

BSC 101  
Fundamental Concepts in  
Biology

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# BSC 101 – Fall 2007

- 3 Credit Hours
  - 2 hours lecture
  - 2 hours lab
- Enrollment – 1218
- Lecture sections – 4
  - 380
  - 216
  - 383
  - 239
- Lab sections –
  - 51

# Gender Distribution

- I am a \_\_\_\_\_ student.
  - Female 732 66.6%
  - Male 362 32.9%

# Class Standings

- I am a \_\_\_\_\_ student.
  - Freshman      876    79.7%
  - Sophomore    133    12.1%
  - Junior         49     4.5%
  - Senior         32     2.9%
  - Other           6      0.5%

# Majors

- My major is in \_\_\_\_\_.
  - Sciences (includes health sciences, technology, and nursing) 146 13.3%
  - Social Sciences 107 9.7%
  - Humanities or Fine Art 96 8.7%
  - Education 332 30.2%
  - Business or others 413 37.6%

# ACT Scores

- My ACT score is \_\_\_\_\_.
- 31 and above      17      1.5%
- 26 to 30            283    25.8%
- 21 to 25            686    62.4%
- 20 and below      100     9.1%

# Grade Expectation

- I expect a grade of \_\_\_\_\_ in this class.
  - A            273   24.8% -- 22.8%\*
  - B            543   49.4% -- 45.5%\*
  - C            227   20.7% -- 19.5%\*
  - D            19     1.7% -- 5.8%\*
  - F            2     0.2% -- 6.4%\*
- \*Actual grade distribution

# Effort

- My level of effort in this course is

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– High	524	47.7%
– Medium	469	42.7%
– Low	66	6.0%



# Effort versus Outcome

- My grade is \_\_\_\_\_ of the effort that I put into the course.
  - Highly reflective      258    23.5%
  - Reflective                637    58.0%
  - Not reflective            161    14.6%

# Interest in Science Programming

- I \_\_\_\_\_ watch biology/science programs, such as NOVA, Nature, National Geographic, on television.
  - Regularly 80 7.3%
  - Frequently 241 21.9%
  - Rarely 521 47.4%
  - Never 254 23.1%

# Interest in Science News

- I \_\_\_\_\_ read news on biology/science in newspaper and magazine.
  - Regularly      19      1.7%
  - Frequently    91      8.3%
  - Rarely        622    56.6%
  - Never         360    32.8%

# Why taking college biology?

## Your place in the universe as a unique, intelligent organism

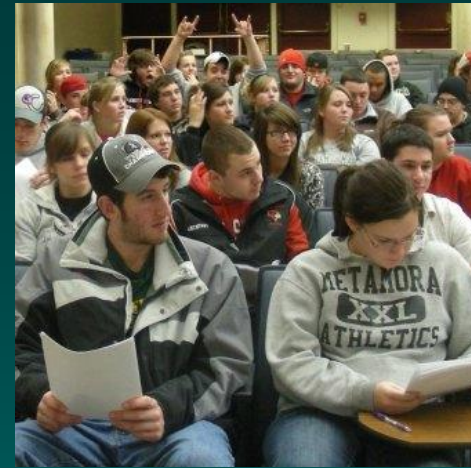


# Human Individuality



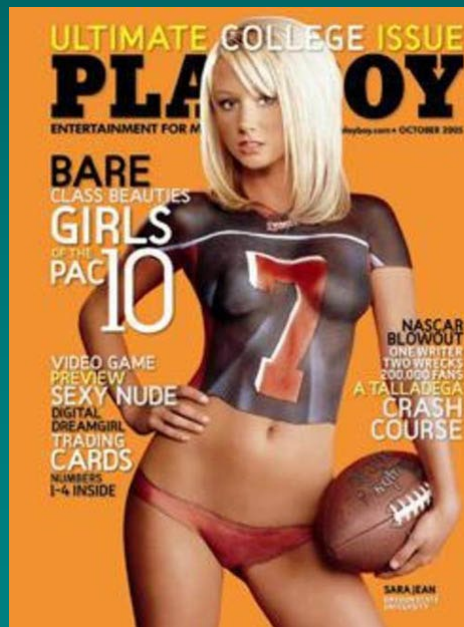
# Your Individuality

- World population
  - 6.8 billion
- Humans ever lived
  - 110 billion
- Minimum odd for genetic identicalness
  - 1 in 70 trillion



