

Introduction to the establishment of a Bachelor Degree Programme in Aviation Science at NTNU

Clean Aviation – NTNU 2023-09-27

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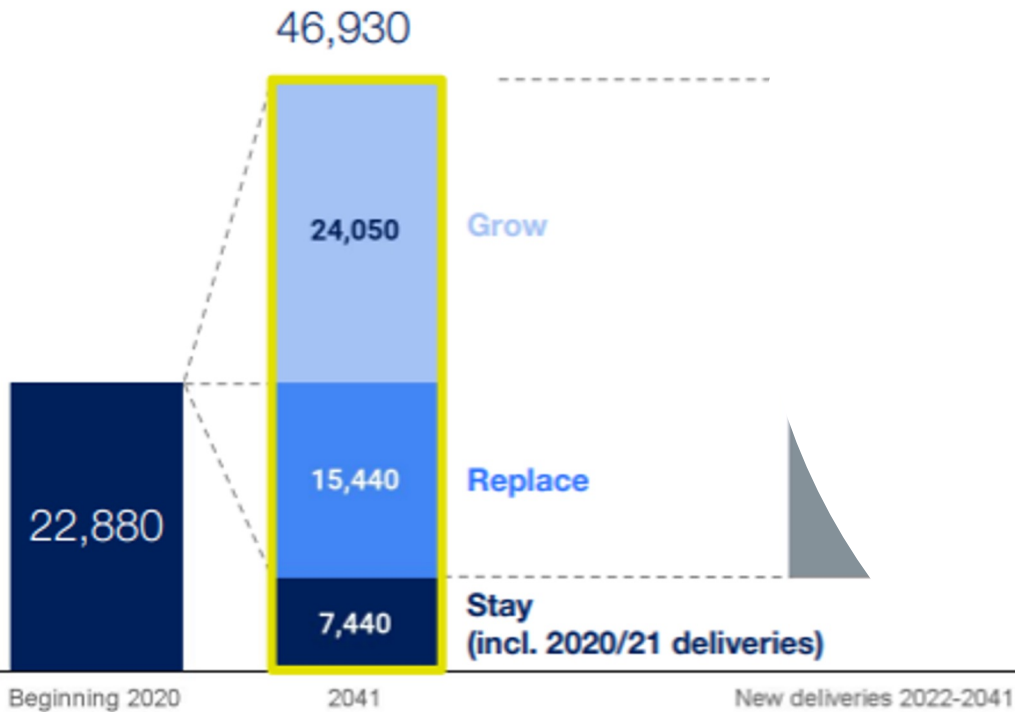
Have we thought
sufficiently about
Maintenance personnel for
the future?



2022 - 2041

Almost 47,000 in service aircraft in 2041

Number of aircraft



Number of Aircraft predicted



Personnel for armed forces are coming in addition

Norway today

Norway have today 1.200 registered aircraft

Distribution	Motorised FX wing	759
	Helicopter	267
	Gliders	155
	Ballons	19

Aircraft on an AOC	Motorised FX wing	177
	Helicopter	179
	Gliders	0
	Ballons	0

In Norway we today have a total of 1.124 persons with a Part 66 Licence

Average age 50year +

40-50 % can leave with pension within 2025

- Aircraft are becoming more and more complicated with the combination of computers and the mechanical construction
- Education will be more demanding as new technology are making the aircraft more complex

Maintenance personnel

- Average age of maintenance and technical admin personnel is going up
- CAMO/Technical admin personnel constantly more challenging to recruit from hangar
- CAMO/Technical admin personnel with relevant education and experience more challenging to recruit
- Compensation gap between Maintenance personnel and CAMO/Admin personnel increasing
- No formal master/bachelor education within aviation in Scandinavia at present!



What do we have to do

- Common responsibility to recruit trainees
- Contribute to initiative coming from NTNU
- Give NTNU student practice, summer jobs
- Student assignments/task
- Recruit trainees after end of program, and graduates from NTNU



Aircraft Engineer at NTNU



- In RNB2023, the Ministry of Education awarded NTNU funds to create a study program for aircraft engineers in the military and civil sectors. The study -program will start from autumn 2024 and focus on aircraft maintenance.
- NTNU is working to establish a 3-year technical engineering education (Bachelor Level) for aircraft engineers with 25 study places.
- The aim is to be up and running from autumn 2024. Thus, the first aircraft engineers will have completed their training in the spring of 2027.

