ATTITUDE DETERMINATION & CONTROL

select attitude control concept	1a	2009 - April
dumping of Angular momentum, calculate force	1b	2009 - April
PD control law - P control law	1c	2009 - April
Graph of attitude vs time	1d	2009 - April
minimum thrust force	4a	2008 - March
effect of gravity gradient disturbance torque	4b	2008 - March
can gps or galilieo determine attitude of Iss	4c	2008 - March
thrust needed/ angular momentum	5a	2008 - January
calculate torque needed	5b	2008 - January
discuss stability of attitude	5c	2008 - January
maximum distubance torque gravity gradient	2a	2007 - February
can it be used?	2b	2007 - February
how long does slew manouvre take	2c	2007 - February
draw PD control system	2d	2007 - February
possible only to have gyroscopes as sensors?	2e	2007 - February
force needed to dump angular momentum	3a	2006 - April
equation of PD control law	3b	2006 - April
what criteria apply to make closed loop system stable	3c	2006 - April
draw block diagram for pitch axis closed loop system	3d	2006 - April
5 controlers to be investigated/analysed: find best controler	2	2005 - April
mass moment of inertia	4a	2005 - January
rotational rate about x-axis	4b	2005 - January
rotational rate after deployment	4c	2005 - January
maximum distubance torque on the spacecraft	4a	2003 - August
torque needed to allow the slew maneuver	4b	2003 - August

STRUCTURES & MECHANISMS

Structures - why factor of savety	3a	2009 - April
lowest natural frequency	3b	2009 - April
expected vibrations during launch	3c	2009 - April
Overall sound pressure level	3d	2009 - April
design loads for antena/solar array/box/complete spacecraft	5a	2003 - August
function of payload adapter	5b	2003 - August
discussion on lowest natural frequency	5c	2003 - August
calculate second moments of area	5d	2003 - August
calculate natural frequencys	5e	2003 - August

THERMAL CONTROL/THERMAL DESIGN

thermal conductivity	1a	2009 - January
ratio alpha/epsilon of radiator coating	1b	2009 - January
solar reflection factor of SC	1c	2009 - January
maximum fraction of each element covered by SC if...	1d	2009 - January
solar radiant flux density	5a	2007 - February
maximum temperature of the foil	5b	2007 - February
what uncertanty margines in thermal analysis?	5c	2007 - February
ratio of alpha/epsilon with uncertainty margin	5d	2007 - February
effective radiative coupling of reflector dish to space	1a	2006 - April
effective solar absorptance	1b	2006 - April
establish heat balance/ calculate temperature	1c	2006 - April
maximum temerature of dish	1d	2006 - April

define optimum thermal layout of bottom surface/justify design	3	2005 - April
heat balance/ investigate feasibility from thermal point of view	1a	2005 - January
draft a thermal network	1b	2005 - January
conduction	1c	2005 - January
radiative couplings to space	1d	2005 - January
linearise conductive coupling to radiative coupling	1e	2005 - January
power absorbed	1f	2005 - January
temperature	1g	2005 - January
temperature	1h	2005 - January
gradient	1i	2005 - January
heat flow into tank	2a	2004 - January
hat flow into payload module	2b	2004 - January
which is another important heat flow?	2c	2004 - January
total heat flow into payload module	2d	2004 - January
evaporation rate of helium	2e	2004 - January
how many days until helium is evaporated	2f	2004 - January
any ideas of significant impove of the thermal design?	2g	2004 - January
solar absorptivity at 25 °	6a	2003 - August
solar absorbtivity at 150°	6b	2003 - August
fraction of OSRs and fraction of solar cells on solar array	6c	2003 - August
tilt angle to keep temperature at 150°	6d	2003 - August
thermal design of the illuminated panel side edge	6e	2003 - August

