - AIR LAW	• Applicable Rules of the Air (including interception of aircraft); • Altimeter setting procedures; • Operation of transponder; • Applicable Part-NCO; • Air Traffic Services: • Airspace; • ATC; • FIS; and • Alerting Service. • Applicable parts of ICAO Doc 4444; Aeronautical Information Services: • AIP; • NOTAM; and • AIC. • Aerodrome data, physical characteristics and visual aids; • Search and Rescue; and • Safety Reports.
021 - AIRCRAFT GENERAL KNOWLEDGE – AIRFRAME, SYSTEMS AND POWER PLANT	• Piston engine: ➤ Fuel management; and ➤ Engine handling and monitoring.
022 - AIRCRAFT GENERAL KNOWLEDGE – INSTRUMENTATION	• Instruments on board (measurements and indications for trouble shooting); and • EFB (if applicable).
031 - FLIGHT PERFORMANCE AND PLANNING – MASS AND BALANCE	-
032 - FLIGHT PERFORMANCE AND PLANNING – PERFORMANCE – AEROPLANES	• Performance applied to the aircraft used: ➤ Take-off; ➤ Climb; ➤ Cruise; • Range; and • Endurance. ➤ Descent; and ➤ Landing.
033 - FLIGHT PERFORMANCE AND PLANNING – FLIGHT PLANNING AND MONITORING	• VFR navigation plan; • Fuel/energy planning; • NOTAM briefing; • Meteorological briefing; • ICAO ATS flight plan; • Flight monitoring and in-flight replanning.
040 - HUMAN PERFORMANCE AND LIMITATIONS	• Threat and error management as applicable; • Physiological and psychological aspects related to VFR navigation.

050 - METEOROLOGY	• Weather-related threats and hazards, including the ability to assess current and developing weather phenomena based on briefing information and in-flight observation.
061 - NAVIGATION – GENERAL NAVIGATION	• Basics of navigation: ➤ Position; ➤ Direction; ➤ Distance; ➤ Speed; ➤ Wind; and ➤ Triangle of velocities. • VFR navigation planning (use of charts); • VFR navigation techniques; and • Sunrise and sunset time.
062 - NAVIGATION – RADIO NAVIGATION	• Basic principles and operation of available NAVaids, based on area and aircraft; and • Basic operating principles of primary and secondary surveillance radar systems.
070 - OPERATIONAL PROCEDURES	Operational Procedures and Hazards, including Operation Manual and Part-NCO requirements and procedures.
081 - PRINCIPLES OF FLIGHT – AEROPLANES	-
090 - RADIO COMMUNICATIONS	• Standard phraseology related to VFR navigation (e.g. position reporting, message relay, traffic information, etc.); • Voice communication failure for VFR; • Distress and urgency phraseology.

Table 4: Theoretical knowledge content for navigation flight training.

Basic instrument training

Subject	Topics
010 - AIR LAW	-
021 - AIRCRAFT GENERAL KNOWLEDGE – AIRFRAME, SYSTEMS AND POWER PLANT	-
022 - AIRCRAFT GENERAL KNOWLEDGE – INSTRUMENTATION	• Relevant knowledge of flight instrument functions, operations and errors. • Engine instruments and engine parameters in normal and abnormal conditions. • Relevant knowledge of EFIS instrumentation. • Instrument monitoring and scanning technique.
031 - FLIGHT PERFORMANCE AND PLANNING – MASS AND BALANCE	-
032 - FLIGHT PERFORMANCE AND PLANNING – PERFORMANCE – AEROPLANES	-
033 - FLIGHT PERFORMANCE AND PLANNING – FLIGHT PLANNING AND MONITORING	-
040 - HUMAN PERFORMANCE AND LIMITATIONS	• Functions and limitations of human senses and related illusions, human information processing, human error and reliability, decision-making. • Threat and error management as applicable to basic instrument flying.
050 - METEOROLOGY	-
061 - NAVIGATION – GENERAL NAVIGATION	-
062 - NAVIGATION – RADIO NAVIGATION	• Principles, presentation, interpretation, errors and accuracy of applicable navigation aids.
070 - OPERATIONAL PROCEDURES	• Part-NCO requirements for IFR flight.
081 - PRINCIPLES OF FLIGHT – AEROPLANES	• Flight mechanics, stability, trimming.
090 - RADIO COMMUNICATIONS	-

Table 5: Theoretical knowledge content for basic instrument training.

Procedural instrument training

Subject	Topics
010 - AIR LAW	• Doc 8168 definitions. • Departure, approach, holding procedures, altimeter-setting. • Applicable rules of the air (SERA). • Radar services.
021 - AIRCRAFT GENERAL KNOWLEDGE – AIRFRAME, SYSTEMS AND POWER PLANT	-
022 - AIRCRAFT GENERAL KNOWLEDGE – INSTRUMENTATION	-
031 - FLIGHT PERFORMANCE AND PLANNING – MASS AND BALANCE	-
032 - FLIGHT PERFORMANCE AND PLANNING – PERFORMANCE – AEROPLANES	• Applicable performance requirements and calculations.
033 - FLIGHT PERFORMANCE AND PLANNING – FLIGHT PLANNING AND MONITORING	• Flight planning for IFR flights including navigation plan and charts, pre-flight preparation, fuel/energy planning and requirements, ICAO ATS flight plan, flight monitoring and in-flight replanning.
040 - HUMAN PERFORMANCE AND LIMITATIONS	• Threat and error management as applicable to procedural instrument flying. • Decision-making.
050 - METEOROLOGY	• Applicable meteorological hazards. • Meteorological information for flight planning.
061 - NAVIGATION – GENERAL NAVIGATION	-
062 - NAVIGATION – RADIO NAVIGATION	• Principles, presentation, interpretation, errors and accuracy of applicable navigation aids. • Performance Based Navigation operations and requirements. • Airborne weather radar (if applicable).
070 - OPERATIONAL PROCEDURES	• Operational procedures regarding environmental hazards including contaminated runways.
081 - PRINCIPLES OF FLIGHT – AEROPLANES	-
090 - RADIO COMMUNICATIONS	• Standard phraseology related to IFR flight. • Voice communication failure for IFR.

Table 6: Theoretical knowledge content for procedural instrument training.

References

Regulation (EU) No 2018/1139 (*Easy Access Rules for the Basic Regulation (Regulation (EU) 2018/1139) - Revision from January 2023 - Available in pdf, online & XML format | EASA (europa.eu)*)

Regulation (EU) No 1178/2011, August 2023 (*Easy Access Rules for Aircrew (Regulation (EU) No 1178/2011) - Revision from August 2023 – Available in pdf, online & XML format | EASA (europa.eu)*)

Regulation (EU) No 965/2012, September 2023 (*Easy Access Rules for Air Operations (Regulation (EU) No 965/2012) - Revision 21, September 2023 — Available in pdf, online & XML format | EASA (europa.eu)*)

ICAO Doc 9868, Procedures For Air Navigation Services – Training, 3rd edition, 2020

JAR-FCL 1 - Flight Crew Licensing, December 2006 (*Microsoft Word - 01 - Cover letter FCL 1 - Amdt 7 _with logo_.doc (europa.eu)*)

Guidance for allowing virtual classroom instruction and distance learning, August 2020 (*Guidance for allowing virtual classroom instruction and distance learning - guidelines in relation to the COVID-19 pandemic | EASA (europa.eu)*)