



Welcome & Introduction

Presented by

NATACHA CALLENS

ESA Education Office

ESA Academy's Training and Learning Centre

- **Training and Learning Centre** developed 2 years ago in the frame of the ESA Academy's Training and Learning programme
- **The Ladybird Guide to Spacecraft Communications Training Course 2018** is the 24th event in the Training and Learning Centre and the 2nd edition of this Training Course.
- ESA Academy **training activities**
 - A thorough and consistent **portfolio of training sessions** on different areas of expertise covered by ESA
 - A **Concurrent Design Facility** (CDF) in reduced scale to provide training experience on the design of a space mission/system
- Typical **training session**
 - Up to 32 training hours (4 days)
 - 22 university students
 - 1-6 experts /day



ESA Academy's Training and Learning Centre

- **Target audience**
 - students participating to ESA hands-on programmes
 - students preparing for a space related career
 - students never involved in the space domain
- **Trainers**
 - mainly ESA staffs (active or retired)
 - university professors
 - experts from space industry
- **Examples of training courses**
 - Gravity-Related Experiments training week
 - CubeSats programmes training weeks
 - Concurrent Design of a Space System
 - **Spacecraft Operations and Communication**
 - Human Space Physiology
 - Standardisation
 - Product Assurance Awareness
 - Science Operation Scheduling
 - Space Law
 - ...



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Day	Morning		Afternoon	
Tuesday 06/03/2018	08:00-08:30 08:30-09:00 09:00-10:00 10:00-10:30 10:30-11:00 11:00-13:15 13:15-14:00	Bus from the Hotel Welcome & Introduction Course Introduction - Part 1 ESA & ESA Education Programme Coffee Break Course Introduction - Part 2 Lunch	14:00-16:00 16:00-16:30 16:30-18:30 18:30-19:00 19:30	The Challenge Coffee Break Modulation Bus to the Hotel Dinner
Wednesday 07/03/2018	08:00-08:30 08:30-10:30 10:30-11:00 11:00-12:00 12:00-13:15 13:15-14:00	Bus from the Hotel Demodulation Coffee Break Coding - Part 1 PROBA Operation Room Visit Lunch	14:00-16:00 16:00-16:30 16:30-17:30 17:30-18:30 18:30-19:00 19:30	Coding - Part 2 Coffee Break Coding - Part 3 Exercise - Part 1 Bus to the Hotel Dinner
Thursday 08/03/2018	08:00-08:30 08:30-10:30 10:30-11:00 11:00-12:00 12:00-13:15 13:15-14:00	Bus from the Hotel Protocols Coffee Break Transmission - Part 1 Baseband Equipment Visit Lunch	14:00-15:00 15:00-16:00 16:00-16:30 16:30-17:30 17:30-18:30 18:30-19:00 19:30	Transmission - Part 2 Reception - Part 1 Coffee Break Reception - Part 2 Exercise - Part 2 Bus to the Hotel Dinner
Friday 09/03/2018	08:00-08:30 08:30-09:30 09:30-10:30 10:30-11:00 11:00-12:00 12:00-13:15 13:15-14:00	Bus from the Hotel Real Ground Stations Summary Coffee Break Exercise - Part 3 Antenna, RF Visit & Galileo Lunch	14:00-16:45 16:45-17:15 17:15-17:45 19:00	Final Group Exercise & Coffee Break Conclusions Bus to the Hotel Dinner



Schedule can evolve!



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Organisers - ESA Education Office



Natacha Callens
Administrator ESA Academy – Training and Learning Centre
Education Office
European Space Agency

Natacha Callens is a physicist and works for the ESA Education Office since 2009. After developing and coordinating for several years some ESA hands-on programmes, including the Fly, Drop and Spin Your Thesis! programmes, she is now in charge of the development and operation of the ESA Academy's Training and Learning Centre.



