Grading Rubric for the Mission Concept Review Presentation

Topic	Expected content	Grade 1	2	3	4	5	6
Mission statement (weight = 20%)	**Goal(s)**	Goal is not mentioned	Goal is very vague or unclear	Goal is mentioned but unclear or mixed up with objectives	Goal is mentioned clearly, but not fully SMART	Goal is SMART	Goal is well thought-through (argued or supported by research gaps)
	Mission & Objectives	Mission & Objectives are not mentioned	Mission & Objectives are unclear	Either the mission, or the objectives have been mentioned. Not both	The mission and the objectives have been described	The mission is clear and the objectives are SMART	The mission fills a clear research gap or customer demand and the objectives flow down well from the Goal(s) and customer demands
Mission design (weight = 25%)	**Preliminary CONOPS**	CONOPS is not mentioned	CONOPS is unclear or vaguely discussed	Only some aspects of the preliminary CONOPS is mentioned	The preliminary CONOPS is discussed	All the early stage choices of the Preliminary CONOPS are clearly mentioned	The Prelliminary CONOPS is clearly argued and flows down from the system engineering. It is clear that some initial reflections have been made on what could be critical mission phases.
	Mission duration & Potential Launch Windows	The mission duration is not mentioned	The mission duration is unclear or vaguely mentioned	The mission duration is only shown but not discussed	The mission duration is shown and mentioned	The mission duration is mentioned. Some arguments for the mission duration are given	The mission duration is clearly discussed and flows down form customer requirements and engineering trade-offs
Systems engineering (weight = 30%)	**Top-level functionality**	Top-level functionality is not mentioned	Vague top-level functionality is shown or mentioned	The top level functionality has not been well thought through, but is presented	Top level functionality of the space mssion has been presented clearly	The discussed mission's top-level functionality follow from, amongst others, customer requirements	The top-level functionality flows from a functonal breakdown or other system engineering tool. Special care has been put into explaining the reasoning behind certain functions, linking them with mission phases, customer requirements or other relevant aspects.
	Preliminary mission (high-level) requirements	The (high-level) requirements are not mentioned	Some requirements are mentioned, but they are not formulated in the correct way or clearly lack a reasonning	The preliminary high-level requirements are mentoned but are not formulated in the correct way	The key preliminary requirements are given and are mentioned. They are written in the correct way (i.e. using the verb " shall")	Most of the preleminary requirements are SMART. The link with the functional breakdown is clear. A good reasoning for them is shown.	All requirements are SMART. They clearly follow from the functional analysis (i.e. functional breakdown). Initial reflections are made with respect to which requirements may drive the design the most (i.e. which requirements are most stringent).
	Mission constraints and limitations (environment)	Mission constraints and limitations are not discussed	A very vague discussion of mission constraints due to the spacecraft's environment is given	Some mission constraints and limittations are given, but the link with the spacecraft environment is mission. Or, the spacecraft environments are mentioned, but its consequences for the mission are not discussed	Key mission constraints and limitations are given and linked to the spacecraft's environments	Clear research on the spacecraft envronments throughout its life cycle has been shown. The essential mission constraints and limitations have been distilled from them.	The key mission constraints and limitations, backed by good research on the spacecraft's environments, are associated to the choice of the conceptual solution, if relevant, and are translated into preliminary requirements.
	Mission sucess criteria and measures of success	No success criteria or measures of success are mentioned	Unclear what the mission success criteria are or how the success is to be measured.	Mission success criteria do not follow logically from mission functions and requirements	Mission success criteria are clearly mentioned and logical	Mission success criteria and measures of success are SMART and logical	The link between mission success and measures of success, and the functional breakdown and requirements is discussed clearly.
Mission architecture (weight = 15%)	**Alternative conceptual solutions**	No alternative conceptual solutions ae mentioned	One or more alternative conceptual solution(s) are presented. No relevant detail is given on them or they are only quickly mentioned.	Only one alternative conceptual design is mentioned and its implicatons for the choice of the final mission concept is discussed	More than one alternative conceptual designs are mentioned. Sufficient information is given on them to support the final mission concept choice	A clear trade-off is performed between each conceptual solutions, using at least one of the trade-off methodologies given in the lectures.	The alternative conceptual solutions are presented with preliminary implications for budgets and mission duration. The trade-off was clear, using amongst others quantifiable parameters that are relevant for the chosen mission.
	Payload components	No payloads have been mentioned	Some payloads have been mentioned in a very vague and unclear way	Payloads are discused without showng what they would be used for	The types of payloads needed for the mission and how they will fill the mission's functions are presented	Specifics on some of the payload types is given (e.g. some comparisons with existing payloads, some requirements, etc)	The chosen payloads are dicussed clearly, with examples of comparable payloads in existing missions. If no identical payload can be found, one which resembles closest is highlighted (in terms of size, mass requirements). Else, estimated size, mass and/or power requirements are discussed. Initial reflection is provided on the payload which will likely require most research and development time
	Preliminary budgets	No preliminary budgets have been shown or mentioned	Some budgets have been show without further explanations	Budgets have been shown but no clear numbers have been presented	All relevant preliminary budgets have been shown and quantified	Preliminary budgets are given and are clearly linked with the preliminary high level functions.	Preliminary budgets are shown and linked to the overall systems engineering process (requirements, etc) and initial safety margins are shown and explained. The technical implications of the most critical budgets are mentioned.
	Preliminary risk assessment	No preliminary risk assessments have been made	A vague risk asessment has been done	A risk assessment has been shown, with little reasoning or link to research	A clear risk assessment has een made	The risk assessment has been made. The most critical risks have been highlighted	Besides making a preliminary risk assessment and highlighting the most critical risks, an early preliminary risk mitigation plan of at least the most critical risks are shown.
Presentation skill (weight = 10%)	**Presentation skill**	No presentation is given	The slides and presentation are given, but either (or both) the slides are messy or the presenters do not present clearly or know what to say	The presentation is understandable. If the presentation time is 30 seconds more than the allowed time, this grade will also be given	The presentation is well-structured and flowed nicely. The structure helps with getting the point accros and was made clear to the public at the start of the presentaton	Transitions (if any) between speakers were logical and smooth. A good body language is displayed by the presenter, as not to distract from the information they convey. The slides are not overcrowded with text and are appropriately designed.	The presentation is captivating and the slides folow good scientific practices (i.e. indicating the sources of statements and quotes, ensuring the figures are readable and all the axes are labeled, etc). There are no noticeable typos in the slides It is clear to the public at any point how far along the presenters are in their presentation and how long it may still last (e.g. through indicators on the slides showing the current section in relation to past and future sections)

The grade is calculated by rounding to the nearest quarter the outcome of the following formula:

Final grade = ROUND[Avg(Mission statement) * 0.2 + Avg(Mission design) * 0.25 + Avg(Systems Engineering) * 0.3 + Avg(Mission Architecture) * 0.15 + Grade(Presentation Skills) * 0.1]

Note: "Avg" stands for "Average" and is composed of the average grade of a given topic