SOUTH DAKOTA BOARD OF REGENTS
Revised Course Request: Common Course

SDSU
Institution: Physics
Division: Arts & Sciences
Form Initiator: Laurie Stenberg Nichols
Institutional Approval Signature: 10/9/13

Physics
Joel Rauber
Kathleen Donovan
6/25/13

NSU
Institution: College of Arts & Sciences/Biology, Chemistry, Physics, & Math Dept.
Division/Department: Institutional Approval Signature: 6/11/13
Dolejsi, Duane

BHSU
Institution: College of Business and Natural Sciences/School of Natural Sciences
Division/Department: Institutional Approval Signature: 6/7/13
Durben, Dan

DSU
Institution: College of Arts & Sciences/Mathematics & Sciences
Division/Department: Institutional Approval Signature: 6/7/13
Szczerbinska, Barbara

SDSMT
Department of Physics
Petukhov, Andre
6/7/13

Indicate (X) the universities that offer the common course.

BHSU ___ DSU _ NSU X SDSMT X SDSU ___ USD

Section 1. Course Title and Description

Prefix & No.  Course Title  Credits
PHYS 481/581  Mathematical Physics  4

Course Description as it currently appears in the system common course database:
This course looks at mathematical methods used to formulate and solve problems in various fields of physics. Topics are chosen from: series solutions, special functions, computational methods, complex variables, multi-variate methods, transform methods, and other areas of mathematical applications to physics.

Section 2. Modification(s) Requested

X Pre-requisite change MATH 321 (completed) to MATH 321 and MATH 225 (completed)

Justification for all changes noted above:
This is a long overdue clean-up item. MATH 225 – Calculus III (multivariate calculus) is an absolutely essential skill-set required in this advanced physics course. Historically it was an indirect prerequisite by virtue of the fact that MATH 321 had MATH 225 as a prerequisite. At some point in time that prerequisite for MATH 321 was removed and was not noticed by the physics departments. Therefore it now needs to be separately listed as a prerequisite.

1. Will this course be equated (considered the same course for degree completion) with any other unique or common course in the course database?  Yes  X  No

Section 4. To Be Completed by Academic Affairs

University Dept Code  SPHYS
Revised Course Request: Common Course

ATTACHMENT

From: Keller, Christina
Sent: Friday, June 07, 2013 8:47 AM
To: Rauber, Joel; Petukhov, Andre; Szczerbinska, Barbara; Durben, Dan
Subject: RE: Prerequisites for PHYS 421,439,451, 471,481

Joel,

I agree to this change.

Tina

From: Rauber, Joel
Sent: Friday, June 07, 2013 8:46 AM
To: Petukhov, Andre; Keller, Christina; Szczerbinska, Barbara; Durben, Dan
Subject: Prerequisites for PHYS 421,439,451, 471,481

Andre, Tina, Barbara, and Dan –

Having gotten no response from my email of April 26, I am resending; see below:

It became painfully obvious in my Classical Mechanics class that an unusually large number of students did not have appropriate mathematics background. While researching why this is the case I found out that the following advanced physics courses lack Calculus III (multivariate calculus) as a prerequisite.

PHYS 421 – Electromagnetism
PHYS439 – Solid State Physics
PHYS451 – Classical Mechanics
PHYS471 – Quantum Mechanics
PHYS481 – Mathematical Methods

In researching the history of this, I discovered that the current MATH321 (differential equations) prerequisite that these courses all have used to have a prerequisite of Calculus III; so we used to have calculus III as an indirect prerequisite. The change in the MATH321 prerequisites (at some point in time) apparently went unnoticed by us (more collateral damage from the common course catalog).

We should correct this as multivariate calculus background is essential for the above courses. I am willing to do the paperwork for this over the summer; but as usual my bureaucracy will require that I provide emails showing your agreement to this common course change.

Joel

PS – ironically Optics does have MATH225 as a prerequisite (possible the one course that could get away with just a differential equation prerequisite)

PPS – I’ll be doing the PHYS211/213 changes discussed before for the schools that expressed interest this summer as well
From: Petukhov, Andre  
Sent: Friday, June 07, 2013 10:31 AM  
To: Keller, Christina  
Cc: Rauber, Joel; Szczerbinska, Barbara; Durben, Dan  
Subject: Re: Prerequisites for PHYS 421,439,451, 471,481  

I also agree.

Andre

From: Szczerbinska, Barbara  
Sent: Friday, June 07, 2013 11:29 AM  
To: Petukhov, Andre; Keller, Christina  
Cc: Rauber, Joel; Durben, Dan  
Subject: RE: Prerequisites for PHYS 421,439,451, 471,481  

Agree  
Barbara

From: Durben, Dan  
Sent: Friday, June 07, 2013 9:46 AM  
To: Rauber, Joel; Petukhov, Andre; Keller, Christina; Szczerbinska, Barbara  
Subject: RE: Prerequisites for PHYS 421,439,451, 471,481  

Joel,  

That looks good to me.  

Dan

From: Dolejsi, Duane  
Sent: Tuesday, June 11, 2013 10:19 AM  
To: Rauber, Joel  
Subject: Re: Advanced course prerequisite changes  

I agree. A similar thing has happened here for students in advanced chemistry classes. Ultimately, over time we have allowed students to take classes without the needed prerequisites so that they can complete their coursework in a timely fashion. We have found that when these students go on to graduate programs, they usually need to retake these courses in order to be competitive. So, we do the students no favors by relaxing prerequisite mathematics requirements.