Ariane Dédeban
Logistic and Administrative Assistant
Education Office
Redu Space Services for European Space Agency

Ariane Dédeban holds a Master's degree in Library Science from the University of Angers in France. She has worked in the field of secondary and tertiary education for the past 7 years. She joined Redu Space Services at ESEC in 2017. Her role is to coordinate the logistics and the administration of the ESA Education events at ESEC.



Delphine Gorlé
Young Graduate Trainee for ESA Academy – Training and Learning Centre
Education Office
European Space Agency

Delphine Gorlé has recently graduated from the University of Liège with a Master of Engineering in Physics, after an Erasmus year at the Politecnico di Torino to study Nanotechnologies. She is taking part in the Young Graduate Trainee programme and works for ESA Education Office to support the Coordination of the ESA Academy's Training and Learning Programme.



Merel Van Wallegghem
Belgian National Trainee for ESA Academy's e-learning activities
Education Office
Belgian Science Policy Office/European Space Agency

Merel Van Wallegghem is a biomedical scientist finishing a PhD thesis on space immunology at the Belgian Nuclear Research Centre (SCK-CEN) in collaboration with Ghent University. During her PhD research she was involved in the preparation and sample processing of human immunology and radiation sensitivity research projects on the International Space Station. As a Belgian National Trainee at ESA ESEC, she is supporting the development of ESA Academy's e-learning activities.



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ESA Trainer



David Evans
Mission Operations Concept Engineer
Advanced Operations Concepts Office of ESOC
European Space Agency

David started his career at the European Space Operations Centre (ESOC) in 1992 and worked as a flight control engineer and simulation officer on the EURECA, ERS-2 and CLUSTER-1 missions. In 1997 he joined EUTELSAT of Paris during a period of intense expansion involving 20 launches and 5 re-orbitings. He eventually became the satellite control centre manager before returning to ESOC in 2007. He now specialises in small spacecraft missions and advanced operations technology. He is the project manager for ESA's first nanosatellite mission OPS-SAT and the holder of several patents on housekeeping telemetry compression. He is also the author of the popular "Ladybird Guide to Spacecraft Operations" lecture courses.



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Guest Speakers



Christian Lezy
Galileo IOT Station Engineer
European Space Agency

Christian Lezy has an engineering degree in telecommunications. He started his career in Redu Ground Station in 1996, first in the software engineering team, he moved to the Payload In Orbit Test team 2 years later, validating and testing telecommunication payloads. In 2004 he became IOT Manager for ESA in Redu and started to share his expertise with Galileo project. Since 2011 he is fully dedicated to the Galileo project, preparing and leading the IOT Operations of every Galileo satellite after launch.



Benoit Demelenne
Head of the Redu satellite operations
European Space Agency

Benoit Demelenne started to work at the ESA Redu Ground station in 1981. He became the first Missions Operations Engineer in 1983 for the first operational European Communications Satellite (ECS) launched in 1983. In 1995, he became responsible of the ARTEMIS data relay mission which has established a first world premiere in 2001 with the laser link communication between the Geo satellite ARTEMIS and the Leo satellite SPOT-4. Since 2006, he is appointed as the Head of the Redu satellite operations section responsible for the PROBA missions and the GALILEO hosting activities.



Etienne Tillmans
Mission Operations Engineer
European Space Agency

Etienne Tillmans has a MSc in Engineering and has joined ESA as spacecraft operations Engineer at the Redu centre for the first series of EUTELSAT GEO telecom satellites. Since 2000, he is in charge of the operations preparation and execution for the ESA mini satellites PROBA: Project for On Board Autonomy. His field of expertise is naturally about space & ground segment control and operations with a particular emphasis on operations automation.



