Syllabus

科目名		宇宙システム工学Ⅰ
英語科目名		Space Systems Engineering Ⅰ
担当教員名		岩田　隆敬(Takanori Iwata)
単位数		1
授業の概要		A large-scale integrated system that consists of spacecraft (satellite, probe, and space station), launch vehicle, ground systems, and communication network is required to realize space mission for space utilization and space exploration. Engineering management including project management, systems engineering, and safety and mission assurance is indispensable process for us to enable to build and operate such a complex space system to accomplish the mission goal. The scope of the two courses, Space Systems Engineering I & II, is to review element, system, and mission technologies of space system and to provide an overview of the engineering management methodologies, with an emphasis on project management (PM) and systems engineering (SE). The goal of these courses is to train students to be able to design, propose, and implement space missions.
カリキュラムにおけるこの授業の位置付け		Space Systems Engineering I & II are subjects for the Space Engineering International Course (SEIC). Space Systems Engineering I provides a review of space mission, space system, constraints, and satellite system/subsystem design and fundamentals of project management/systems engineering with applications to space development. Space Systems Engineering II further explores detailed steps of project management/systems engineering processes applied to NASA's space development, with various exercises.
授業計画		テーマ　内容 1. Introduction and Space System Overview 2. Spacecraft System Design 3. Spacecraft Subsystem Design 4. Introduction to Project Management 5. Applied Project Management for Space Development 6. Introduction to Systems Engineering 7. Applied Systems Engineering for Space Development 8. Final Examination
授業の進め方		Lectures are given by oral presentation with lecture materials provided before each lecture. Language is English. Face-to-face presentation is a baseline, but some lectures could be given remotely.
授業方法および授業形態		【授業方法】 講義 【授業形態】 対面のみ 【Teaching Methods】Lectures 【Course Formats】Face-to-Face only
授業の達成目標	授業の達成目標の解説)	The goal of the two courses, Space Systems Engineering I & II, is to train students to be able to design, propose, and implement space missions. In particular, the goal of Space Systems Engineering I includes:
	具体的な授業の達成目標	1. To understand space missions, space systems, and spacecraft design 2. To understand basics of project management and systems engineering 3. To understand mission realization processes and their engineering management, including project management and systems enginnering applied to space development
成績評価の基準および評価方法		Attendance at lectures and final examination
成績評価の基準および評価方法の詳細		Attendance: 50%, final examination: 50%
授業外学習(予習・復習)の指示		Download and study lecture materials. Students are expected to study for 2 hours per one lecture, in addition to the lecture itself.
予習時間の目安		2 hours per week
キーワード		Space Mission, Space System, Space System, Spacecraft Design, Satellite Design, Engineering Management, Project Management, Systems Engineering, Safety and Mission Assurance
教科書		No textbook is assigned for this course. Lecture materials (mainly presentation files) are provided via Moodle prior to each lecture.
参考書		1. A Guide to the Project Management Body of Knowledge (PMBOK), 7th Edition, PMI, PMI, 2021. 2. Systems Engineering Handbook, 5th Edition, INCOSE, Wiley, 2023. Other references and recommended reading will be introduced during the leacture.
備考		Recommended prerequisite: "Introduction to Satellite Engineering"
電子メールアドレス		To be provided in the first lecture.

Syllabus

科目名		宇宙システム工学Ⅱ
英語科目名		Space Systems Engineering Ⅱ
担当教員名		岩田　隆敬（Takanori Iwata）
単位数		1
授業の概要		A large-scale integrated system that consists of spacecraft (satellite, probe, and space station), launch vehicle, ground systems, and communication network is required to realize space mission for space utilization and space exploration. Engineering management including project management, systems engineering, and safety and mission assurance is indispensable process for us to enable to build and operate such a complex space system to accomplish the mission goal. The scope of the two courses, Space Systems Engineering I & II, is to review element, system, and mission technologies of space system and to provide an overview of the engineering management methodologies, with an emphasis on project management (PM) and systems engineering (SE). The goal of these courses is to train students to be able to design, propose, and implement space missions.
カリキュラムにおけるこの授業の位置付け		Space Systems Engineering I & II are subjects for the Space Engineering International Course (SEIC). Space Systems Engineering I provides a review of space mission, space system, constraints, and satellite system/subsystem design and fundamentals of project management/systems engineering with applications to space development. Space Systems Engineering II further explores detailed steps of project management/systems engineering processes applied to NASA's space development, with various exercises.
授業計画		テーマ　内容 1. SE: NASA's SE Fundamentals & Program/Project Life Cycle 2. SE: System Design Processes 3. SE: Product Realization Processes 4. SE: Technical Management & Selected Crosscutting Topics 5. PM: Overview of NASA's Program & Project Management 6. PM: Project Planning and Control 7. PM: WBS and Schedule Management 8. PM: Cost and Risk Management
授業の進め方		Lectures are given by oral presentation with lecture materials provided before each lecture. Language is English. Face-to-face presentation is a baseline, but some lectures could be given remotely. Space Systems Engineering II includes excercise experiences through assignments in lectures to develop practical experiences.
授業方法および授業形態		【授業方法】 講義、演習（一部） 【授業形態】 対面のみ 【Teaching Methods】Lectures, Seminars (Partially) 【Course Formats】Face-to-Face only
授業の達成目標	授業の達成目標の解説）	The goal of the two courses, Space Systems Engineering I & II, is to train students to be able to design, propose, and implement space missions. In particular, the goal of Space Systems Engineering II includes:
	具体的な授業の達成目標	1. To understand mission realization processes and their engineering management, including project management and systems enginnering applied to space development 2. To practice applied project management and systems engineering processes for space to be able to start and implement space missions
成績評価の基準および評価方法		Attendance at lectures and submission of assignments
成績評価の基準および評価方法の詳細		Attendance 50%, assignments 50%
授業外学習（予習・復習）の指示		Download and study lecture materials. Students are expected to study for 2 hours per one lecture, in addition to the lecture itself.
予習時間の目安		2 hours per week
キーワード		Space Mission, Space System, Space System, Spacecraft Design, Satellite Design, Engineering Management, Project Management, Systems Engineering, Safety and Mission Assurance
教科書		No textbook is assigned for this course. Lecture materials (mainly presentation files) are provided via Moodle prior to each lecture. For the following materials, only internet links are provided: 1. NASA Space Flight Program and Project Management Handbook, NASA/ SP-2022-9501, 2022. 2. NASA Sysetems Engineering Handbook, Rev.2, NASA/SP-2016-6105, Rev.2, 2017. 3. Expanded Guidance for NASA Systems Engineering, Vol. 1: Systems Engineering Practices, NASA/SP-2016-6105-SUPPLE, 2016. 4. Expanded Guidance for NASA Systems Engineering, Vol. 2: Crosscutting Topics, Special Topics, and Appendices, NASA/SP-2016-6105-SUPPLE, 2016.
参考書		1. A Guide to the Project Management Body of Knowledge (PMBOK), 7th Edition, PMI, PMI, 2021. 2. Systems Engineering Handbook, 5th Edition, INCOSE, Wiley, 2023. Other references and recommended reading will be introduced during the leacture.
備考		Recommended prerequisite: "Introduction to Satellite Engineering" and "Space Systems Engineering I"
電子メールアドレス		To be provided in the first lecture.