Unit Update to AUR Recommendations

This document provides an update on the department's extensive report (Dr. N. Mobed, 2017) regarding the 17 recommendations by the External Review Committee.

Undergraduate Teaching and Learning

Recommendation 1: The review of the undergraduate curriculum already started by the Department of Physics should continue.

Unit Update: Steps have continued to make our programs more accessible and diverse, to enhance student retention and success, and to increase the efficiency of course offerings. Prerequisites and the course numbering for high attrition classes have been modified to enhance student retention and success . Flexibility in program assembly (pure and applied) was achieved through 3xx and 4xx physics electives. A full list of approved changes is included in Appendix A.

Recommendation 2: The unit is strongly encouraged to consider means to diversify, and eventually increase, its undergraduate physics major population. These may include an upgrade of the undergraduate curriculum and the consideration of alternative teaching approaches.

Unit Update: The majority of our physics majors are enrolled in B.Sc. and B.Sc. Honours. We have made progress in strengthening our applied physics program by hiring a faculty member in Nuclear and Medical Imaging and introduced a new class PHYS 219 (Introductory Radiation Science and Biophysics), which is offered to all science majors and ties in with Physics 319 (Health Physics). The Bachelor of Medical Imaging (BMI) is a joint program between SaskPoly and U of R is now housed in the Department of Physics. We will offer Physics 377 (Introductory Electronics) for the first time this fall. These classes promise to diversify and enrich the regular physics program and they appeal to students. We have not yet seen increasing enrollments in applied physics. The Department plans a more concerted effort in 'advertising' these courses through Academic Advisors in other Departments/faculties and through modern means (e.g., videos are being developed with the help of the Faculty of Science.)

As reported in 2017, we are examining updates in the content of the first two years of the program with the goal of making the program more accessible to a broader group of students with varying levels of academic proficiency and aptitude. We hope that this will address the current high attrition rate in the first two years of the program, as students find the program too challenging. We are proceeding carefully, to achieve gains without expending considerable resources that might be beyond our reach at this time. In this vein, we have implement changes to the material in Physics 111, 112 and 201, by introducing modern physics topics, their applications, and their connections to main physics concepts, by removing some traditional material. This was done following recommendations by the American Physical Society, with the goal of achieving higher interest and particularly higher retention. These were implemented in 2020/2021 so it will take a few years to assess their impact.

Following the sabbatical of one our laboratory instructors, we established a collaboration with Kwantlen Polytechnic University (KPU, in BC). U of R students perform measurements and acquire data remotely,

using equipment hosted by KPU and then carryout the analysis and reports locally. This has been implemented into select labs in Physics 111 and 201, which met with considerable enthusiasm by students, especially in the "flipped versions" of the lab, where the students are given equipment access and the goals and are asked to design the experiment to meet the objectives. Students found these labs stimulating: they deepened their understanding and they peaked their interest. With the recent of appointment of a second (tenure track) laboratory instructor, we plan to modernize more experiments but also to build our own experiments that will be offered to KPU students and to those from other universities. We hope to place those in visible locations on campus (e.g. in hallways outside the Archer Library and/or the RIC atrium), so that passers-by can see them move during data taking.

Recommendation 3: The unit should consider the development of joint majors with other Departments, a possible accelerated BSc/MSc, and the inclusion of adjunct professors to diversify its academic palette.

Unit Update: At this time, with the present complement and available resources, the development of joint majors, a course-based MSc in Applied Physics or Post Degree certificate or diploma in Health and Radiation Physics are not feasible; these were options touched upon in the last three years. Once current operations stabilize (recent curriculum changes, recruitment efforts, research of new Departmental members) these or similar can be revisited.

Collaborative teaching (undergraduate and graduate) and research with other Departments and units has been discussed in connection to the applied physics program with focus on nuclear and medical imaging. Discussions with a member of the U of C Physics Department are underway to co-offer one or more of: introduction to nuclear science and technology class for science students, overview of energy for a non-technical audience, Nuclear 101 for Saskatchewan Science teachers, material for professional development days, and online resources ('questions people have about nuclear'). These are pertinent in our province considering SaskPower's plans to invest in clean-energy Small Nuclear Reactors in the future and they also tie in with our Department's partnership with the Fedoruk Centre.