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ESEC Students



Begz Altankhuyag
Field of study: Engineering
Level: Bachelor
University: Carleton
University
Nationality: Canadian



Renée Andersen
Field of study: Earth
and Space Physics
and Engineering
Level: Bachelor
University: Technical
University of Denmark
Nationality: Danish



Diego Bermúdez Martín
Field of study: Engineering
Level: Master
University: Polytechnic
University of Madrid
Nationality: Spanish



Silvia Ceccato
Field of study: Engineering
Level: PhD
University: University
of Padova
Nationality: Italian



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ESEC Students



Spyridon Daskalakis
Field of study: Engineering
Level: PhD
University: Heriot-Watt
University
Nationality: Greek



Maeve Doyle
Field of study: Astrophysics
Level: Master
University: University
College Dublin
Nationality: Irish



Dávid Kóbor
Field of study: Engineering
Level: Master
University: Budapest
University of Technology
and Economics
Nationality: Hungarian



Joan Mitjans i Blasco
Field of study: Engineering
Level: Bachelor
University: Polytechnic
University of Catalonia
Nationality: Spanish



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ESEC Students



Erik J. Sandal
Field of study: Computer
Science
Level: Bachelor
University: University
of Stavanger
Nationality: Norwegian



Costel Cherciu
Field of study: Engineering
Level: Master
University: University
Politehnica of Bucharest
Nationality: Romanian



Francesco Formaggio
Field of study: Engineering
Level: PhD
University: University
of Padova
Nationality: Italian



Ariel Ladegaard
Field of study: Space
Science and Robotics
Level: Bachelor
University: Aberystwyth
University
Nationality: Norwegian



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ESEC Students



Naomi Luglio
Field of study: Engineering
Level: Master
University: Politecnico di Torino
Nationality: Italian



Tom Mladenov
Field of study: Engineering
Level: Master
University: Universities of Hasselt and Leuven
Nationality: Belgian



Giuseppe Siciliano
Field of study: Engineering
Level: PhD
University: University of Pavia
Nationality: Italian



Małgorzata Siutkowska
Field of study: Geodesy and Cartography
Level: Master
University: University of Warmia and Mazury
Nationality: Polish



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ESEC Students



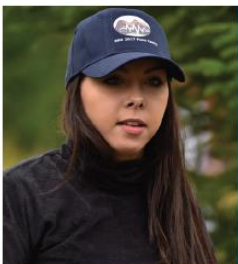
Daniel Vera Nieto
Field of study: Engineering
Level: Bachelor
University: Technical
University of Madrid
Nationality: Spanish



Nicole Zieba
Field of study: Engineering
Level: Master
University: University of
Manchester
Nationality: German



Andres Lüdeke
Field of study: Engineering
Level: Bachelor
University: Aachen
University of Applied
Sciences
Nationality: German



Monica Stancu
Field of study: Geophysics
Level: Bachelor
University: University
of Bucharest
Nationality: Romanian



Stefano Marinaci
Field of study: Engineering
Level: PhD
University: University of
Salento
Nationality: Italian

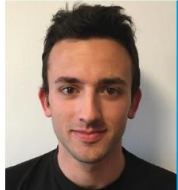


Terese Svensson
Field of study: Engineering
Level: Master
University: Luleå
University of Technology
Nationality: Swedish



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Livestream Students



Boyan Naydenov
Field of study: Engineering
Level: Master
University: Polytechnic
University of Catalonia
Nationality: Bulgarian



Ana Ambrosio
Field of study: Engineering
Level: Master
University:
ISAE - SUPAERO
Nationality: Spanish



Matteo Marchetti
Field of study: Engineering
Level: Master
University: University of
Pavia
Nationality: Italian



Laura Gonzalez Llamazares
Field of study: Engineering
Level: Master
University: University
Carlos III of Madrid
Nationality: Spanish



Guillermo Rodriguez Lage
Field of study: Engineering
Level: Master
University: Polytechnic
University of Madrid
Nationality: Spanish



Michał Wiczorek
Field of study: Engineering
Level: Bachelor
University: Wrocław
University of Science and
Technology
Nationality: Polish



Thomas Golfetto
Field of study: Engineering
Level: Bachelor
University: University
of Padova
Nationality: Italian