# Are you sexy?

- Sex determination
  - Biological processes
  - Genetic mechanisms
- Gender
  - Nature versus nurture
- Sexual attraction
  - Universal factors
  - Fertility signals
- Why sex?
  - Significance of sexual reproduction



# Does Race Exist?

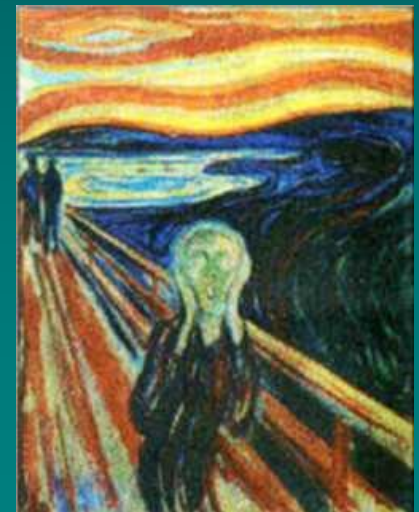
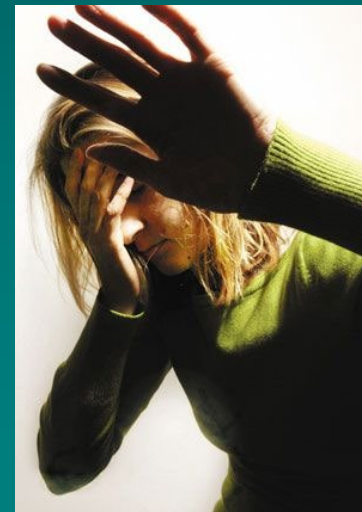
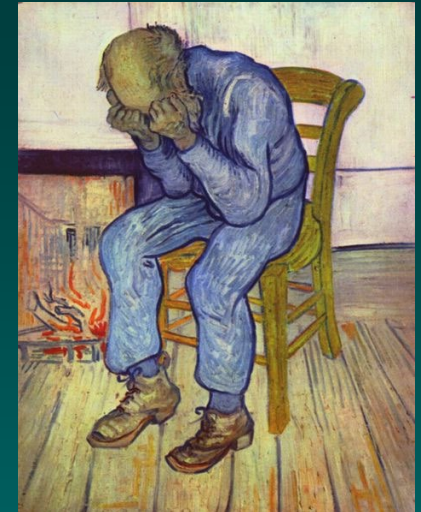
- Race versus ethnic differences
  - Biological variations
  - Cultural differences
- Human adaptations
  - Skin color
  - Facial features
  - Body types
  - Temperament
  - Abilities





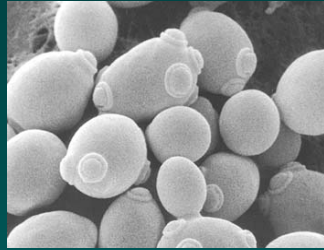
# Biological Basis of Emotion

- Mood disorders
- Depression
  - Normal
  - Clinical
- Bipolar
  - Manic phase
- Schizophrenia
- Alzheimer's disease
- Autism



# Why do you get hooked?

- Addiction
  - Cigarette
  - Alcohol



Yeast



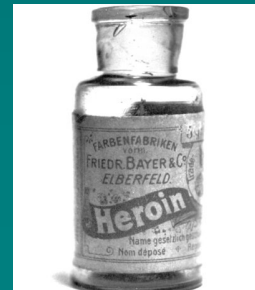
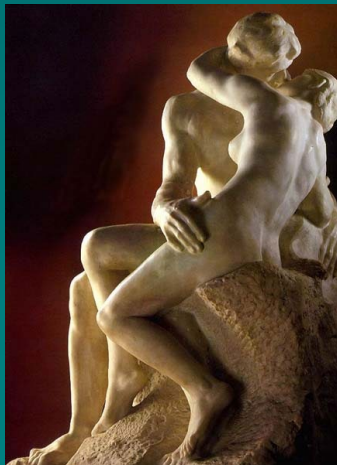
Tobacco plant



