ENSO GROUP

SCHEDULE

Day 1 **Saturday**	Arrival Bristol Airport Greetings. Bus transfer to Bristol Temple Meads. Pick up from Host Families.
Day 2 **Sunday**	**Free day**
STAGE 1 **Week 1 - 2**	**Mechatronics & Robotics training with Peter Gibbons form Gibbons Association** **9:00-14 (including lunch break 13-14:00 1H)** **SUBJECT: Introduction to robotics. Robotics market. Robotics resources. The current state of the art in Robotics. Research skills.** Introduction to robotics: ● History of robotics ● Overview of robotics ● Benefits of robots ● Types of robots ● Cost of robots Robotics Market: ● History of robotics market ● Current robotics market ● Breakdown of robotics market by industry ● Demographics of robotics market ● Future of robotics market Robotics Research:

	● Overview of robotics research ● Objectives of robotic research ● Specific areas of interest in research ● Future research ● Robot Competitions The course material will be a mixture of lectures and self learning. The aim is to provide participants with an in-depth insight into the world of robotics whilst developing their skills to investigate and present relevant new information in this field. This will require participants to work both individually and together to achieve project goals.
Friday	***10:00-12:00 The National Composites Centre Bristol & Bath Science Park, Emersons Green, Bristol BS16 7FS*** accompanied by Peter Gibbons ● Tour of the factory with Jack Cheasley. ● See robots in action. ● Presentation - Learn about NCC, what they do, their aims and what they are currently working on. ● Availability for questions and discussions
STAGE 2 **Week 3 - 5**	**SUBJECT: Developing skills and knowledge in Computer Aided Design (CAD), Computer Vision and robotics.** **Mechatronics & Robotics training with Peter Gibbons from Gibbons Association** **9:00-14 (including lunch break 13-14:00 1H)** Computer Aided Design (CAD) ● Introduction ● Software and formats ● Designing objects

	● Creating Assemblies ● Developing CAD skills ● Parameterising objects ● Design for manufacture ● CAD vs Reality 3D Printing ● Introduction ● History ● Benefits and constraints ● Practical workshop ● CAD vs 3D printing ● 3D printing vs Reality Computer Vision ● Introduction to computer vision ● Current state of the art in computer vision ● OpenCV ● Introduction to programming using OpenCV Robotics ● Motor Control ● Senses and actuators ● Navigation ● Robot programming using ROS ● Autonomous vehicles and CAVs ● Drones and UAVs ● Human robot interaction (HRI) ● Robot Football ● Robot Competitions Stage 2 will consist of practical skills learning for design and programming. This will be enhanced with lectures giving an overview of the subject areas. Participants will be expected to start to develop

	their skills on there own by utilising any available resources in preparation for project work in Stage 3.
Thursday	***12:30 - 16.00 visit to Airbus, Pegasus House, Aerospace Ave, Filton, Bristol BS34 7PA*** 11.30 am - Meet at The centre bus stop ● Sign in at Barnwell Reception ● Corporate Presentation ● A350 landing Gear Facility 10Z ● Virtual Reality Suite ● AWIC Structures Test 07Y
STAGE 3 **Week 6 - 8**	**SUBJECT: Group and individual project work. Skills to develop include; Problem Solving, Creativity, Communication,** **Mechatronics & Robotics training with Peter Gibbons form Gibbons Association** **9:00-14 (including lunch break 13-14:00 1H)** **Presentation, Project Management, Costa Analysis, Team Work, Working to Deadlines, Programming, Research, Personal Development, Critical thinking.** Group Project ● Project concept ● Concept research ● Concept evaluation

	● Concept decision ● Design and manufacture ● Integration ● Programme and test ● Redesign ● Evaluate ● Presentation Individual Project ● Design integration ● Projects timings ● Design process ● Documentation ● Implementation ● Evaluation ● Presentation

Departure	Bus Transfer from Bristol Temple Meads to Airport by Bristol Flyer