Gabriele Ceccato
Field of study: Engineering
Level: Master
University: University of
Pavia
Nationality: Italian



Giorgio Pasquali
Field of study: Engineering
Level: Master
University: University of
Pavia
Nationality: Italian



Riccardo Calao
Field of study: Engineering
Level: Master
University: University of
Padova
Nationality: Italian



Ioannis Varvaringos
Field of study: Engineering
Level: Bachelor
University: Aristotle
University of Thessaloniki
Nationality: Greek



Pedro Cachim
Field of study: Engineering
Level: Master
University: Instituto
Superior Técnico
Nationality: Portuguese






Federico Mustich
Field of study: Engineering
Level: Bachelor
University: University of
Bologna
Nationality: Italian



João Silvestre
Field of study: Engineering
Level: Master
University: University
of Lisboa
Nationality: Portuguese

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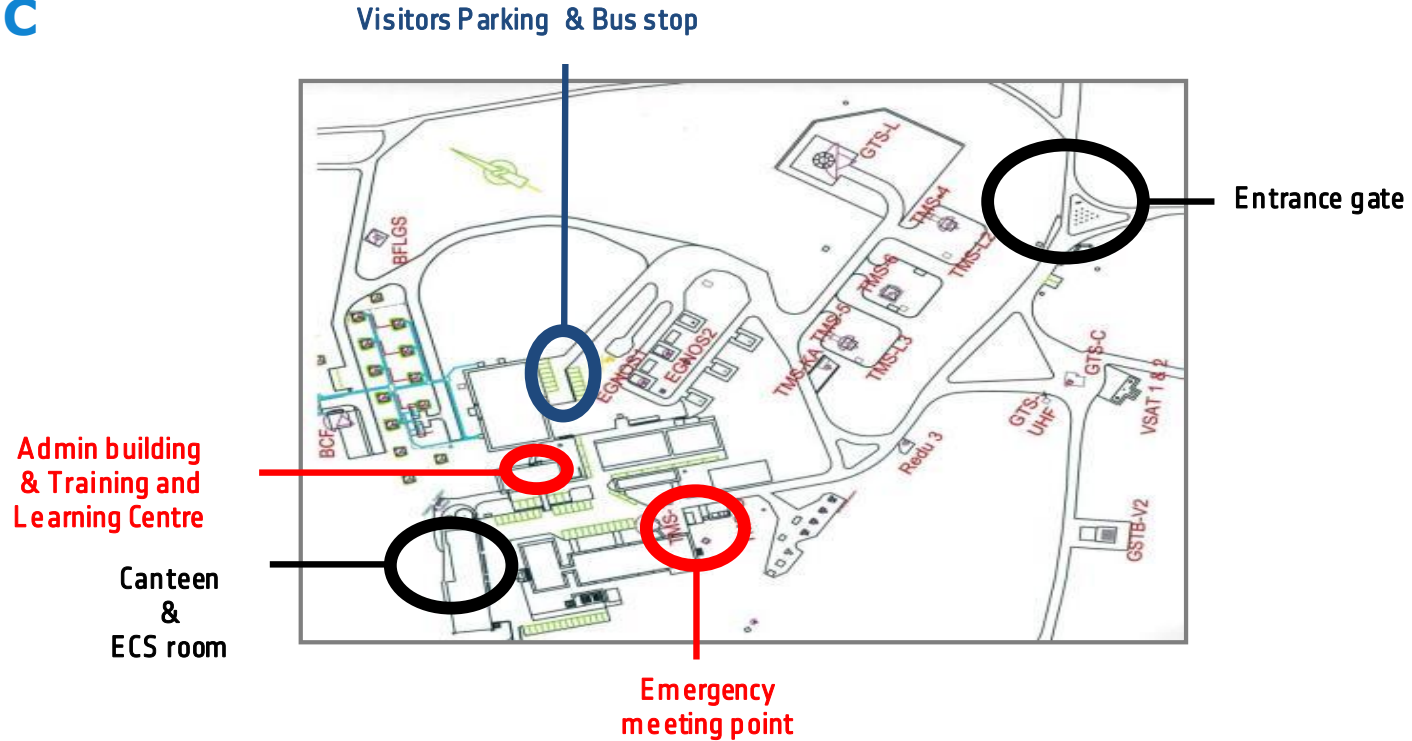
Logistics