Cooperation with military and civil aviation

- If NTNU is to succeed with the new study programme, it is crucial that good cooperation can be established between NTNU, the Military aviation and civil aviation so that the candidates are both motivated and can be ready to take up positions as maintenance engineers.
- Both the military and civil aviation organizations show great interest in helping to make the new study program a success.
- Great interest is expressed in giving students good access to authentic aviation environments, which will serve as a valuable source of motivation and contextualisation for the education.
- Potential learning sites include
 - Ørland air base
 - Gardermoen (Norse Atlantic and Norwegian)
 - Helicopter environment in Stavanger
 - Military premises at Kjeller

Overall Learning outcome description



- Candidates must be qualified for positions as aircraft engineers in military and civil aviation, where they can perform tasks independently and as part of a team. Candidates must have good insight in the operation of various aircraft and the systems the aircraft consist of. Furthermore, the candidates must have basic knowledge of aircraft maintenance and be able to organize and lead the associated activities.
- Detailed Learning Outcome Descriptions developed and reviewed by the military and civil aviation.

Detailed Learning Outcome Descriptions



- According to NOKUT Guidelines for engineering education
- Competence Goal no 1:
 - *The candidate can explain the operation of aircraft in general and can explain the technical principles and procedures for aircraft maintenance, including repair, troubleshooting and inspection of systems, components and structures. He or she also has training in maintenance management for aircraft and describes the laws, rules and systems that govern maintenance work in the aircraft industry*
- Skills Goal no 1:
 - *The candidate applies knowledge and relevant results from research and development work to solve theoretical, technical and practical issues within aircraft maintenance.*

6	INGT2300 Ingeniørfaglig systemtenkning	FlyXXXX Bacheloroppgave Flyingeniør 22,5 stp		
5	Valgemne (Matematikk 3)	Valgbart emne (Fly 7 Autonome og fjernstyrte flysystemer)	Fly 6 Studiepoenggivende praksis innen luftfart	Fly 5 Flysystemer (Reguleringsteknikk, autopilot, styresystemer, avionikk, flight computer)
4	MAST2012 Tilstandsbasert vedlikehold	FENT2002 Fluidmekanikk og hydraulikk	TTK4101 Instrumentering og måleteknikk	Fly 4 Flyfysikk (Flyfartøys fremdrift, struktur, aerodynamikk og mekaniskesystem)
3	EXPH0600 Exphil for ingeniørfag	ISTT1002 Statistikk	MAST2100 Materialteknologi	Fly 3 Flyvedlikehold (Vedlikeholdsstyring, etikk, human factors og ledelse. Inn med temaer fra MAST2003).
2	IMAT2012 - Matematikk for ingeniørfag 2 A	Fysikk IFYT1000	TKT4116 Mekanikk 1	Fly 2 Flymekanikk (Flymekanikk m. vedlikeholdskontekst, maskindeler/vedlikeholdsdeler, intro til vedlikehold)
1	IMAT1001 Matematiske metoder 1	INGT1002 Programmering, numerikk og sikkerhet	TTT4203 Innføring i analog digital elektronikk	Fly 1 Introduksjon til luftfartøy og luftfart (Identitet. Intro til fly, terminologi/betegnelse, intro flymekanikk, overordnet oversikt over flysystemer (Avionikk kontekstualisere TTT4203), deler etc. Historie)
	7,5 stp	7,5 stp	7,5 stp	7,5 stp

Flyingeniør

Milestones

1. Finish course plan (Sep 2023)
2. Accreditation of study program (Nov 2023)
3. Agreements with Military Aviation and Civil Aviation (Dec 2023)
4. Start Marketing Campaign (Jan 2024)
5. Deadline for application (Apr 2024)
6. Completion of new courses to be taught 1st year (June 2024)
7. Immatriculation of students (August 2024)

