**GAS: Environmental and Natural Resource Sciences**

**Program Review 2009 - 2010**

**Program Co-ordinator: Mr. Lawrie Gulston**

June 2010

**GSN :** **Program Review**

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| **Indicator****1.0 Industry Trends** | **Summary of Key Findings** |
| **1.1 Sectoral Standards and Industry Trends****Review / discuss:*** New or emergent industry / sector themes or issues that may have a potential impact on program positioning
* Industry / sector issues identified by the Program Advisory Committee
* Recent labour market data or sector reports
* Recent or anticipated changes in occupational standards, level of entry and credential and / or standards of accreditation
* Program alignment to labour market and sectoral trends
 | * Increasing need for generalists because of trend to environmental legislation and planning, awareness of human factors balancing scientific ones
* Expected mining labour-force shortage for Ontario for the period of 2009-2018
* Expected strong growth in public sector jobs in Ontario in science and technology, modest growth in resource industries
* Employment trends in biological sciences (F&W, EM, ET) will be average to fair, in earth sciences (including RDB) good. Geomatics will be limited.
* ECO Canada continues to evolve occupational standards in environmental and natural resource sciences
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| * 1. **Program Advisory Committee Feedback**

**Review / discuss:*** Key regional issues identified by the Program Advisory Committee that may not have emerged in labour market data
* The Advisory Committee’s assessment of the response, or capacity to respond, to the above issues or trends
 | * PAC for GSN has no sector representatives for SENRS.

SENRS Committees consistently ask for graduates with better writing skills. |
| **1.3 Industry Liaison****Review / discuss:*** Program initiatives to maintain involvement with the industry / sector such as field placement supervisions, clinical, faculty renewal, professional learning, other professional affiliations, or community-based projects
 | * Sector involvement is through SENRS programs.

Graduate options: direct entry into Semester 2 SENRS, workplace in environmental and natural resource fields, application to other college programs |

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| **2.0 Curriculum Development and Framework** | **Summary of Key Findings** |
| **2.1 Curriculum Framework****Review / discuss:*** The program faculty’s approach to, and philosophy of, teaching and learning
 | * Balance of practical and theoretical knowledge and skills
* Lots of counseling, enabling
* Regular feedback on student progress
* Building knowledge and enthusiasm for SENRS programs
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| **2.2 Outcomes from Curriculum Renewal****Review / discuss:*** Key outcomes from the Curriculum Renewal processes of the past few years
* Progress to date in implementing the recommendations arising from Curriculum Renewal
* Success of the changes implemented and the means by which they are being evaluated
 | * Decreasing enrolment in recent years, only 4 applicants in 2009
* Initial review meeting December 3, 2009: goal set to revise curriculum to allow graduates direct entry into SENRS Semester 2
* PAC meeting December 19, 2009: revised curriculum presented and approved
* Meeting with SENRS Dean and curriculum lead January 20, 2010: agreement to move forward with proposed curriculum changes
* Meeting February 25, 2010 with Admissions and Marketing to review changes to GSN curriculum and update promotional materials
* March email campaign to prospective students
* Confirmed change to chemistry course (prep chemistry) as recommended by SENRS and chemistry co-ordinator
* First formal review meeting May 6 with faculty and PMS
* Trip to Haliburton May 7 to scout locations for fall field camp
* Second review meeting May 17 with faculty and PMS
* currently review work ongoing, target enrolment for fall exceeded
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| **2.3 Curriculum Map*** Review the Program Curriculum Map and discuss the extent to which there is alignment of vocational and course outcomes
* Review / discuss the distribution and progression of Vocational Learning Outcomes, Essential Employability Skills, and General Education themes across the curriculum.

