

Minnehaha Academy Upper School
AP/Honors Application Form
Advanced Placement Physics
Due Date: 2/16/17
Return to your current Science teacher

Student Name _____

Grade level in '17-'18 _____

AP Physics C is a Calculus-based Physics course. This course covers the typical 2 semester-long introductory Calculus-based Physics courses all Physics and Engineering majors would take their freshman year of college: **Newtonian Mechanics** and **Electromagnetism**. This also means that **there are 2 AP Physics C exams!** This class also contains a strong lab component. * *See attached sheet for a full outline of topics covered.*

Do you fulfill the listed prerequisites from the SIGNAL? YES NO

How many AP/Honors/CIS classes are you planning on being in next fall? 1 2 3 4+

YOU ARE EXPECTED TO CHECK YOUR MINNEHAHA EMAIL DURING THE SUMMER!

If you for some reason can't be reached at your MA email during the summer, please provide me with an email at which you can be reached.

Non-MA Email (if needed): _____

ESSAY

Write a one page, 1.5-spaced, 12-pt font essay explaining why you desire to be enrolled in this science course. You should also address your ability to handle heavy reading loads, diligence with homework and daily preparation, response to academic challenge, daily attendance and attendance for zero hour labs in your essay. Give specific examples where possible. In addition, describe your typical attitude and behavior during class, as well as the contributions that you can make to the class.

PARENT/GUARDIAN INPUT - Please initial one space.

_____ I wholeheartedly support my child's decision to apply for this course.

_____ I support my child's decision to apply but have misgivings about his/her course load and/or am concerned about my child "taking on too much" (academics, co-curricular activities, student council, church youth group, job, etc).

_____ I do not support my child's decision to apply for this course.

STUDENT & PARENT/GUARDIAN SIGNATURES

Please read the following statement and sign below. Unsigned applications will be discarded.

We, the undersigned, understand that upon completion of the essay and application form by the deadline the student will be considered for enrollment in the course by department members as directed by administration. We also verify that the essays were completed solely by the student.

(student signature/date)

(parent/guardian signature/date)

STUDENTS PLEASE FILL IN THE FOLLOWING INFORMATION:

SCIENCE COURSE GRADES

COURSE	SEMESTER 1	SEMESTER 2
_____	_____	_____
_____	_____	_____
_____	_____	_____

MATH COURSE GRADES

COURSE	SEMESTER 1	SEMESTER 2
_____	_____	_____
_____	_____	_____
_____	_____	_____

TEACHER EVALUATION: to be completed by current science teacher

Evaluate the student in the following areas. Write the corresponding point value in the adjacent blank provided. Sign your name and provide a final, overall recommendation.

_____ SCIENCE G.P.A. (High School Courses only)

<u>Points</u>	<u>Grade</u>	<u>% Achieved in course</u>
5	A	95 - 100
4	A to A-	90 - 94
3	B to B+	85 - 89
2	B- to B	80 - 84
1	C+	77 - 79

_____ BEHAVIOR (on time, focused, respectful, follows directions)

_____ ATTITUDE (likes challenge, motivated by learning)

_____ APTITUDE (will thrive in rigorous setting, is capable)

_____ WORK ETHIC (attends, completes work on time, asks for help when needed)

_____ ESSAY (accepts the challenges of this rigorous course)

_____ TOTAL POINTS

(teacher signature/date)

