

ASTRONOMY 153 – Moons and Planets – (REM) Syllabus

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Email Office hours: Mon through Fri 1 to 5

Keep checking UVM Blackboard for course updates

Purpose: Explore the most recent findings in our planetary system and others

Prerequisite: Astronomy 05, Math 10 or permission

Course Structure: Lectures will be presented online. Possible topics are listed below. The exact format of the classes will depend on class size.

Possible Topics List:

- 1- Definitions of life in the broadest sense
- 2- Necessary environments for life; habitable zones
- 3- Bode's Law – cause and effect, or merely coincidence?
- 4- Sun's angular momentum problem, and possible solutions
- 5- Deriving Earth's Lagrange points
- 6- Where did Earth's water come from?
- 7- Water ice in the solar system
- 8- Were Earth's mass extinctions and ice ages astronomical in origin?
- 9- What causes the length of the day to change?
- 10- Our lopsided moon – why the lunar Maria and "Mascons"?
- 11- Origins of the solar system the moons
- 12- Details of the 1960s radar measurements of Venus' rotation
- 13- What started the runaway greenhouse effect on Venus?
- 14- Could life exist in the atmosphere if Venus?
- 15- Terraforming Venus and Mars
- 16- How did Mars lose most of its atmosphere?
- 17- Possibilities for life on Mars – past and present
- 18- Why is there an inner asteroid belt?
- 19- Ceres details from the Dawn mission (+ Bennu flyby?)
- 20- Does Europa have oceans, and could they harbor life?
- 21- Details of Titan – could it host life? (& recent dust storm)
- 22- The water geysers on Enceladus – could it host life?
- 23- Rate of loss of Saturn's rings
- 24- Saturn's polar hexagon
- 25- The tilted axis of Uranus – how did that happen?
- 26- Why does Neptune's orbit cross Pluto's?
- 27- Theories for Tritan's retrograde orbit
- 28- Pluto and Charon from New Horizons
- 29- Ultima Thule from New Horizons
- 30- The search for Earthlike exoplanets (not methods of discovery)
- 31- Detecting exomoons
- 32- Commercial mining of asteroids
- 33- How we can avoid an asteroid or meteoroid collision
- 34- The SETI program
- 35- Tabby's star
- 36- Evidence for and against Planet X
- 37- Oumuamua
- 38- The Heliopause from Pioneers and Voyagers
- 39- Earth's volcanoes and the history of the solar system

Recommended Text: Websites

Grade Structure:

13 weekly assignments – 6% each

Final assignment – 22%

Assignments will consist of multiple choice problems posted on Blackboard