- Be on time for the bus
- Security desk → Bring your ID/Passport every day! 
- Training Week in Training and Learning Centre (Admin building)
- Coffee breaks in **ECS meeting room** (next to ESEC canteen)
- No food or drink in the room 
- WiFi : esa-public (Username and password behind your name holder!)
- Meeting space available at the hotel 
- If you leave on Friday: check out and leave keys at reception on Friday morning
- Change plans → inform Ariane in advance!



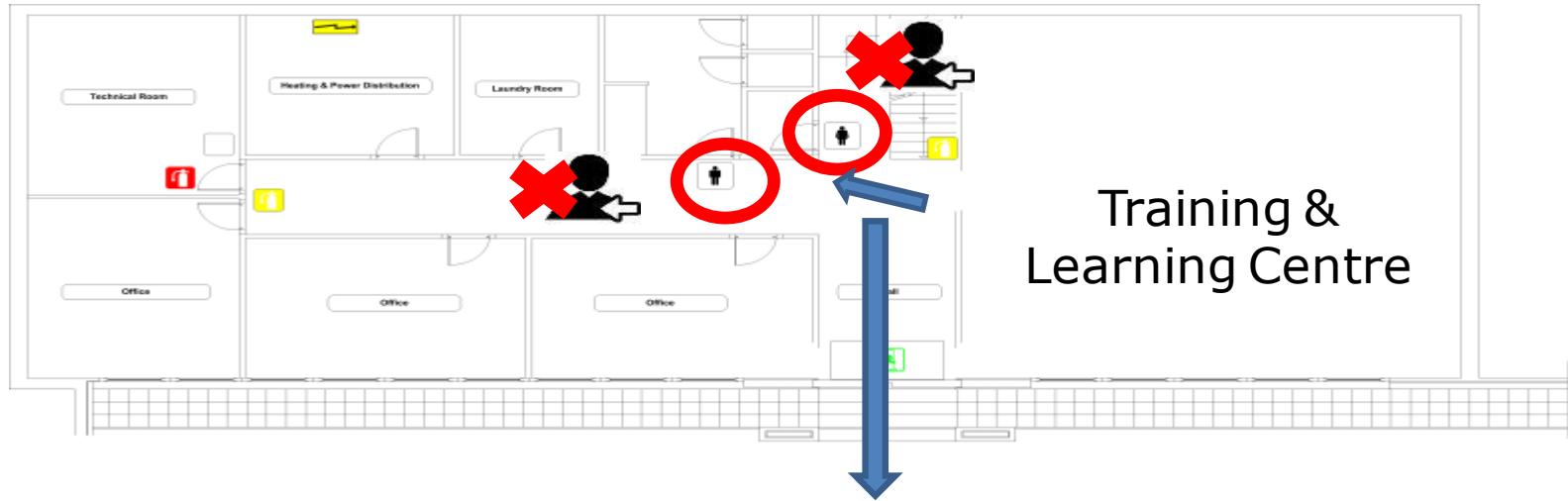
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ESEC



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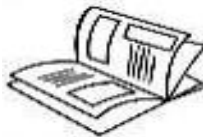
Admin building




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Material

- **Booklet**



- General and logistic information
- Schedule
- Participants
- Abstract lectures
- Safety and Security Information 

- **TLC Computers**



For you to use!