COST RISK RELIABILITY

calculate SE	5a	2009 - April
RDT&E and TFU	5b	2009 - April
fullfils required reliability with probablilty of 90%?	5c	2009 - April
determine reliabiity	5a	2009 - January
discuss the assumption of constant failure rate	5b	2009 - January
system reliabiity	5c	2009 - January
determine standard error	5a	2008 - March
calculate total cost	5b	2008 - March
average cost price of single unit	5c	2008 - March
mean time to failure	7a	2008 - January
probablity of 15 week survial	7b	2008 - January
discuss two approches to increase reliability	7c	2008 - January
determine availibility	7d	2008 - January
Standard error for summed RDT&E cost	5b	2007 - March
average time to build 5 spacecraft	5d	2007 - March
mean time to failure	4a	2007 - February
reliability of this computer system	4b	2007 - February
calculate percentage margin	4c	2007 - February
average time to build spacecraft	4d	2007 - February
calculate standard error	4e	2007 - February
various reliabilities to ensure total reliability of 0.9	5a	2006 - April
failure rate pf power subsystem	5b	2006 - April
reliability of propulsion subsystem	5c	2006 - April
reliability of subsystem/ ...	5d	2006 - April
reliability of subsystem/ ...	5e	2006 - April
MTTF for structure subsystem/minimum test length	5f	2006 - April
reliabilty of solar cell/blocking diode	3a	2005 - January
reliability of single string	3b	2005 - January
reliability of single solar panel	3c	2005 - January
probability of successful deployment	3d	2005 - January

probability of successfull power provision	3e	2005 - January
discuss effect of solar cell open circuit failure	3f	2005 - January
probability of successfull power provision two more strings	3g	2005 - January
total mission cost	3a	2003 - August
probability of complete success	3b	2003 - August
associated risk	3c	2003 - August
overall launch success probability	3d	2003 - August
do 3d again with other data	3e	2003 - August

COMMAND AND DATA HANDLING /TELECOMMUNICATIONS

data volume	2a	2009 - January
free space loss	2b	2009 - January
required transmit power	2c	2009 - January
data volume of panoramic photo	1a	2008 - January
data volume of temperature set	1b	2008 - January
gain of transmitting antenna	2a	2008 - January
what is free space loss	2b	2008 - January
calculate transmitt power	2c	2008 - January
data volume	2a	2009 - April
free space loss	2d	2009 - April
Eb/No (given free space loss)	2e	2009 - April
Eb/No (increasing distance)	2f	2009 - April
Calculate gain of helix antenna	2a	2007 - March
Calcualte free space loss	2b	2007 - March
calculate Eb/N0	2c	2007 - March
How much DC input power can be saved using BPSK	2d	2007 - March
calculate required data rate	3a	2007 - February
calculate required bandwidth	3b	2007 - February
determine space loss	3c	2007 - February
transmitter power	3d	2007 - February
signal round trip/ accuracy in time	4a	2006 - April
diameter of antenna foot print area	4b	2006 - April
power density at earth surface	4c	2006 - April
power received back by the spacecraft	4d	2006 - April
minimum data rate	1a	2005 - April
link budget at height of 500km	1b	2005 - April
distance from earth when satellite in geometric horizon	2a	2005 - January
space loss at geometric horizon	2b	2005 - January
space loss right above ground station	2c	2005 - January
link budget Eb/N0 right above ground station	2d	2005 - January
Data rate of transmission link with intermediate steps	5	2004 - January
number of bits needed for one pixel	5a	2004 - January
number of bits per second delivered by camera	5b	2004 - January
effects of convolutional encoding and reed solomon	5c	2004 - January
data rate a maximum distance	1a	2003 - August
estimate total amount of databits received	1b	2003 - August
estimate amount of data without coding	1c	2003 - August

PROPULSION

exhaust velocity (solar photovoltaic)	4b	2009 - April
characteristic exhaust velocity (solar photovoltaic)	4c	2009 - April
propellant mass + photovoltaic system mass ?	4d	2009 - April

