MEMORANDUM

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5.80-110

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From Office of the Dean of Graduate Studies.

Subject Graduate Curriculum Changes - Department of Physics

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Date July 14, 1980

MOTION: That Senate approve and recommend approval to the Board, as set forth in S.80-110 - Graduate Curriculum Changes in the Department of Physics.

These changes were approved by the Senate Graduate Studies Committee on July 14, 1980.

> Bryan P. Beirne Dean of Graduate Studies

mm/ attachs.

MEMORANDUM

То	Senate Graduate Studies Committee	From	N. Heath Administrative Assistant to the Dean of Science
Subject	REVISIONS TO PHYSICS GRADUATE CURRICULUM	Date	1980 06 10

At the meeting of 1980 06 05, the Faculty of Science approved the following motion:

"That the proposed revisions to the Physics graduate curriculum and degree requirements, as described in F-80-12, be approved and forwarded to the Senate Graduate Studies Committee and Senate for consideration and approval."

The paper referred to in the above motion is attached. Please note that the revisions include:

1. Deletion of all existing PHYS graduate courses with the exception of PHYS 801-2, 898 and 899.

2. New course proposals:

PHYS	810-3	Fundamental Quantum Mechanics
PHYS	811-3	Advanced Topics in Quantum Mechanics
PHYS	812-3	Relativistic Quantum Mechanics and
		Elementary Particle Theory
PHYS	821-3	Electromagnetic Theory
PHYS	841-3	Equilibrium Statistical Mechanics
PHYS	845-3	Nonequilibrium Statistical Physics
PHYS	861-3	Introduction to Solid State Physics
PHYS	862-3	Solid State Physics II
PHYS	871-3	Introduction to Elementary Particle Physics
PHYS	880-3	Applications of Group Theory to Physics
PHYS	881-3	Special Topics I
PHYS	882-3	Special Topics II
PHYS	883-3	Special Topics III
PHYS	884-2	Special Topics IV
PHYS	885-2	Special Topics V
PHYS	886-2	Special Topics VI
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3. Changes to the amounts of credit required for the M.Sc. and Ph.D. degrees.

4. Discontinuance of the comprehensive examination.

5. Changes to the Language Requirements.

JUN 111980 REGISTRAR'S OFFICE MAIL DESK -

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Senate Graduate Studies Committee

Page 2 1980 06 10

Please refer to pp. 184-188 of the 1979-80 Graduate Studies Calendar for the current requirements and list of courses.

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N. Heath

MEMORANDUM

Jo. Dr. J. M. Webster Dean of Science	M. Plischke, Chairman Graduate Program Committee Physics Department
Subject. Graduate Program Revisions in Physics	Date. 1980 05 20

The Physics Department is proposing several revisions to the program requirements for both the M.Sc. and Ph.D. degree. In addition, it is proposed that all courses listed in the 1979-1980 Graduate Studies Calendar (pages 186-188), with the exception of PHYS 801-2, PHYS 898 and PHYS 899, be dropped and replaced with the new courses described in the appended pages.

Program changes

a) M.Sc. program

The only change proposed in the degree requirements for the M.Sc. degree is a lowering of the minimum number of hours of course credit from 18 semester hours to 17 semester hours.

- b) Ph.D. program
 - (i) It is proposed that the minimum course requirement for the Ph.D. degree shall be 9 semester hours beyond the M.Sc. level rather than 10 semester hours as in the present program.
 - (ii) The comprehensive examination is discontinued. (See p.185 of 1979-1980 calendar for statement of old requirement).
 - (iii) The Ph.D. language requirement is modified. It is proposed that the new calendar entry shall read:

Language Requirement

In certain areas of research, familiarity with languages other than English may be important. In such cases a student's supervisory committee may require him to attain reading knowledge of one such language.

(See p.185 of the 1979-1980 Graduate Calendar for the existing requirement).