 **Submit an updated curriculum map as an attachment.** | * Course outcomes align very well with the revised program outcomes.
* The revised program has a good balance of VLOs, EES, and General Education.
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| **2.4 Curriculum Sequencing****Review / discuss:*** The extent to which course content, levels of learning, and assessment methodology are successfully sequenced and aligned between courses and across semesters
 | * Semester 1 introduces students to foundational skills and concepts that will be developed in later semesters. Note the following examples
* Ecology and Environment introduces foundational concepts developed in all SENRS programs.
* Ecosystem Skills introduces processes of identification of plant and animal species and of mineral types, as well as orientation skills using compass and GPS. These are necessary for field work in most SENRS courses.
* Introductory Computing ensures competence with file management, network software, and the Microsoft Office Suite (excepting Access); the student will be able to acquire the International Computer Drivers and to meet the challenge of advanced software in Geospatial Techniques in Semester 2.
* Similar care has been taken to match course content, levels of learning, and a healthy variety of assessment methods across all courses in both GSN semesters.
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| **2.5 Delivery Mode****Review / discuss:*** The *primary* modes used to deliver curriculum such as lecture, seminar, lab, applied project, field camp and web based or hybrid courses
* The rationale for, and appropriateness of, these delivery modes in relation to program learning outcomes
 | * Lectures, seminars, labs, applied and cross-course projects, field camp and hybrid courses are all used where appropriate for the content being presented.
* Foundational concepts such as declination are best taught in a lecture format. Applied outdoor skills such as compassing are best done in a lab. Discovering with students the implications of principles such as the business cycle are most effectively done in seminars in which case studies are presented and analyzed. The field camp allows concentrated development of field and team skills. The hybrid format in which lecture material is delivered online is appropriate for concepts in technical writing.
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| **2.6 Evaluation Methods****Review / discuss:*** The program approach to learning assessment
* The balance and frequency of assessment types across the curriculum and their appropriateness to course / vocational outcomes
 | * A variety of assessments are used: these are appropriate for the students and content, and the variety makes them more pedagogically valid.
* Program courses prefer small frequent assessments to single large ones. This approach is best for GSN outcomes which are mostly environmental concepts and skills.
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| **2.7 Curriculum and Diversity****Review / discuss:*** Program strategies that support student diversity and promote understanding of diversity, including program culture / climate, curriculum content and approaches to teaching and learning
 | * GSN students take two general education courses that promote diversity.
* Their Business Essentials course requires self-analysis through DISC to demonstrate diversity of learning and personality types within the class.
* Field Camp reinforces teamwork and builds program cohesiveness early in the curriculum.
* Weekly staff meetings allow close monitoring of student progress and early recognition and resolution of interpersonal issues.
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| **2.8 Credentials Framework****Review / discuss:*** The Ontario College Credentials Framework and the extent to which the program aligns with the provincial standards
* The program’s current admission requirements and their suitability in relation to program rigour and student preparedness
 | * GSN aligns very well with provincial standards.
* 1.1 Vocational courses include Field Camp, Ecosystem Skills, and Geospatial Techniques.
* 1.2 Essential Employability Skills include two maths, Communications, and Business and Workplace Essentials.
* 1.3 One General Education Elective course is included in Semester 2.
* GSN also meets requirements 2, 3, and 4
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| **2.9 Learning Pathways****Review / discuss:*** Recent or anticipated initiatives that promote student pathways including high school articulations, dual credit, program laddering, dual diplomas, and university transfer, articulations, and partnerships
 | * GSN ladders into programs in the School of Environmental and Natural Resource Sciences. Students graduate with all credits in SENRS Semester 1 (Common First Semester), and one credit for a General Education elective course which can be applied in later semesters in a SENRS program or at other colleges.
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| **3.0 Student and Graduate Satisfaction** | **Summary of Key Findings** |
| **3.1 Formal Measures of Student and / or Graduate Satisfaction****Review / discuss:*** Key Performance Indicator results for the program with a focus on #s 4, 8, 9, and 11
* Program status and positioning in relation to the KPIs of other programs of a similar type (where applicable)
* Feedback and summary report from Learning Support Services (LSS) summary
* Themes or issues emerging from a review of course evaluation summaries
 | * Student satisfaction ratings are higher in most aspects at Frost than at Brealey
* 2008 grad survey: 5 responses – 4 continuing education, 1 working
* 2008 KPI results for GSN: #4 nil, #8 83 (74), #9 89 (77), #11 nil.
* 2009 no KPI for GSN: combined results for GAS programs #4 87 (72), #8 72 (75), #9 80 (77), #11 87 (84).
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| **3.2 Other Measures of Student and Graduate Satisfaction****Review / discuss outcomes from:*** Student or graduate focus groups
* Student Advisor observations / reports
* Formal or informal discussions with students and graduates such as class councils, class representatives, individuals or delegations
* Debriefing sessions following a field placement, clinical placement, or practicum
 | * no focus group data available
* anecdotal evidence from first intake: mixed responses regarding satisfaction. The program was well taught and fulfilled its mandate. Some students found they didn’t want to apply to SENRS and withdrew. Some students applied to SENRS in January without completing GSN. Some students succeeded in entering SENRS and completing a diploma program. Most students complained that CFS repeated much of what they learned in GSN.