Folder TLC students



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→ Training Material

→ Shared information

- **Feedback form**

Fill in before Monday 19 March 2018



- **Quotes**

Send to **esa.academy@esa.int** by Monday 12 March 2018

- **Reimbursement form**

Fill in before Friday 23 March 2018



CubeSats Hands-on Training Week 2018

Pictures

Us

- ESA Education Office will take pictures during the event for outreach purposes
- Group picture **Thursday after lunch**
- **Paxi will be with us part of the week!** Maybe he wants to make some picture with you!
- Ok?



You

- Recording pictures or video in ESEC is strictly forbidden unless specifically authorised by your host
- You can take pictures inside the Training and Learning Centre !



Safety and Security

- A safety briefing is required by Belgian law. This provides you with all the information necessary for safety.
- For any questions, please contact responsible health and safety for ESEC:
- **Vincent Grandjean : 94562**
- **Koen Van Hove : +33153697180**
- **Read Safety and Security information provided in the booklet**



Safety and Security

Badge - access

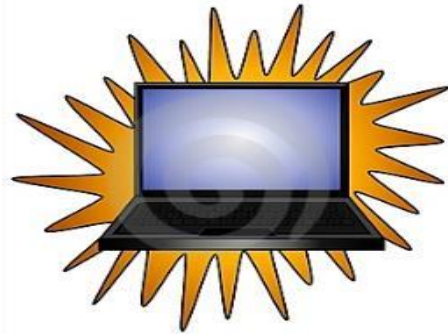
- Please wear your personal access badge visibly at all times
- In case of badge loss, the event organiser or Security should immediately be notified
- Your badge is specifically activated for areas where you are allowed to enter – don't enter other zones unless authorised and accompanied



Safety and Security

Personal Belongings

- Take good care of yourself and your property...
- Do not leave any items unattended. Unattended bags may be removed and inspected for security reasons
- Leave your items in the TLC room



Safety and Security

ESA Health and Safety Policy

- The rules of Health and Safety of ESA define the purpose and the following principles
- **Purpose:**
 - **Minimize risks health and safety of ESA staff and all people on the site.**
 - **Promote the health** of people working at ESA's service
 - **Ensure that health and safety are recognized** as part of the culture of professional excellence of ESA
 - **Ensure** that the Director General of ESA and other Directors have complete visibility into the management of Health and Safety within the agency and they can exercise fully their responsibility



Safety and Security

ESA Health and Safety Policy

- **Principles**
 - ESA manages the health and safety using a risk analysis approach
 - Everyone has the duty to prevent risks and actively promote the health and safety of staff, contractors and visitors of ESA establishments
 - Everyone is responsible for his own health and safety
 - Decisions affecting the risks to health and safety are taken in a competent, transparent and, where appropriate, a long-term perspective
 - Each site must comply with national legislation on health and safety
 - All personnel working in the premises of the ESA has the right to act in the interests of his own health and safety
 - The agreements made in health and safety taking into account the characteristics and individual needs
 - Information on the promotion of health and safety has continued and actively communicated
 - The health and safety conventions reflect the change
 - The Agency will ensure the availability of adequate resources



Safety and Security

Emergency call!

Call 3333



**110 / 112 (from public
networks e.g. Cell phone)**



Safety and Security

Emergency : First Aid

- **First aid kits are located at the entrance of each building**
- An infirmary is located in the building O01
- The name of several first aid workers are on the following slide.
- All incident must be reported to the ESEC H&S responsible
- An incident report has to be filled after any incident with the responsible H&S
- Any injury must necessarily be recorded by completing the appropriate form

Safety and Security

Defibrillator DEA

- **Location:**
 - T02
 - **Admin building**
 - 001
- **Full Automatic DEA** but if necessary first aid workers have been trained to use these defibrillators (see first aid workers list)
- Any utilisation of a DEA must be reported to responsible H&S

Safety and Security

Emergency : FIRE

- **Don't panic!**
- Report the fire immediately using exact information on the location, calling the emergency number: **3333**
- Call or use the **alarm push button** for this purpose
- **Warn the person in charge**



