

**Physics & Astronomy Articulation Committee Meeting Minutes**  
**2 May 2014**  
**North Island College, Courtenay, BC**

**Present:**

	<b>Name</b>	<b>Institution</b>	<b>Email</b>
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**1. Welcome by Dennis Lightfoot and Introductions**

**2. Approval of Agenda**

Moved: Mike Hasinoff (UBC-V), Seconded Richard Christie (Okanagan). Carried.

**3. Approval of 4 May 2013 Meeting Minutes**

Moved: Janusz Chrzanowski (Coquitlam), Seconded: James Brewer (BCIT). Carried.

**4. Matters arising from minutes**

Stan asked the members to look at the textbook list and send changes to him (don't worry about edition changes).

**5. Google group –**

Has not been heavily used, but is there for us to use.

**6. Confirmation of date & place of 2015 Meeting**

SFU - Burnaby on Friday, 1 May 2015.

Possibly Camosun or UNBC in 2016, to be confirmed at the 2015 meeting.

**7. Nomination and election of new articulation committee chair**

Stan Greenspoon will be retiring this summer after 26 years at Capilano U and 10 years of being chair of the articulation committee.

Arnold Sikkema (TWU) and Andy Selwood (VCC) were both nominated and accepted the nominations.

Andy Selwood (VCC) was elected chair.

**8. BCCAT issues and reports**

Check the outstanding transfers, attached to agenda. If you have outstanding transfer requests, contact your local Transfer Credit Contact (TCC) person at your registrar's office.

There was some discussion about the practice of transfer requests expiring after one year...Some courses are falling through the cracks.

There has also been confusion around courses being sent to the wrong department (ie. Engineering vs. Physics, or UBC-O vs. UBC-V). This is largely an internal bureaucratic issue, particularly at the receiving institutions.

**ACTION:** Notify BCCAT that TCC need to be aware of this issue, and must endeavor to send requests to the correct department.

## 9. Dealing with institutional budget constraints

Province wide prioritizing of K-post secondary programs is affecting all institutions. Capilano has lost the Computing Science department (while still maintaining some Computing Science courses) , and will likely lose the lab version of its Astronomy course .

UVic has streamlined its first-year physics offerings to make them run more efficiently (more students per class).

Camosun is investigating merging of related departments to reduce administrative costs.

A second year physics (geometric optics) course was discussed to be an attractive option for biology and chemistry students.

UBC has amalgamated algebra and calculus based courses to streamline first year. UBC also has passed a shared information policy, whereby all info that instructors post to UBC servers (course notes, assignments, quizzes, etc.) is considered UBC property, and may be used by colleagues (without consultation). After pressure from faculty, it is being implemented as an “opt in” policy instead of an “opt out”.

Okanagan College also has a new policy that any info on any machine is college property, but faculty members’ challenge has caused institution to back down for now. General fear is that institutions will use this policy to replace face-to-face courses with online or even MOOC’s to save money (but on the backs of faculty-developed, and copyrighted, materials.

An informal poll showed that about 25% of instructors use clickers in their courses.

There was much discussion of MasteringPhysics, and its use as a learning tool and the potential for cheating.

Potential for collaboration, or alternate year offerings was discussed.

Video conference between campuses was also discussed (within institution, and in collaboration with other institutions).

## 10. Roundtable reports/brief discussions of significant curriculum changes and associated issues

**See attached departmental reports appended to the minutes.**

Further notes from the discussions are summarized below.

BCIT is rewriting their labs to be MS Excel-based (UBC-V encourages students to use spreadsheets, but not necessarily Excel – but also journal the entries by hand, or hard copy from spreadsheet into journal). UBC-O first year labs are based on Excel- based templates.

Capilano is continuing its turnover of faculty with the retirement of Stan, and Stan brought to the attention of members of a regular part-time position (7/8 full-time) at Capilano. Please distribute to anyone qualified and potentially interested.

Columbia College presentation led to a general discussion of international students, and the new private colleges associated with the Universities (Vantage College at UBC, Fraser International at SFU, and UVic International). Students who do not have language skills to get into university pay to learn English and their subjects in an integrated manner before transitioning to UBC or SFU in year 2. Alexander College and Columbia have not noticed any affect of the big three universities entering their traditional market, as the demand is still large and increasing. Langara is also watching the universities, as they also benefit from international students.

Douglas College is using the open source textbook (Open Stax) College Physics for their algebra based course, and recommends it. This is one of the textbooks recommended by BC Campus. Partnered with Sapling Learning (like Mastering Physics), with links to e-version of text. Sapling cost to the student is about \$40 per semester, or \$60 per year, with 60 day refund and free access to the student if he/she fails the course. Kwantlen and Langara also use this text, and Kwantlen will be printing custom editions (around \$40 per copy), or students can use the free pdf's.

SFU noted that formal lab reports are no longer expected in first year courses. Instead, less formal journaling is used and focus is on the physics, not the report. What did you learn, and how does your data support what you found?

TRU introduced an open-ended type of video project to their first year physics, and will continue this year (but will reduce the number of labs to make the workload manageable for students). Arnold Sikkema will share some videos with the group.

UBC will be replacing PHY 153 (Physics for Engineers) with two lecture courses and one lab course. More thermodynamics is included, and geometric optics has been dropped. Lab grade is primarily based on a (practical, hands-on) lab exam, and a smaller proportion on a lab journal. Labs are done in pairs, but lab exam is an individual exercise. Labs are two-week exercises, which include design of the experiment – only given objective (Socratic method). There are only three main labs per term, after a number of tutorials on measurements, random errors, propagation of uncertainties, etc. Student reaction has been negative at the beginning of term, and positive at the end. This encourages creativity and problem solving. Mike Poon from Kwantlen argued that the Socratic method works best for a limited number of labs, with other more traditional lab exercises interspersed.

UFV has a new diploma (2 year mechatronics technologist).

UNBC will be introducing integrated labs (physics, chemistry, math) in 2015.

UVic has streamlined first-year physics, and now has September and January entry points. Enrolments are up.

VCC is working on engineering transfer to SFU (no new physics courses, but will affect enrolments).

**11. Afternoon discussion topics**

Richard Christie thanked our outgoing chair, Stan Greenspoon, for his years of service (overwhelming applause)

Camosun asked for feedback on coop programs – going up at UVic, UBC, which can cause issues with summer scheduling of courses.

Mike asked that email contact list for articulation meeting be sent to attendees.

**Adjournment** - ~ 4 p.m.

## DEPARTMENTAL REPORTS

### **Alexander College Physics Articulation Report North Island College, Courtenay, May 2, 2014**

Alexander College is a small private college that focuses primarily on foreign students who cannot get into the regular Provincial universities due to a lack of language and cultural skills. We have two campuses, one in Burnaby near Metrotown and the other in Downtown Vancouver opposite SFU Harbour Centre. We typically offer about 100 different courses with a combined enrollment of 1,000+ students.