Courses of interest to Computer Science (CS) students have been distilled to a choice from three options: Technology of Computing, The Physics of Computer Games and Computer Animations, and Computer Science Application in Physics Data Analysis; these are being discussed with CS.

The Department has grown the number of adjunct professors to seven, with two contributing to undergraduate teaching and all contributing to graduate student supervision (formal or informal co-supervision) or by serving on PhD advisory committees. The Department plans to initiate the appointment of physicists and other professionals from Regina Cancer Clinic as adjunct professors in connection to the applied physics and BMI program, who can teach or co-teach relevant classes as well as be involved in graduate student supervision in these areas.

Recommendation 4: The Honours program should require a written thesis.

Unit Update: This has been implemented since 2018 through two new courses PHYS 498 (Senior Research, 0 credit) and PHYS 499 (Honours Thesis, 3 credits). The students overall appreciate this effort, despite the work load. At least four of those students rose to the occasion and produced outstanding

reports and presentations to the Department, with all students gaining valuable skills in research, data analysis, computation and scientific writing. All but one are pursuing graduate degrees (3 here and the others at Calgary/Dalhousie, Ryerson, Victoria, Ottawa).

Graduate Teaching and Learning

Recommendation 5: A new faculty hire in theory is badly needed to support core courses in the graduate program. Ideally, a guaranteed replacement of the retiring faculty member (Lolos) is required to support the program. See section on staffing for additional possibilities.

Unit Update: This has been our highest faculty priority in the annual budget submission process, and has been proposed three times for a CRC Tier-II (most recently in the current call). In 2016, the Department's proposal received top ranking from the Faculty of Science but no chairs came to Science. We currently have two theorists in our Department: one who is the Associate Dean Undergraduate and one who was recently promoted to Assistant Professor (he used to be Instructor with a course load of 6 annually). When one of our theorists retires, *all* of the Department's needs for theory-focused graduate instruction will fall on the shoulders of the sole remaining theorist. This will force a difficult choice between reducing the number of undergraduate classes that can be offered or compromising this individual's ability to mount a successful research program by overloading him on teaching. Not restoring the available theoretical support and resources will also negatively impact the work of the experimental members in the Department.

Recommendation 6: Highest priority must be given to fielding a reasonable number of graduate courses, in particular core courses, in-house, on a regular basis.

Unit Response: The flexible offering of senior undergraduate courses (see Recommendation 1 above) has eased some pressure off the simultaneous offering of certain undergraduate and graduate courses. We have been able to fill the remaining gaps creatively through remote graduate course delivery: our students take courses from U of S, UBC/TRIUMF and Indiana University. Our graduate students have raised concerns about this method when core courses are involved, but have been complimentary on specialized courses (e.g. nuclear scattering from renown theorists at IU). The Department has identified three 400/800 cross-listed courses to further enhance the efficiency in our course offering (Physics 432/887AA, 471/887AD, 411/811). This is what is done by a number of other Science Departments at U of R and U of S. That said, there are core courses that cannot be cross-listed without compromising the quality of graduate experience. The only long-term solution to this challenge is addition of a new theorist to staff complement. A full list of graduate program changes is included in Appendix A.

Recommendation 7: Consider the creation of an accelerated BSc/MSc program to attract more graduate students with a focus on medical imaging, and possibly other areas of synergy, e.g. with the Faculty of Engineering.

Unit Update: See Recommendation 3. The Department needs 2-3 years of stable operation before dedicating existing resources to investigate such a program, in the absence of new resources.

Recommendation 8: Explore aggressively scholarship opportunities outside the traditional sources suitable for subatomic physics. Ensure at the Departmental level that faculty members exhaust all internal possibilities for support.

Unit Update: After meetings with FGSR, the conclusion is that our students apply and receive their fair share of standard scholarships and fellowships available internally. We have attracted a few Mitacs scholarships and summer support from the Global Institute for Food Security (GIFS). Other international collaborative research scholarships, granted by participating countries on research topics of mutual interest, do not overlap with our research focus in subatomic physics. We recently investigated an International Atomic Energy Agency scholarship intended for female students working in the areas of nuclear safety, security, and non-proliferation; we had an excellent candidate but the overlap of fields was not close enough to guarantee success in such a competitive environment. With the broadening research focus of the Department in applied physics, we anticipate that we would be eligible for a variety of different external scholarships.