3333



Safety and Security

Emergency : EVACUATION

1. Leave the danger area immediately following the escape routes and evacuation indicated. **Stay calm !**



2. Follow the displayed symbols



3. Fresh air is near the floor

4. Go to the meeting point!



Safety and Security

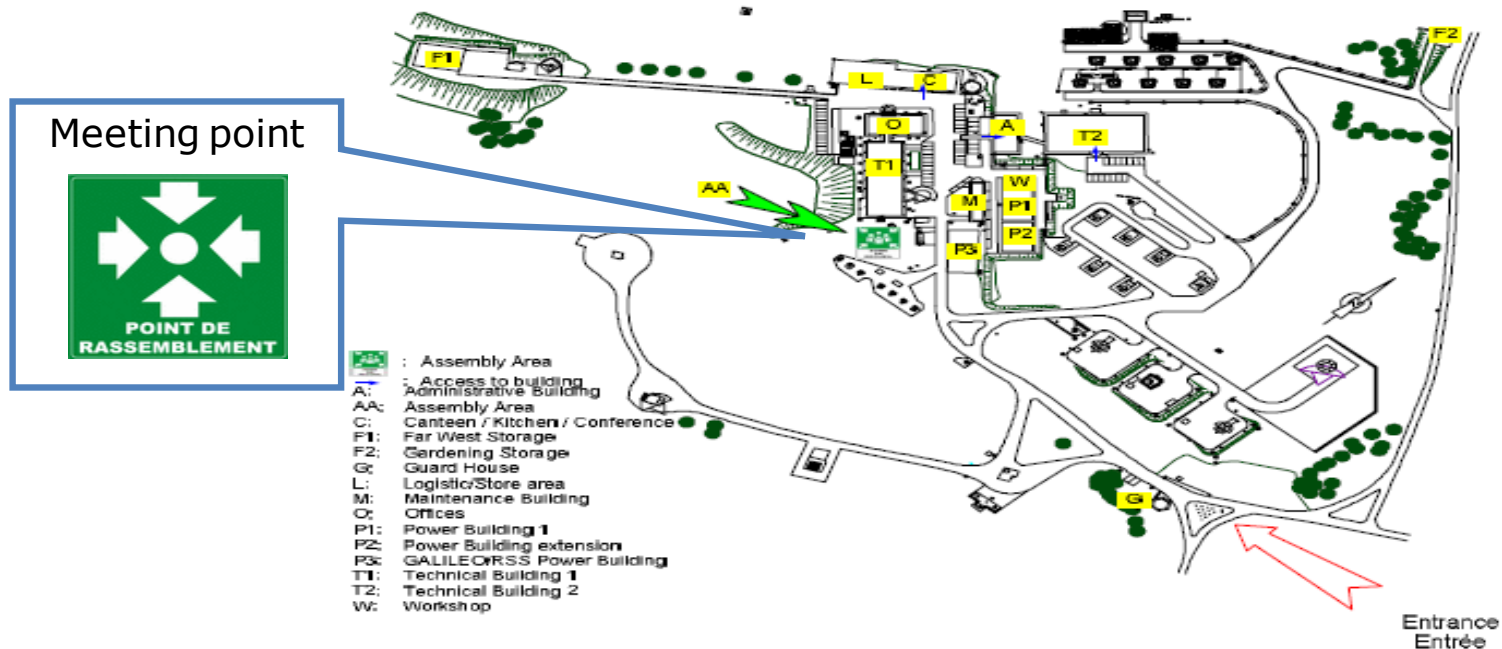
Emergency routes and meeting point

CONSIGNES GÉNÉRALES D'URGENCE / GENERAL EMERGENCY PROCEDURES

Numéro d'urgence : 3333 Emergency number :	Poste de garde : 578 Guardhouse :	Pompiers : (0) 112 Fire Brigade :					
PREVENTION	EVACUATION	INCENDIE / ACCIDENT / FIRE					
<p> La Site est non fumeur. Smoking area outside the canteen</p> <p> N'ENCOMBREZ PAS LES ABOIS DES MOYENS DE SECOURS DO NOT OBSTRUCT EMERGENCY EXIT</p> <p> INFORMEZ-VOUS DE LEURS EMPLACEMENTS ET LEUR MODE D'EMPLOI MAKE SURE THAT YOU KNOW WHERE THEY ARE AND HOW TO OPERATE THEM</p>	<p> ÉVACUEZ DÈS L'ALERTON DU SIGNAL SONORE D'ÉVACUATION EVACUATE THE BUILDING AS SOON AS YOU HEAR THE EVACUATE ALARM</p> <p> GARDEZ VOTRE SANS FROID. QUITTER L'ENDROIT OÙ VOUS VOUS TROUVEZ SANS PRÉCIPITATION ET EN RESPECTANT LES CONSIGNES DES PERSONNES DE SÉCURITÉ OU DES POMPIERS STAY CALM. LEAVE THE AREA YOU ARE IN WITHOUT HURRYING AND FOLLOW THE INSTRUCTIONS OF THE SECURITY TEAM OR THE FIRE BRIGADE</p> <p> IMPLÉMENTER LES CHEMINS D'ÉVACUATION ET REJOINTEZ LE POINT DE RASSEMBLEMENT À L'EXTÉRIEUR DU BÂTIMENT FOLLOW THE EVACUATION ROUTES AND GO TO THE ASSEMBLY POINT OUTSIDE THE BUILDING</p>	<p> DES LA DÉCOUVERTE D'UN FEU, GARDER VOTRE CALME ET PRÉVENIR LA SÉCURITÉ AU POSTE 578 OU DÉCLENCHER L'ALARME EN BRISANT LA VITRE D'UN BOUTON ROUGE IF YOU DISCOVER A FIRE, STAY CALM AND CALL SECURITY ON 578 OR BREAK