Our general aim is to offer students a palette of first- and second-year courses along with intensive language training and small classes, where a large amount of personal attention is possible. The courses are designed to be at the academic standards of the corresponding introductory courses at SFU, UBC and UVic and, thus, to provide transferable credits to students who wish to gain entry to those institutions. We presently offer two-year “Associate” programs in Arts, Science, and Business, all of which include laboratory science requirements. We are in the process of developing a program of First-Year Engineering Transfer.

All Physics courses are offered at the Downtown campus in a dedicated classroom which can accommodate up to 16 students. Teaching is in studio format with full laboratory exercises. Typical enrollments in each course are 8—16 students, although we occasionally run with smaller enrollments in special circumstances.

Physics courses presently approved and on our books are:

Physics 100: Introduction to Physics

A one-semester preparatory course for students lacking physics background at the BC 12 level.

(Text: Knight, Jones, and Field, *College Physics*)

Note: Runs every semester; typically ~60% A+B grades for completing students.

Physics 101-102: Physics for the Life Sciences I and II

Two sequential one-semester algebra-based introductory physics courses for students concentrating in Biology and Chemistry.

(Text: Giancoli, *Physics: Principles with Applications*)

Note: Runs one cycle/year or less; typically ~50% A+B grades for completing students.

Physics 141-142: Engineering Physics I and II

I: Mechanics and Modern Physics

II: Electricity and Magnetism, Optics

Two sequential one-semester calculus-based introductory physics courses designed for science and engineering students.

(Text: Cummings, Laws, Reddish, and Cooney, *Understanding Physics*)

Note: Runs one cycle/year: typically ~50% A+B grades for completing students (low statistics!)

Physics 151-152-153: Our 3-course Engineering sequence, approved but not yet offered.

151: Mechanics for Engineers

(Text: Hibbeler, *Engineering Mechanics: Static and Dynamics*)

152: Oscillations and Waves, Fluids, Heat, and Thermodynamics

153: Electricity and Magnetism, Circuits, and Radiation

(Text: Knight, *Physics for Scientists and Engineers*)

## **BCIT Physics Department Report, 2014**

The BCIT Physics department has 10 full time faculty members, 3 technicians, and teaches around 1000 students in 17 different technologies. A summary of the courses taught by the BCIT Physics Department is attached.

A new astronomy course started in January 2014. This course is to provide the natural science elective needed for the Mechanical engineering degree program. Future offering of this course may be made available to students in other degree programs. There is a possibility that a Modern Physics elective will also be offered starting in 2015.

A large project was undertaken within the department to update the 60 lab write-ups such that lab data collection and analysis is undertaken with Excel. The students' response to using Excel for data collection and analysis has been very positive.

In common with most post-secondary institutes, BCIT is undergoing funding difficulties. At the moment it appears that none of the physics courses will be cut, but there is a possibility that one of the technicians will not be replaced upon retirement.

PHYSICS COURSE NUMBER	SCHOOL	TECHNOLOGY	TOTAL LECTURE HOURS	TOTAL LAB HOURS	CREDITS	LEARNING RESOURCES	TERM(S) S/S = Spring/Summer F = Fall W = Winter	INSTRUCTOR
0304	Computing & Academic Studies	Physics Part-time Studies	30	0	0	None	S/S	Frank DiSpirito
0309	Computing & Academic Studies	Physics Part-time Studies	73	20	0	Betts/Foster	W	Shaun Culham
0309	Computing & Academic Studies	Physics Part-time Studies	73	20	0	Betts/Foster	S/S	Randall Woods
0309	Computing & Academic Studies	Physics Part-time Studies	73	20	0	Betts Modules	F	James Brewer
0311	Computing & Academic Studies	Technology Entry	60	30	0	Betts/Foster	F & W	Jennifer Talman
0312	Computing & Academic Studies	Technology Entry	60	30	0	Giancoli - Physics 6th Edition	W	Pam Borman
1073	Health Sciences	Diagnostic Medical Sonography	45	0	3	Booth Notes and Miele US Physics	F	Jim Booth
1140	Construction and the Environment	Building	45	15	4	Young - College Physics 9th Edition	F	Ken Mark
1143	Energy	Electrical and Computer Eng.	51	34	5.5	Betts Modules	F	James Brewer
1143	Energy	Electrical and Computer Eng.	51	34	5.5	Betts Modules	W	Pam Borman
1145	Health Sciences	Food	37	8	3	Betts Modules	F	James Brewer
1147	Construction and the Environment	Mining	45	30	5	Betts Modules	F	Frank DiSpirito
1151	Construction and the Environment	Geomatics Engineering	45	30	5	Betts Modules	F	Pam Borman
1164	Energy	Robotics	45	30	5	Young - College Physics 9th Edition	F	Ken Mark
1178	Health Sciences	Biomedical Engineering	60	10	4	Betts Modules	F	Shaun Culham
1181	Energy	Chemical & Environmental Tech.	45	30	5	Vincent P. Colleta	F	Randall Woods
1192	Construction and the Environment	Civil Engineering	45	30	5	Giancoli - Physics for Scientists and Engineers 4th Edition	F	Kevin Dunphy
1274	Health Sciences	Nuclear Medicine	60	30	6	Self Published	F	Barry Pointon
1276	Health Sciences	Medical Radiography	45	30	5	Boshong/Self Published	F	Jennifer Talman
1280	Health Sciences	Electroneurophysiology	30	0	2	Booth Notes and Cutnell	F (even numbered years)	Jim Booth
1288	Health Sciences	Occupational Health & Safety	45	30	5	Vincent P. Colleta	F	Randall Woods
1301	Computing & Academic Studies	Physics Part-time Studies	62	22	6	Betts Modules	W & S/S	Frank DiSpirito
2073	Health Sciences	Diagnostic Medical Sonography	36	0	2.5	Booth Notes and Miele US Physics	W	Jim Booth
2143	Energy	Electrical and Computer Eng.	51	34	5.5	Betts Modules	F	Pam Borman
2143	Energy	Electrical and Computer Eng.	51	34	5.5	Betts Modules	W	James Brewer
2145	Health Sciences	Food	70	10	5.5	Betts Modules	W	James Brewer
2147	Construction and the Environment	Mining	48	32	5.5	Betts Modules	W	Frank DiSpirito
2148	Construction and the Environment	Building	30	10	3	Young - College Physics 9th Edition/Betts Modules	W	Ken Mark
2148	Construction and the Environment	Building (Physics PTS)	28	8	3	Betts Modules	S/S	Shaun Culham
2149	Energy	Mechanical	80	20	5.5	Betts Modules	W	Shaun Culham
2151	Construction and the Environment	Geomatics Engineering	60	0	4	Betts Modules	W	Pam Borman
2164	Energy	Robotics	60	40	6.5	Young - College Physics/Betts Modules	W	Ken Mark
2181	Energy	Chemical & Environmental Tech.	60	40	6.5	Vincent P. Colleta	W	Randall Woods
2192	Construction and the Environment	Civil Engineering	60	40	6.5	Giancoli - Physics for Scientists and Engineers 4th Edition	W	Kevin Dunphy
2274	Health Sciences	Nuclear Medicine	100	40	9.5	Self Published	W	Barry Pointon
2276	Health Sciences	Medical Radiography	40	40	5.5	Self Published	W	Jennifer Talman
2280	Health Sciences	Electroneurophysiology	60	40	6.5	Booth Notes and Cutnell	W (odd numbered years)	Jim Booth
2288	Health Sciences	Occupational Health & Safety	40	40	5.5	Vincent P. Colleta	W	Randall Woods
2301	Computing & Academic Studies	Physics Part-time Studies	64	20	6	Betts Modules	S/S	Shaun Culham
3073	Health Sciences	Diagnostic Medical Sonography	45	0	3	Booth Notes and Miele US Physics	F	Jim Booth
3274	Health Sciences	Nuclear Medicine	48	0	3	J. Prekeges - Nuclear Medicine Instrumentation	F	Barry Pointon
4274	Health Sciences	Nuclear Medicine	50	0	3	J. Prekeges - Nuclear Medicine Instrumentation	W	Barry Pointon
5103	Health Sciences	Radiation Therapy	45	0	4.5	F.M. Khan - Physics of Radiation Therapy 4th Edition	F	Kevin Dunphy
6104	Health Sciences	Radiation Therapy	55	0	5.5	F.M. Khan - Physics of Radiation Therapy 4th Edition	W	Kevin Dunphy