calculate total mass of kick stage	4a	2009 - January
estimate mass moments	4c	2009 - January
List&discuss adv/disadv of liquid hydrogen as prop	6a	2008 - January
thrust level&total operation time for lunar transfer	6b	2008 - January
estimate propellant tank volume	6c	2008 - January
Mass of propellant	1a	2007 - February
Required hydrogen tank volume	1b	2007 - February
collector frontal diameter	1c	2007 - February
hydrogen temperature for true exhaust velocity of..	1d	2007 - February
thrust efficiency	1e	2007 - February
size of spherical pressure tank	4e	2006 - January
true exhaust velocity	4f	2006 - January
what is electro thermal rocket propulsion	5a	2005 - January
thrust needed to provide for attitude control	5b	2005 - January
nozzel pressure ratio needed to obtain certain exhaust velocity	5c	2005 - January
effective exhaust velocity in vacuum	5d	2005 - January
power to raise mass flow rate to required temperature	5e	2005 - January
jet power /discuss difference with calculated power in e	5f	2005 - January
propellant mass	2a	2003 - August
thrust duration	2b	2003 - August
optimum exhaust velocity	2c	2003 - August
total power needed for thrusters	2d	2003 - August
discuss effect of too less power on exhaust velocity	2e	2003 - August
discuss if ion engine is able to change exhaust velocity	2f	2003 - August

DESIGN AND SIZING OF SATELLITE BUS

empty vehicle mass	4a	2009 - April
propellant mass + photovoltaic system mass ?	4d	2009 - April
calculate total mass of kick stage	4a	2009 - January
estimate SC mass with margins	4b	2009 - January
estimate mass moments	4c	2009 - January
determine mass moment of inertia	1a	2008 - March
discuss steps to generate first mass budget	1b	2008 - March
discuss adv/disadv of cylindycal shape	1c	2008 - March
total propellant mass for transfer stage	4a	2008 - January
remaining mass in moon rover vehicle	4b	2008 - January
set up mass budget	4c	2008 - January
Mass of propellant	1a	2007 - February
Required hydrogen tank volume	1b	2007 - February
collector frontal diameter	1c	2007 - February
hydrogen temperature for true exhaust velocity of..	1d	2007 - February
thrust efficiency	1e	2007 - February
set up mass budget taking design margin into account	5a	2005 - April
Calculate SE for mass of all subsystems	5b	2005 - April
Mass of water tank	5c	2005 - April

ELECTRICAL POWER SUPLY

required power from solar aray	2a	2008 - March
required solar aray area	2b	2008 - March
mass of EPS	2c	2008 - March
area of solar array	3a	2008 - January
mass of solar aray/power system/space craft	3b	2008 - January

battery capacity	2b	2009 - April
mass of battery (given capacity)	2c	2009 - April
determine duration of daylight and eclipse period	3a	2007 - March
minimum power provided during daylight	3b	2007 - March
required array area	3c	2007 - March
required battery capacity	3d	2007 - March
required battery capacity	3e	2007 - March
solar panel area	2a	2006 - April
mass of solar panel	2b	2006 - April
power to be delivered by battery during eclipse	2c	2006 - April
battery energy storage capacity	2d	2006 - April
volume and mass of battery	2e	2006 - April
solar panel area including intermediate steps	3	2004 - January
battery power during eclipse	4a	2004 - January
depth of discharge	4b	2004 - January
energy storage capacity in Wh	4c	2004 - January
mass and volume of battery	4d	2004 - January

SPACECRAFT SYSTEMS ENGINEERING		
SMART	3a	2009 - January
which delta v is needed	3b	2009 - January
calculate data rate	3c	2009 - January
required storage capacity/required bit rate	3d	2009 - January
Sum of RDT&E cost	5a	2007 - March
Standard error for summed RDT&E cost	5b	2007 - March
Prppellant tank mass	5c	2007 - March
average time to build 5 spacecraft	5d	2007 - March
mean time to failure	4a	2007 - February
reliability of this computer system	4b	2007 - February
calculate percentage margin	4c	2007 - February
average time to build spacecraft	4d	2007 - February
calculate standard error	4e	2007 - February

SPACE MISSION CONCEPT EXPLORATION		
advantages/dsadvantages of different flight trajectories	8a	2008 - January
discuss possibility of direct two way communcicatin	8b	2008 - January

EARTH OBSERVATION		
wavelength of frequency	4a	2007 - March
3db beam width	4b	2007 - March
radius of instantaneous coverage	4c	2007 - March
signal round trip/ accuracy in time	4a	2006 - April
diameter of antenna foot print area	4b	2006 - April
power density at earth surface	4c	2006 - April
power received back by the spacecraft	4d	2006 - April