1. Will this course revision affect a current program?  
   Yes ☐ No ☒  
   If "yes", has a Program Revision Form been submitted concurrently?  
   Yes ☐ No ☒

2. Teaching Department:  
   Physics

3. Administering Faculty/Unit:  
   Science

4. Campus  
   (Downtown, Macdonald, Off Campus, Distance Ed, Other – specify)  
   Downtown

5. Effective Term of Implementation  
   (Ex. Sept. 2004 = 200409)  
   Term: 200609  
   ☐ Retirement

6. Responsible Instructor:  
   R. Rutledge, A. Cumming, V. Kaspi

7. Credit Weight  
   (or CEU's for non-credit CE courses):  
   3
   Old Credit Weight or CEU’s (if applicable):  
   3

8. Course Number(s)  
   Indicate course number & the number of terms spanned:  
   (tick all that apply)  
   Subject/course number: PHYS 645
   Course(s) Span:  
   ☒ 1 term
   ☒ 2 consecutive terms (D1, D2)
   ☒ 2 non-consecutive terms (N1, N2)
   ☒ 3 consecutive terms (J1, J2, J3)

9. Number Change From:  
   PHYS 621

10. Consolidation of Courses:  

11. Split of Multi-Term Course:  

12. Course Title (Limit 30 char.) - required for all courses.  
   High Energy Astrophysics

   Old Course Title (if applicable)  
   High Energy Astrophysics

13. Course Title to Appear in the Calendar (Optional)  
   (Limit 59 characters):  
   Note: This can ONLY be an expansion of word(s) abbreviated in the 30 character course title in Box 12.

14. Rationale for revised course  
   (1) Course Description is updated to reflect greater emphasis on photonic (X-ray, Gamma-ray) and gravitational observational and theoretical astrophysics;  
   (2) Removal of pre-requisite PHYS 567; (3) change course number from PHYS 621 to PHYS 645, to give logical relation with four newly proposed graduate-level astrophysics courses PHYS 641, PHYS 642, PHYS 643 and PHYS 644. This change is being made in the context of several changes to expand graduate core-level curriculum in astrophysics in the department of physics, as described in “Graduate Curriculum for Masters and Ph.D Degree Students in the Department of Physics, Specializing in Astrophysics.” Following the 2000-6 expansion in astrophysics from two to eight faculty, and the expected expansion in the number of MSc and PhD-level students over the next decade, the proposed curriculum will provide coursework at the MSc and PhD level equal to that available at top-tier international programs.

15. New Course Description  
   (as it will appear in the Calendar [maximum 50 words]):  
   (N.B. Faculty of Medicine must append complete course outline)  
   Physical bases for phenomena associated with strong gravity and high-energy processes in astrophysical contexts. X-rays, gamma-rays, nuclear processes, strong gravity and magnetic fields. Shocks, acceleration, and jets.

16. Old Course Description  
   (may be found in the Calendar or Banner)  
   Sources and detection of radiation and high energy particles (cosmic rays, neutrinos, and high energy gamma rays) in astrophysics.
17. Supplementary information to appear in the Calendar in addition to the course description.
   Such as: equivalent course(s), contact hours, enrolment limitations, language of instruction etc.
   Please enter the information as it should appear in the calendar notes.

18. Schedule Types(s):
   (Enter all that apply – see course guidelines for a complete list.)

<table>
<thead>
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<th>Hours per Week</th>
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<tbody>
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   Total Hours per Week: 3

   Total Number of Weeks: 13

19. Projected Enrolment:
   10

20. Revised Prerequisite(s) (Courses or Tests) (in full)
   Specify course number(s) or name(s) of test(s):

   none

   If the student does not have a prerequisite
   should web registration be blocked?
   Yes  No

   If “Yes” complete A and B:
   A. Indicate minimum grade or test score(s) the student
      must attain in prerequisite course(s) or test(s):

   B. Can the prerequisite course(s) or test(s) be taken in the
      same term as this course?
      Yes  No

   Old prerequisite course number(s)
   or test score title(s) (if applicable)

   PHYS 567 or permission of the instructor

21. Revised Corequisite(s) Course Number(s) (in full):
   Specify course number(s):

   none

   If the student does not register for the corequisite
   in the same term should web registration be blocked?
   Yes  No

   Old corequisite(s) course numbers (if applicable):

22. Revised Restriction(s):
   Enrolled in MSc or PhD degree program or permission of instructor

   Old Restriction(s):

23. Additional Course Charges (must be approved by the Fee Policy Committee)
   Description of Fee
   (e.g. screening fee)  Amount
   none

24. Requires Teaching, Physical, or Financial Resources
   Not Currently Available (attach explanation)
   Yes  No

25. Consultation Reports Attached
   Yes  N/A
### INFORMATION FOR ADMISSIONS, RECRUITMENT & REGISTRAR'S OFFICE

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<thead>
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<th>To be completed by ARR</th>
<th>For Continuing Education Use</th>
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### 26. Approvals:

**Routing Sequence**

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<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert Rutledge, 398-6509, <a href="mailto:Rutledge@physics.mcgill.ca">Rutledge@physics.mcgill.ca</a></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Departmental Contact Person**

(name/phone/email)