Camosun College Department of Physics and Astronomy  
Articulation Report - May 2014

In the Arts & Science Studies program, we offer PHYS 104/105 (algebra based) and PHYS 114/115 (calculus based), remains full and steady in 2013/2014. Enrollment in college prep (Access) Physics courses continue to slightly decline. The increased Spring & Summer offerings in 2012 & 2013, PHYS101 (Access Physics) in Spring and PHYS104 in Summer, are facing cancellation due to budget cutbacks. Astronomy courses (ASTR 101/102) continue to attract students in large numbers and we have continued to maintain increased offerings with 3 sections per semester. We are working to compile a new Astronomy course (ASTR 103) specifically designed for Education students – first offering in 2015 pending EdCo approval and funding.

The second year courses (PHYS 200, 210, 214 and 215) remain closed since 2010. We continue to teach Physics labs for one local High School, whose students are enrolled in their Grade 12 Physics AP courses (both “B” and “C” Mechanics).

The Medical Radiology Technology program is now in its third year with the department servicing two courses, MRAD 113 and MRAD245. The third stream is beginning in Sept. 2014 and we are working extensively with the program leaders to re-vamp the program.

The first intact of students for the Engineering Transfer Program (bridging to UVic 2<sup>nd</sup> yr Engineering) occurred in Fall 2013, students are still completing their courses until the end of June. Interested applicants have doubled for Fall 2014 but funding remains capped at an intake of 30 students. Development on a blended version of PHYS104 (first-half of algebra-based physics) began in 2013 but was stalled due to funding. Further work will occur this year.

In the Physics for Engineering Technology Programs (PHYS 154/191/192), and the Engineering Bridge Programs (which prepare students for 3<sup>rd</sup> year Mechanical, Civil, Electrical and Mining Engineering at UVic and UBC) enrollment remains solid with a slight increase of International Ed students. Mastering Physics was introduced to the students of these programs and received with missed reviews. It was decided to use this program for only Bridge students.

PHYS 160 Biomechanics for elite athletes, trainers, etc. continues at one section of 35 students. A service course for PISE (Pacific Institute for Sport Excellence).

The search for a new Dean for the School of Arts and Science was completed in Summer 2013 and Dominic Beregon was the successful candidate. Extensive cutbacks at the college will be in effect this year and next year increasing the pressure to investigate different growth options such as blended course offerings and development of new programs. Wilf Nienaber, a long-time faculty member, has now retired allowing for the conversion of a term faculty member, Chris Avis. The college is in the process of converting to Infosilem for all scheduling – a difficult process. The Quarter system remains in effect at the Interurban campus but is scheduled to be converted to the Semester system effective Fall 2016.

Nancy Luick  
Chair of Physics & Astronomy

## Capilano University Physics Department

### Report to the 2014 Articulation Committee Meeting, North Island College - Courtenay

Our course offerings remained unchanged from the previous year – first year physics (at introductory, “calculus-based”, and “algebra—based” levels), introductory astronomy (with and without lab) and a course on sound and light, taken by students in motion picture arts, liberal studies, and music.

Enrolments in our courses were just about unchanged from the 2012-2013 academic year.

In view of severe financial problems at the university, every area was required to come up with proposals for cuts of 5% for the 2014-2015 budget. Although the budget has not yet been formally approved by the Senate and Board, we will likely not be able to offer an astronomy lab this coming academic year.

The retirements of Mike Freeman last year and Stan Greenspoon this coming July 31<sup>st</sup> have led to the following:

- (i) The convenor of the Physics Department, effective August 1<sup>st</sup>, will be our new regular full-time faculty member, Bruno Tomberli;
- (ii) We are in the process of hiring a regular part time faculty member [7 sections (7/8 full time), with a possible additional section in some subsequent years] to start August 1<sup>st</sup>. The posting is at <http://www.capilanou.ca/WorkArea/DownloadAsset.aspx?id=34665>, with a closing date for applications of May 15<sup>th</sup>.

# **College of New Caledonia**

## **2014 Physics & Astronomy Articulation Report**

CNC continues to offer calculus and algebra based physics courses to accommodate first year engineering transfer and general science transfer programs. Enrolment for calculus based physics in the fall semester was comparable to last year but we observed an increase in the winter semester (33% for Physics 102 and 61% for Physics 204). Algebra based physics classes had 30% decrease in enrolment in both semesters.

- Physics 101 (Introductory Physics I) – 37 students
- Physics 102 (Introductory Physics II) – 32 students
- Physics 105 (General Physics I) – 18 students
- Physics 106 (General Physics II) – 9 students
- Physics 204 (Mechanics I - Statics) – 29 students

Next year CNC will offer Physics 101 and Physics 102 on line in collaboration with Northern Lights College.

Barbara Rudecki, P.Eng.

Applied Science/Physics Instructor

Institutional Report  
Physics and Astronomy Articulation Meeting  
College of the Rockies — May 2014

- We have a new faculty member, Rana Ahmed, who has a PhD in Electrical Engineering. He is teaching our Engineering Design (APSC 123), Linear Algebra (MATH 221), and Computer Programming (COMP 105) courses.
- Astronomy was offered last fall, taught by Ron Evans. I believe that the current plans are to offer it every second year.
- North Island College and College of the Rockies again offered Engineering Statics and Dynamics collaboratively this year, in the same format as last year.
- We held a spaghetti bridge contest this year. Some entries were better than others...
- I have worked out an agreement with my dean where I will be allowed to teach MATH 203 (Differential Equations), MATH 205 (Multivariable and Vector Calculus), PHYS 201 (Classical Mechanics), and STAT 206 (Calculus Based Statistics) next year. We will not be offering PHYS 202 (Modern Physics).

## **Columbia College**

### **2014 Physics & Astronomy Articulation Report**

Columbia College is completing our first year at our new campus and enrollment is still on the rise for the entire college, as well as the physics program. The physics department has grown due to demand and now consists of two full-time faculty members, one part-time sessional, as well as a lab technician.