Recommendation 9: For a program with low enrolment, a written comprehensive examination is likely not an effective use of resources. Its usefulness should be revisited.

Unit Update: We initially agreed with this recommendation. However, after carefully reviewing it we have come to the decision that we will maintain both written and oral components of the comprehensive examination. We issue a Doctorate of Philosophy *in Physics*, and not *subatomic physics.* Therefore, we believe that this examination establishes whether the students' knowledge is adequate to award this degree, which could result in a teaching career soon thereafter. Although it is rare that students fail completely, there have been a few cases where they were asked to repeat one component, and in all cases students have been appraised of their gaps in knowledge and advised to rectify those. The students appreciate this type of feedback. Whereas a written comprehensive examination is not used by all Canadian universities it is certainly in place in American ones.

Recommendation 10: Bring adjunct faculty into the program for the diversity of the program, to increase the graduate enrolment and the graduate course offerings.

Unit Update: We have made progress as presented in Recommendation 3 above. Our most recent addition was in astronomy. Our adjunct professors have high standing in their institutions, collaborations and come from universities with excellent reputation (William & Mary, Harvard, Mt. Alison). Additional efforts have been expended by supervisors to arrange for specific meetings and short tutorials by experts in the field on an as-needed basis to the benefit of graduate students.

Recommendation 11: Address issues that make the program less attractive to students, paying close attention to aspects such as international differential fees.

Unit Update: The issue of differential fees for international students has been discussed at various fora by students and faculty and with FGSR. We will continue to discuss the topic to ameliorate the situation. In the interim, many grant holders in our Department provide a supplemental stipend to international students to mitigate the effect of the differential fees.

Research

Recommendation 12: The Department is to be commended for its excellent research dossier in the field of experimental subatomic physics. The unit is encouraged to build on its expertise and successes to explore avenues to broaden its research focus.

Unit Update: The Department has a longstanding history of research excellence in experimental subatomic physics. Building upon the existing strengths, in the past few years, the Department has succeeded in diversifying its research and teaching goals, as described below.

- The first faculty member in applied physics, Dr. A. Teymurazyan, was appointed as a Fedoruk Chair in Nuclear Imaging Technologies in 2015 and achieved tenure and promotion to the Associate professor rank in 2020. The associated research has been extremely successful: the first Positron Emission tomography (PET) plant-imaging system in Canada was built in partnership with Jefferson Lab. A next-generation system, that includes PET and X-ray CT capability, was designed and built by the U of R and is being deployed at the Saskatchewan Centre for Cyclotron Sciences. It will be one of the world's largest and most advanced systems in PET plant and bioremediation research. Funding came from the Fedoruk Centre, WED, Innovation Saskatchewan, and GIFS.
- In 2017 the Department filled the retirement of Dr. G.J. Lolos (experimentalist, intermediate energy at Jefferson Lab) with Dr. G. Grinyer (experimentalist, low energy radioactive isotopes and astrophysics). Dr. Grinyer's research has broadened our scope and graduate teaching topics, while establishing new collaborations in Canada, USA and France. In addition, this hire firmed up our connection to TRIUMF (just this year, TRIUMF became a new incorporated legal entity, and the U of R is a full member of the governing group). Dr. Grinyer has achieved success in NSERC and CFI-JELF funding and is building a unique detector for installation at TRIUMF.
- Campion College hired an astronomer, Dr. S. Lawler, to replace a retiring member (Dr. M. Beech). Dr. Lawler carries out research in observational astronomy, planetary science and dynamical modelling of exoplanets. She has been tightly integrated in our Department, and is an active member on many fronts, including outreach and future development of the Astronomy Lab. We have also introduced new astronomy class offerings (See Appendix A).
- With the promotion of Dr. P-P. Ouimet to the assistant professor rank, our breadth has increased further, as Dr. Ouimet carries out theoretical research in an integrated manner with experimental colleagues at the U of A in novel formulations of Quantum Field Theories, Magnetic Monopoles, all at high energies. He also carries out research in Physics Education and is the Chief Judge of the Regional Science Fair.
- The U of R has submitted a proposal to the Fedoruk Centre for a new, five-year, bridge-funded position in the area of Neutron Scattering, which is of considerable interest in Canada. The outcome will be known by early June 2021. If successful, the Department will advertise the position, which will eventually occupy a base-budget position following a future retirement.
- Potential exists to pursue similar, bridge-funded chairs from TRIUMF (astrophysics) and also SaskPower (nuclear safety or material imaging.)