M. Plischke

MP/m1

F-80-12

CALENDAR 1	IFORMATION:		
Department	PHYSICS		Course Number:
Title:	Fundamental Quantum Mech	anics	
Description	: Review of Foundations of ment theory; angular mom variational methods; tim	Quantum Mechanic Mentum, time rever Me dependent pertu	s; states and observables, measure sal; stationary perturbation theor rbation.
Credit Hou	rs: <u> </u>	tor:	PHYS 415-3 Prerequisite(s) if anv: <u>or equi</u> vale
ENROLLMENT	AND SCHEDULING:	M-1, <u>maj fara jata</u> din <u>a a</u> ta <u>i</u> ta <u>ita ana a</u>	· · · · · · · · · · · · · · · · · · ·
Estimated	Enrollment: 6 Wher	will the course fir	st be offered: 80-3
How often	vill the course be offered:	Once a year	
JUSTIFICAT			
	To provide, together wit	h PHYS 811-3, a s	olid grounding in non-
	relativistic quantum mec	chanics.	
RESOURCES:		· · · · · · · · · · · · · · · · · · ·	·
Which Facu	- lty member will normally teach	the course: Any mem	ber of department
What are t	ne budgetary implications of mo	ounting the course:	None
· · ·			
Are there	sufficient Library resources (4	append details):	Yes
Appended:	a) Outline of the Courseb) An indication of the competition of the compe	stence of the Faculty	member to give the course.
			Ano Ale
Approved:	Departmental Graduate Studies	Committee: Muffinf	1/4/2004 Date: 1980-05-09
-	Faculty Graduate Studies Comme	ttee: Daw t C.	Broke Date: 13 May 160
	Faculty:	Liseber I	Date: 10 June 1980
	Senate Graduate Studies Commit	ttee: <u>3111</u>	Blue Date: 14 ply 80
	Senate:	1	Date:

New Graduate Course Proposal Form

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epartment:	PHYSICS	Course Number: PHYS 811-3
itle:	Advanced Topics in Quantum Mechanic	5
escription:	A continuation of PHYS 810-3; scatter spin statistics, creation and annih perturbation theory, Hartree Fock th	ring theory, identical particles, lation operators, diagrammatic eory.
redit Hours	:	Prerequisite(s) if anv: PHYS 81 or equi
ENROLLMENT A	ND SCHEDULING: rollment: 6 When will the cours	e first be offered: 81-1
low often wi	11 the course be offered: Once	
JUSTIFICATIC	To provide, with PHYS 810-3, a soli	d grounding in nonrelativistic
	quantum mechanics.	
	quantum mechanics.	
	quantum mechanics.	
RESOURCES: Which Facult What are the	quantum mechanics. ty member will normally teach the course: e budgetary implications of mounting the cou	r. L. E. Ballentine, Dr. K. S iswanathan, and others. rse:None
RESOURCES: Which Facul What are the	quantum mechanics. ty member will normally teach the course: I e budgetary implications of mounting the cou	r. L. E. Ballentine, Dr. K. S. iswanathan, and others. rse:
RESOURCES: Which Facul What are the Are there s	quantum mechanics. ty member will normally teach the course: e budgetary implications of mounting the cou- ufficient Library resources (annend details)	r. L. E. Ballentine, Dr. K. S. iswanathan, and others. rse:
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ALENDAR IN	FORMATLO3:
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epartment:	PHYSICS Course Number: PHYS 812-3
itle:	Relativistic Quantum Mechanics and Elementary Particle Theory
escription	: Lorentz group and representations; Dirac and Klein Gordon Equations, Maxwell Equations and Quantization; perturbation theory; Feynman diagrams and rules; strong and weak interactions.
redit Hour	s: <u>3 Vector</u> : <u>3-0-0</u> Prerequisite(s) if anv: PHYS
ENROLLMENT	AND SCHEDULING:
Estimated H	nrollment: 6 When will the course first be offered:
low often w	ill the course be offered: On demand; probably-once every 2 years.
JUSTIFICATI	ON :
•	To provide an introduction to field theory and elementary
	At the theory for students intending to commy out research
	particle theory for students intending to cally out research
,	in this area.
	in this area.
RESOURCES: Which Facu What are th	in this area.
RESOURCES: Which Facu What are the	in this area. in this area. ity member will normally teach the course: Dr. K. S. Viswanathan, Dr. L. E. Ba he budgetary implications of mounting the course: None Sufficient Library resources (append details): Yes
RESOURCES: Which Facu What are the Are there Appended:	in this area. in this area. ity member will normally teach the course: Dr. K. S. Viswanathan, Dr. L. E. Ba he budgetary implications of mounting the course: None sufficient Library resources (annend details): Yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources
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RESOURCES: Which Facu What are the Are there Appended: Approved:	in this area. in this area. ity member will normally teach the course: Dr. K. S. Viswanathan, Dr. L. E. Ba he budgetary implications of mounting the course: None sufficient Library resources (append details): Yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources Departmental Graduate Studies Committee: Miles Miles Date: 1980-05-09 Faculty Graduate Rudice Committee: Depart G. Forester Date: 13 May 160 Faculty: Date: 10 June 15 Senate Graduate Studies Committee: Bud Bate: 10 June 15 Senate Graduate Studies Committee: Bud Bate: 14 July 6