In 2013/14 Columbia College ran six Physics courses, with four of them at the UT level and 2 at the secondary level:

- Physics 110 (first part of the calculus based General Physics)
- Physics 120 (second part of the calculus based General Physics)
- Physics 118 (Engineering Mechanics)
- Physics 200 (Introduction to Modern Physics)
- Physics 11
- Physics 12

The enrollment has risen significantly over the last five years. In Physics 110, we had a total of 60 students enrolled in two sections in Fall 2013, and 49 students in two section in Winter 2014. In Physics 120, we had a total of 24 students in Fall 2013, and 25 in Winter 2014. Columbia College offers both courses every semester (including the summer). Physics 118, offered in Fall 2013, had a slight increase in enrollment, from Fall 2012 with 19 students, to 22 students in Winter 2013. Physics 200 was offered in Fall 2013 as a directed study and had a low enrollment of 3 students.

Enrollment in Physics 11 is consistently low, with only 7 students in Winter 2014, but the enrollment in Physics 12 is high, with 26 students in Fall 2013. Throughout the year, Physics 11 and 12 courses are offered in alternating semesters.

We are working on resurrecting Physics 130 (Optics and Thermodynamics) with the intention of offering it in Fall 2014 and hoping to articulate a second year Thermal Physics course to be offered in the 2014/2015 academic year.

Tara Todoruk

Columbia College  
Vancouver, BC

## Coquitlam College

No changes in the Physics curriculum at Coquitlam College. As in the past we offer only the first-year courses.

We offer Physics 101 (mechanics, heat) in the Summer and Fall semesters, and Physics 102 (electricity, magnetism, and optics) in the Spring semester.

The enrolment has been pretty steady so far - 20 students in Phys 101 classes (full) and 12 – 15 in Phys 102.

The number of students enrolled in a class is limited by the size of the lab ( max. 20 students).

In the Fall semester the demand for Phys 101 often rises so that the number of students increases to 30 – 35.

A second Phys lab is therefore open.

## Douglas College Articulation Report 2014

Enrolments have been steadily increasing and the Department is the largest it has ever been with three full time faculty. The College plans to expand its engineering options and we will likely be advertising for a new position for the fall.

Engineering graphics courses have been experiencing steady growth and the College is working on attracting more International students as well as building a new lab space just for engineering students. 3D printers will be ordered this summer.

We have been using an open source textbook called Physics by Open Stax and have been very happy with it for our physics 1104 course ( for those with no high school physics) and our algebra / life science stream Physics 1107 and 1207. We have been using Blackboard as a course management system in all our courses now.

First year astronomy for liberal arts majors continue to grow. We teach it at both our New Westminster and Coquitlam campuses as a night course with an integrated lab. We are pleased with the quality of observations that can be done even in our urban environments.

We are a multi-campus institution with campuses in New Westminster and Coquitlam. We have been teaching one section of our calculus based first year physics course via video-conference for several year now and it has been successful in allowing us to keep a section at the Coquitlam campus.

We have great hopes for expansion at the Coquitlam campus in 2016 when the "Nevergreen" Skytrain line will be finished. The terminus station is right at the campus and will be called "Douglas College". We have a very nice series of photographs detailing the building of the line. A very visible engineering and physics project going on literally at our front door.

## **Physics Articulation Report, 2014**

### **Kwantlen Polytechnic University**

The most important change at Kwantlen is that in September 2014 we will launch both first and second year of our Physics for Modern Technology degree (PMT degree). We already have some students registered in the degree program. Several institutions (Langara, VCC ...) are very supportive and have given us opportunities to promote our program as a transfer option for their students.

Unfortunately, we got approved for only half of the money we requested. We originally asked for two full time faculty and one lab technician. We need to be creative for now and the hope is that in the future we may get more money. The departmental decision was not to hire the lab technician and we will advertise for one full time faculty only. We need someone with expertise in applied optics & optoelectronics/signal and image processing and/or sensors and actuators/process control. Recent experience in an industrial setting is very desirable. We are also setting up an Industrial Advisory Committee for the degree to be up to date with what is demanded in the job market.

Our Physics and Astronomy courses were in strong demand in 2013/2014. With last year's implementation of a new competitive admission model for Engineering students we avoided the frustration experienced in recent years of many Engineering students not being able to get seats in their required Physics courses. Despite offering 7 sections of ASTR 1100 a year, we have experienced long waitlists for this course.

Physics 1400 will no longer be required for Sustainable Agriculture degree and will be offered only as elective for this degree. PHYS 1101 stays mandatory for Biology and Health Science degrees and PHYS 1102 for Health Science.

Jana Kolac,

Faculty, Physics department at KPU



## **Langara Physics and Astronomy Articulation Report 2014**

First-year enrolments were strong in 2013-14. We typically run 36 sections of physics and astronomy, 15 in each of Fall and Spring, and 6 in Summer. We have had waitlists for almost all of our sections.

Over the year we ran 7 sections of PHYS 1125 (first-year physics I with calculus) and 3 sections of PHYS 1101 (physics I for life sciences).

This year all sections of our PHYS 1118 (grade 12 equivalent) used the OpenStax College Physics text, which is free to students.

We ran two half-sections of astronomy in Fall and two in Spring: ASTR 1101 (for science) and 3310 (for arts) in Fall, ASTR 1102 and 3311 in spring.

We ran our second-year physics program this year. Relativity and Quanta ran in the fall with 14 students, and Newtonian Mechanics in the spring with 8. The second-year lab ran both semesters, with lower enrolments.

In summer 2013 we ran our PHYS 1124: Energy and Environment for the second time. Text is Wolfson: Energy, Environment, and Climate (2<sup>nd</sup> Ed). Labs include solar and wind, field trips to a solar house, and to the Grouse Mountain wind turbine. We plan to run the course again in Fall 2014.

Excavation for the new Sciences and Student Services building began in April. Completion is expected in April 2016, with move-in over the summer. The building should be fully operational for Fall 2016. Physics has two large labs, with fixed benches, and one studio classroom with moveable tables. All three rooms will have multiple data projectors and screens.

Administratively, we have a new college president, and faculty are participating in the preparation of an academic plan, which we are told will drive a new strategic plan. Budget forecasts for the next few years are gloomy, with a shortfall this year to be made up from “non-salary expenses” and projected larger shortfalls in subsequent years, as the provincial grant decreases.

# NIC Physics Articulation Notes 2014

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North Island College offers first-year physics (both calculus based PHY 120/121 and algebra based PHY 100/101) at three campuses. Enrollments were up at our Courtenay campus this year (we actually had waitlists for first-year and ABE physics!), but remain low at Campbell River and Port Alberni campuses.

We will continue to offer all first year physics courses at three campuses, but ITV is being used to combine lecture sections from two (or more) campuses. The instructors try to visit the remote campuses several times during the term, and labs and tutorials occur locally at all three campuses. Web content (MasteringPhysics quizzes and homework, PHET simulations, and video links) are used to augment the lecture content and provide more of a “blended” learning environment.