- Substance abuse
  - Heroin
  - Cocaine
  - Methamphetamine



- Love



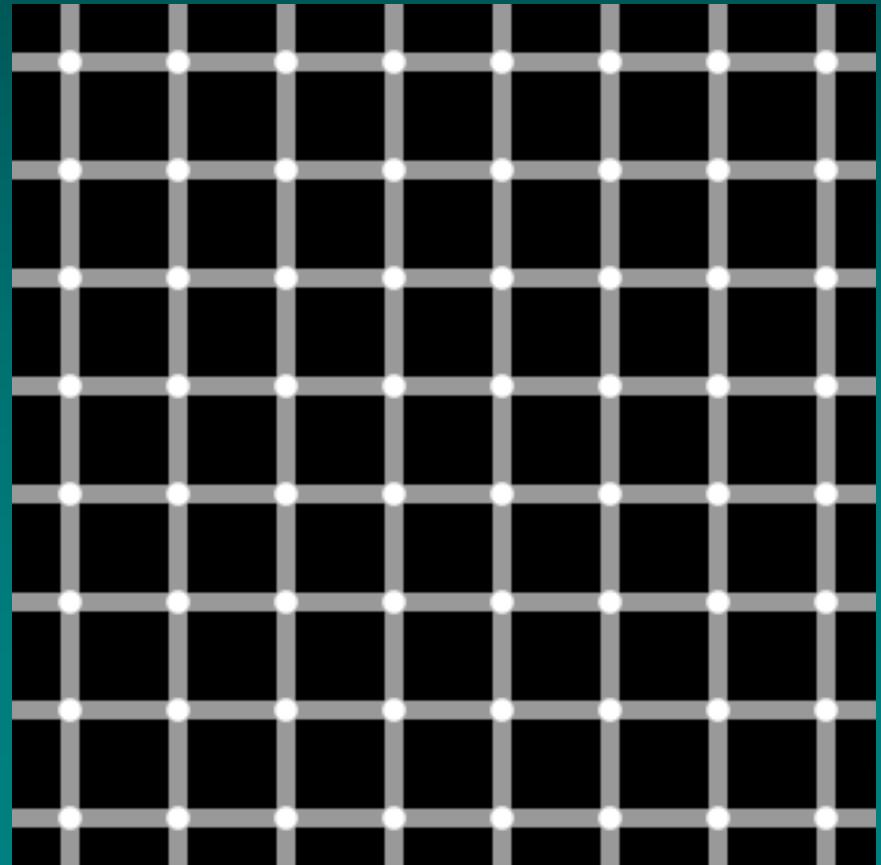
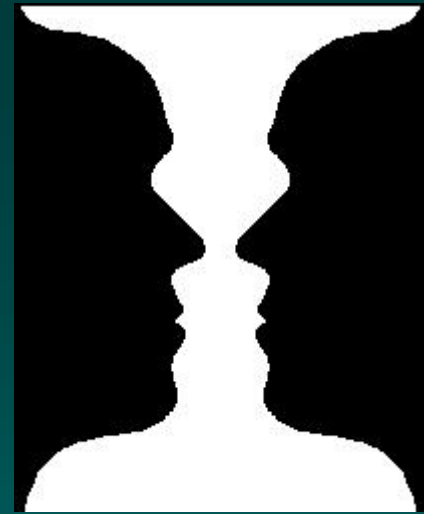
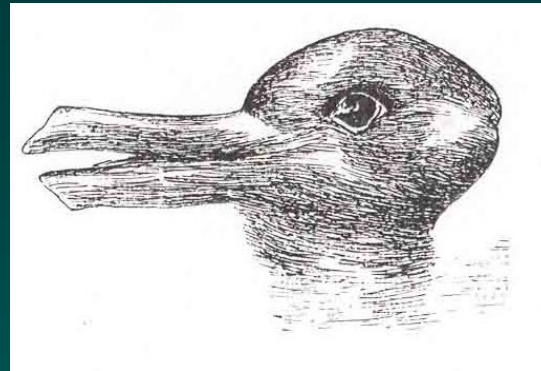
Opium Poppy

# Cocaine Addiction



# Perception and Creativity

- Perception
  - Visual images
    - Eye
    - Brain structure and function
- Creativity
  - Imagination
  - Hallucination
    - Biochemistry
      - LSD
      - Psychedelic mushrooms