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CALENDAR	1N	IFOR	MAT	103	:
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)epartment:	PHYSICS			Course Numbe	r:	
fitle:	Electromagnetic	Theory in classica	<u>1 electroma</u>	gnefic theory;	review of	Maxwell's
Description:	equations, wave electromagnetic radiation dampir	propagation theory, mag	<u>radiation</u> netohydrody	theory, speci namics and pla	<u>al relativi</u> .sma physics	<u>ty a</u> nd ;
Credit Hours:_	3	Vector:	3-0-0	Prorequisit	e(a) if anv:_	PHYS 425-3 or equiva
ENROLLMENT ANI	SCHEDULING:					
Estimated Enro	ollment: <u>6</u>	When will	the course fi	lrst be offered:	80-3	
How often will	l the course be offe	red: Once c	or twice a y	ear		
	····					
MOTTELCATION	•					
This cour	i rse is intended a	s a basic o	raduate com	rse for all st	udents	
	rse is intended a	<u> </u>				
in the M	.Sc. program.					<u> </u>
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RESOURCES:				members of the	department	
RESOURCES:	member will normall	ly teach the c	ourse: All	members of the	department	
RESOURCES: Which Faculty What are the	member will normall budgetary implication	ly teach the c	course: All in the course:	members of the None	department	
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RESOURCES: Which Faculty What are the	member will normall budgetary implicatio	ly teach the cons of mountin	ourse: All i	members of the None	department	
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Department:_	PHYSICS Course Number: PHYS 841-3
Title:	Equilibrium Statistical Mechanics
Description:	Review of ensembles and thermodynamics; Ideal gases, Imperfect classical gases, classical and modern theories of phase transitions, Renormalization group.
Credit Hours	: <u>3</u> <u>Vector: 3-0-0</u> Prerequisite(s) if anv: PHYS 345-3 or equival
ENROLLMENT A Estimated Er How often wi	IND SCHEDULING: Incollment: 6 When will the course first be offered: 81-1
now orten wa	
JUSTIFICATIO	<u>N:</u> This course is intended for all students in the M.Sc. program and should provide a good grounding in statistical physics.
RESOURCES: Which Facul	ty member will normally teach the course: Any member of the department
What are th	e budgetary implications of mounting the course: None
What are th	e budgetary implications of mounting the course: None
What are th Are there s Appended:	e budgetary implications of mounting the course: None ufficient Library resources (annend details): Yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources
Are there s Appended: Approved:	e budgetary implications of mounting the course:
What are th Are there s Appended: Approved:	e budgetary implications of mounting the course: None ufficient Library resources (annend details): Yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources Departmental Graduate Studies Committee: Multiplic Date: 1980-05-09 Faculty Graduate Studies Committee: Depart C. Toroute Date: 13 May 160 Faculty: Date: 10 June 1980
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epartment:	PHYSICS Course Number:PHYS 845-3
itle:	Nonequilibrium Statistical Physics
escription:	Boltzmann equation and applications; H-theorem, conservation laws, Navier Stokes equation; Fluctuation-dissipation theorem, Kubo formalism systems far from equilibrium, stability theory, stoichastic analysis.
redit Hours	3Vector:3-0-0Prerequisite(s) if anv:PHYS_84
NROLLMENT A	ND SCHEDULING:
etimated En	rollment: 6 When will the course first be offered:
the second	11 the course be offered: On demand; probably every second year
low often wi	
JUSTIFICATIO	N:
	To provide an introduction to the growing field of nonequilibrium
	statistical mechanics.
	Statistical mechanics.
RESOURCES:	
RESOURCES:	Dr. B. L. Jones, Dr. L. E. Ballentine
<u>RESOURCES:</u> Which Facul	ty member will normally teach the course: Dr. B. L. Jones, Dr. L. E. Ballentine
RESOURCES: Which Facul What are th	budgetary implications of mounting the course:
RESOURCES: Which Facul What are th	ty member will normally teach the course: Dr. B. L. Jones, Dr. L. E. Ballentine Dr. B. Plischke None
RESOURCES: Which Facul What are th Are there s	ty member will normally teach the course: Dr. B. L. Jones, Dr. L. E. Ballentine Dr. B. Plischke None ufficient Library resources (append details): Yes
RESOURCES: Which Facul What are th Are there s Appended:	ty member will normally teach the course: Dr. B. L. Jones, Dr. L. E. Ballentine budgetary implications of mounting the course: None ufficient Library resources (append details): Yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources
RESOURCES: Which Facul What are th Are there s Appended:	ty member will normally teach the course: Dr. B. L. Jones, Dr. L. E. Ballentine Dr. B. Plischke e budgetary implications of mounting the course: None ufficient Library resources (append details): Yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources
RESOURCES: Which Facul What are th Are there s Appended: Approved:	budgetary implications of mounting the course: None ufficient Library resources (append details): Yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources Dr. B. L. Jones, Dr. L. E. Ballentine Dr. B. Plischke Pr. B. Plischke Dr. B. Plischke Pr. B. Plischke Dr. B. Plischke Pr. B. Plischke Dr. B. L. Jones, Dr. L. E. Ballentine Dr. B. Plischke Pr. Pr. Pr. Pr. Pr. Pr. Pr. Pr. Pr. Pr.
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RESOURCES: Which Facul What are th Are there s Appended: Approved:	by member will normally teach the course: Dr. B. L. Jones, Dr. L. E. Ballentine Dr. B. Plischke budgetary implications of mounting the course: None None ufficient Library resources (append details): Yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources Departmental Graduate Studies Committee: Hard Michigan Date: 1980-05-09 Faculty Graduate Studies Committee: Faculty Craduate Studies Committee: Depart C. Forence Date: 10 June 1980
RESOURCES: Which Facul What are th Are there s Appended: Approved:	budgetary implications of mounting the course: None ufficient Library resources (annend details): Yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources Departmental Graduate Studies Committee: Muse Millin Menate: 1980-05-09 Faculty Graduate Studies Committee: Down C. Forester Date: 1980-05-09 Faculty Graduate Studies Committee: Down C. Forester Date: 10 June 1980 Faculty Graduate Studies Committee: Busice Market Date: 10 June 1980 Faculty Graduate Studies Committee: Busice Market Date: 10 June 1980 Faculty Graduate Studies Committee: Busice Date: 14 May 60 Faculty Graduate Studies Committee: Busice Date: 14 May 60 Faculty Faculty Faculty Faculty Bate: 14 May 60 Faculty Faculty Facu
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epartment:	PHYSICS Course Number: PHYS 861-3
itle:	Introduction to solid state physics: free electron theory, crystal
escription:	structure, band theory, Bloch's theorem, electron dynamics, Phonons,
	semiconductors.
redit Hours:_	3 Vector: <u>3-0-0</u> Prerequisite(s) if any: or equiv. PHYS 405 PHYS 405 PHYS 405 PHYS 405
INPOLIMENT ANT	SCHEDULING:
etimated Enro	llment: 6 When will the course first be offered: 81-1
low often will	the course be offered:Once a year
JUSTIFICATION	
	To provide an introduction to solid state physics
	for graduate students.
	101 graduate studenes.
	101 graduate students.
RESOURCES:	
RESOURCES:	member will normally teach the course: Any member of the department
RESOURCES: Which Faculty	member will normally teach the course: Any member of the department
RESOURCES: Which Faculty What are the	member will normally teach the course: <u>Any member of the department</u> budgetary implications of mounting the course: <u>None</u>
RESOURCES: Which Faculty What are the	member will normally teach the course: <u>Any member of the department</u> budgetary implications of mounting the course: <u>None</u>
RESOURCES: Which Faculty What are the Are there suf	member will normally teach the course: <u>Any member of the department</u> budgetary implications of mounting the course: <u>None</u> ficient Library resources (annend details): <u>Yes</u>
RESOURCES: Which Faculty What are the Are there suf Appended: a) b) c)	member will normally teach the course:Any member of the department
RESOURCES: Which Faculty What are the Are there suf Appended: a) b) c)	member will normally teach the course: <u>Any member of the department</u> budgetary implications of mounting the course: <u>None</u> ficient Library resources (annend details): <u>Yes</u> Outline of the Course An indication of the competence of the Faculty member to give the course. Library resources
RESOURCES: Which Faculty What are the Are there suf Appended: a) b) c) Approved: De	member will normally teach the course: <u>Any member of the department</u> budgetary implications of mounting the course: <u>None</u> ficient Library resources (annend details): <u>Yes</u> Outline of the Course An indication of the competence of the Faculty member to give the course. Library resources
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RESOURCES: Which Faculty What are the Are there suf Appended: a) b) c) Approved: De Fa	member will normally teach the course: <u>Any member of the department</u> budgetary implications of mounting the course: <u>None</u> ficient Library resources (annend details): <u>Yes</u> Outline of the Course An indication of the competence of the Faculty member to give the course. Library resources expartmental Graduate Studies Committee: <u>Minifile Minifile</u> Date: <u>1980-05-09</u> aculty Graduate Studies Committee: <u>Depart C. Foreste</u> Date: <u>13 Nay Be</u> Date: <u>10 June 1980</u>
RESOURCES: Which Faculty What are the Are there suf Appended: a) b) c) Approved: De Fa	member will normally teach the course: <u>Any member of the department</u> budgetary implications of mounting the course: <u>None</u> ficient Library resources (annend details): <u>Yes</u> Outline of the Course An indication of the competence of the Faculty member to give the course. Library resources expartmental Graduate Studies Committee: <u>Main Michael Date</u> : <u>1980-05-09</u> aculty Graduate Studies Committee: <u>Down C. Foreste</u> <u>Date</u> : <u>13 Main 182</u> pate: <u>10 June 1980</u> pate Graduate Studies Committee: <u>Buddefeute</u> <u>Date</u> : <u>14 June 1980</u>