We also teach two first-year engineering mechanics classes, PHY 141 (to UVic) and PHY 170 (to UBC). This was again taught in collaboration with CoTR this year. The first half of the course covers common material, which is all taught in local lectures, and the second half of PHY 141 is taught by NIC while the second half of PHY 170 is taught by CoTR. Local instructors do all assessments, marking, and provide local (tutorial and office hour) support.

With the retirement of Ron Evans, our Space Science and Astronomy courses (SSA 100 and 101) are not going to be offered next year.

## Northwest Community College Physics Articulation Report 2014

Northwest Community College (NWCC) serves the rich and diverse communities and learners of BC's beautiful northwest region including Haida Gwaii and the Great Bear Rain Forest. Established in 1975 in Terrace, BC, NWCC has expanded to nine regional campuses serving 34 communities where the College provides students with innovative programs that lead to sustainable careers for people in the North. NWCC offers quality and affordable education and a wide variety of certificates, diplomas, and associate degrees. NWCC offers college access programs; health and human services programs; online programs; university credit programs, trades foundation and apprenticeship programs; plus the Freda Diesing School of Northwest Coast Art, The School of Exploration & Mining and The School of Northwest Culinary Arts. Aboriginal peoples comprise roughly 30 percent of the region's population, the highest among all BC college regions and, at NWCC, Aboriginals make up roughly 40 per cent of the student body. The university credit program has 27 faculty members across the region.

We continue to run one section of algebra based physics 101/102 (using Giancoli) at the Prince Rupert Campus and one section of calculus based physics 121/122 (using Fundamentals of Physics, 9e, Halliday, Resnick, & Waker) at the campus in Terrace. We have added one section of physics 101/102 at the Terrace campus this year where the students for 101/102 and 121/122 share the same lab time. At both campuses the class sizes are maxed out at 18 which is the maximum permitted in our lab. Both courses have three hours of lecture and 3 hours of lab each week for fourteen weeks and then one week for final exams in each term (Fall and Winter). We are now offering a Java programming course with the hopes of attracting more engineering students.

Enrollment was higher at the Terrace campus, but lower at the Prince Rupert campus (six students only). The low enrollment at Prince Rupert is likely due to the physics 11 and 12 equivalent courses being cut because of budget restrictions. It seems as though this year's students were very weak compared to normal. The Physics teacher in Prince Rupert and I are visiting high schools talking with teachers and students in an effort to impress upon them the importance of physics for exciting career opportunities, increased analytical abilities, etc.

Regan Sibbald

## **Okanagan College – May 2, 2014 Physics and Astronomy Articulation Report**

Our numbers overall were up slightly this year in Science at Okanagan College (+6.56%). Science at Kelowna (+12.0%), Penticton (+12.5%), and Vernon (+2.4%) were up. The numbers in Salmon Arm dropped (-23.5%). Kelowna represents 57.4% of our Science students, Vernon 22.1%, Penticton 13.8%, and Salmon Arm 6.67%.

Applications for next year are down slightly (-5.10%) with growth in Penticton (+20.8%) and drops in Salmon Arm (-45.5%), Vernon (-14.8%), and Kelowna (-1.68%).

The numbers in Physics at Kelowna this year were up for the calculus-stream (+38.5%) and down (-15.6%) for the algebra-based. Our Physics numbers in Penticton were down (-14.3% algebra-based), up in Salmon Arm (+117% algebra-based), and up overall (+22.7%) in Vernon (+41.7% for calculus-based and 0.00% algebra-based). We expect a modest drop in first-year Physics (both streams) next year. We predict growth at Penticton (+20.8%), a modest drop at Kelowna (-1.68%), a drop at Vernon (-14.8%), and a very significant drop at Salmon Arm (-45.5%). Attrition in first-year Physics was not a major problem this year. Most of the attrition still occurs in the first semester.

This year we offered three second-year Physics courses. They were Modern Physics (OC PHYS 200) with 2 students, Thermodynamics (OC PHYS 215) with 10 students, and Statics and Dynamics (OC PHYS 202) with 7 students. OC PHYS 215 is better protected now since it forms part of the Engineering Bridges for both the ELEN and CIEN programs into UBC-O Engineering. We had four (4) students last year in the Bridge and have 5 qualified students this year apply so far.

We did offer our two second-year Astronomy courses for Science and Arts students this year (ASTR 220 – Astrobiology with 12 students versus 19 last year and ASTR 230 - History of Cosmology with 14 students versus 28 last year). Arts numbers at OC have dropped each of the past two years.

With a retirement two years ago we lost half of a continuing position to term as Chair replacement. That means we are looking for half-time Term faculty member this year largely based out of Vernon. We are looking for applicants with strong teaching skills who would enjoy teaching both lectures and laboratories.

Yours sincerely,  
Richard Christie.

## SFU Departmental Report 2014

There has been no major curriculum or pedagogical changes in 2013-14. The list of streams and textbooks remains the same.

### First-year Textbook Summary:

- Physics 100 (physics 12): Knight, Jones and Field - College Physics
- Physics 101/102 (algebra): Giancoli - Physics: Principles with applications
- Physics 120/121 (calculus): SmartPhysics + Tipler (optional)
- Physics 125/126 (enriched): Halliday, Resnick and Krane
- Physics 140/141(studio): SmartPhysics + Tipler (optional)

Enrolment is steady, with a slight upward trend. 2013/14 September + January enrolments for the Burnaby campus only were:

- Physics 100: 558
- Physics 101: 578
- Physics 102: 389
- Physics 120: 447
- Physics 121: 345
- Physics 125: 47
- Physics 126: 36

We have broken ground on the Trottier Observatory and Studio for Innovative Science Education on the Burnaby campus, dedicated to engaging children and youth in science. The Observatory will have a 6 m dome and house a 0.7 m reflector telescope, and the Studio will host workshops and outreach programs for all ages.

### Future:

As part of the Dean of Science INSPIRE initiative to spur significant shifts in the way science is taught, we will begin transitioning the 125/126 enriched stream to part of a first-year honours cohort in 2014/15. Initially this will be an informal coordination with the new corequisite courses, Math 125/126. In ensuing years the cohort will include an integrated block of Physics, Math, and Chemistry 125/126. We are also will need new lab courses that have traditional Physics lab components as well as units of integrated Physics/Chemistry experiments.

We have undertaken a major revision of introductory labs, especially the lab component of our 120/121 calculus-based Physics stream. Extensive renovations to the first-year lab space have begun, to be completed August 2014. Renovations will enlarge the lab space and allow us to serve all introductory Physics students every semester. This space may be used for labs or tutorials, and it will also allow us to include an integrated lab component with each lecture course. Initially we are investigating the possibility of changing 120/121 into two 4-credit courses with integrated labs and will consider other first-year streams subsequently.