Our Department now covers all major areas of foundational subatomic physics (low, intermediate, high energy and nuclear/particle) and through Campion College has bolstered our astronomy offerings. On the applied side, we have made excellent progress in nuclear imaging, and if successful, a new position in neutron would leverage the University of Regina's extensive expertise in scattering experiments and nuclear imaging and create valuable synergies. Through fostering the integration of neutron imaging into key research areas, such as small modular reactors, this effort promises to drive commercial and economic potential in nuclear tools and techniques and personnel. The department also carries out experiments in applied methods to paleontology (dinosaur fossils) at the Canadian Light Source.

Service

Recommendation 13: The Department should elaborate a recruitment strategy that involves reaching out to schools and youth in general.

Unit Update: The Department plays a leadership role in a number of outreach activities. The organization of the annual Regina Regional Science Fair for the past three decades, and the Canada-Wide Science Fair in 1997 and 2017 are examples of such leadership. The Department participates at career fairs (Regina, Moose Jaw, Balgonie). We have launched several additional efforts:

- Outreach, recruitment, and retention: The activities of the our relevant standing committee include visiting Regina area schools and hosting events for pupils, teachers, and counselors at our Department's teaching and research laboratories. Since 2016, 6-12 such activities took place per year. These continued under covid (via Zoom) to high schools and elementary schools on a variety of topics (astronomy: Kuiper Belt objects and exoplanets; general physics: gravitational waves, antimatter and plants, heat and entropy). School presentations on the breaking news from muon g-2 results are planned in May 2021.
- Build Club: The Department created an undergraduate "Build Club". Professors (including one from JSGS) and students applied for and received funding from the Fedoruk Centre and the Faculty of Science. The goal of this project is to encourage students, especially females, to pursue their education in nuclear physics, and to provide undergraduate students with experience in nuclear technology, project management and science policy. These goals are partly facilitated by having undergraduates develop subatomic physics instrumentation (e.g. muon detection systems) and, importantly, with outreach visits to schools in Regina and rural areas by teams of undergraduates and a professor. Industry-built electronics boards for the muon detectors just arrived and, covid-permitting, this will allow kits to be built for Regina high schools in a pilot program. The first professor-student "show and tell" took place at Weyburn Comprehensive High School on March 4, 2020, two weeks before covid broke out and was enthusiastically received by the teacher students; all subsequent engagements were suspended. The Department plans to apply for NSERC Promo Science funding to expand this effort.
- Astronomy Lab: With strong endorsement from our VPR and the Deans of Science and Campion, a working group was struck to plan a major renovation of the Astronomy Lab (Classroom Building roof). The goals are enhanced undergraduate learning and experience and outreach, with select opportunities in research. The group has recruited the President of the

Royal Astronomical Society (Regina Chapter) and a retired U of R astronomer. Synergy between RASC and our Department has been identified (RASC will focus on elementary school children and we will focus on high school recruitment, with a careful handoff between the two). Phase 1 includes acquisition of modern equipment to take advantage of viewing opportunities (e.g. comets, occultations, eclipses), using internal funds. Phase 2 will include renovation of the spaces, following a significant capital expenditure to repair the roofs for water leakage and safety on the viewing deck, requiring capital funds. UAC is involved in pursuing private funders.

- Summer pilot recruitment program: In 2017, three female students from Miller Comprehensive High School were invited to carry out a two-week research project in photogrammetry (3D optical imaging). All three students came to the U of R, two in biology and one in Physics. The latter could have gone to U of C to pursue astrophysics, but elected to come to the U of R. She is now graduating with an Honours and 91% GPA and has accepted a graduate student position at the University of Victoria. That hands-on program has potential and will be revisited when the pandemic allows.
- Summer pilot retention program: as the retention rates from 1st to 2nd year are considerably lower than the U of R's average, we embarked on a pilot program to invite students that have completed their 1st year of study, to hands-on summer research. This started in 2020 (virtually!) with four students, two female and two male. It was successful: one female student received a UGRA, one male received a USRA and the other male a research stipend, all for the summer of 2021. This program will continue in 2021, with 3-4 new students, emphasizing gender diversity.
- Social Media: the Department has considerably enhanced its social media presence.