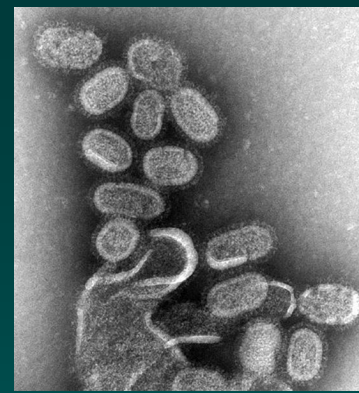


Amanita Mushroom

# Commonality of Life

- Interconnectivity

- Viruses
- Bacteria
- Fungi
- Plants
- Animals



Influenza virus



Ebola virus



Salmonella bacteria



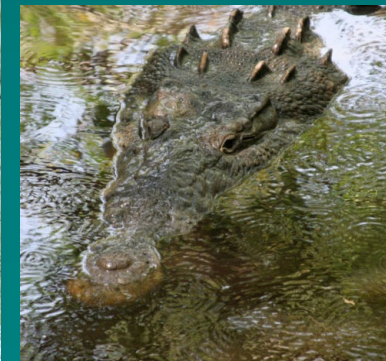
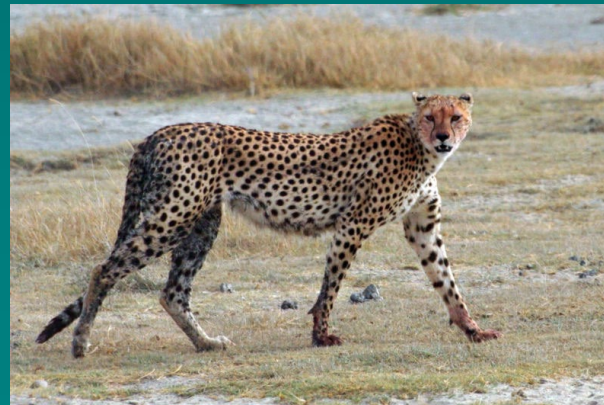
Moon Jelly



Tape worm

- Common origin

- Diversity



# Crocodile Hunting



# Diversity

- Artificial Selection
  - Inbreeding
    - Agriculture
    - Livestock
    - Dogs
    - Cats
- Natural Selection
  - Evolutionary arms race
    - Predator vs prey
  - Cooperation



A cheetah consuming a gazelle



Termite Mount

# Cycles

- Cycle of Life
  - Birth
  - Growth
  - Reproduction
  - Aging
  - Death
- Reproductive cycles
  - Menstrual cycle
- Diurnal cycles
  - Circadian rhythm
- Seasonal cycles





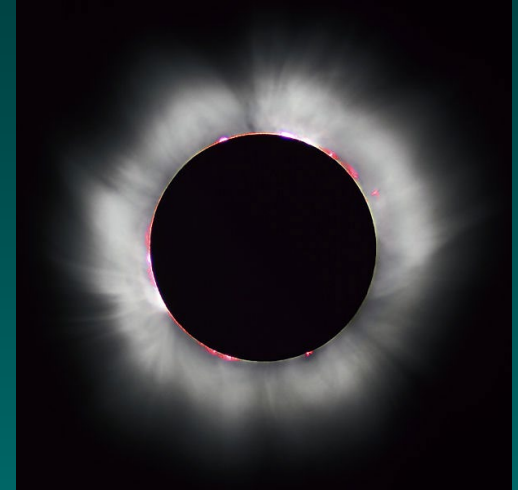
# Earth's Seasons Explained

# Environment for Life

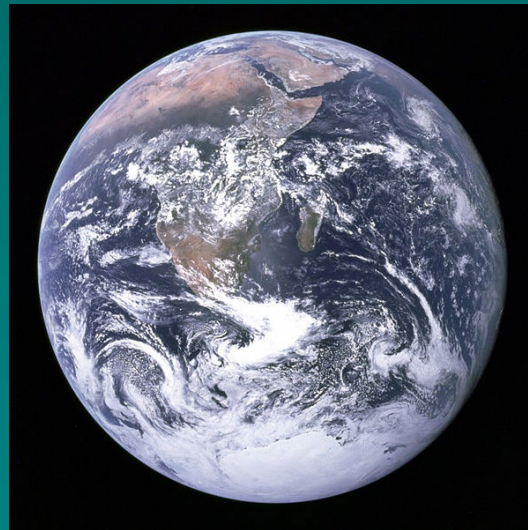
- Energy
  - Solar energy
- Climate
  - Precipitation
  - Temperature
  - Pressure
- Gravity
- Solar System
  - Origin
  - Formation