### Articulation Report, North Island College, Friday May 2, 2014

#### Enrolments for 2013-2014 (# of students writing final exams)

##### **Fall Semester**

ASTR 1140 – The Solar System	55
PHYS 1010 – Physics for Future Leaders	20
PHYS 1100 – Fundamentals of Physics 1	117
PHYS 1150 – Mechanics and Waves	63
EPHY 1150 – Physics for Engineer 1	40
PHYS 1510 – Applied Physics 1	22
PHYS 1580 – Physics for Respiratory Therapists	<u>66</u>
	<b>383 (403)</b>

##### **Winter Semester**

ASTR 1150 – Stars and Galaxies	63
PHYS 1200 – Fundamentals of Physics 2	95
PHYS 1250 – Thermodynamics, Electricity and Magnetism	43
EPHY 1250 – Physics for Engineers 2	33
PHYS 1610 – Applied Physics 2	<u>24</u>
	<b>258 (247)</b>

#### Texts

- ASTR 114/115 - Voyages to the Planets, Voyages to the Stars and Galaxies, 3<sup>rd</sup> ed., Fraknoi, Morrison, Wolff
- PHYS 110/120 - College Physics, 8th ed, Serway
- PHYS 115/125 - Physics for Scientists & Engineers, 8<sup>th</sup> ed., Serway & Jewett
- PHYS 158- Physics for the Health Sciences, 3<sup>rd</sup> ed., Nave & Nave

#### **B.Sc. Degree**

- No change to the Physics program this year.
- Enrolment is stable.
- 10 students/course in 3rd and 4th year
- Graduating ~5 students per year

#### **Engineering Transfer Program**

- Expanding size of the first year cohort from 40 to 60 students.
- Very close to an agreement with UVic to offer a second year in Electrical Engineering. This could result in a significant increase in enrolments in some of our second year physics courses.
- Developed 4 new courses:
  - EPHY 2200 - Electrical Properties of Materials
  - EPHY 2950 - Engineering Fundamentals
  - EPHY 2990 - Introduction to ECE Design
  - EPHY 3600 - Continuous-Time Signals and Systems

## Physics at Trinity Western University

Report for the BC Articulation Committee Meeting  
2 May 2014

by Dr. Arnold E. Sikkema  
Professor of Physics  
Chair of the Mathematical Sciences Department  
Trinity Western University

- TWU Physics mainly serves our B.Sc. programmes in Biology and Chemistry, but also offers one course each year for non-science students.
- Physics is part of our Department of Mathematical Sciences, which includes math, computing science, physics, and engineering transfer.
- Enrolment in our first-year calculus-based physics sequence (with lab) was just a bit below normal: 52 & 36, with 7 failing Physics 111 in the fall and 2 failing Physics 112 in the spring. We continue to use Knight's *Physics* (3<sup>rd</sup> edition) and *MasteringPhysics* for these courses.
- For Physics 111, I required an open-ended video project for groups of students to analyze the kinematics and dynamics of an interesting phenomenon. This generated lots of excitement and collaboration, but was also lots of work for the students.
- All our other courses are offered on an alternate year basis, to allow students to complete a minor or concentration, with zero to three graduating per year with these options. (Two graduated in 2014 with a minor in physics [8 courses].)
- Enrolment in 2013-14 were:
  - 215: Astronomy: 18
  - 360: Optics, with lab: 2
  - 220: Mechanics: 4
  - 240: Physical Chemistry (with lab, and cross-listed with Chemistry): 13
- Courses Planned for Fall 2014 are:
  - 210: Conceptual Modern Physics
  - 341: Advanced Physical Chemistry (with lab, and cross-listed with Chemistry)
- Courses planned for Spring 2015 are:
  - 230: Electricity & Magnetism (with lab)
  - 310: Modern Physics
- Point for discussion: I am considering Mazur's new book(s) *Principles and Practice of Physics* for 2015-16, and would appreciate anyone's remarks about it. I've only seen the first half, and am intrigued.

## Articulation Report 2013-14 - UBC Okanagan

The past academic year has witnessed some decline in first-year Physics enrolments. In the fall term there were 650 students (down from 702) altogether, counting both algebra- and calculus-based streams, and in the spring term there were 568 (down from 582). The author is unaware whether this drop is due to a decline in application or acceptance rates.

Second-year enrolments are a different story. There has been a marked surge in class sizes, with about 30 students declared as Physics majors at the second-year level (roughly double last year's figure). Upper-level enrolments have also increased, with enrolment in mandatory courses for the Physics major now standing at about 25. The number of Physics graduates expected this year is 13 (4 Honours + 8 Majors + 1 Minor), versus 6 last year.

No changes have occurred in our undergraduate program during the past year, except that a 2<sup>nd</sup>-year E & M course, which was cancelled the previous year, has been reinstated. Substantive changes are in the pipeline, however. There is some discussion of eliminating the algebra-based stream in first year, and subsuming it into the regular calculus-based stream with additional tutorial time provided for the less-prepared students who would formerly have chosen the algebra-based stream. This change would be accompanied by making Calculus a corequisite for all first-year Physics students, and by introducing a new entrance requirement of Physics 11 for all first-year Science students.

In the coming year, two new 300- and 400-level Medical Physics courses will be offered, in line with the department's intent to build a postgraduate program in Medical Physics. A newly hired faculty member in Medical Physics is arriving this summer, and a second faculty position in the same field has been approved and is currently being advertised.



## BCCAT Articulation Committee Report for Courtenay Meeting May 2/14

Michael Hasinoff --- UBC-Vancouver Apr 29, 2014

Our enrollment numbers are unchanged within +/- 5% from last year except for the following courses -- PHYS 101 ( up 8% to 1594 ) and PHYS 102 ( up 12% to 520 ), ASTR 310/311 ( down 35% to 213 ). There were  $25/97 = 26\%$  female students in PHYS 107 and  $184/750 = 25\%$  female students in PHYS 153. This latter number compares to  $115/677 = 17\%$  in 2007/8. Our 2<sup>nd</sup> year program enrolment is up 18% to 86 students with PHYS 200 and 203 both up more than 30%. Our new PHYS 333 Energy & Climate -- Thermodynamics online course had an enrollment of 22 students -- up from 14 students in 2013. Our General Science course on Zoological Physics was offered for the 1<sup>st</sup> time since 2006 and it had an enrolment of 27 students.

In May and November 2013 we graduated 53 students in our various Physics specializations and 4 students in our various Astronomy specializations. We also graduated 54 students in Engineering Physics. The total number of students registered in years 2-3-4 of our various different PHAS specializations in 2013/14 is 262. The largest specialization is Majors Physics with 87 students, followed by Honours Biophysics (40), Honours Physics (32), Combined Majors Physics/Computer Science (34), Honours Physics/Mathematics (21), Majors Astronomy (16) and Honours Physics & Astronomy (11).

Our Astronomy program was completely re-organized in 2013/14. We replaced ASTR 201 and 202 with ASTR 200 and 205. There were also changes in our 3<sup>rd</sup> & 4<sup>th</sup> year ASTR courses -- we replaced ASTR 303/304 with ASTR 300 and in 4<sup>th</sup> year we discontinued ASTR 402 and introduced ASTR 406 and 407. For more details please look at our website-- [www.phas.ubc.ca/undergraduate/courses](http://www.phas.ubc.ca/undergraduate/courses).