* Feedback from 2010 Open House indicates high level of satisfaction with changes to GSN curriculum
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| **4.0 Employment Trends** | **Summary of Key Findings** |
| **4.1 Employment****Review / discuss:*** Graduate employment statistics over the last few years, including those of students employed in the field, in a related field, outside the field, or unemployed, and any emerging patterns in this data
* Student preparedness for entry-level positions
* Emergent employment trends such as new types of positions, changing job market, regional distinctions, changing employer profile, or emerging skill shortages
 | * The statistics for 2007-8 (last available) indicate 100% employment, since only one graduate was available for work and found work.
* Overall, General Arts and Science programs at Fleming have close to 100% overall employment rate for the last five years.
* Provincial labour market reports indicate a need for generalists and a continuing strong market for environmental practitioners.
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| **4.2 Other Graduate Destinations****Review / discuss:*** Alternative graduate destinations such as further education, international opportunities, volunteer service, or other experiences
 | * The GSN program is designed to be a gateway for students directly into Semester 2 SENRS diploma programs. In three more semesters, a student can graduate with a college diploma.
* Alternative colleges with environmental programs include Algonquin, Sault, and Seneca.
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| **5.0 Strategic Positioning** | **Summary of Key Findings** |
| **5.1** **College Alignment****Review / discuss:*** Program alignment with college priorities such as vision, mission, values, strategic plan, academic framework, and the educational mandate, and / or academic priorities of the School
* Opportunities for new program initiatives based on Program, School, or community strengths and alliances
 | * The new strategic plan for the college calls for modest growth and a renewed emphasis on development of academic resources. The current revision of GSN to attract more students and better align it with programs in the School of Environmental and Natural Resource Sciences meets those goals.
* The School of General Arts and Sciences set as one of its 2009-10 goals the renewal of GSN.
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| **5.2 Competitor Programs****Review / discuss:*** Key parallels and differences between this program and those of its closest competitors, where applicable
* ’Value-added’ program distinctions and their attractiveness to prospective students
 | * Algonquin College: General Arts and Sciences – Environmental Studies (certificate and diploma program)
* Same mix of generic skills and environmental sciences
* Algonquin emphasizes arts courses (ethics, economics); Fleming is more hands-on (skills, geospatial, etc)
* Value added is the practical value of courses for job market or entry directly into Semester 2 SENRS diploma programs.
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| **6.0 Enrolment Trends** | **Summary of Key Findings** |
| **6.1 Demand for the Program** **Review / discuss:*** Patterns in the number of program applicants, qualified applicants, and actual registrants over the past 6 years
* Changes, if any, in the student demographic profile, including level of maturity, diversity, prior knowledge, technological literacy, work experience, and expectations
* Impact, if any, of this changing student profile on program curriculum
 | * The current intake is the 5th since the program’s inception in 2006.
* Demand remained steady at 20-28 students for three years. In the 4th year, it dropped to 3.
* Applications in 2010 are 222 (111 in 2009). Currently we have 21 open offers, 22 confirmed acceptances, and 7 paid fees, indicating a conversion rate of 7.5-8%.
* An estimated half of GSN applicants lack the U/C math required for admission to SENRS. Applicants denied admission to SENRS are sent alternative offers to GSN. The other half of GSN applicants express a need to experience and evaluate SENRS programs, both in terms of what it means to work outdoors doing environmental work or which programs are best suited to their interests, and they see GSN as the best opportunity to assess those things before they commit to a SENRS program. Hence the biggest complaint about the earlier curriculum in GSN was the overlap with CFS in SENRS and the lack of transferrable credits when admitted to SENRS.
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| **6.2 Student Progression****Review / discuss:*** Patterns of student success and retention on a semester by semester basis over the last six years
* The effectiveness of any strategies adopted to improve student success and retention
 | * An estimated 70% of GSN students continued into Semester 2, and about 55% of graduates entered the Common First Semester in SENRS.
* Some students with SENRS admission requirements were admitted to SENRS in January without completing the GSN certificate.
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| **7.0 External Relations** | **Summary of Key Findings** |
| **7.1 Alumnae** **Review / discuss:*** The type and range of alumnae involvement in the program
* Current and future strategies to engage alumnae in the program
 | * Currently there are no alumnae strategies in place.
* A future strategy would be to track graduates into the workplace and into SENRS, the latter to measure their success in SENRS programs.
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| **7.2 Community Relations****Review / discuss:*** Significant partnerships, relationships, connections, or offers of support from the community that help to enrich the program and the student experience
* Faculty, staff, and student involvement in volunteer projects and events
* Contributions to the not for profit sector such as committee or board service by program-associated faculty and staff
* Community recognition in the form of student bursaries, awards and scholarships
 | * Currently there are none apart from what is available at the Frost Campus.
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| **7.3 Program Advisory Committee****Review / discuss:*** The distribution of Committee membership by constituency, sector, and / or region
* The vitality of the Committee such as the frequency of meetings, and members’ level of participation, engagement, and turnover
* The extent to which Committee operations are aligned with the Fleming College Advisory Committee Orientation Manual and Advisory Committee policy.