GLASS ON THE RED ANNUAL CALL POINT</p> <p> BASSEZ VOUS S'IL Y A DE LA CHALEUR ET DES FUMÉES L'AIR FRAIS EST PRÈS DU SOL. KNEEL OR IF HEAT AND SMOKE ARE PRESENT THE FRESH AIR STAYS AT GROUND LEVEL</p> <p> ATTAQUER LE FEU AVEC LES EXTINCTEURS SANS PRENDRE DE RISQUES USE EXTINGUISHERS TO FIGHT THE FIRE WITHOUT TAKING ANY RISKS</p> <p> EN CAS D'ACCIDENT OU DE MALAISE, PRÉVEZ LA SÉCURITÉ AU POSTE 578 IN THE EVENT OF ACCIDENT OR SUDDEN ILLNESS, CALL SECURITY ON 578</p>					
EVACUATION : ESA Administrative Building (A) – First floor							
Approved by: _____ Date: _____							
VOUS ÊTES ICI / YOU ARE HERE							
SIGNES CONVENTIONNELS / SYMBOLS							
Extincteur à eau Water extinguisher	Extincteur à poudre Powder extinguisher	Poste de secours First-aid room	Arrêt d'urgence Emergency Stop	Alarme Incendie Fire alarm	Défibrillateur Automatique Externe Automated External Defibrillator	L'accès doit rester fermé Access must remain closed	Vestiaire pour femmes Women's dressing room
Extincteur au CO2 Carbon dioxide extinguisher	Extincteur au CO2 sur roues Mobile CO2 extinguisher	Sortie de secours Emergency Exit	Tableau électrique Electrical cabinet	Lance à incendie Fire hose	Local Haute tension ou Transformateur High Voltage or Transformer	Boîte de secours First aid box	Vestiaire pour hommes Men's dressing room

Safety and Security

Emergency routes and meeting point



Safety and Security



Conclusion

- Make the most of this Training Course
- This week is made for you
- Learn as much as you can
- Meet the other students
- Take the opportunity to learn from the experts
- Ask all your questions

Enjoy your Training Course!

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