CALENDAR	INFORMATION:
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Dopartmant	PHYSICS	Course Num	ber:
minles	Solid State Physics II		
Description:	Special topics in solid stat	e physics such as sup	erconductivity,
Description	magnetism, optical propertie	es of solids, electron	correlations.
Credit Hours:	3 Vector:	3-0-0 Prorequi	site(s) if any: PHYS 861-3
ENROLLMENT AN Estimated Enr How often wil	D SCHEDULING: Dollment:6When will the course be offered:On dema	the course first be offere nd; perhaps two times	d: every 3 years
JUSTIFICATION	: Advanced course for students of	arrying out research :	in
	solid state physics.		and the second se
RESOURCES: Which Faculty What are the	member will normally teach the co budgetary implications of mounting	urse: Any member of the the course: None	e department
Are there su	fficient Library resources (annend	details): Yes	·
Appended: a b c) Outline of the Course) An indication of the competence) Library resources	of the Faculty member to	give the course.
Approved: D	epartmental Graduate Studies Commi	tee: Michael Plych	Date: 1980-05-09
. 1	Paculty Graduate Studies committee:	Debe Brinke	Date: <u>13 Man 80</u> Date: <u>10 June 1980</u>
:	Senate Graduate Studies Committee:	Sur Blue	e Date: 14 Mily P
:	Senate:	موج معمومی و معروب است مربوسی با اور موجه می و مان و موجه می و مان و موجه مان و مارو با مان و مان و مان و مو	uare:

epartment:	PHYSICSCourse Number: PHYS 871-3
itle:	Introduction to Elementary Particle Physics Elementary Particle Phenomenology; classification of particles, for
escription	conservation laws; relativistic scattering theory, electromagnetic actions of leptons and hadrons, weak interactions, gauge theories, strong interactions.
credit Hour	s: 7-0 Prerequisite(s) if anv:
ENROLLMENT	AND SCHEDULING:
Estimated H	nrollment: 0 When will the course first be offered:
low often v	ill the course be offered: On demand; perhaps every second year
JUSTIFICAT	<u>ON :</u>
	To provide a survey of elementary particle physics.
RESOURCES:	Dr. K. S. Viswanathan
RESOURCES: Which Facu What are t	Ity member will normally teach the course: Dr. K. S. Viswanathan
RESOURCES: Which Facu What are t	Ity member will normally teach the course: Dr. K. S. Viswanathan
RESOURCES: Which Facu What are t Are there	Ity member will normally teach the course: Dr. K. S. Viswanathan
RESOURCES: Which Facu What are t Are there Appended:	a) Outline of the Course (append details): yes yes yes yes yes yes yes yes
RESOURCES: Which Facu What are t Are there Appended:	A sufficient Library resources (append details): a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources
RESOURCES: Which Facu What are t Are there Appended: Approved:	Lty member will normally teach the course: Dr. K. S. Viswanathan he budgetary implications of mounting the course: None sufficient Library resources (append details):yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources Departmental Graduate Studies Committee:
RESOURCES: Which Facu What are t Are there Appended: Approved:	Ity member will normally teach the course: Dr. K. S. Viswanathan ne budgetary implications of mounting the course: None sufficient Library resources (annend details): yes a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources Departmental Graduate Studies Committee: Machine Machine Date: 1980-05-09 Faculty Graduate Studies Committee: Date: C. Pornste Date: 13 May 140 Faculty: Date: 10 June 194
RESOURCES: Which Facu What are t Are there Appended: Approved:	Lty member will normally teach the course: Dr. K. S. Viswanathan he budgetary implications of mounting the course: None sufficient Library resources (annend details): yes a) Outline of the Course b) An indication of the commetence of the Faculty member to give the course. c) Library resources Departmental Graduate Studies Committee: C. Formies Date: 1980-05-09 Faculty Graduate Studies Committee: C. Formies Date:

New Graduate Course Proposal Form

CALENDAR INF	ORMATION:	, · · ·
Department:	PHYSICS	Course Number: PHYS 880-3
Title:	Applications of Group Theory to Physi	C5
Description	Elements of group theory, matrix repr series; applications of finite and co in atomic, solid state and elementary	esentations, the Clebsch-Gordon mtinuous groups to problems particle physics.
Credit Hour	s:3Vector:3-0-0	Prerequisite(s) if anv:
ENROLLMENT	AND SCHEDULING:	
Estimated E	nrollment: 6 When will the course f:	lrst be offered:
How often w	111 the course be offered: On demand	·
JUSTIFICATI	<u>ON:</u> Survey course on group theory and ap	plications.
	Survey course on group theory and ap	
RESOURCES: Which Facul	- Ity member will normally teach the course: Dr. L	. E. Ballentine, Dr. K. S. mathan, Dr. J. C. Irwin
What are th	ne budgetary implications of mounting the course:	
	None	I
Are there	sufficient Library resources (annend details):	(es
Appended:	 a) Outline of the Course b) An indication of the competence of the Facul c) Library resources 	ty member to give the course.
	Mil	ADVI-1400 1980-05-09
Approved:	Departmental Graduate Studies Committee: 1 Lun	ay I window wate:
	Faculty Graduate Stadies Committee; Departy	Date: 10 June 198
	raculty: Build	Benne Date: 14 hely h
	Senate Graduate Studies Committee: / OUP	Date:
	Senate:	