Recommendation: (circle one) Accept Probationary Acceptance Decline

Comments

Topics in AP Physics C

Content Area	Physics C
I. Newtonian Mechanics	50%
A. Kinematics (including vectors, vector algebra, components of vectors, coordinate systems, displacement, velocity, and acceleration) <ol style="list-style-type: none"> 1. Motion in one dimension 2. Motion in two dimensions including projectile motion 	9%
B. Newton's laws of motion <ol style="list-style-type: none"> 1. Static equilibrium (first law) 2. Dynamics of a single particle (second law) 3. Systems of two or more bodies (third law) 	10%
C. Work, energy, power <ol style="list-style-type: none"> 1. Work and work-energy theorem 2. Forces and potential energy 3. Conservation of energy 4. Power 	7%
D. Systems of particles, linear momentum <ol style="list-style-type: none"> 1. Center of mass ✓ 2. Impulse and momentum 3. Conservation of linear momentum, collisions 	6%
E. Circular motion and rotation <ol style="list-style-type: none"> 1. Uniform circular motion 2. Torque and rotational statics 3. Rotational kinematics and dynamics ✓ 4. Angular momentum and its conservation ✓ 	9%
F. Oscillations and gravitation <ol style="list-style-type: none"> 1. Simple harmonic motion (dynamics and energy relationships) 2. Mass on a spring 3. Pendulum and other oscillations 4. Newton's law of gravity 5. Orbits of planets and satellites <ol style="list-style-type: none"> 1. Circular 2. General ✓ 	9%
II. Fluid Mechanics and Thermal Physics	N/A
A. Fluid Mechanics <ol style="list-style-type: none"> 1. Hydrostatic pressure 2. Buoyancy 3. Fluid flow continuity 4. Bernoulli's equation 	
B. Temperature and heat <ol style="list-style-type: none"> 1. Mechanical equivalent of heat 2. Heat transfer and thermal expansion 	
C. Kinetic theory and thermodynamics <ol style="list-style-type: none"> 1. Ideal gases <ol style="list-style-type: none"> 1. Kinetic model 2. Ideal gas law 2. Laws of thermodynamics <ol style="list-style-type: none"> 1. First law (including processes on pV diagrams) 2. Second law (including heat engines) 	

III. Electricity and Magnetism	50%
A. Electrostatics <ol style="list-style-type: none"> 1. Charge and Coulomb's law 2. Electric field and electric potential (including point charges) 3. Gauss's law ✓ 4. Fields and potentials of other charge distributions ✓ 	15%
B. Conductors, capacitors, dielectrics <ol style="list-style-type: none"> 1. Electrostatics with conductors 2. Capacitors <ol style="list-style-type: none"> 1. Capacitance 2. Parallel plate 3. Spherical and cylindrical ✓ 3. Dielectrics ✓ 	7%
C. Electric circuits <ol style="list-style-type: none"> 1. Current, resistance, power 2. Steady-state direct current circuits with batteries and resistors only 3. Capacitors in circuits <ol style="list-style-type: none"> 1. Steady state 2. Transients in RC circuits ✓ 	10%
D. Magnetic Fields <ol style="list-style-type: none"> 1. Forces on moving charges in magnetic fields 2. Forces on current-carrying wires in magnetic fields 3. Fields of long current-carrying wires 4. Biot-Savart's law and Ampere's law ✓ 	10%
E. Electromagnetism <ol style="list-style-type: none"> 1. Electromagnetic induction (including Faraday's law and Lenz's law) 2. Inductance (including LR and LC circuits) ✓ 3. Maxwell's equations ✓ 	8%
IV. Waves and Optics	N/A
A. Wave motion (including sound) <ol style="list-style-type: none"> 1. Traveling waves 2. Wave propagation 3. Standing waves 4. Superposition 	
B. Physical optics <ol style="list-style-type: none"> 1. Interference and diffraction 2. Dispersion of light and the electromagnetic spectrum 	
C. Geometric optics <ol style="list-style-type: none"> 1. Reflection and refraction 2. Mirrors 3. Lenses 	
V. Atomic and Nuclear Physics	N/A
A. Atomic physics and quantum effects <ol style="list-style-type: none"> 1. Photons, the photoelectric effect, Compton scattering, x-rays 2. Atomic energy levels 3. Wave-particle duality 	
B. Nuclear physics <ol style="list-style-type: none"> 1. Nuclear reactions (including conservation of mass number and charge) 2. Mass-energy equivalence 	