In Sept 2014 Physics 153 will be split into 3 one semester courses ( 157(3) -- Thermodynamics and Waves, 158(3) -- Electricity & Magnetism, and 159(1) -- Introductory Laboratory for Engineers ). The total credit load will also be increased from 6 to 7. There will be no change in the lecture material but the laboratory has been completely redesigned over the last 3 years to include a design component and a two-part written and practical exam which contributes 60% to the student's final lab grade. The lab is being taught in a Socratic manner with considerable time spent on Think/Pair/Share exercises in which the students are slowly guided to the methods used by experts. They are not provided with any experimental procedure to follow -- they are only given an objective and some basic experimental apparatus. They are expected to come up with an experimental procedure that includes a set of measurements that they can analyze to determine the objective ( e.g. -- use an AC square wave pulse generator to determine the value of an unknown capacitor in an RC circuit ). We have also introduced spreadsheets and fitting methods along with computer graphical presentation of their data so that the students can compare their data to their theoretical model.

We had expected to be able to make a similar change to our Phys102 course ( i.e. -- separate the LAB into a one credit advanced lab similar to our Enriched Physics 107/108/109 sequence ) but this change has been delayed by one year in order to allow other departments to comment. This would increase the 102 lab time from bi-weekly to weekly.

The Applied Science Dean has decided to institute a small pilot program which will permit the acceptance of High School students who have not taken Physics 12 as long as they complete this course in summer school or take UBC Physics 100 in their 1<sup>st</sup> term. We are very concerned about this proposal since the modified curriculum of our Physics 100 course is now more suited to Life Science students than Physical Science or Engineering students. Hopefully this will not become commonplace in BC High Schools.

# 2014 Articulation Report

## Department of Physics, University of the Fraser Valley

April 28, 2014

This past academic year 2013--2014, we filled a total of 990 seats across all physics classes (including engineering and astronomy). This is up just over 3% from our previous enrollment high in 2012—2013. Breaking the enrollments down by category,

- All 48 seats offered in ABE physics courses were filled. A handful of students were left on the waitlists unfortunately.
- We ran a single introductory, 36-seat astronomy course that filled.
- Our enrollments in first year, algebra-based physics were largely the same as last academic year. Overall, student interest in these courses just isn't what it was a few years ago.
- Although down about 8% from 2012—2013, enrollments in our first year, calculus-based physics classes were still strong: a total of 380 seats were filled, our second highest total ever.
- Enrollments in our first year engineering classes were the best we have ever had: all four courses we offered filled with waitlists.
- We also broke the departmental record with regards to second year enrollments. We filled 82 seats; our previous high was 80 back in 2011—2012.
- Finally, we had a banner year with respect to upper division enrollments. We filled 182 seats, a 17% improvement over the previous departmental best of 155.

This summer's convocation will be a strong one for the Department of Physics: we will be awarding one honours degree, 14 majors, and one minor. This is our largest graduating class ever.

This September, 2014, we will begin offering a two-year Engineering Physics Diploma in Mechatronics. To qualify for the program, students must have successfully completed first year calculus as well as calculus-based classical mechanics and electromagnetism. Among the courses included in the program are electronics; automatic control systems; microprocessors and embedded systems; and sensors and actuators. Initially, enrollment will be restricted to 18 students, nine domestic and nine international. In the future, we are interested in expanding the program provided there is both sufficient laboratory space and high student demand.

Last summer, one of our faculty members, Dr. Joss Ives accepted a full-time position at UBC, and so resigned from UFV. While we are saddened by his leaving, we, of course, wish him and his family all the best in Vancouver. To compensate for Joss's departure and to provide instructional support for the aforementioned mechatronics program, we requested a pair of full-time hires. Unfortunately, we were given only one; we plan to have this position filled by the end of May, 2014.

Last summer, we welcomed three new adjunct professors to our department. All are medical physicists with the BC Cancer Agency in Abbotsford.

UFV has recently implemented a collection of Institutional Learning Outcomes (ILOs) that every single program on campus is expected to meet. Last summer, as directed, the physics department put together its own list of program learning outcomes (PLOs). Our next task in this regard is to map the PLOs to the ILOs. Furthermore, it is now the case that each and every course on our books is to be mapped to the ILOs at some point in the future.

This past year, UFV instituted a new budgetary model in which individual departments have greater control with regards to numbers of sections offered. However, each department is largely expected to turn a profit. From a practical perspective, this means that we can run additional physics classes each academic year provided that doing so is revenue-generating.

We have also recently moved to a university-wide system of rank and tenure. In doing so, those lecture faculty who had successfully completed a single three-year review were grand-parented in, with tenure, at the rank of associate professor. All faculties are currently in the process of defining the processes that will govern future promotions from assistant to associate professor and from associate to full professor.

## UNBC Articulation Committee Meeting Report 2014

### Enrollment

	2012-2013	2013-2014	% change
Physics 115 (phys 12)	64	60	-6
Physics 110/111 (calculus-based)	124	128	3
Physics 100/101 (algebra-based)	231	191	-19
Physics 120/121 (Astronomy)	19	9	-52
Physics 150 (Physics for Future Leaders)	29	16	-44

After being quite low in 2012-2013, 2013-2014 second-year class sizes were in the healthier the 8 – 10 range. Astronomy continues to see very low numbers.

### Curriculum notes

**First-Year Labs.** Some first-year lab experiments on kinematics and dynamics will be dropped in 2014-2015, as there is duplication. The dropped labs will be replaced by new experiments on: ideal gases and absolute zero; fluids and Bernoulli's equation; and momentum and energy. New equipment has been purchased so that two lab sections now can be run simultaneously.

**Second-Year Labs.** A Franck-Hertz apparatus was purchased and used for the first time in 2013-2014 in the lab component of Modern Physics 206. In the lab component of Electromagnetism and Optics 201, a high current power supply was purchased and used in the current balance experiment, and a Faraday's law experiment, based on the article "An experimental observation of Faraday's law of induction" from the June 2002 issue of The American Journal of Physics, will be introduced in 2014-2015.

**Textbook Change.** The textbook for the algebra-based Physics 100/101 was changed to *College Physics* by Serway and Vuille from *College Physics: a strategic approach* by Knight, Jones, and Field, as the latter textbook was not well-received.

George Jones  
Department of Physics  
University of Northern BC

## UVic 1<sup>st</sup> and 2<sup>nd</sup> year PHYS and ASTR articulation report, April 2014

### 1<sup>st</sup> year PHYS:

This year (starting September 2013) we undertook a significant curriculum revision that amalgamated the calculus-based Physics streams for Natural Science and Engineering. This revision means that UVic offers three “streams” of physics in 1st year: algebra-based, calculus-based, and honours.

We experienced significant growth in enrolment in our calculus-based offerings this year, mainly but not exclusively because of an increase in the Engineering cohort.

#### Courses offered:

PHYS 102 (two-term course) – An algebra-based survey of physics.