Sun



Solar Eclipse



Mars

# Chemistry of Life

- Chemical processes of life
  - Enzymes
  - Organic molecules
  - Carbon-based life
  - Food web
- Energy transformation
  - Photosynthesis
  - Growth
    - Building life
  - Behavior



# Extraterrestrial Life

- Space Exploration
  - Apollo Moon landing
  - Mars Exploration Rovers
  - Voyager spacecrafts
- Possible life forms
  - Simple life
  - Intelligent life
    - SETI



Apollo Moon Landing



Mars Exploration Rover



Voyager 2 passing Saturn

# Four Course Components

Your individuality

Your biological nature

Your intelligence

Your physical entities



Your place in the universe as a unique intelligent organism

# Attitudes Toward Biology/Science

- Before taking this course, my attitude toward biology/science is \_\_\_\_\_.

– Highly positive	87	7.9%	
– Positive	394	35.9%	- 44%
– Indifferent	431	39.2%	
– Negative	149	13.6%	
– Highly negative	35	3.2%	

- After taking this course, my attitude toward biology/science is \_\_\_\_\_.

– Highly positive	122	11.1%	
– Positive	546	49.7%	- 60.8%
– Indifferent	322	29.3%	
– Negative	81	7.4%	
– Highly negative	25	2.3%	

# Relevance of Biology/Science

- Before taking this course, I find biology/science to be \_\_\_\_\_ in my life.
  - Highly relevant 91 8.3%
  - Relevant 575 52.3% - 60.6%
  - Indifferent 344 31.3%
  - Irrelevant 85 7.7%
- After taking this course, I find biology/science to be \_\_\_\_\_ in my life.
  - Highly relevant 329 29.9%
  - Relevant 601 54.7% - 85.6%
  - Indifferent 143 13.0%
  - Irrelevant 21 1.9%

# Biology/Science on Society

- My understanding on the impact of biology/science on the society and culture has \_\_\_\_\_ after taking this course.
  - Changed significantly 217 19.7%
  - Changed 722 65.7%
  - Remained unchanged 156 14.2%



# Understanding of Science News

- My ability to understand biological/scientific issues in the news has \_\_\_\_\_ after taking this course.
  - Significantly improved 173 15.7%
  - Improved 652 59.3%
  - Remained the same 271 24.7%

# Understanding of Evolution

- My understanding of evolution has \_\_\_\_\_ after taking this course.

– Significantly improved	223	20.3%
– Improved	566	51.5%
– Remained the same	304	27.7%

**Describe one piece of information that you have learned in this course to be most significant to you. Explain the reasons.**

- *Your place in the universe as a unique, intelligent organism*
  - Individuality – 141
  - Intelligence – 59
  - Organism – 38
  - Universe – 60
- The other responses that did not fit the above categories were:
  - All – 12
  - No Comments – 38

# Comments on Individuality

- The one piece of information that has been the most significant to me is individuality. It was amazing how different we are compared to every one else in the world. I believe the 1 in 70 trillion will actually mean something to me from now on. I also think that because the universe is so never ending that even then individuality will play a significant role because there are others like us out there.

# Comments on Intelligence

- The most significant piece of information I learned about in Bio 101 would have to be the lectures involving addiction and disorders. I found these incredibly fascinating as I could relate what I learned back to personal family experiences. By learning in depth about the causes and effects of drugs and diseases on your body, it gave me a reason to have hope for people I know or to at least help.

# Comments on Organisms

- The Darwin's hawk moth, there is actually a flower that hides its nectar so far down the moth had to adapt and change by making a tongue long enough to reach the nectar. But also very interesting is the fact the moth helps the flower reproduce the two species are working together in perfect harmony.

# Comments on Universe

- The whole universe section is extremely fascinating to me. From space exploration theories to the big bang theory. I'm completely captivated. This section has helped me understand who I am as a person and where I fit in this universe. I'm super excited to see what the next few years will be like with the space missions/exploration. I'm really pumped for the Voyager mission!!

# Textbook for the Course