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CALENDAR INF	ORMATLON:
Department:	PHYSICSCourse Number: PHYS 881-3
Title:	Special Topics I
Description	:
١	
Credit Hour	s: <u>3</u> Vector: <u>3-0-0</u> Prerequisite(s) if anv:
ENROLLMENT Estimated E How often w	AND SCHEDULING: nrollment:6 When will the course first be offered: ill the course be offered:On demand
JUSTIFICATI	ON: This will be an advanced course in a specialised
-	area of physics.
RESOURCES: Which Facu What are t	- Ity member will normally teach the course: <u>All members of the department</u> he budgetary implications of mounting the course: <u>None</u>
<u> </u>	
Are there	sufficient Library resources (annend details): Yes
Appended:	 a) Outline of the Course b) An indication of the competence of the Faculty member to give the course. c) Library resources
Approved:	Departmental Graduate Studies Committee: Muke Offitte Date: 1980-05-09
	Faculty: Date: 13 Man 1980
	Senate Graduate Studies Committee: Popul Sluine Date: 4 July 8
	Senate:uare:

New Graduate Course Proposal Form

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CALENDAR IN	FORMATION:
)enartment:	PHYSICS Course Number: PHYS 882-3
fitla.	Special Topics II
Jescription	· · · · · · · · · · · · · · · · · · ·
Credit Hour	s:3Vector:3-0-0Prerequisite(s) if anv:
ENROLLMENT	AND SCHEDULING:
Estimated H	Enrollment: 6 When will the course first be offered:
How often w	vill the course be offered: On demand
JUSTIFICAT	<u>10N :</u>
	This will be an advanced course in a specialised
	area of physics.
• • • • • • • • • • • • • • • • • • • •	
RESOURCES:	
Which Facu	Ity member will normally teach the course: All members of the department
What are t	he budgetary implications of mounting the course:
<u></u>	None
Are there	sufficient Library resources (annend details): Yes
Appended:	a) Outline of the Course
Appendee	 b) An indication of the competence of the Faculty member to give the course. b) Idvances
	C) LIDEALY REDUCCES
Approved:	Departmental Graduate Studies Committee: When Much Date: 1980-05-09
	Faculty Graduate Studies committee: Day A. C. Formake Date: 13 Mary 180
	Faculty: Date: 10 June 198
	Pro Alaria man in helph
	Senate Graduate Studies Committee:
	Senate:Date:

CALENDAR IN	FORMATION:				•	
Department:	PHYSICS			_Course Numbe	er: PHYS 88	33-3
Title:	Special Topics	III				
Description	:					-
		,				
Credit Hour	3	Vector:	3-0-0	Prcrequisi	te(s) if anv:	-
ENROLLMENT Estimated How often v	AND SCHEDULING: Chrollment:6	When will the o d:On_demand	course first	be offered:		
JUSTIFICAT	ION: This will be an	advanced cour	rse in a s	pecialised		
	area of physics	5.				<u></u>
	<u>, 1997 - A. C. A.</u>					
					· · · · · · · · · · · · · · · · · · ·	
RESOURCES:	1					
Which Facu	lty member will normally	teach the course	:A11_mem	bers of th	<u>e departmen</u>	<u>t</u>
What are t	he budgetary implications	of mounting the	course:	None		
			· · ·			<u> </u>
Are there	sufficient Library resour	ces (annend deta	ils): Yes			
Appended:	a) Outline of the Coursb) An indication of thec) Library resources	e competence of t	he Faculty.	member to giv	ve the course	
Approved:	Departmental Graduate St	udies Committee:	Michigh	hillse	Date: 1980-	-05-09
	Faculty Graduate Stopics	Committee: De	mry G. P	brotes	Date: 13 Mar	180
	Faculty:	V Ludel	185	2	_Date:10	<u>une 19</u> 80
	Senate Graduate Studies	Committee:	Jul B	lune	Date: 14 p	ly 80
	Senate:				Date:	. <u></u>