The Department will continue its efforts to arrive at effective multifaceted approaches to recruitment and retention, that will include visits to urban and rural schools in the U of R's sphere.

Staffing

Recommendation 14: In view of the unit's commitment to deliver a complete graduate experience and of the importance of theoretical physics in the graduate curriculum, the institution is encouraged to revisit the current situation where a theoretical physicist in the Department carries a considerable administrative load.

Unit Update: Dr. Mobed has been Department Head (until 2019) and Associate Dean of Science of Science for over a decade; he is scheduled to complete the latter in 2022. During this entire period he has admirably and commendably continued to shoulder a vital load in teaching select senior undergraduate and core graduate theoretical classes. After 2022, it is possible that he could teach up to three courses a year, but details are not known at this time. The need for his eventual replacement is presented in Recommendations 5, 6 and 15.

Recommendation 15: The institution should make every effort to replace the retiring faculty members. Based on material at hand (report and visit) and on the requirements related to offering complete graduate and undergraduate curricula, the Committee would favour a hire in theoretical physics. Also, in view of its research accomplishments and of its teaching record, the unit and institution are strongly

encouraged to consider using excellence-based funding (e.g. the Canada Research Chairs program, named Chairs, possible joint positions) to recruit and augment its faculty roster beyond this single replacement.

Unit Update: See Recommendations 5, 6 and 14. In addition, the University of Regina is a member of TRIUMF as well as SURA. These memberships were granted because of the longstanding leadership of the U of R physicists to research in subatomic physics and the U of R commitment to support that research. As a member institution, we are actively exploring the possibility of securing bridge-funded positions in fundamental and applied physics sponsored by TRIUMF or the Fedoruk Centre.

Financial Resources

Recommendation 16: The Department should seek additional sources of funding to supplement its core budget.

Unit Update: The Departmental budget allocation from the Faculty of Science is based on student enrollments, TA and laboratory equipment needs, partial support for seminar speakers, and supplies needed to run the Department office. The Department spends 80% of its budget on student TAs, 10% on operations and 10% capital expenditures (equipment maintenance). The staffing of our undergraduate labs relies on graduate student TAs. The Departmental TA budget is supplemented by 3-4 GTAs annually from FGSR through the Faculty of Science. We will attempt to proactively seek additional sources of funding.

Role in meeting University's Strategic Plan

Recommendation 17: Given that decisions and budget allocations at the University level are guided by the Strategic Plan, the Department should consider to be guided by it as well. The Department should therefore develop a plan to address the goals of the University's Strategic Plan and use its principles when making request for resources.

1) Unit Update: Here are summaries in connection to our **2020-2025** Plan *All Our Relations*.

- **Discovery.** The high profile of the Departmental research in national and international arenas in experimental subatomic physics is acknowledged in the AUR report. We have added breadth to this area. We are well on the road to establishing such reputation in applied physics, which will be further enhanced if we are successful in securing a second Fedoruk Chair and/or similar chairs in the future from TRIUMF or SaskPower. We have grown the number of graduate students to 15 and our postdocs to 7. These are the highest numbers in the history of the Department, including when the Department had 13 faculty members. The Canadian Association of Physicists 2014 Summary of Physics Departments shows that the smallest Department has 4 faculty members and the largest has 62, with 87% of faculty being research active. Our corresponding numbers in 2021 are 9 (including Dr. Lawler) and 100% (was 87% in 2016).
- **Well-being and Belonging.** There is a high level of collegiality in our department, and a healthy and productive atmosphere among faculty, postdocs and graduate students. Pre-covid, we staged social

events. Our graduate student group is quite diverse and we have seen an increasing diversity in our undergraduate programs. The AUR report identified an attrition rate of more than 60% among undergraduate physics majors. To address this, an overhaul of the undergraduate curriculum has been carried out. Additionally, we: i) regularly employ undergraduates in summer research through USRA, UGRA, etc.; ii) started pilot projects in recruitment from high school and retention for undergraduates completing their 1st year; iii) created the Build Club to engage senior undergraduate students in interesting research and develop them into mentors for junior students, iv) works closely with the PSS, and the PSS seniors do mentor the younger students on their own as well; iv) plan to create a "Big Buddies" program between faculty and students starting 2021-30. The Department has two female faculty and 20% female graduate students. In our undergraduate courses, female students constitute a wide range in the percentage of the total number of students in our courses, from 23% to 75%, and we hope that our pilot projects stabilize the numbers at or above the national average. In recent years there has been an increase in the participation of women in physics globally, but at an inconsistent pace, without achieving a full representation of women in physics, from classroom to careers.

- **Impact and Identity.** The Department's significant and notable contributions to the professional community, university community, and public at large are recognized in the AUR Report. These efforts have redoubled in the last two years. The Department will continue to explore further avenues to incorporate the themes of sustainability and indigenization into its activities, including following the Faculty of Science's lead in developing relationships with Indigenous educational leaders and members of First Nations University of Canada.
- **Environment and Climate Action:** The department is not directly involved in these activities. If the second Fedoruk Chair in neutron imaging is awarded, one of the areas of potential research is clean energy.
- **Truth and Reconciliation**. The Department has taken the following steps to explicitly promote indigenization through its course offerings as follows.
  - PHYS 103 (Essential Physics: Ideas and Applications) has been offered for the first time in 2021-10 to facilitate the transition from high school to university. The plan is to include physics examples of indigenous practices by the time the course is offered again.
  - The course PHYS 140 (Physics of Energy and the Environment) was created years ago, but we have not had the resources to offer the course to date. This will change in 2021-30 in partnership with FNU (Dr. A. Sardarli). A second-year student received an UGRA for 2021-20, and she will work in part on developing indigenous materials for the course with Dr. Sardarli. Some of this material will also be used in PHYS 103.

Summary: The Department has addressed 16 of the 17 External Review recommendations. The many updates made (e.g. curriculum, etc.) as well as the changes in the faculty complement (1 retirement, 2 new members, 1 promoted, 1 in Campion and new adjuncts) have taken effort to put in place. The Department plans to stabilize these and assess their impact in the next 3-4 years with a focus on recruitment and retention, where there is significant room for improvement, before investigating other avenues in Recommendation 3.

2) Unit Update: Here are summaries in connection to our **2016-2021** Plan *Together We Are Stronger*.

To avoid duplication, all topics below refer to the new Strategic Plan sections.

- **Student Success.** Please refer to section **Well-being and Belonging** (*All our Relations*).
- **Research Impact.** Please refer to section **Discovery** (*All our Relations*).
- **Commitment to Communities.** Please refer to sections **Impact and Identity** and **Truth and Reconciliation** (*All our Relations*).
- **Sustainability and Indigenization.** Please refer to sections **Environment and Climate Action** and **Truth and Reconciliation** (*All our Relations*).

Appendix A

Curriculum Changes (since 2016)

2016:
- implementation of B.Sc. Honours thesis (as recommended in AUR): modification of Phys 498, 499, deletion of Phys 490, and changes to BSc Honours requirements
- modify fluid mechanics class: Phys 292 -> 392
- modify math phys classes: Phys 351 -> 251, modify Phys 352
- modify BSc physics degree requirements to increase flexibility
- modify BSc applied physics degree requirements
- changes to 4 year program schedules for BSc, BSc Hons, and Applied Physics to better guide students through program
- modify Phys 421 prerequisites
- implement a 2-year class offering schedule, to increase student variety and decrease Department teaching load

2017:
- create PHYS 885, approved graduate summer school

2018:
- create PHYS 103, essential physics: ideas and applications (offered for the 1st time in 2021-10)
- create PHYS 871, experimental methods of subatomic physics
- create PHYS 240, technological and engineering applications of modern physics (not offered yet)

2019:
- rename BMI program do BMRT and extensively revise the degree requirements
- create ASTR 290, special topics in astronomy/astrophysics

2020:
- create PHYS 811, graduate version of PHYS 411
- create PHYS 902, PhD comprehensive exam (0 credit)
- modify PHYS 900, graduate seminar
- revise MSc, PhD (after BSc), PhD (after MSc) degree requirements
- modify PHYS 140 calendar description, physics of energy and the environment (offered 1st time in 2021-30)
- create ASTR 199, astrobiology
- create ASTR 300, astronomical observation
- create ASTR 390, selected topics in astrophysics
- revise BSc physics, applied physics and BSc Hons requirements to enable physics majors to take ASTR 3xx courses as part of program
- updated the 2-year class offering schedule