Primary Audience: Biology students

Text: Serway (algebra based, latest edition)

Enrollment: Initially around 500. 2014 final enrolment 399 (2013: 436)

Topics: Mechanics and energetics, oscillatory and wave motion, fluids, thermodynamics, electricity and magnetism, optics, modern physics

PHYS 110 (first term) and 111 (second term) – A calculus-based survey of physics

Primary Audience: Natural Science and Engineering students

Text: UVic custom edition Young & Freedman with locally-written supplements.

Enrollment: 110: Fall-566, Spring-136. 111: Spring-435, Summer-78 (Last year enrolments were about 350 at the end of the spring term, initial enrolments 450)

Topics: As for 102, with limited content on fluids and electromagnetism

110 – Mechanics, conservation laws, electric and magnetic forces

111 – Thermodynamics, oscillatory and wave motion, optics, modern physics

PHYS 120 (first term) and 130 (second term) – Physics for Physicists and Astronomers

Primary Audience: Prospective major/honours students

Text: Young and Freedman – University Physics with Modern Physics (latest edition)

Enrollment: 120 - 107 (2012: 116), 130 – 73 (2013: 66)

Topics: As for 102 omitting Electricity and Magnetism and Thermodynamics

120 – mechanics and special relativity

130 – rotational motion, oscillatory motion, waves, modern physics

### 1<sup>st</sup> year ASTR:

The University of Victoria offers three 1<sup>st</sup> year Astronomy courses, two intended for non-majors and one that is the first course in our ASTR progression. ASTR 101 and 102 are formerly halves of ASTR 120. This resulted in substantial increase in enrollment in these courses.

#### Courses offered:

ASTR 101 and 102 – Astronomy for non specialists (101-Solar System, 102-Cosmology/Stars)

Primary Audience: General interest

Text: Varies depending on instructor

Enrollment: About 400-450 in ASTR 101; about 250 in ASTR 102. At least one section of each offered fall and spring. At least one normally offered in the summer. This year there were 4 sections of 101 and 3 of 102.

#### ASTR 150 – Concepts in Astronomy

Primary Audience: Astronomy major/honours students

Text: Varies depending on instructor

Enrollment: About 50. Normally offered in the spring.

#### 2<sup>nd</sup> year PHYS:

The University of Victoria offers five second year Physics courses, four of which are common to all our undergraduate programs. These have had fairly stable enrollment for the past years. This year we have seen lower spring enrolment and higher summer enrolment than in the previous year.

#### Courses offered:

##### PHYS 210 (also EOS 210) – Geophysics

Primary Audience: PHYS/EOS combined program students

Text: Selections from several books, including Lillie – Whole Earth Geophysics

Enrollment: About 60 (20 as PHYS, 40 as EOS). Normally offered in the fall.

##### PHYS 214 – Laboratory Electronics

Primary Audience: PHYS and ASTR major and honours students

Text: Horowitz and Hill – Art of Electronics

Enrollment: 47 (2012: 46) Normally offered in the fall.

##### PHYS 215 – Introductory Quantum Physics

Primary Audience: PHYS and ASTR major and honours students

Text: Varies depending on instructor, usually Thornton and Rex

Enrollment: 33 (2013: 48). Normally offered in the spring.

This course is regularly offered in the summer; enrollment: 19 (2013: 9).

##### PHYS 216 – Introductory Electricity and Magnetism

Primary Audience: PHYS and ASTR major and honours students, and Engineers

Text: Excerpts from Young and Freedman

Enrollment: 55 (2013: 61) Offered in the fall.

##### PHYS 217 – Introductory Thermodynamics

Primary Audience: PHYS and ASTR major and honours students

Text: Carter

Enrollment: 28 (2013: 46). Normally offered in the spring.

This course is regularly offered in the summer; enrollment: 20 (2013: 7).

#### 2<sup>nd</sup> year ASTR:

The University of Victoria offers three second-year Astronomy courses, one intended for general interest, and two that form part of our ASTR program. ASTR 201 is a recently developed course.

Courses offered:

ASTR 201 – Search for Life in the Universe

Primary Audience: General interest

Text: Readings

Enrollment: 40-50. Normally offered in the fall.

ASTR 250 – Introductory Astrophysics

Primary Audience: ASTR major/honours students

Text: Freedman and Kaufman - Universe

Enrollment: 30 (2012: 21). Normally offered in the fall.

ASTR 255 – Planetary Science

Primary Audience: ASTR major/honours students

Text: Cole and Woolfson – Planetary Science

Enrollment: 11 (2012: 16). Normally offered in the spring.

## **Report to UT Physics and Astronomy Articulation 2014 Vancouver Community College**

We offered two sections of the first half of calculus-based 1<sup>st</sup> year physics (Phys 1100) in the fall. One was offered during the day in the regular time slot. The other was at night which, as in fall 2012, was to gauge interest in an evening offering. We then offered one section of the second half (Phys 1200) in the winter which had quite good enrolment. Likely in fall 2014 we will only offer one 1100 in the fall and then offer both an 1100 and a 1200 in winter 2015.

We are currently putting together a complete 1<sup>st</sup> year engineering transfer certificate which would give our students assured admission to SFU engineering as long as a certain GPA is acquired within a certain time frame. The certificate will have the following courses:

Calculus 1 and 2 (MATH 1100 and 1200), total 6 credits

Physics 1 and 2 (PHYS 1100 and 1200), total 8 credits

Chemistry 1 (CHEM 1121), 4 credits

Introduction to computer programming 1 (CMPT 1010), 3 credits

Introduction to computer programming 2 (CMPT 1020), 3 credits

Applied Linear Algebra (MATH 1221), 3 credits

Engineering Technology and Society (SCIE 1100), 3 credits

Professional Communication (SCIE 1110), 3 credits

Introduction to Engineering Analysis (SCIE 1180), 3 credits

The last six courses listed are new to VCC and will be equivalent to SFU CMPT 130, CMPT 135, MATH 232, ENSC 100, ENSC 105 and ENSC 180 respectively.

As of April 3<sup>rd</sup> 2014 the proposal is at the curriculum review stage at VCC. We may try a soft launch in January 2015 depending on the progress of approval and course development.

We are also working on a certificate for VCC students to transfer into the 2<sup>nd</sup> year of the Physics for Modern Technology degree at Kwantlen PU.



**Vancouver Island University**  
report to the  
**Physics Articulation Meeting (02-May/14)**

1. Student numbers were stable in our 1<sup>st</sup> year. Life sciences courses (P111/P112) up slightly (this year: 100 / 75; last year: 91\*/69) while calculus based courses (P121/P122) have been fairly constant over the last few years (this year: 67/49; last year 61/47).

\*PHYS 111 numbers down slightly due to time class list numbers recorded.

2. Astronomy continuing to run two 1<sup>st</sup> year (solar system, stars & galaxies) & two 3<sup>rd</sup> year (cosmology, history). Numbers are fairly steady compared to last year (this year 115; last year 118). A total of ten (10) viewing nights were held over the Fall and Spring semesters.
3. Physics for (primarily) education students has showed a steady decline over the last few years (this year: 20; last year: 24)
4. The annual Extreme Science show (benefiting the charity LED Africa) continues to be popular with 2000 attendees (mostly K-12 students) over six sessions.