  | * PAC for General Arts and Science encompasses all GAS program. Therefore, members are drawn from local school boards in Peterborough and the City of Kawartha Lakes and from Trent University, the latter because some GAS programs transfer credits directly to Trent.
* Meetings are held twice a year in fall and winter semesters. Engagement is high. Members see GAS programs as an important gateway for students to or from their educational institutions.
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| **8.0 Program Resources**  | **Summary of Key Findings** |
| **8.1 Human Resources** **Review / discuss:*** The number and distribution of all faculty, technicians, and technologists associated with the program including full-time, part-time, sessional, and cross-appointments
* Profile of the Dean, faculty, and staff associated with the program including cumulative credentials, scholarship, work-related and teaching experience, and expertise in education
* Significant faculty or staff accomplishments such as professional recognition and awards, achievement of credentials, and appointments
* Contributions to the professional community or industry by program-associated faculty and staff including board / committee service, research, and presentations / publications
* Current staffing levels for the program in relation to program

 numbers, curriculum, delivery modes and areas of specialization / generalization* Hiring priorities over the next few years based on the above
* Current professional development and renewal plans in relation to program or student needs
 | * Faculty who teach the six courses from SENRS CFS are SENRS faculty, as is the faculty member who administers and runs the field camp. The rest are GAS school faculty. Technical support for field camp and for CFS courses is provided by SENRS technicians. Approximately half the teaching faculty are full-time; the rest are partial load.
* The Dean, faculty, and staff hold university degrees, some graduate degrees, and most have at least five years teaching experience at the postsecondary level. The program co-ordinator has a Masters degree and 40 years’ experience.
* Staffing is adequate for the revised curriculum. Technical support has been requested for the field camp.
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| **8.2 Physical Resources****Review / discuss:*** Program costing information
* Scope of current program resources such as laboratory equipment, software, library holdings, or tools essential to or which enhance program delivery or student learning
* The adequacy of above resources in the context of program outcomes, program currency, and student numbers
* Program specific external revenue such as sponsorships, grants, donations or gifts-in-kind
* Other externally generated revenues, if applicable
 | * Students pay an extra field camp fee of $75, currently based on two nights away. This will be adjusted to accommodate four nights away in camp, about $150 each.
* Other required resources are shared between SENRS and GAS or are provided by the college such as computer laboratories, the Biocommons, the Learning Commons, Learning Support Services, and library services.
* Resources are currently adequate for the program. No external grants or sources of funding are available.
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File report in:

**S:\shared data\CLT\:*< School name*>: <*Program Name*>: Program Review Report**

Attach copies of existing and revised bench marks

Attach an updated Program Curriculum Map

**Based on an analysis of your key findings, identify areas that require attention.**

**Develop recommendations and an action plan that reflects the program’s priorities and its capacity to achieve them.**

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| **Program Review Action Plan** | **Responsibility** | **Timeframe** |
| **Recommendations:**Alumni: follow up with graduatesField Camp fee increase (to cover 4 nights away) | Co-ordinatorCo-ordinator, Dean | 20112011 |