New Graduate Course Proposal Form

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CALENDAR INF	ORMATION:				
Department:_	PHYSICS		······	Course Numb	er:
Title:	Special Topi	cs IV			
Description:			<i>۲</i>		
Credit Hours	3:2	Vector:	2-0-0	Prorequis	ite(s) if anv:
ENROLLMENT / Estimated En How often wa	AND SCHEDULING: nrollment:6 111 the course be off	When will t ered: On dema	he course fin nd	rst be offered	:
JUSTIFICATI	<u>ON :</u>				
RESOURCES: Which Facul What are th	- ity member will normal ne budgetary implicat	lly teach the conting	urse: <u>All m</u> the course:	embers of th None	ne department
Are there a	sufficient Library re	sources (append	details):	Yes	· · · · · · · · · · · · · · · · · · ·
Appended:	 a) Outline of the C b) An indication of c) Library resource 	ourse the competence 9	of the Facul	ty member to g	ive the course.
Approved:	Departmental Graduate Faculty Graduate Sty Faculty:	e Studies Commit	Den St.	Plinkte Bours	Date: 1980-05-0 Date: 13 New 18- Date: 10 June Date: 14 July
	Senate Gradulate Stud	iles Committee:	Chine 1	<u>verns</u>	Uate:

CALENDAR INFOR	RMATLOA:
Department:	PHYSICSCourse Number: PHYS 885-2
Title:	Special Topics V
Description:	
, · •	
Credit Hours:	2 Vector: 2-0-0 Prorequisite(s) if anv:
ENROLLMENT AN Estimated Enr How often wil	D SCHEDULING: collment:6 When will the course first be offered: If the course be offered: On demand
JUSTIFICATION	δ <u>.</u>
	This is an advanced course in a specialised
	area of physics.
RESOURCES:	y member will normally teach the course: All members of the department
What are the	budgetary implications of mounting the course: <u>None</u>
·	·
•	
Are there su	fficient Library resources (append details):Yes
Appended: a b c) Outline of the Course) An indication of the competence of the Faculty member to give the course.) Library resources
	-AAn
Approved: D	Departmental Graduate Studies Committee: Mulay / Willer Date: 1980-05-09
F	Faculty Graduate Studies committees Der VC: Frenke Date: 13 Mary (80
F	Faculty:
S	Senate Graduate Studies Committee: Min Seine Date: 14 ply D
S	Senate:Date:

New Graduate Course Proposal Form

CALENDAR INFORMATION:

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Department:		PHYSICS	·	·	Course Numbe	er:	PHYS 886-2
Title:		Special Top	ics VI				
Description	:	······································			an a		
Credit Hour	s:	2	Vector:	2-0-0	Prerequisi	te(s)	if anv:
ENROLLMENT	AND SCH	EDULING:			· · · · · · · · · · · · · · · · · · ·		
Estimated E How often w	ill the	course be of	When will fered demand	the course fi	rst be offered:		
JUSTIFICATI	ON :	·					
		This will b	be an advanced	course in	a specialised	l 	
		area of phy	ysics.				
·							
RESOURCES: Which Facul What are th	- lty mem he budge	per will norma etary implicat	illy teach the co	urse: All m	nembers of the None	e dej	partment
							<u> </u>
Are there a	suffici	ent Library ro	esources (append	details): <u>Y</u> e	s		
Appended:	a) Ou b) An c) Li	tline of the (indication of brary resource	Course f the competence as	of the Facul	ty member to giv	ve th	e course.
Approved:	Depart	mental Gradua	te Studies Commit	toe: Nika	ff-horthe	Date	: 1980-05-09
	Facult Facult	y Graduate St y:	udies compitted:	-ebs E	Borrike	_Dato _Date	: <u>13 May)80</u> : <u>10 June 198</u>
	Senate	Graduate Stu	dies Committee:	Rupp	Blue	_Date	14 ply 8
				r	•	Date	>: