Annual Report for the Year 2001

National Institute of Physics
College of Science, University of the Philippines
Diliman, Quezon City 1101, Philippines

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Chapter I. Executive Summary

by *Caesar Saloma*

A. Introduction

This annual report is the second in the series under my term as Director of Institute which began on June 1, 2000. The first was published in January 2001 and could be accessed from the official website (www.nip.upd.edu.ph) of the National Institute of Physics (NIP).

The NIP was established by former President Ferdinand E. Marcos via the issuance of Executive Order 889 in 1983. It started operation as an institute on 26 May 1983 immediately after the approval of Board of Regents of the University of the Philippines (UP).

The NIP has been envisioned to be a national center of excellence for the acquisition, dissemination and application of knowledge in physics. In 1997, the NIP was accredited by the Commission on Higher Education as a Center of Excellence in physics in recognition of its status as the premier institute for tertiary and postgraduate physics education in the Philippines.

As an academic unit the NIP has three major functions, namely: Teaching, Research, and Extension Services. In the second semester, AY 2001 - 2002, the all PhD NIP Faculty is composed of eight (8) Professors, four (4) Associate Professors, and four (4) Assistant Professors. Ten (8 Professors and 2 Associate Professor) of these faculty members are on permanent (tenure) appointments. Professors Arnel Salvador and Roland Sarmago were granted tenure in 2001.

The NIP offers two kinds of undergraduate degree programs (BS Physics and BS Applied Physics) in addition to graduate degree programs in MA (Physics), MS (Physics) and PhD (Physics). The successful presentation of a undergraduate (research) thesis is a requirement in our five-year BS programs. An MS degree may be obtained either through passing the comprehensive examinations or by presenting an MS thesis. A PhD degree is granted to an MS (Physics) degree holder upon the successful presentation of PhD dissertation and the acceptance of at least one paper in an ISI-abstracted journal. To a non MS degree holder, a PhD degree is granted after passing the comprehensive examinations with high marks, the successful presentation of PhD dissertation and the acceptance of at least one paper in an ISI-abstracted journal.

The NIP also handles the general physics course requirements (service courses) of the other undergraduate degree programs of UP Diliman. To accomplish its teaching responsibilities, the NIP relies on the services of seventeen (17) Instructors, one (1) Teaching Fellow and fourteen (14) Teaching Associates. All of our junior faculty are enrolled in the Graduate School either as PhD or MS Physics students.

The NIP operates six research groups with interests in *condensed matter physics, instrumentation physics, liquid crystals, photonics, plasma physics,* and *theory*. Each research group is managed by a program coordinator who is appointed on a yearly basis. A research group consists of regular faculty members, university researchers, graduate and undergraduate students, and adjunct researchers from other academic units. Research grants from the Philippine Center for Advanced Science and Technology Research and Development of the Department of Science and Technology, Commission on Higher Education, and the University of the Philippines are the primary source of funds for the operation of our research laboratories.

The NIP is the country's leading research center in physics and applied physics. In the 2001, NIP researchers published seventeen (17) papers in ISI-abstracted journals in addition to more than ninety (90) technical paper presentations in domestic and international conferences.

Our faculty members are also active in the activities of the Samahang Pisika ng Pilipinas (Physical Society of the Philippines). Dr Salvador is the current President of the Samahang Pisika. Dr Zenaida Domingo is the current chair of the NRCP Physics Division. A number of NIP faculty have also been appointed as administrators and advisers in University and other government agencies. Dr Henry Ramos is the program coordinator of the Science and Society Program of the College of Science, UP Diliman. Dr Jose Magpantay serves as a science and technology adviser in the office of UP President Francisco Nemenzo.

Latest information about the NIP may be obtained from its official website: www.nip.upd.edu.ph.

B. Personnel and Organization

In 1 June 2001, Dr. Caesar Saloma began to serve the second year of his three-year appointment as the Director of the Institute. Dr. Saloma has been ably assisted in managing the day-to-day operations of the Institute by the following Deputy Directors: Dr. Ronald Banzon (Academic Affairs), Dr. Luis Ma. Bo-ot (Facilities & Resources), and Dr. Arnel Salvador (Research & Extension Services). Deputy Directors serve on the basis of annual appointments. Dr Bo-ot resigned his appointment on 31 May 2000 to enable him to pursue postdoctoral research in Japan. He was replaced by Dr. Maricor Soriano.

Figure 1 presents the organizational structure of the National Institute of Physics. The NIP Executive Council which is chaired by the NIP Director, is the highest policy-making body of the Institute. Apart from the NIP Director, it is composed of full-time Professors and Associate Professors as permanent members, and the three deputy directors, and six program coordinators as *ad hoc* members. The NIP Director also chairs the Graduate Committee which consists of all full-time Ph.D. faculty members of the Institute. The Graduate Committee is tasked to review and approve student applications into the NIP graduate program and to prepare the annual M.S./Ph.D. comprehensive examinations.

The Undergraduate Physics Committee consists of all full-time faculty members who are handling courses in the B.S. Physics and Applied Physics programs. It is chaired by the Deputy Director for Academic Affairs. The General Physics Committee consists of all faculty members who are handling general physics courses (Physics 71, 72, 73, 71.1, 72.1, and 73.1). It is chaired by a faculty that is appointed (with a term of one academic year) the NIP Executive Council through the recommendation of the NIP Director. Mr. Giovanni Tapang served as GPC chair in AY 2000-2001. The current GPC chair is Mr Matthew George Escobido.

Table I lists the NIP faculty in the second semester, SY 2001 - 2002 which include 16 Ph.D.'s and 32 instructors and teaching associates. Seven faculty members are on postdoctoral leave in foreign research institutions while one is on PhD study leave in Australia. The ten tenured faculty members are: J. Magpantay, L. Chan, D. Yanga, C Saloma, H. Ramos, Z. Domingo, A Salvador, R Sarmago, V. Abastillas, and L. Posadas). The rest are on temporary appointments.

Cognizant of the situation that most of its young PhD faculty obtained their degrees from the University of the Philippines, the NIP is committed to sending them abroad to gain valuable postdoctoral research experience. This program however, has to implemented in such a manner that the teaching functions of NIP are not seriously compromised. In 2001, the NIP Executive Council agreed on the following guidelines for the granting of faculty leaves:

1) Study leaves (with or without pay) to pursue graduate study are no longer granted except under very extreme circumstances.

2) For the purpose of postdoctoral research, leaves with pay are granted only to NIP faculty members who obtained their PhD degree from NIP. No leave shall be longer than one academic year and its extension is an exceptional case which is based on merit and discussed by the NIP Executive Council.

To help achieve its various research objectives, the NIP also employs one University Researcher (W Garcia) and three University Research Associates (R Cureg, R Gutierrez, B Buenaobra). Mr. Garcia is connected with the Photonics Research Group while Mssrs Gutierrez and Cureg are with the Liquid Crystals Group. The NIP also hires a number of undergraduate and graduate student assistants on a semestral appointments which are assigned to the various research laboratories based on need. Their number varies from one semester to another according to the availability of funds from the central UP Diliman administration. To qualify for assistantships, students must pass all their courses in the previous two semesters.

The following are the administrative load credit per semester of the various administrative positions: NIP Director (9 units), Deputy Director (3 units), Program Coordinators (1 unit), and System Administrator (3 units). The NIP System Administrator is

in-charged of the maintenance and upgrade of the NIP local-area network and represents the NIP in the technical committee of the Computational Science Research Center of the UP College of Science.

Table II presents the administrative and technical support staff of NIP. Those assigned at the Office of the Director are responsible for the processing and storage of documents related to appointments, teaching evaluation, and other official requests. The staff at the Supply Office are responsible for documenting the purchase and requisition of equipment, supplies and materials that are needed to carry-out the research and teaching functions of the NIP. The technical staff at the Machine Shop are trained to make precision parts and components for vacuum systems. Apart from maintenance and repair duties, those in the teaching laboratories are trained to make replacement parts and components for experimental set-ups.

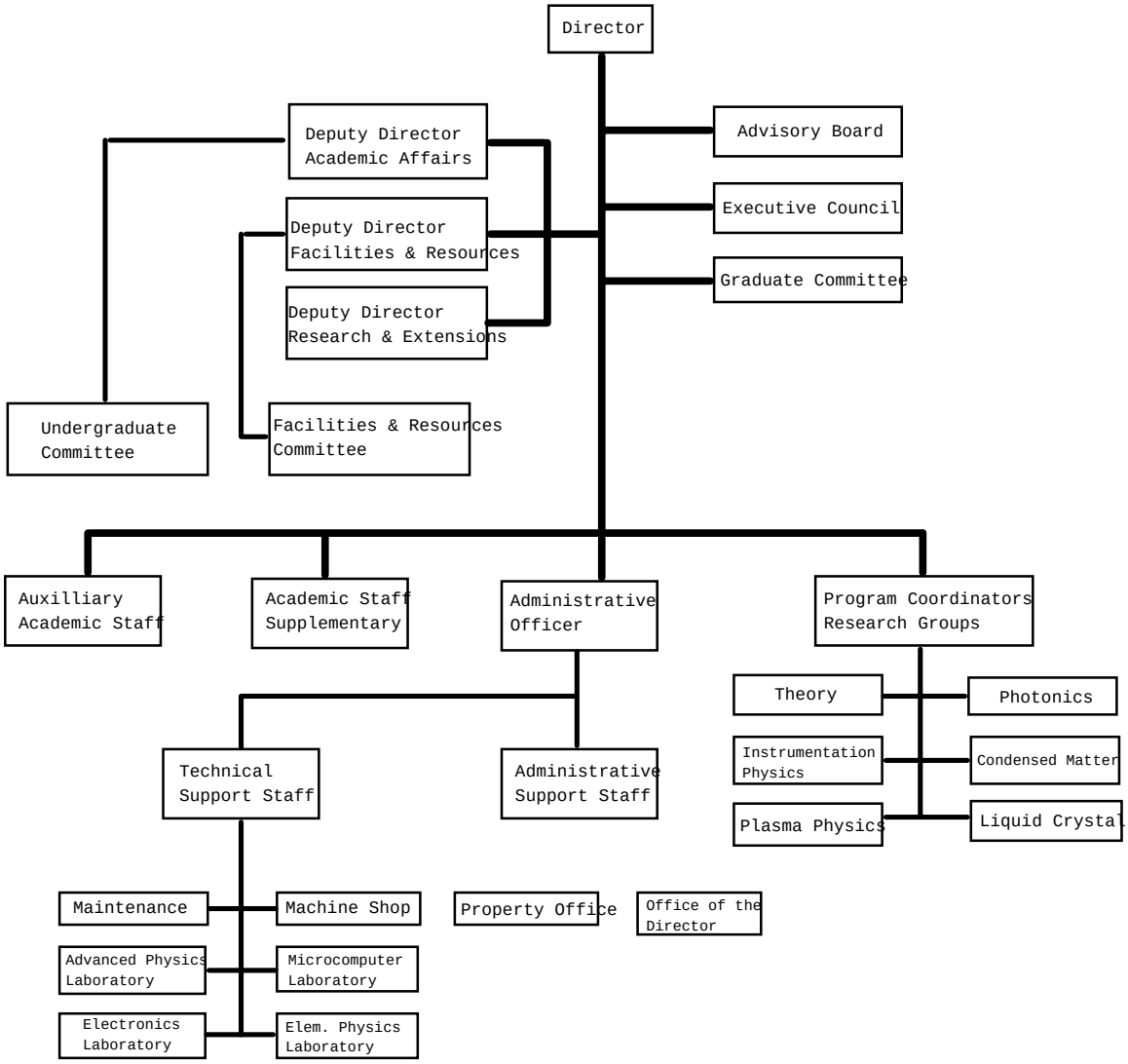

Figure 1. Organizational Structure of the National Institute of Physics

C. Academic Programs

The degree programs offered by the Institute during the period covered by this report are: at the undergraduate level, Bachelor of Science in Physics (B.S. Physics) and Bachelor of Science in Applied Physics (B.S. Applied Physics); and for graduate degrees, Diploma in Physics, Master of Arts in Physics (M.A. Physics), Master of Science in Physics (M.S. Physics), and the Doctor of Philosophy in Physics (Ph.D. Physics). Aside from these regular offerings, the NIP co-implements the following graduate degree programs: M.S. Environmental Science and Ph.D. Environmental Science (with other units in the College of Science) and the M.S. Materials Science and Ph.D. Materials Science (with the College of Engineering). For details of the various programs, please see the Annual Report for 2000 in: http://www.nip.upd.edu.ph

Every B.S. student is required to submit a thesis that is based on a research work which is done under the supervision of an NIP faculty with an advanced physics degree. The undergraduate thesis is presented to the public at the end of each semester in a scheduled program of the Institute. An examination panel consisting of the thesis supervisor and at least two faculty with advanced physics degrees, is tasked to evaluate the correctness and suitability of the thesis work.

On 18 July 2001, the NIP Executive Council approved the following guidelines concerning the application/recruitment of BS students in its research laboratories:

1) *Background*. The undergraduate thesis is a requirement for graduation in the BS Physics and BS Applied Physics programs of NIP. The undergraduate thesis is based upon an independent research work carried out by the student under the supervision of an NIP faculty who must possess the minimum requirement of an MS (Physics) degree or equivalent.

It is the duty and obligation of NIP to provide a research supervisor to any BS Physics/Applied Physics student who is in need of one. The student is understood to have satisfied all the academic requirements of a regular third-year student and will be on her fourth year when she starts her research.

The objective of NIP to increase the number of BS graduates per academic year creates an increase in the number of BS students who will be in need of thesis supervisors.

The supervision of undergraduate student research is expected of all qualified NIP faculty member.

2) *Recruitment*. Only BS students of regular third-year standing or higher, is qualified to become a researcher in any of the NIP research laboratories. The acceptance of a regular third-year BS student in the first-round of recruitment is

based on merit according to a set of academic and skill requirements that is defined by each research group.

If a regular fourth-year student fails to find a research supervisor after the first round, s/he may request the Office of the NIP Director for a suitable thesis supervisor. The assignment of a supervisor is done in a meeting of the NIP Graduate Committee and only during specific times of the academic year.

The above guidelines are subject to change and revision by the NIP Graduate Committee.

In the first semester of SY2001-2002, Physics 195 (Special topics-selected topics of current interest in applied physics, 3 unit lecture course) was offered for the first time for BS Applied Physics (Instrumentation Physics concentration) students. The course is designed to include topics which are covered in EEE 101 (Control Systems Theory) with emphasis in electro-optic instrumentation and signal processing. In the second semester, Physics 195a has been offered as a possible substitute course for ECE 123 (Digital Instrumentation and Control Techniques). EEE 101 and ECE 123 are offered by the EEE Department of the UP College of Engineering.

Below is a summary of the number of students in the various academic degree programs offered by the Institute in the last two academic years. Figures in parentheses correspond to the number of graduates in a given term.

Degree	1st Sem 00-01	2nd Sem 00-01	Summer 00-01	1st Sem 00-01	2nd Sem 00-01
Ph.D.	4	15	4	21(3)	16
M.S.	10 (1)	34	14(3)	37(4)	37
M.A.	2	1	-	4	1
B.S. Physics	66	134	88(1)	148	142
B.S. Applied Physics	176	167	118(2)	167	156

The table reveals a marked increase in the number of graduate students from SY 2000 - 2001 to SY 2001 - 2002. The graduate student population has increased by 425% and 270% respectively. The number of BS Physics students has also increased by more than 100% within the same duration of time.

Most of our graduate students are full-time enrollees with scholarship support from the Department of Science and Technology (DOST). A large number of our college freshmen are also supported by DOST scholarships. Starting in SY 2001-2002, six three Intel scholarship awards shall be awarded to qualified NIP students via a program that is administered by the Philippine Foundation for Physics Incorporated. In the current

schoolyear, the following are recipients of the Intel scholarship awards: G Blantocas (PhD), P Rodrigo (MS), C Alonzo (MS), DE Juanico (BS), M Arciaga (BS), and K Hiroki (BS).

In AY 2001-2002, the NIP made a conscious effort to improve the passing rate of its general physics classes (Physics 71, 72, and 73) to 75%. The goal is to be achieved without compromising the quality of physics instruction and the academic freedom of NIP physics instructors. It is to be accomplished by instituting an active feedback mechanism between the Office of the NIP Director, the GPC chair, and the various course groups concerning class performance after every long examination in relation to its content and composition of the examination questions that were given.

The following (data provided by M. G. Escobido) are the performance of the various classes during the first semester, SY 2001-2002:

Course	Enrollment	Pass (%)	Fail (%)	Dropped (%)	Grade of 4.0 (%)
Physics 71	624	467 (74.8)	60 (9.6)	15 (2.4)	75 (12.1)
Physics 72	669	402 (60.1)	121 (18.1)	40 (6)	102 (15.2)
Physics 73	271	236 (87)	12 (4.4)	1 (0.36)	22 (8.1)
Physics 71.1	575	461 (80.2)	31 (5.4)	34 (5.9)	5 (0.9)
Physics 72.1	375	342 (91.2)	16 (4.3)	6 (1.6)	7 (1.9)
Physics 73.1	263	235 (89.3)	5 (1.9)	19 (7.2)	4 (1.52)

The above information do not take into account that those with grades of 4.0 could have passed the removal examinations given after the final examination period. If taken into consideration, the passing rates could be higher for the various lecture classes.

The performance of the general physics classes were not documented in the past and the above record shall serve as the baseline for future studies.

D. Infrastructure Development

The NIP building occupies two floors of Palma Hall, Pavilion III and the Llamas Hall for a combined dedicated floor space of 4200 m^2. The main entrance is located in the Llamas Hall facing the Quirino Avenue. The first floor is being utilized by five research laboratories (Liquid Crystal, Plasma Physics, Condensed Matter Physics, Instrumentation Physics and Photonics), Machine Shop, two teaching laboratories for physics/applied physics students (Physical Electronics, Advanced Physics), and three general physics laboratories (Physics 71.1, 72.1, 73.1). The second floor houses the lecture rooms (two air-conditioned rooms with a seating capacity of 120, one room with a seating capacity of 60, four rooms with a seating capacity of 30), Audio-visual room, NIP Library, faculty offices, and the Office of the NIP Director. The diagnostics facility of the Condensed Matter Physics Laboratory is also situated in the same floor.

In 2001, a new lathe machine (Pinacho S90/285-155) was installed at the NIP Machine Shop. The machine was purchased using an equipment grant that was awarded by

Chancellor Emerlinda Roman. The Diliman Science Research Foundation donated an LCD projector for the NIP audiovisual room. Seminar presentations can now be done using a variety of media: overhead projector, opaque projector, and a computer-based LCD projector.

The UP System awarded to the NIP an equipment grant in the amount of PhP18 Million that would be used to develop a femtosecond laser facility (PhP12 Million). The laser system is scheduled for delivery in February 2002. The rest of the grant has been used to purchase equipment for the Condensed Matter Physics, Liquid Crystal and Plasma Physics laboratories.

A new architectural design was adapted for the NIP Building that reduced its floor space from 27,000 m^2 to 14,000 m^2. The redesign was carried out by Architect Francisco Nakpil Jr, Architect Nick de Castillo of the UPD Office of Campus Architect in consultation with the NIP Director and Deputy Directors. The construction of the new building is estimated to cost PhP 210 Million (@ PhP 15,000/m^2; 2001 estimate). In December 2001, the technical/legal infirmities associated with the contract of the Phase I construction were resolved paving the way for the Phase II construction (budget PhP 30 Million). The bidding process for Phase II is expected to start in January 2002. The completion of Phase II (estimated construction time = 10 months) will permit the transfer of two research laboratories (Plasma Physics, Liquid Crystal) and all teaching laboratories (Physics 7x.1, Computational Physics Laboratory, etc) to the new site. The student capacity for the Physics 7x.1 classes will double with the opening of the new site.

E. Research Highlights

The Institute is the leading research center of physics and applied physics in the country. It produces the most number of scientific publications in ISI-abstracted journals among the physics and engineering departments in the Philippines. In the year 2001, NIP scientists published seventeen papers in ISI journals (See Appendix A) and presented the largest number (60% or 79 out of 119 papers) of technical papers in the 19th Physics Congress of the Samahang Pisika ng Pilipinas which was held at the St Mary's University in Bayombong, Nueva Vizcaya on 24-26 October 2001. The SPP percentage contribution is the same as that of last year.

Through the financial support of the CHED Center of Excellence grant and the UP Faculty Development Fund, our faculty have been able to present technical papers in more international conferences that at any time in the past. Appendix B presents a listing the international conferences attended by NIP faculty in the year 2000.

NIP authors of papers in ISI-abstracted journals have also benefited from the Presidential Award for International Publications (for faculty and staff only) and the CHED Center of Excellence grant (including teaching associates and fellows). Each paper is awarded a maximum of PhP 50,000.00 that is to be divided equally among the authors.

In 2001, NIP scientists were able to publish for the first time in the Physical Review Letters (M Quito, et al, PRL 86(21):4741-4744, 2001 May 21) based on a research work that was completely done at NIP.

Largely due to their outstanding research performance, the following NIP students garnered awards during the Recognition Program of the College of Science on 21 April 2000: 1) Clarina R. De La Cruz (*cum laude,* Outstanding B.S. Graduate for Physics), 2) Ayn Hazel D. Manuel (*cum laude,* Outstanding B.S. Graduate for Applied Physics), 3) Darwin C. Te (Best Undergraduate Thesis in Applied Physics), and 4) Katrina C. Molina (Best Undergraduate Thesis in Physics). Miss Clarina R. De La Cruz also received the BPI Science Award for 2001.

The following NIP personnel were recipients of the Gawad Chanselor in February 2001: 1) *Pinakamahusay na Website* (Unang Gantimpala) - www.nip.upd.edu.ph (Miss May Lim represented as the official NIP System Administrator), 2) *Pinakamahusay na Imbensiyon at Inobasyon* - The Laser Scanning Confocal Microscope (Dr. Vincent Ricardo Daria, Dr. Caesar Saloma and Mr. Darwin Te), 3) *Pinakamahusay na Nilathalang Pananaliksik* (Science & Technology Cluster) - C Palmes-Saloma and C Saloma, "Long-depth imaging of specific gene expressions in wholemount mouse embryos with single photon excitation confocal fluorescence microscope and FISH," Journal of Structural Biology Vol. 131, pp. 56-66 (2000).

Dr. Caesar Saloma became the first recipient of the Concepcion Dadufalza Award for Distinguished Achievement on 20 February 2001.

F. Extension Efforts

The voluntary services of NIP scientists are crucial to the continued growth of the Samahang Pisika ng Pilipinas (Physical Society of the Philippines). On 1 January 2001, Prof Arnel Salvador assumed the presidency of the SPP. Dr Maricor Soriano and Dr Marlon Rosendo Daza are currently serving as the Secretary-General and First Vice-President of SPP respectively. The length of their terms of office is two years. The following faculty members also serve as SPP councilors: Johnrob Bantang and Cristine Ison. In 2001, Professor Zenaida Domingo also assumed the chair (term: one year) of the Physics Division of the National Research Council of the Philippines.

The Philippine Foundation for Physics, Inc. (PFPI) has continued the following fund raising activities for NIP: 1) Sale of textbooks for the Physics 71 course series, and 2) Sale of laboratory manuals for Physics 71.1, 72.1, and 73.1. The PFPI is a non-stock non-profit foundation that was established more than five years ago by NIP alumni to promote the interest and well-being of their *alma mater*. Financial assistance (PhP 3,000 per person) was given by PFPI to NIP non-academic personnel in 2001. The Intel Scholarship program for NIP students is also handled by the PFPI.

The NIP also providing space for the UP Physics Association (UPPA) which is a duly-recognized academic organization that is composed mostly of undergraduate physics students of UPD. The UPPA held the following activities in 2001: 1) Physics Week (January), UPPAgibig (February), 3) Freshman Orientation Program (May), 4) CHAOS & Bingo (September), and 5) Lantern Parade (December). Miss Maria Veronica Sibayan is the current UPPA President.

G. Prospects for 2002

The following have remained to be the most important challenges facing the Institute: 1) Increasing the number of B.S. Physics/Applied Physics graduate per academic year, 2) Improving the quality of NIP Graduate School, and 3) Completion of the new NIP Building.

For the past five years ending the SY 1999-2000, the NIP produces an annual average of less than ten BS graduates from an undergraduate population of about 300 (average number in the last two academic years). Every year, the NIP accepts a maximum of 120 freshmen (60 slots for each B.S. program). The B.S. Physics/Applied Physics programs are flagship scholarship programs of the DOST-SEI in terms of stipend value. Despite the favorable conditions, less than 50% of the freshmen are able to reach the third-year level of the B.S. programs in regular time. Our studies show the following causes of mortality: 1) Inadequate high school preparation in physics and mathematics, 2) Lure of shifting to traditional courses in engineering and computer science, and 3) Difficult B.S. curriculum requirements.

The following activities have been implemented to improve the situation: 1) Promotion and active recruitment of high school students in the leading (science) high schools in the country, 2) Revision in the B.S. curriculum to allow for more choice in the elective courses and to remove the APE requirement in Math 11, and 3) Undertaking of (social) activities to encourage the freshmen and sophomores to remain with NIP. Efforts to promote NIP among the student population will be done in collaboration with the UP Physics Association.

The lack of space is a major factor that prevents the NIP from offering more sections of Physics 7X.1 classes (maximum capacity of 20 students per class) where demand is significantly greater than the number of slots offered. The resumption of the new NIP building construction provides hope for a 100% increase in the enrollment capacity for the said course in the second semester of AY 2001-2002.

The reputation of NIP as a center of excellence in physics and applied physics is derived mainly from the quality of its graduate school. The presence of scientifically-productive faculty members is most crucial to the development and sustenance of a graduate program that is comparable to the European, Japanese and Americal standards. Outstanding mentors attract and produce outstanding Ph.D. graduates. They also bring money into the Institute in the form of research grants and commissioned projects. At the present time, not all Ph.D. faculty are publishing annually in ISI-abstracted journals nor serving as research supervisors of graduate students. This situation needs to be improved considerably.

Table I. Faculty Members of the National Institute of Physics (2nd semester, SY 2000 - 2001)

PROFESSORS	Lorenzo C. Chan, Ph.D.	*Quantum Field Theory*
	Jose A. Magpantay, Ph.D.	*Quantum Field Theory*
	Danilo M. Yanga	*Quantum Field Theory*
	Caesar A. Saloma, Ph.D.	*Optics, Signal Processing*
	Henry J. Ramos, Ph.D.	*Experimental PlasmaPhysics*
	Zenaida B. Domingo, Ph.D.	*Liquid Crystal Physics*
	Arnel A. Salvador, Ph.D.	*Condensed Matter Physics*
	Roland V. Sarmago, Ph.D.	*Condensed Matter Physics*
ASSOCIATE PROFESSORS	Vivencio Abastillas, Ph.D.	*PhotoacousticSpectroscopy*
	Ludek Jirkovsky, Ph.D.	*Statistical Physics*
	Marlon Rosendo H. Daza, Ph.D.	Photonics
	Roy B. Tumlos, Ph.D.	*Experimental Plasma*
ASSISTANT PROFESSORS	Ronald S. Banzon, Ph.D.	*Computational Physics*
	Luis Ma. T. Bo-ot, Ph.D.	*Experimental Plasma Physics*
	Maricor Soriano, Ph.D.	*Signal, Image Processing*
	Jose Perico Esguerra, Ph.D.	*Statistical Physics*
	Eric Galapon, Ph.D.	*Quantum Physics*
INSTRUCTORS	Percival F. Almoro, M.S.	Michelle Bailon, MS
	M. George O. Escobido, M.S.	May T. Lim, M.S.
	Christopher P. Monterola, M.S.	Armando S. Somintac, M.S.
	Giovanni A. Tapang, M.S.	
	Rumelo Amor	Rainier Awayan
	Minerva Cruz	Stephen Daedalus E. Separa
	Alvin Baclig	Serafin F. Delica
	Joihren F. Joson	Maritess J. Labora
	Cheryll Lei E. Mahinay	Ma. Sheila Angeli C. Marcos
TEACHING FELLOW	Nathaniel Hermosa II	
TEACHING ASSOCIATES	Carlo Amadeo C. Alonzo	Marian F. Baclayon
	Johnrob Y. Bantang	Edmundo P. Casulla
	Clarina R. dela Cruz	Albert Z. Francia
	Kim A. Gargar	Christine S. Ison
	Ayn Hazel G. Manuel	Erwin G. Navarro
	Jonathan A. Palero	Peter John L. Rodrigo
	Junie Jhon M. Vequizo	Miguel DL. Yambot
FACULTY ON LEAVE	Linda S. Posadas, Ph.D.	Associate Professor
	Carlo Mar Blanca, Ph.D.	on postdoctoral leave
	Vincent Ricardo Daria	on postdoctoral leave
	Epifanio Bagarinao, Jr., Ph.D.	on postdoctoral leave
	Cristine DLR. Villagonzalo, PhD	on postdoctoral leave
	Michael HLS Wang, PhD	on postdoctoral leave
	Rex S. Absin	on study

Table II. Staff of the National Institute of Physics (2nd semester, SY 2000-2001)

ADMINISTRATIVE PERSONNEL

Office of the Director

Flora P. Luis	Administrative Officer II
Angelina H. Palo-Galapon	Data Entry Mach. Optr III
Christopher L. Moralejo	Reprod. Eqpt. Mach. Optr. II
Joel Arellano	Utility Worker

Supply and Property Office

Jaime S. Sayaman	Supply Officer II
Antonio Sajol, Jr.	Administrative Assistant
Patrocinio M. Enriquez, Jr.	Property Custodian

TECHNICAL SUPPORT

Machine Shop

Danilo F. Gayagoy	Mach. Shop Foreman
Rodolfo P. Gaca	Machinist

Electrical & Electronics and other Services

Roberto A. Gray	Electrician
Felix V. Maulion	Electronics Comm. Eqpt. Tech. 2001 Building Administrator
Romeo B. Albaniel	Prec. Inst. Techn.
Daniel S. De los Reyes	Laboratory Aide (Elementary Physics)
Neil Balila	Laboratory Aide (Physical Electronics)
Macario Roque	Carpentry

Chapter 2. Report of the Deputy Director for Academic Affairs

by *Ronald Banzon*

Curricular Proposals

MA Physics Program

The laboratory component of the course Physics 204.1 (Foundations of Modern Physics I) was suggested to be removed. The introductory laboratory component has become unnecessary for this graduate course.

The proposal has been sent to the College of Science Academic Affairs Committee for consideration. Details may be found in Appendix E.

BS Physics and BS Applied Physics Program

It was suggested to make the prerequisite for Physics 101 (Fundamental Physics I) similar to that of Physics 71 (Elementary Physics I). The proposal, if accepted, will enable students of the Institute to take Physics 101 instead of Physics 71. This will effectively increase the number of available slots in Physics 71 and Physics 71.1 (Elementary Physics I Laboratory) for service students of the Institute.

A suggestion to change the course descriptions of Applied Physics 181(Physical Electronics I) and Applied Physics 182 (Physical Electronics II) was made. The proposal was to have all analog topics in Applied Physics 181, leaving the digital topics to be covered in Applied Physics 182.

A proposal was made to remove the Physics 112 (Mathematical Physics II) prerequisite for Physics 104 (Modern Physics I). It was observed that a background in differential equations is sufficient to appreciate the course. In addition, the accepted proposal would clarify why engineering students could take Physics 104 without the equivalent of Physics 112.

The above proposals, including some minor changes, have been sent to the College of Science Academic Affairs Committee for consideration. Details may be found in Appendix E.

Proposals from the Instrumentation Physics Group

A proposal for consideration of the Institute from the Instrumentation Physics Group may be found in Appendix F. The minor parts of the proposal has been sent to the College of Science Academic Affairs Committee (See Appendix E).

It is hoped that a similar proposal be made for the condensed matter physics concentration of the BS Applied Physics program.

Developments in the Implementation of Undergraduate Programs

Retention Rules

A practical difficulty was encountered in the implementation of the retention rules for students of the NIP programs. Questions regarding the incorporation of grades of "4.0" in the calculation of the average were raised by faculty advisers. In addition, there were questions regarding the authenticity of the true copy of grades (TCG). It was suggested to have the College of Science Secretary's Office determine the average of math and physics courses of BS Physics and BS Applied Physics students.

Applied Physics 195 and Applied Physics 195A

The Institute offered the courses Applied Physics 195 (Special Topics in Applied Physics: Modern Control Systems) and Applied Physics 195A (Special Topics in Applied Physics: Modern Control System II) as possible substitutes for EEE 101(Control Systems Theory) and ECE 123 (Digital Instrumentation & Control Techniques) respectively.

Applied Physics 195 was offered during the First Semester AY 2001-2002. Dr. Vincent Daria handled the class. Appendix G contains the outline for the course.

Applied Physics 195A was offered during the Second Semester AY 2001-2002 and had as prerequisite EEE 101 or Applied Physics 195 of the previous semester. The class was assigned to Ms. May Lim. Appendix H contains the course outline for the course.

The Institute intends to institute these special topic courses as regular course offerings in a revision of its undergraduate programs.

Physics 104

The current textbook for the engineering classes of Physics 104, "Nonclassical Physics" by Harris (Addison-Wesley: 1999), was adopted for the Physics 104 for physics majors during the First Semester of AY 2001-2002.

Undergraduate Thesis

The undergraduate thesis presentations still follow the format of the previous year – a twenty-minute open forum and examination, and then a ten-minute deliberation of the panel members follows the thirty-minute presentation. It was, however, suggested to have a short break between presentations to enable panel members of the previous session, who may need to be present in the next session, to relax.

A total of eighteen (18) presentations were made. The table below (Table 1) summarizes the number of undergraduate theses presented during the year.

Table 1: Number of Undergraduate Thesis Presentations

Degree Course	Second Semester 2000-2001	Summer 2001	First Semester 2001-2002	Total
BS Physics	2	1	0	3
BS Applied Physics	10	0	5	15

Second Semester AY 2000-2001

The Undergraduate Thesis Presentations for Second Semester AY 2000-2001 was held on Wednesday, 14 March and Saturday, 17 March 2001, at the NIP AVR. Following was the schedule of presentations.

DAY 1: Wednesday, 14 March 2001

09:00 AM Clarina R. de la Cruz (BS Physics)
"Investigations of electrical dissipation properties of c-axis oriented $Bi_2Sr_2CaCu_2O_{8+\delta}$ Thin Films"
Adviser: Dr. Roland V. Sarmago
Panel: Dr. Ronald S. Banzon, Dr. Luis Ma. Bo-ot

10:00 AM Serafin F. Delica (BS Applied Physics)
"Light Scattering in Polymer Dispersed Liquid Crystal: Monte Carlo Analysis and Parametrization"
Adviser: Dr. Carlo Mar Blanca
Co-adviser: Dr. Zenaida B. Domingo
Panel: Dr. Caesar Saloma, Dr. Vincent Daria

11:00 AM Joihren F. Joson (BS Applied Physics)
"Non-isothermal Cold-crystallization Kinetics of Polyimide"
Adviser: Dr. Zenaida B. Domingo
Panel: Dr. Henry Ramos, Dr. Arnel Salvador

02:00 PM Nina Ann A. Lacap (BS Applied Physics)
"Photocurrent Spectroscopy of a Resonant Cavity Enhanced Photodetector"
Adviser: Dr. Arnel Salvador
Panel: Dr. Marlon Daza, Dr. Caesar Saloma

03:00 PM Claire M. Macale (BS Applied Physics)
"Phase transitions of Lyotropic Liquid Crystals"
Adviser: Dr. Zenaida B. Domingo
Panel: Dr. Lorenzo Chan, Dr. Maricor Soriano

04:00 PM Cheryll Lei E. Mahinay (BS Applied Physics)
"Electro-optic Characterization of Photopolymerization-induced Polymer Dispersed Cholesteric Liquid Crystals"
Adviser: Dr. Zenaida B. Domingo
Panel: Dr. Henry Ramos, Dr. Arnel Salvador

DAY 2: Saturday, 17 March 2001

09:00 AM Ayn Hazel G. Manuel (BS Applied Physics)
"Hall voltage measurements in Bi-2212 films"
Adviser: Dr. Roland V. Sarmago
Panel: Dr. Ronald S. Banzon, Dr. Luis Ma. Bo-ot

10:00 AM Ma. Sheila Angeli C. Marcos (BS Applied Physics)
"Color-texture image analysis of coral reefs"
Adviser: Dr. Maricor Soriano
Co-Adviser: Dr. Caesar Saloma
Panel: Dr. Marlon Daza, Mr. Felicisimo Domingo

11:00 AM Katrina Louise C. Molina (BS Physics)
"Frequency and applied field dependence of magnetic susceptibility measurements of YBCO in a mutual inductance bridge"
Adviser: Dr. Roland V. Sarmago
Panel: Dr. Luis Ma. Bo-ot, Dr. Marlon Daza

02:00 PM Arnita C. Podpod (BS Applied Physics)
"Deposition of Silicon Dioxide and Silicon Nitride Thin Films by PECVD"
Adviser: Dr. Arnel Salvador
Panel: Dr. Henry Ramos, Dr. Roy Tumlos

03:00 PM Stephen Daedalus Separa (BS Applied Physics)
"Noise-aided detection and reconstruction of weak signals and images: Theory and Experiment"
Adviser: Dr. Caesar Saloma
Panel: Dr. Ronald S. Banzon, Mr. Wilson O. Garcia

04:00 PM Corleon Ugalino Torralba (BS Applied Physics)
"Optically Controlled Realignment of Liquid Crystals Using Dye-Doped Alignment Layer"
Adviser: Dr. Zenaida B. Domingo
Panel: Dr. Roland V. Sarmago, Dr. Maricor Soriano

Summer 2001

The Undergraduate Thesis Presentations for Summer 2001 was held on Wednesday, 30 May 2000, at the NIP AVR. Following was the schedule of presentations:

01:00 PM Ronald F. Isip (BS Physics)
"Simulation of a Self-Pulsating Semiconductor Laser Under Optical Feedback"
Adviser: Dr. Marlon Rosendo H. Daza
Panel: Dr. Ronald S. Banzon, Dr. Roland V. Sarmago

First Semester AY 2001-2002

The Undergraduate Thesis Presentations for the First Semester AY 2001-2002 was held on Wednesday, 26 September 2001, at the NIP AVR. Following was the schedule of presentations:

09:00 AM Alvin Baclig (BS Applied Physics)
"Optical Recognition of Fingerprints"
Adviser: Dr. Marlon Rosendo H. Daza
Panel: Ms. May Lim, Dr. Maricor Soriano

10:00 AM O'mer Fernandez (BS Applied Physics)
"Ordering Stability of Polymer Network-Stabilized Nematic E7 Liquid Crystal"
Adviser: Dr. Zenaida Domingo
Panel: Mr. Percival Almoro, Mr. Christopher Monterola

11:00 AM Marilyn Hui (BS Applied Physics)
"Temporal Measurement of Electron Temperature and Density in a 1064 nm Nd:YAG Laser Produced Copper Plasma"
Adviser: Mr. Wilson Garcia
Panel: Dr. Ronald S. Banzon, Mr. Giovanni Tapang

02:00 PM Jay Tio (BS Applied Physics)
"Theoretical Analysis of a One Dimensional Photonic Crystal with Defects"
Adviser: Dr. Marlon Rosendo H. Daza
Panel: Dr. Ronald S. Banzon, Dr. Vincent Daria

03:00 PM Ayrah Tumbokon (BS Applied Physics)
"Physical Characterization of Synthesized Canola-Based Cholesteryl Ester (CANCE) and its Formulations with Nematic E7"
Adviser: Dr. Zenaida Domingo
Panel: Dr. Lorenzo Chan, Dr. Roy Tumlos

Undergraduate Program Student Profile

According to data obtained from the Secretary's Office of the College of Science, the Institute now has the most number of undergraduate students in the college. The Institute also has the most number of incoming freshmen in the college during the First Semester AY 2001-2002.

Table 2 shows the distribution of students by year of admission during the First Semester, while Table 3 shows the same for the Second Semester AY 2001-2002.

Table 2: Total Enrolment for the First Semester AY 2001-2002

Course	1st year	2nd year	3rd year	4th year	5th year	6th year	7-9th year	Total
BS Applied Physics	45	37	31	20	24	2	8	167
BS Physics	53	33	29	14	8	7	3	147
Total	98	70	60	34	32	9	11	314

Table 3: Total Enrolment for the Second Semester AY 2001-2002

Course	1st year	2nd year	3rd year	4th year	5th year	6th year	7-9th year	Total
BS Applied Physics	42	35	31	18	21	1	8	156
BS Physics	51	32	27	15	8	6	3	142
Total	93	67	58	33	29	7	11	298

From the tables above, it is easy to estimate that the total number of third year standing students is well over sixty (60). This resulted in a larger class size for the third year level courses, as well as an increase in the number of advanced laboratory sections. The number of third year standing students used to be around thirty (30). The increase is expected to significantly strain advanced laboratory resources.

The overall increase in the number of students necessitated the assignment of graders for classes with a relatively large number of students – increasing the number of sections not made possible by the limited number of rooms available for instruction.

A continued increase in the number of students pursuing physics is of course a welcome development for the Institute. It is hoped that a concurrent increase in resources could be arranged to enable the accommodation of more students of physics. In the absence of a significant augmentation of current resources, the Institute will be forced to reduce its uptake of students – a development that would not be consistent with the increasing need for well-trained scientific personnel in the country.

Table 4A shows extracted data from reports of the Secretary's Office of the College of Science, indicating the number of freshmen and graduates for the academic year over the past few years. The numbers of graduates are enclosed in parentheses.

Table 4A: Total Freshman Enrolment for the First Semester and Number of Graduates for the Academic Years Starting 1997-2001

Course	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002
BS Applied Physics	31 (10)	67 (7)	69 (6)	41 (17)	45
BS Physics	43 (03)	67 (9)	60 (0)	42 (05)	53
Total	74 (13)	134 (16)	129(6)	83 (22)	98

The recently concluded academic year saw a dramatic increase in the number of graduates of the Institute. It is a trend that is expected to continue for at least the next two years. An estimate that could be made by inference from data in Table 2 and Table 3 for the distribution of students in the Institute's sponsored programs. Estimates are made based on the number of students that finish their third year in the program.

The NIP Office made a tabulation of raw data from the Secretary's Office of the College of Science. Similar data have been incorporated in Appendix I. An excerpt from these are presented in Table 4B.

Table 4B: Total Freshman Enrolment for the First Semester and Number of Graduates for the Academic Years Starting 1992 - 1996

Course	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997
BS Applied Physics	21 (12)	28 (19)	32 (05)	18 (21)	22 (09)
BS Physics	20 (05)	36 (03)	43 (05)	24 (05)	57 (06)
Total	41 (17)	64 (22)	75 (10)	42 (26)	79 (15)

The number of graduates of an academic year over the number of freshmen five years earlier may be used as a measure of the "graduation rate". This rate may be calculated from Tables 4A and 4B from the academic year ending 1997 to 2001. In percentage, these calculations yield in succession about 37, 20, 21, 14, and 28 for the past five years.

The number of graduates in the coming years may be expected to increase by considering the number of third and fourth year students in NIP undergraduate programs. From data found in Appendix I, a summary of this detail is presented in Figure 1. The past four academic years saw increases in the number of third and fourth year students in NIP undergraduate programs. This is a parameter which conditions the number of expected graduates, since most of these students are already expected to follow their prescribed curricula – the number of shiftees to programs outside the NIP a lot smaller than students in their first two years.

Increased activity in the research laboratories of the Institute due to continued acquisitions and research production is expected to further increase the number of students retained in the program beyond the second year.

Shifting/Transfer Guidelines

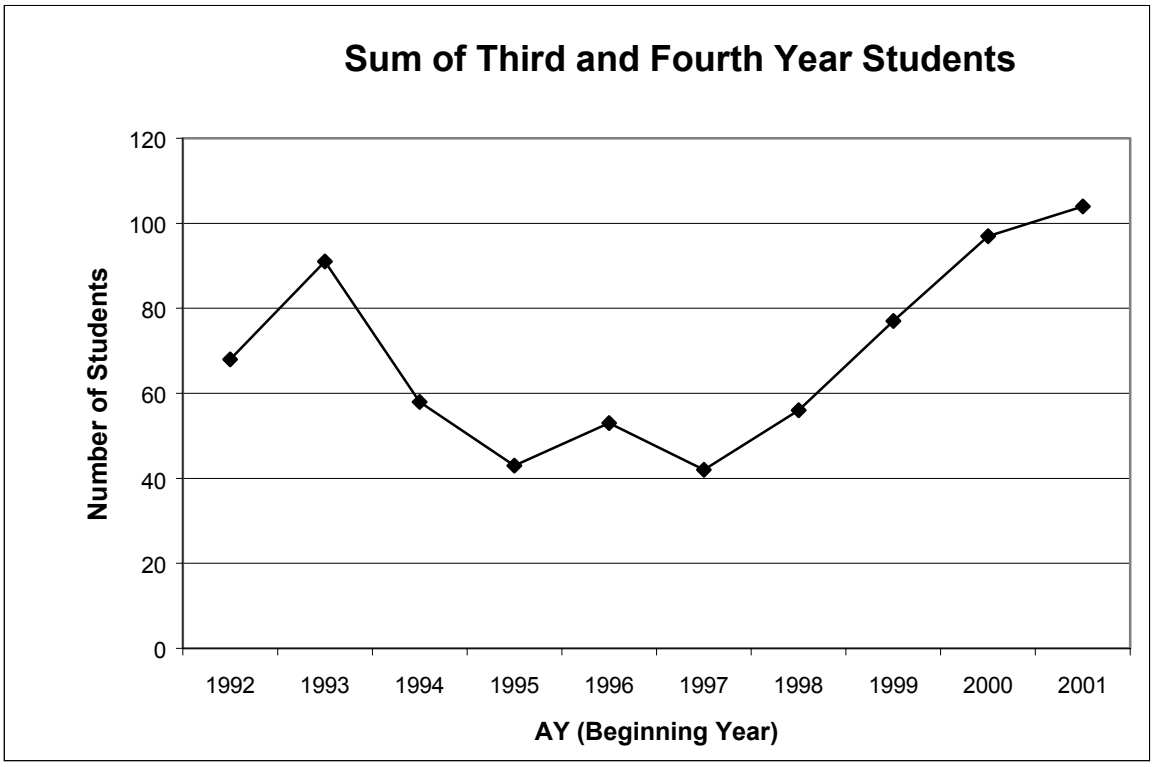

Figure 1 Sum of third and fourth year students in NIP undergraduate programs

As a response to an inquiry from the College of Science Secretary's Office, the Institute sent the same set of guidelines to be used for transfer and shifting students.

Table 5: Minimum Acceptable Averages for Shifting/Transfer

Student's School/Unit	GWA	Science/Math Average
Within Diliman	2.75	2.5
Other UP	2.25	2.0
Other schools	1.75	1.5

Service Courses

Textbooks

The laboratory manuals for Physics 7x.1 courses were updated under the supervision of Dr. Maricor Soriano.

Physics 7x and 7x.1

At the beginning of the academic year 2001-2002, the Director started a program to monitor the passing rate in the traditional service courses of the Institute. A target of about seventy-five percent (75%) of the total number of initial enrollees was indicated. A review of the statistics of the examinations was made soon after

its administration. This enables adjustments to be made in the distribution of the degree of difficulty of the questions for the succeeding examinations. Monitoring was directly under the supervision of the chair of the general physics committee, Mr. Matthew George Escobido.

A summary of data reported by Mr. Escobido for the student performance in Physics 7x and Physics 7x.1 courses is shown in Table 6.

Table 6: Student Performance First Semester AY 2001-2002

Course	Number of St	Pass	Fail	"4.0"	Drop	INC	Percent Pass
Physics 71	623	467	60	75	15	6	74.96
Physics 72	669	402	121	102	40	2	60.09
Physics 73	271	236	12	22	1	2	87.08
Physics 71.1	575	461	31	5	34	35	80.17
Physics 72.1	375	342	16	7	6	4	91.20
Physics 73.1	263	235	5	4	11	8	89.35
Total	2776	2143	245	215	107	57	77.20

The objective of having a passing rate of at least seventy-five percent was practically achieved in all the monitored courses, with the exception of Physics 72. Though no hard data has been compiled previously, the estimated passing rate for Physics 72 used to be well under fifty percent. Similarly, previous rates for Physics 71 were around sixty percent.

The relatively low passing rate for Physics 72 has previously been attributed to the level of mathematical proficiency expected of the student. It has been suggested to require integral calculus as a prerequisite to the course, instead of the current co-requisite requirement.

The gathering of data similar to the above shows the Institutes continuing effort to improve the efficiency of its instruction. Previous efforts includes a study on student expectations in physics, initially presented at the NIP 1999 Workshop. A similar educational gathering will be made to address, among other things, the problems associated with the low passing rate in Physics 72.

The monitoring of student performance in the Institute's service courses had an impact on the utility of resources provided by the Institute.

Total enrolment for service courses offered by the Institute in the current and the previous academic year is shown in Table 7. Previous academic year items are enclosed in parentheses.

Table 7: Service Courses Enrolment for First and Second Semester AY 2001-2002 and (First and Second Semester AY 2000-2001)

Course	Number of Sections		Number of Students		Average Number of Students	
	First	Second	First	Second	First	Second
Physics 71	5 (5)	7 (7)	623 (630)	718 (835)	124.60 (126.00)	102.57 (119.29)
Physics 72	7 (7)	5 (5)	669 (640)	558 (518)	95.57 (91.43)	111.60 (103.60)
Physics 73	3 (3)	3 (3)	271 (301)	346 (317)	90.33 (100.33)	115.33 (105.67)
Physics 71.1	30 (20)	25 (27)	575 (435)	479 (541)	19.17 (21.75)	19.16 (20.04)
Physics 72.1	21 (20)	20 (20)	375 (349)	348 (337)	17.86 (17.45)	17.4 (16.85)
Physics 73.1	13 (12)	14 (14)	263 (228)	255 (277)	20.23 (19.00)	18.21 (19.79)

It is evident from the table above that class performance monitoring increased the average number of students per section during the Second Semester AY 2001-2002. Even with a relatively smaller number of students in Physics 71 during the First Semester AY 2001-2002 compared to the same semester of the previous year, the number of students that progressed to Physics 72 during the Second Semester AY 2001-2002 is relatively higher than that of the previous academic year. This increased the average number of students per section for Physics 72 in the Second Semester AY 2001-2002 to 111.60 from the previous year's 103.60. A similar observation may be made for the First Semester AY 2001-2002 students of Physics 72 that progressed to Physics 73 during the second semester – the average number of students per section increased to 115.33 from 105.68 the previous year.

As a response to the publicized backlog in Physics 71.1, the Institute made thirty (30) sections available during the First Semester AY 2001-2002. Usually, Laboratory classes start at 8:00 AM and end at 4:00 PM (four two-hour sessions, or four sections) everyday from Monday to Friday – a total of twenty (20) possible sections. The thirty (30) sections of Physics 71.1 meant the introduction of a 4:00 PM to 6:00 PM laboratory class to yield five possible sections per day, and then utilizing Saturdays as well for the 8:00 AM to 6:00 PM stretch. This enabled a reduction in the average number of students per section in Physics 71.1 for both semesters of AY 2001-2002 compared to the same period of the previous academic year.

A total of twenty (20) slots is made available per laboratory class. The increased number of sections in Physics 71.1 reduced the average number of students per section to just under twenty, from the previous year's over twenty. Noting that the total number of slots were not totally utilized, the number of sections was reduced to twenty-five (25) during the Second Semester AY 2001-2002.

It was noted that the total number of slots available was not utilized due to a number of cancellations of enlistment after the regular registration period. All sections were full at the end of the regular registration period. Some even exceeding the stretched allotment of twenty slots. It was reported that

cancellations had to made by students because of resulting conflicts in their schedules.

The maximum number of possible laboratory classes were offered in Summer 2001. The Institute intends to continue doing so until the average number of students is reduced considerably to the current ideal of eighteen.

Physics 103 and Physics 104 for College of Engineering Students

The Institute still offered two sections of Physics 104 and Physics 103 during the First and Second Semester AY 2001-2002, respectively, for students of the College of Engineering. Both sections of Physics 103 were assigned to faculty members with MS degrees – a departure from the traditional assignment of a faculty with a Ph.D. degree.

Registration

The College of Science still utilizes its faculty for enlistment. It is hoped that this activity, and those associated with it, will cease from being part of the regular workload of the faculty of the College of Science.

Chapter III. Report of the Deputy Director on Research and Extensions

by *Arnel Salvador*

The year 2001 has been a very good year for the research endeavors of the National Institute of Physics. The dialogues between the Institute and the UP administration finally bore results as majority of our requests from them were favorably acted on. In particular, we saw increased financial support for the acquisition of equipment and operating expenses. Furthermore, we received the needed administrative support in securing exemptions from customs and value added taxes on imported equipment. We continue to be successful in tapping external agencies for research funding as well as scholarships for our students. Despite the downturn in the nation's economy the level of funding that NIP received for this year increased. And , as a result of increased extension work, the Institute gained pronounced visibility with the private industry particularly those involved in advanced technologies. It is hoped that these interactions will translate to a more active support to NIP in the years to come.

This year the Institute received from the UP Systems Administration a total of 18 PhP M for the equipment buildup and improvement of NIP's research laboratories. The money came from the UP Laboratory Modernization Project: Phase 1 and was given to NIP based on its track record on research. In return the UP Systems Administration expects the researchers of the Institute to have an increased presence on ISSI journal publications.

In an executive council meeting the 18 PhP M grant was divided for the following purposes:

1. 12 PhP M for the purchase of a femtosecond laser. This unit will be the heart of the femtosecond laser facility which the NIP is setting up. The facility will be accessible for usage to all the research laboratories subject to guidelines defined by the executive council. Additional support from the private industry is currently being worked out to obtain accessories for the facility such as a streak camera and an autocorrelator.

2. 1 PhP M for the repair of the optical parametric analyzer of the nanosecond pulsed laser.

3. 2 PhP M for the purchase of an additional cryostat and measuring instruments for the Condensed Matter Physics Laboratory.

4. 1 PhP M for the upgrade of facilities in the Plasma Physics Laboratory.

5. 1 PhP M for the purchase of an electro-optics characterization setup in the Liquid Crystal Laboratory.

6. 1 PhP M for various research related construction at NIP. This includes the installation of an optics routing setup that will deliver the output of the Nd-YAG laser in the Photonics Research Laboratory to the Plasma Physics Laboratory.

The availability of institutional grants within UP served as an eye opener to the future direction of NIP. With the expected increase in the number of senior faculty members in the years to come it is highly likely that additional research laboratories will emerge. This in turn will mean a needed increase in yearly funding support from the administration and that the policies regarding resource allocation between the research laboratories will have to be re-evaluated.

The UP Diliman Chancellor's Office was also highly supportive of the research activities of the Institute. Our request for increased financial budget in the maintenance and operating expenses of the research laboratories was acted upon and this year we received an additional 1 PhP M. We also received a grant for the purchase of a new lathe machine. The addition of the machine enhances the capability of the Institute's machine shop in fabricating vacuum chamber components such as flanges, view ports, and connecting tees. It is expected that the various research laboratories needing specially designed vacuum chambers will consider having the unit built in house instead of purchasing it from abroad.

Through the efforts of the UP Administration the NIP was able to avail of a favorable ruling from the Department of Finance regarding exemption from the payment of taxes on imported scientific equipment and supplies (Republic Act 8292). In the past the financial resources the laboratories where unduly strained since a considerable portion was used to shoulder the cost of the value added tax assessed on imported equipment. Under the present ruling , all imported scientific equipment and supplies listed in the line item budget of research grants that were approved by the UP board of regents shall not be assessed any tax. As it stands, all externally funded research grants of NIP that have a signed memorandum of agreement between UP Diliman and the funding agency are covered in this ruling.

This year the Institute had a marked improvement in term of visibility among the technology firms particularly in the semiconductor sector. Through the efforts of the Physics Foundation of the Philippines , the NIP was tapped to conduct seminars in its field of expertise . Notable among the private firms that sought NIP's collaboration were Integrated Microelectronics Inc., (IMI), Perkin Elmer, On Semiconductor and Intel Philippines. The Institute welcomes these interactions as it provides NIP with another possible funding avenue as well as job placements for its graduates. In particular, the Institute is grateful to Intel Philippines for providing six scholarship slots (3 graduate students and 3 undergraduate) for the academic year 2001-2002, and to the Physics Foundation of the Philippines for assisting in securing this scholarship fund.

Finally, the Institute continues its quest to gain international recognition among its peers. For the year 2001 there were 15 papers published in ISI journals. Other works

initiated in 2001 have been accepted for publication and will appear on 2002. In addition faculty members were able to present their research work in international conferences.

Chapter IV. Report of the Deputy-Director for Resources and Facilities

by *Maricor Soriano*

NIP Building

Plans for the construction of Phase II of the new NIP Building are under way. Phase II involves two floors which will house the Plasma Lab, Liquid Crystals Lab, Elementary Labs, Advanced Lab and Electronics Lab.

The original building design was found to be overspecified and impractical to maintain. Thus the whole was building was redesigned with the aim of having the current room usage in the old NIP building (Palma Hall Pavilion 3) doubled in the new. A summary of major changes are as follows:

a) The Certificate of Availability of Funds will be drawn from the 30 M PhP budget for the building. (In the previous construction phase, the Architect's contract was rendered null and void due to the lack of a certificate of availability of funds. The long delay between construction phases was due to this legal stumbling block.)

b) The contract for the Architect was drafted before the bidding of Phase II. A new contract will be drawn per building phase construction.

c) The main entrance of the building was redesigned to face the PAGASA observatory to avoid traffic congestion along CP Garcia Avenue. The original floor area of 27,400 sq km. was reduced to 14,000 sq km.

d) The electrical plans are being redesigned to meet the demands of the research lab.

New Facilities

The following items were acquired for the modernization of instructions:

ELEMENTARY LABORATORIES

- 5 Personal Computers for interfaced experiments
- 4 units of LabPro Physics Package (each consisting of Lab Pro Data Acquisition systems, Motion Detector, Dual Range Force Sensor, Microphone, Stainless Steel Temperature Probe, Light Sensor, Low g accelerometer, Vernier Photogate, Smart pulley attachment, Magnetic Field Sensor, Current and Voltage Probes, and Picket Fence).
- 10 units digital multimeter
- 10 units analog multimeter

ELECTRONICS LABORATORY

- 2 Tektronix Digital Storage Oscilloscopes
- 5 units digital multimeter
- 5 units analog multimeter
- Circuit Maker software

ADVANCED UNDERGRADUATE PHYSICS LABORATORY
- 5 units digital multimeter
- 5 units analog multimeter
- 4 units 30W soldering iron

MULTIMEDIA (NIP Audiovisual Room)
- LCD Projector
- Multimedia PC (for AVR)

Studies conducted

ELECTRICITY CONSUMPTION

For year 2001, the average electricity usage was 32,000 kWh/Month. The peak usage was in September (41280 kWh) and minima were observed in April (28800) and November (28428) due to summer and sem breaks respectively. Please see attached Excel File list for graphs.

UPDATED ROOM USAGE IN NIP

The current floor area and room usage in Pavilion 3 NIP Building was reassessed. The existing building plans from the Office of the Campus Architect (OCA) does not contain renovations, new mezzanines, recent civil works and new room assignments. The total floor area of the current building plus circulation is approximately 4000 sq. meters. Please see attached Excel File for table. The information was used in redesigning the new NIP building.

Visits to the NIP

In addition to those listed in Appendix C, the following visitors also came to the NIP in 2001:

- 30 graduate students Don Mariano Marcos Memorial State University, Sept. 21
- 33 undergraduate students from Peninsula School, Limay Bataan, Oct. 19
- Participants from the International Conference on Computers and Information Technology in Physics Education. Dec. 6

To optimize the purpose of an NIP academic tour, a compilation of PowerPoint presentations of reseach activities from each lab has been collected.

Other on-going projects

The following are the on-going projects and future plans of the Facilities and Resources Committee:

1. Repair of NIP water tank
2. Modernization of teaching laboratories
3. Parking lot expansion
4. Updating of electrical plans
5. Compilation of Online Resources such as official forms, Powerpoint Presentations of Research Labs
6. Improvement of NIP grounds

APPENDIX A. PUBLICATIONS

A1. ISI-abstracted Journals

1. Garcia W., Palero J., Saloma C. Temporal coherence control of Nd : YAG pumped Raman shifter. Optics Communications. 197(1-3):109-114, 2001 Sep 15.
2. Monterola C., Saloma C. Solving the nonlinear Schrodinger equation with an unsupervised neural network. Optics Express. 9(2):72-84, 2001 Jul 16.
3. Quito M., Monterola C., Saloma C. Solving N-body problems with neural networks. Physical Review Letters. 86(21):4741-4744, 2001 May 21.
4. Blanca CM., Saloma C. Two-color excitation fluorescence microscopy through highly scattering media. Applied Optics. 40(16):2722-2729, 2001 Jun 1.
5. Lim M., Saloma C. Noise-enhanced measurement of weak doublet spectra with a Fourier-transform spectrometer and a 1-bit analog-to-digital converter. Applied Optics. 40(11):1767-1775, 2001 Apr 10.
6. Soriano M., Garcia L., Saloma C. Fluorescent image classification by major color histograms and a neural network. Optics Express. 8(5):271-277, 2001 Feb 26
7. Daza MRH., Saloma CA. Jitter dynamics of a gainswitched semiconductor laser under self-feedback and external optical injection. IEEE Journal of Quantum Electronics. 37(2):254-264, 2001 Feb.
8. Rodrigo PJ., Lim M., Saloma C. Optical-feedback semiconductor laser Michelson interferometer for displacement measurements with directional discrimination. Applied Optics. 40(4):506-513, 2001 Feb 1.
9. Galapon EA. Quantum-classical correspondence of dynamical observables, quantization, and the time of arrival correspondence problem. Optics & Spectroscopy. 91(3):399-405, 2001 Sep.
10. Gu M., Amistoso JO., Toriumi A., Irie M., Kawata S. Effect of saturable response to two-photon absorption on the readout signal level of three-dimensional bit optical data storage in a photochromic polymer. Applied Physics Letters. 79(2):148-150, 2001 Jul 9.
11. Yanga DM., Morales AA. Applications of the spin polaron theory at finite temperature. Physica C. 364:123-126, 2001 Nov.
12. Sarmago RV., Molina KLC., Guerra LJD. A new perspective to AC magnetic susceptibility measurements in an unbalanced mutual inductance bridge. Physica C. 364:239-242, 2001 Nov.
13. Tumbokon AB., Cruz AB., Domingo ZB., Cada LG. Synthesis and characterization of Canola-based Cholesteryl Ester and Nematic E7 mixture. Mol Cryst & Liq Cryst. 364:937-942, 2001.
14. Mahinay CLE., Macale CM., Amos FF., Domingo ZB., Cada LG. Electro-optical characterization of E48 : PVP polymer dispersed liquid crystals. Mol Cryst & Liq Cryst. 365:1261-+, 2001.
15. Delica S., Estonactoc M., Micaller MC.,Cada L., Domingo Z. Phase diagram of binary mixture TM74A : E48 liquid crystals. Mol Cryst & Liq Cryst. 366:1953-+, 2001.
16. Micaller MCA., Domingo ZB., Cada LG. Molecular imprinting in polymer stabilized liquid crystals. Mol Cryst & Liq Cryst.. 368:4013-4022, 2001.
17. Blanca CM., Gutierrez RC., Domingo ZB. Electrically tunable optical filter for visible wavelength using a liquid crystal multiplexed to a Fabry-Perot etalon. Mol Cryst & Liq Cryst. 368:4023-4030, 2001.

A2. PAPER PRESENTATIONS IN INTERNATIONAL CONFERENCES (16)

K. L. C. Molina, L.J.D. Guerra and **R. V. Sarmago**, "Magnetic susceptibility measurements in YBCO supercondcutors in an unbalanced mutual inductance bridge," THIRD INTERNATIONAL CONFERENCE ON NEW THEORIES, DISCOVERIES,, AND APPLICATIONS OF SUPERCONDUCTORS AND RELATED MATERIALS, HONOLULU (JAN 2001).

D. M. Yanga and A. A. Morales Jr., "Application of the spin polaron theory at finite temperature," THIRD INTERNATIONAL CONFERENCE ON NEW THEORIES, DISCOVERIES,, AND APPLICATIONS OF SUPERCONDUCTORS AND RELATED MATERIALS, HONOLULU (JAN 2001)..

R Guerrero and **MR Daza**, "Optical encryption using pattern-multiplexing in a photorefractive crystal," OPTICAL SOCIETY OF AMERICA *OPTICS IN COMPUTING* (OSA OC 2001), LAKE TAHOE, NEVADA (JANUARY 9-11 2001).

V Darla, **C Saloma** and S Kawata, "Modified Monte Carlo of photon transport for studying the imaging properties of highly scattering media," Coherence Domain Optical Methods in Biomedical Science and Clinical Applications V, 23-24 January 2001, San Jose CA, edited by V Tuchin, J Izatt and J Fujimoto (Progress in Biomedical Optics and Imaging Vol 8, No.8, Proceedings of SPIE 4551, pp 228-231

C. M. Monterola and **C Saloma,** "Accurate Forecasting of the Undecided Populations in a Publib Opinion Poll Using Neural Networks," 21ST SYMPOSIUM ON FORECASTING (ISF 2001), ATLANTA, GEORGIA, USA (JUNE 17-20, 2001)

N Hermosa, A Francia and **MR Daza**, "Polarization dependent optical grating in a methyl red doped polymer dispersed liquid crystal (E48:PVP)," CLEO/PACIFIC RIM, CHIBA, JAPAN (JULY 15-19,2001).

R Guerrero and **MR Daza**, "Optical switching via pattern-multiplexed holographic storage," CLEO/PACIFIC RIM, CHIBA, JAPAN (JULY 15-19,2001).

JA Palero, WO Garcia, and **CA Saloma**, "Temporal coherence control of a Nd:YAG pumped Raman shifter," CLEO/PACIFIC RIM, CHIBA, JAPAN (JULY 15-19,2001).

V. Innis, F. Amos and **Z. Domingo** , "Physical Characterization of the liquid crystalline properties of Isolated mitochondria and mitochondrial membranes in brain cells of Mice," 4TH INTERNATIONAL CONFERENCE ON BIOLOGICAL PHYSICS , KYOTO, JAPAN (JULY 30-AUGUST 2, 2001)

M. Calix, M. Macale and **Z. Domingo**, "Numerical and experimental study of a two componenet lyotropic model membrane," 4TH INTERNATIONAL CONFERENCE ON BIOLOGICAL PHYSICS , KYOTO, JAPAN (JULY 30-AUGUST 2, 2001)

C. R. de la Cruz, L. J. D. Guerra, and **R. V. Sarmago**, "Electrical dissipation in a Bi-2212 thin film due to thermally activated vortex motion," INTERNATIONAL CONFERENCE ON MATERIALS FOR ADVANCED TECHNOLOGIES , SINGAPORE 2001

G. Blantocas, H. Ramos, and M. Wada, "Extraction and profile analysis of hydrogen-like helium ions in a magnetized sheet plasma," 9TH INTERNATIONAL CONFERENCE ON ION SOURCES, OAKLAND, CALIFORNIA, USA (SEPTEMBER 3-7, 2001)

C. A. Saloma (Invited Talk), "Segmentation of Microscopic Features in Fluorescence Images," MULTI-DIMENSIONAL MICROSCOPY 2001 (THE 3RD ASIA PACIFIC SYMPOSIUM ON CONFOCAL MICROSCOPY AND RELATED TECHNOLOGIES in MELBOURNE, AUSTRALIA (25-28 NOVEMBER 2001)

G. Blantocas, H. Ramos and M. Wada, "Model analysis of hydrogenic helium ions in a magnetized sheet plasma," 12TH INTERNATIONAL TOKI CONFERENCE IN FUSION AND PLASMA SCIENCE, TOKI, GIFU, JAPAN (DECEMBER 11-14, 2001).

M.N. Soriano, **L. Garcia** and **C. Saloma**, "Classification of fluorescent microsphere images using color," 14th International Conference on Vision Interface (ed. S.S. Beauchemin, F. Nouboud, G. Roth), (June 7-9, Canada)

M.N. Soriano, **M.S. Marcos** and **C. Saloma**, "Image Classification of Coral Reef Components from Underwater Color Video," MTS/IEEE Oceans 2001 (November 5-8, Hawaii)

A3. OFFICIAL TRAVELS OF NIP FACULTY IN 2001

1.	Dr. Caesar A. Saloma	3rd Asia-Pacific Symposium on Confocal Microscopy and Related Technologies Melbourne, Australia November 24-29, 2001
2.	Dr. Henry J. Ramos	9th Internaitonal Conference on Ion Source (JCIS 2001) , Oaland, California, USA, September 2-8, 2001
3.	Mr. Wilson O. Garcia	4th Pacific Rim Conference on Lasers and Electro-Optics, Chiba, Japan July 14-20, 2001 UP Support: $1,000 chargeable against 9127006 P1,000 pre-travel expenses $775.50 chargeable against the CHED funds
4.	Ms. Clarina R. de la Cruz	International Conference on Materials for Advanced Technologies (ICMAT 2001) SUNTEC City, Singapore, June 30 to July 7, 2001 UP Support: P1,500 pre-travel expenses chargeable Against 9110001 (FDF)
5.	Mr. Leandro Jose D. Guerra	International Conference on Materials for Advanced Technologies (ICMAT2001) SUNTEC City, Singapore, June 30 to July 7, 2001 UP Support: Round trip air fare, $225 registration fee P1,500 pre-travel expenses chargeable Against 9127006 (UP Diliman Administrative Development Fund)
6.	Dr. Henry J. Ramos	3rd International Symposium on Applied Plasma Science Fairbanks, Alaska, USA, July 1-7, 2001
7.	Mr. Christopher P. Monterola	21st Symposium on Forecasting (ISF 2001) Atlanta, Georgia, USA, June 17-20, 2001 UP Support: P76,785.00 chargeable against 9110302 (CS/FDF-Research)
8.	Dr. Maricor N. Soriano	To do collaborative research at The University of Oulu in Finland June 1-12, 2001 Vision Interface 2001 Conference Ottawa, Canada, June 7-9, 2001

9.	Dr. Henry J. Ramos	First Experimental Plasma International Collaboration Workshop Meeting Bangkok, Thailand, May 13-19, 2001
10.	Dr. Danilo M. Yanga	3rd International Conference on New Theories Discoveries, and Applications of Superconductors and Related Materials Honolulu, Hawaii, USA, January 30 to February 4, 2001 UP Support: Research Dissemination grant of P75,225.00 chargeable against 9110302 (CS/FDF-Research)
11.	Dr. Vincent Ricardo M. Daria	BIOS 2001 San Jose, California, USA, January 19-27, 2001 UP Support: USD2000 - Research dessimination grant
12.	Mr. Leandro Jose D. Guerra	3rd International Conference on New Theories, Discoveries and Applications of Superconductors and Related Materials Honolulu, Hawaii, USA, January l4-20, 2001 UP Support: P1,500 pre-travel expenses charged against 9127006
13.	Dr. Roland V. Sarmago	3rd International Conference on New Theories, Discoveries and Applications of Superconductors and Related Materials Honolulu, Hawaii, USA, January l4-20, 2001 UP Support: Research dissemination grant of P75,225.00 Chargeable against 910302 (FDF-Research)
14.	Dr. Marlon Rosendo H. Daza	Optical Society of America-Sponsored Conference "Optics in Computing" Lake Tahoe, Nevada, USA January 8-14, 2001 UP Support: Research dissemination grant of P15,000 Chargeable against (FDF-Research)
15.	Dr. Carlo Mar Y. Blanca	Postdoctoral fellowship in Max Planck Institute Biophysical Chemistry in Gottingen, Germany, October 15, 2001 to October 14, 2002 UP Support: Round trip economy class airfare $400 clothing allowance

		P1,500 pre-travel expenses chargeable Against Creative and Research Scholarship Fund.
16.	Dr. Luis Ma. T. Bo-ot	Postdoctoral fellowship in National Institute for Fusion Science Toki City, Japan, July 1 to December 31, 2001 UP Support: P1,500 pre-travel expenses and $300 clothing allowance chargeable against 9110001 (FDF)
17.	Dr. Danilo M. Yanga	Visiting Professor under the ASEAN University Network (AUN) Distinguished Professor Program Burpha University, Thailand June 17 to July 2, 2001
18.	Dr. Caesar P. Palisoc	To undertake post-doctoral research at the Second Institute for Theoretical Physics, University of Hamburg, Germany June 1, 2001 to May 31, 2002 UP Support: $400 clothing allowance P1,500 pre-travel expenses Round trip air fare chargeable Against Creative and Research Scholarship Fund of the UP System.
19.	Mr. Percival Almoro	Regional Workshop on Lasers and Optoelectronics Puspiptek, Serpong, Indonesia, June 24 to July 7, 2001 UP Support: P1,500 pre-travel expenses chargeable Against 9110001 (FDF)
6.	Dr. Maricor N. Soriano	To do collaborative research on Color-Texture Image Analysis and Face Image Processing, Department of Electrical Engineering, University of Oulu, Finland April 1 to May 31, 2001
7.	Dr. Danilo M. Yanga	To attend the General Council Meeting of the Asia-Pacific Center for Theoretical Physics, Seoul, Korea, March 22-26, 2001
8.	Dr. Henry J. Ramos	Regional College on Plasma Physics Quaid-Azam University, Islamabad, Pakistan, January 28 to February 4, 2001

A4. CONFERENCE PROCEEDINGS

Paper Presentations (71) in the *19th Physics Congress* of the *Samahang Pisika ng Pilipinas* in Bayombong, Nueva Vizcaya onn24-26 October 2001. Papers are published as full length articles in the Proceedings of the 19th SPP Congress.

1. A. Somintac, E. Estacio, M. Bailon and A. Salvador. Growth of GaAs based VCSEL/ RCE structures for optoelectronic applications via molecular beam epitaxy.
2. R. Sarmiento, A. Somintac, L. Guiao, F. Agra and A. Salvador. Electron traps in GaAs grown by molecular beam epitaxy on on-axis (100) and off-axis substrates
3. N.P. Hermosa II[1] and M. Daza. Holographic gratings in a Methyl Red-doped PDLC (E48:PVP)
4. S. Delica and C. Blanca. Polarized light propagation in polymer dispersed liquid crystal
5. L. Jirkovsky and L. Bo-ot. Onset of turbulence in planar and circular pipe
6. J. Pampolina, M. Solis, J. Esguerra, A. Morales and D. Yanga. Spin density waves in cuprate superconductors
7. P. Rodrigo, M. Lim and C. Saloma. Displacement measurement at diffraction-limited resolution using optical-feedback laser diode Michelson-interferometer
8. M. Baclayon, C. Alonzo, and W. Garcia
Time of Flight Measurements of a 355nm Nd:YAG Laser-Produced Plasma
9. R. Guerrero, J. Dungao, and M. Daza
All-optical recognition of 3D objects with a photorefractive crystal
10. P. ParaÒal and M. Daza. Full-field measurement of laser induced non-local birefringence in homeotropically aligned nematic liquid crystals
11 P. Almoro, M. Cadatal and M. Daza. Measurement of 3d deformations by phase-shifting digital holographic interferometry
12 M. Quito, C. Monterola, and C. Saloma. "Walking ant in the rain" model: Microscopic complexity in a general decision-based system
13 P. A. Castro, J. Bantang, M. Lim, C. Monterola, J. Garcia, and C. Saloma. Investigation of the characteristics of foreign exchange
14 G. Perez, G. Tapang, M. Lim, and C. Saloma. Self-organized criticality in the exit dynamics of pedestrians using two dimensional cellular automata
15 M. Lim and C. Saloma. Integrating hysterisis into system models
16 J. Bantang, M. Lim, C. Monterola, and C. Saloma. A numerical approach in the dynamical segregation of granular material through a pipe
17 D. Yanga, A. Morales, and S. Kurihara. The holon spectral function at finite temperature for high Tc superconductors
18 C. de la Cruz, A. dela Cruz, L. Guerra, and R. Sarmago. Thermally activated vortex motion and electrical dissipation in a $Bi_2Sr_2CaCu_2O_?$ Thin Film
19 M. P. Solis, J. Pampolina, J. Esguerra, A. Morales, and D. Yanga. Magnetic susceptibility of high temperature superconductors using the Matsubara formalism
20 L. Guerra, I. Ambanta, A. Cueto, and R. Sarmago. Liquid phase epitaxial growth of superconducting $Bi_2Sr_2CaCu_2O_{8+\delta}$ on MgO and Al_2O_3 Substrates
21 S. D. Separa, G. Tapang, M. Lim and C. Saloma. Noise-aided detection of weak optically-transmitted signals
22 M. S. A. Marcos, M. Soriano and C. Saloma. Low-level color and texture feature extraction of coral reef components
23 A. Araullo, M. Soriano and C. Saloma. Front-view gait parameterization using arm movement
24 V. Cemine, V. Daria, C. Saloma Noise-assisted weak signal detection using a sinusoid-crossing analog-to-digital converter
25 S. Johnson, S. Delica and Z. Domingo. A new liquid crystal mixture based on E48 and castor oil
26 M.L. Pagcu, V. Innis and Z. Domingo. Liquid crystalline properties of rheumatoid arthritis erythrocyte ghosts: a polarized light microscopy study
27 A. Rara, C. Macale and Z. Domingo. Measurement of curvature-elastic modulus of soya-lecithin vescicles
28 J. Joson, L. Davila and Z. Domingo. Kinetics of non-isothermal crystallization of coconut-based cholesterol ester: Avrami and Ozawa approaches

29 G. Blantocas and H. Ramos. Extraction characteristics of hydrogen-like helium ions in a magnetized sheet plasma
30 G. Blantocas and H. Ramos. Profile analysis of hydrogenic helium ions in a magnetized sheet plasma
31 M. Fernandez and H. Ramos. Optimized extraction of H- by three-electrode Faraday cup system in magnetized sheet plasma ion source
32 L. Guerra, M. Olbinado and R. Sarmago. Synthesis of bulk superconducting magnesium diboride
33 R. Sarmago. AC magnetic susceptibility of bulk MgB_2 at various excitation frequencies and applied fields
34 C. dela Cruz, L. Guerra and R. Sarmago. Critical current and magnetoresistance measurements in bulk MgB_2
35 K. Molina, M. Sibayan, L. Guerra and R. Sarmago. Frequency and applied field dependence of ac magnetic susceptibility obtained by phase-tuning at low temperature
36 E. Hinojales, C. dela Cruz and R. Sarmago. Fluctuation conductivity studies on $Bi_2Sr_2CaCu_2O_{8+\delta}$ film with varying applied currents
37 M. Escobido. Path integral approach to the amplitude fluctuation of an optical field
38 L. Chan. Study of the perturbation to a Bose-Einstein gas
39 E. Juanico, C. Monterola and C. Saloma. Onset of small-world behavior in topologically evolving networks
40 R. Bahague Jr. and E. Galapon. Static behaviors of confined time-arrival operators
41 K. Gargar and J. P. Esguerra Numerical investigation of non-homologous collapse of the one-dimensional gravitational gas
42 M. R. Solis and J. P. Esguerra. Special relativistic effects in the equilibrium statistical mechanics of the one-dimensional gravitational gas and the Takahashi gas
43 G. Tapang and C. Saloma. Detection statistic of ultrafast twin-photon pulses
44 R. Isip and M. Daza. Dynamics of a self-pulsating semiconductor laser under optical feedback
45). J. Tio and M. Daza. Theoretical analysis of one dimensional photonic crystals with defects
46 E. Escario, S. Delica and Z. Domingo. Effect of surface anchoring on optically induced refractive index modulation: a Monte Carlo simulation
47 W. Oblefias, M. Soriano and C. Saloma. Reconstruction of spectral emittance of flourescent dyes using image color component analysis
48 A. Tarun, M. Daza, N. Hayazawa, Y. Inouye and S. Kawata. Apertureless optical near field fabrication using atomic force microscope on photoresists
49 J. Miranda, V. Daria and C. Saloma. Single-photon optical-beam-induced current microscopy of semiconductor devices with enhanced contrast
50 M. Bailon, A. Somintac and A. Salvador. Investigation of the electron mobility of modulation-doped GaAs/AlGaAs heterostructures
51 C. Ison, E. Estacio, M. Bailon, A. Somintac and A. Salvador. Observation of the quantum-confined stark effect in a GaAs/AlGaAs p-i-n diode by room temperature photocurrent spectroscopy
52 L. Guiao, A. Somintac, R. Sarmiento, E. Estacio and A. Salvador. Comparative Study on x-ray diffraction of GaAs/AlGaAs multiple quantum wells grown on on-axis and off-axis substrates
53 CA. Alonzo and M. Daza A comparison of three pulse-retrieval algorithms in frequency resolved optical gating
54 M. Escobido. Statistical analysis of the Philippine stock index
55 C. Monterola and C. Saloma. Noise-aided signal detection in neural networks
56 R. Roxas, M. Soriano and C. Saloma. Automated human chromosome karyotyping using Matlab
57 J. Palero, R. Ibarreta and W. Garcia. Frequency conversion of a 532 nm Nd: YAG laser using a hydrogen raman shifter
58 J. Gabayno, N. Hermosa and M. Daza. Signal amplification in a methyl-red-dye-doped nematic liquid crystal
59 D. Palima, R. Amor, N. Hermosa, and M. Daza. Laser-induced nonlocal refractive index change in methyl red-doped nematic liquid crystal E7
60 N. Hermosa and M. Daza.Micro-holograms in a methyl red doped PDLC (E48:PVP)
61 A. Baclig, P. Almoro and M. Daza Optical recognition of fingerprints
62) J. Palero, R. Ibaretta and W. Garcia. Stimulated rotational and vibrational Raman scattering in hydrogen
63) M. Bailon, E. Estacio, A. Somintac and A. Salvador. Low temperature photoluminescence of GaAs-epitaxial layers
64) P. Almoro[1], M. Cadatal and M. Daza Reconstruction of 3-D objects by phase-shifting digital holography

65) A. Bernaldez, K. Molina and R. Sarmago. Investigation of phasor behavior of high Tc bulk superconductors by AC susceptibility measurements
66) H.Rillera, R. Sioson, M. Cruz and R. Sarmago. Study of the growth orientation of Bi-221i single crystals via X-ray diffraction
67) J. Ronulo, M. Dimamay, C. dela Cruz and R. Sarmago. Varying transition of $Bi_2Sr_2CaCu_2O_{8+\delta}$ films with applied current
68 M. Cruz and R. Sarmago. Synthesis and characterization of $Yba_2Cu_3O_{7-\delta}$ single crystals
69 A. Singidas, K. Molina, L. Guerra and R. Sarmago Reinterpretation of AC susceptibility features of YBCO in a mutual inductance bridge based on phase de-tuning
70) H.Domingo and E. Galapon.The time of arrival quantum-classical correspondence problem for arbitrary arrival points
71)R. Perez, R. Bahague and E. Galapon. Confined time of arrival operator (TAO) for the (0,l) segment

APPENDIX B.
OFFICIAL VISITORS

NAME	AFFILIATION	TIME
Dr. John K. Webb	Dept of Astrophysics, Univ. of New South Wales Sydney, Australia	February 21, 2001
Prof Naoki Itoh	Sophia University Tokyo, Japan	March 2, 2001
Prof Adrianus Lodder	Div. of Physics & Astronomy Vrije Universiteit Amsterdam, The Netherlands	October 3, 2001
Prof. Dietrich C. Fries	University of Karlsruhe Germany	October - December 2001 (6 weeks)
Prof Lee Keum-Hwi	Chonbuk Nat'l University Chonju, South Korea	February 28, 2001
Prof Edward Guinan	Dept of Astronomy & Astrophysics Villanova University Pennsylvania	23 November 2001

APPENDIX C1. Externally-funded research initiated in 2001

CONDENSED MATTER PHYSICS LABORATORY

Project Title: Magnetic susceptibility of YBCO superconductors
Proponent: Dr. Roland V. Sarmago
Source of Funding: UP OVCRD
Amount of funding: PhP 350,000

Project Title: Program for the development of III-V opto-electronic devices and optoelectronic integrated circuits.
Proponent: Dr. Arnel Salvador
Source of Funding: PCASTRD/DOST
Amount of Funding: PhP 7,435,456

INSTRUMENTATION PHYSICS LABORATORY
Project Title: Facilities Build Up Grant
Proponent: Dr. Caesar C. Saloma
Source of Funding: PCASTRD/DOST
Amount of Funding: PhP1,991,597.00

LIQUID CRYSTAL PHYSICS LABORATORY
Project Title: Synthesis and Characterization of Canola-based Cholesteryl Ester and Nematic E7 Liquid Crystal Mixture
Proponent: Dr. Zeneida Domingo
Source of Funding: UP Creative Writing and Research Fund
Amount of Funding: PhP148,000

PHOTONICS RESEARCH LABORATORY
Project Title: Institutional Build Up Grant
Proponent: Dr. Marlon Rosendo H. Daza
Source of Funding: PCASTRD/DOST
Amount of Funding: PhP 687,570.00

Project Title: Measurement of deformations of microelectronics circuit components and packages using real-time holographic interferometry
Proponent: Dr. Marlon Rosendo H. Daza
Source of Funding:
Amount of Funding: PhP 464,775.00

Project Title: Optical data storage in $LiNbO_3$ crystal
Proponent: Dr. Marlon Rosendo H. Daza
Source of Funding: PCASTRD/DOST
Amount of Funding: PhP 478,025

PLASMA PHYSICS LABORATORY
Project Title: Prototype plasma devices for industrial applications: Year 2
Proponent: Dr. Henry J. Ramos
Source of Funding: DOST GIA
Amount of Funding: PhP 3,000,000.00

Project Title: Deposition of Amorphous Silicon-Based Material Using a Magnetized Sheet Plasma Negative Ion Source
Proponent: Dr. Henry J. Ramos
Source of Funding: UP Creative Writing and Research Fund
Amount of Funding: PhP 201,000.00

THEORETICAL PHYSICS GROUP

Project Title; Self-adjoint Fredholm Integral Realization of Time Operators For Autonomous Bounded and Unbounded Hamiltonian Systems
Proponent: Dr. Eric Galapon
Source of Funding: National Research Council of the Philippines
Amount of Funding: P 98,000.00

Jose Perico Esguerra
Project Title:Contributions to the Statistical Mechanics of Classical Many Body Systems
Proponent: DR. Jose Perico Esguerra
Source of Funding: Dissertation Grant, UP-OVCRD
Amount: of Funding: PhP 30,000

APPENDIX C2. Research funded by NIP in 2001

Amount of research funding: PhP 48,000 (Professor), PhP42,000 (Associate Professor), PhP36,000 (Assistant Professor), PhP30,000 (Instructor)

FACULTY	PERIOD	TITLE OF RESEARCH
Luis Ma. T. Bo-ot	1 January-30 June 2001	Derivation of 3rd Order MHD Equation
Lorenzo C. Chan	1 January-30 June 2001	Effect of a Dominant Term in Perturbation Approach to Effective Hamiltonian of a Bose-Einstein Condensation
Vincent Ricardo M. Daria	1 January-30 June 2001	3-Dimensional Observation of the Growth of Biological Neural Network Using a Laser Scanning Microscope
Marlon Rosendo H. Daza	1 January-30 June 2001	Optical Data Encryption in Photo-Refractive Materials
Matthew George O. Escobido	1 January-30 June 2001	Path Integral Analysis of the Amplitude Fluctuation of an Optical Field
Eric A. Galapon	1 January-30 June 2001	Bounded Representation of the Bender Basis and Its Rigorous Application in Confined Quantum Time of Arrival
Ludek Jirkovsky	1 January-30 June 2001	Onset of Turbulence in Planar and Circular Piple Flow Using 3rd Order MHD Equations in Hydrodyn Limit
May T. Lim	1 January-30 June 2001	Modeling Hysteresis in Natural Systems
Jose A. Magpantay	1 January-30 June 2001	Gauge Theory Quantization
Christopher P. Monterola	1 January-30 June 2001	Feasibility of a Neural Network as Classifier of Undecided Respondents In a Public Opinion Survey
Henry J. Ramos	1 January-30 June 2001	Helium Ion Production in a Magnetized Sheet Plasma
Caesar A. Saloma	1 January-30 June 2001	Direction-Sensitive Subwavelength Displacement Measurements at Diffraction-Limited Spatial Resolution
Arnel A. Salvador	1 January-30 June 2001	In GaAs Quantum Walls and Quantum Dots

Roland V. Sarmago	1 January-30 June 2001	AC Magnetic Susceptibility Measurements on YBCO Superconductors
Armando S. Somintac	1 January-30 June 2001	Growth of AlGaAs-Based VCSEL Via Molecular Beam Epitaxy
Maricor N. Soriano	1 January-30 June 2001	Prototyping of Computer-Based Physics Experiments Using Locally Available Components
Giovanni A. Tapang	1 January-30 June 2001	Photon Detection of Ultrafast Laser Pulses
Alvarado B. Tarun	1 January-30 June 2001	Experimental Enhancement on the Spectral Purity of Laser Diode Using Optical Feedback
Danilo M. Yanga	1 January-30 June 2001	The Holon Spectral Function at Finite Temperature for High Tc Superconductors

Research Projects funded by UP System Creative and Research Scholarship Fund 2000

Proponent	Title
Dr. Zeneida B. Domingo	Synthesis and chracterization of canola based cholesteryl ester and nemactic E7 liquid crystal mixture
Dr. Jose Magpantay	Quantization of open systems
Dr. Henry J. Ramos	Optimization and enhancement of negative hydrogen ion production in a magnetized sheet plasma
Dr. Caesar Saloma	Third harmonic generation microscopy in optically thick biological samples
Dr. Arnel Salvador	Growth and Fabrication of GaAs optical devices
Dr. Roland Sarmago	Bi 2223 films on MgO substrates by liquid phase epitaxy

APPENDIX D:
PhD Dissertation, MS & BS Thesis

PHD GRADUATES (1ST SEMESTER, SY 2001-2002)
1. Jose Perico H. Esguerra
Contributions to the Statistical Mechanics of Classical Many-Body Systems

2. Eric A. Galapon
The Quantum Time Problem

3. Roland Emerito S. Otadoy
Andreev Bound States and Self-Consistent Gap Functions in Clean Layered Superconductor/Normal Metal Systems With Finite Transverse Width

MS GRADUATES (2ND SEMESTER, SY 2000-2001)
1. Gene Blantocas
Extraction and Profile Analysis of Hydrogen-Like Helium Ions in a Magnetized Sheet Plasma

2. Giovanni M. Malapit
Low Temperature PECVD Diamond and DLC Thin Films

3. Darwin Z. Palima
Laser-Induced Transient and Nonlocal Birefringence Change In Methyl Red-Doped Nematic Liquid Crytal E7

MS GRADUATES (1ST SEMESTER, SY 2001-2002)
1. Michelle F. Bailon
Investigation on the Electron Mobility and Interface Electric Field in Modulation-Doped GaAs/AlGaAs Heterostructures

2. Luisito C. Guiao
X-Ray Diffraction Investigations of GaAs-Based Heterostructures Grown on ON-Axis and Off-Axis Substrates

3. Raymund Lee Antonio C. Sarmiento, Jr.
Deep Level Transient Spectroscopy of GaAs Grown by Molecular Beam Epitaxy on On-Axis (100) and Off-Axis Substrates

4. Nathaniel P. Hermosa II
Optical Storage in a Methyl Red Doped Polyer Dispersed Liquid Crystal

UNDERGRADUATE THESIS (2ND SEMESTER AY 2000-2001)
1. Stephen Daedalus Separa
Noise-Aided Detection and Reconstruction of Weak Signals and Images: Theory and Experiment

2. Arnita C. Podpod
Deposition of Silicon Dioxide and Silicon Nitride Thin Films by PECVD

3. Katrina Louise C. Molina
Frequency and Applied Field Dependence of Magnetic Susceptibility Measurements of YBCO in a Mutual Inductance Bridge

4. Ma. Sheila Angeli C. Marcos
Color-Texture Image Analysis of Coral Reefs
5. Ayn Hazel G. Manuel
Hall Voltage Measurements in Bi-2212 Films

6. Cheryll Lei E. Mahinay

Electro-Optic Characterization of Photopolymerization-Induced Polymer Dispersed Cholesteric Liquid Crystals

7. Claire M. Macale
Thermotropic Phase Transistion of Lecithin-Water System

8. Nina Ann A. Lacap
Photocurrent Spectroscopy of a Resonant Cavity Enhanced Photodetector

9. Joihren F. Joson
A Kinetic Study of the Non-Isothermal Crystalization of Coco-Based Cholesteryl Ester

10. Serafin Delica
Light Scattering in Polymer Dispersed Liquid Crystal: Monte Carlo Analysis and Parametrization

11. Clarina R. De La Cruz
Investigations of Electrical Dissipation Properties of C-Axis Oriented $Bi_2Sr_2CaCu_2O_{8+\delta}$

SUMMER 2001
1. Ronald F. Isip
Simulation of a Self-Pusating Semiconductor Laser Under Optical Feedback

UNDERGRADUATE THESIS (1ST SEMESTER AY 2001-2002)
1. Alvin Baclig
Optical Recognition of Fingerprints

2. O-Mer Fernandez
Electrically Induced Reorientation in a Polymer Network-Stabilized Nematic E7 Liquid Crystal System

3. Marilyn Hui
Temporal Measurement of Electron Temperature and Density in a 1064 nm Nd:YAG Laser Produced Copper Plasma

4. Jay Erickson Tio
Simulation of a One-Dimensional Photonic Crystal with Defects"

5. Ayrah Tumbokon
Physical Characterization of Synthesized Canola-Based Cholesteryl Ester (CANCE) and Its Formulations With Nematic E7

Appendix E: NIP Curricular Proposals

1. Revision of the MA Physics Program

1.1. Change in Credit Units

Physics 204.1 Foundations of Modern Physics I
Course description: Fundamentals of modern physics with emphasis on atomic physics.
Prerequisite: Consent of Instructor

From: 7h (4 lec, 3 lab) 5 units To: 4h (4 lec) 4 units

Justification:The course may be effectively taught without a laboratory component. The laboratory part consists of introductory undergraduate level experiments. These experiments have become unnecessary for this graduate course.

2. Revision of the BS Physics/Applied Physics Program

2.1. Change in Course Prerequisite

2.1.1. Physics 71 Elementary Physics I
From: Coreq: Math 52/53
To: Prereq: Math 17/equiv., Coreq: Math 53/equiv.

Justification: The course Math 52 is no longer offered. The prerequisite course is explicitly indicated for convenience in implementation.

2.1.2. Physics 101 Fundamental Physics I
From: Coreq: Math 54/equiv.
To: Prereq: Math 17/equiv., Coreq: Math 53/equiv.

Justification: The content of Math 17 (Algebra & Trigonometry) is sufficient as prerequisite for this initial physics course for BS Physics and BS Applied Physics students.

2.1.3. Physics 104 Modern Physics I
From: Prereq: Physics 103, 112; Math 121.1
To: Prereq: Physics 103, Math 121.1/equiv.

Justification: A background in differential equations is sufficient for the course. Math 121.1 (Elementary Differential Equations) or its equivalent satisfies the prerequisite necessary for the course. Only minor details of Physics 112 (Mathematical Physics II, which includes complex analysis, differential equations and special functions, Fourier series and transforms) are needed in the course. These minor details are readily incorporated in the course.

2.2. Change in Course Description

2.2.1 Applied Physics 181: PHYSICAL ELECTRONICS I
Prereq: Physics 104. 6 h. (3 lec, 3 lab) 4 u.
From:
Analysis of passive circuits; resonance & filters; semiconductor theory; noise theory; semiconductor devices & their applications; *digital theory; logic and switching circuits;* electronic instrumentation.

To:

Analysis of passive circuits; resonance & filters; semiconductor theory; noise theory; semiconductor devices & their applications; *operational amplifiers & analog electronics; FET, MOSFET,CMOS, integrated circuits*; electronic instrumentation.

Justification: The course will cover only analog electronics topics. The digital electronics topics are covered in Applied Physics 182 (Physical Electronics II).

2.2.2. Applied Physics 182: PHYSICAL ELECTRONICS II
Prereq: App Physics 181. 6 h. (3 lec, 3 lab) 4 u.
From:
Integrated circuits; operational amplifiers & analog electronics; FET, MOSFET, CMOS, analog-digital conversion & multiplexing*;* computer hardware & interfacing; microprocessors & machine language programming; applications of microprocessors.

To:
Digital theory; logic & switching circuits; analog-digital conversion and multiplexing; computer hardware & interfacing; microprocessors & machine language programming; applications of microprocessors.

Justification: The course will cover only digital electronics topics. The deleted (analog electronics) topics will be covered in Applied Physics 181 (Physical Electronics I).

Appendix F: Proposed revision of the BS Applied Physics -Instrumentation Physics Concentration curriculum

Summary of subjects to be removed from and added to the BS Applied Physics, Instrumentation Physics Concentration curriculum

Year	Semester	Removed Subject	Units	Replacement	Units
3rd	1	EE 6	-4	Humanities I	3
	2	EE 7	-3	Social Science I	3
4th	1	EE 131 (ECE101)	-3	Applied Physics 156	4
	2	EE 132 (ECE135)	-3	Applied Physics 166	3
		Humanities I	-3	Applied Physics 183	3
5th	1	Social Science I	-3	Applied Physics 184	3
		TOTAL	-19		19

Subjects to be introduced

1. Applied Physics 156: COMPUTER METHODS IN PHYSICS II

   Prereq : AP 155. 6 h. (3 lec, 3 lab) 4 u. (1st semester)

   Course Description: Advanced computer programming methods: Simulation and modelling of complex systems; Finite-difference time domain methods; Monte Carlo methods.

   Justification: Students cannot efficiently absorb the numerous important topics discussed in a single course. Offering of another course that will deal into more specific and important topics will be helpful in their future courses and research.

2. Physics 166: OPTICAL PHYSICS II

   Prereq: AP 165. 3 h. (3 lec) 3 u. (2nd semester)
   Course Description: Fresnel Diffraction; coherence; statistical optics; polarization; quantum optics; non-linear optics

   Justification: One semester is not sufficient to cover the basics of optics.

3. Applied Physics 183: APPLIED OPTICS AND INSTRUMENTATION

   Coreq : AP 185, Pre-req: Phys 165. 3 h. (3 lec) 3 u. (2nd semester)
   Course Description: Current topics and techniques for engineering optical instruments; design of microprocessor/DSP-based instrumentation systems; Machine vision; image-detection devices and systems;

   Justification: Majors must be abreast with the latest techniques and methodologies in optical and electronic instrumentation.

Applied Physics 184: CONTROL SYSTEMS

Prereq: AP 181. 3 h. (3 lec) 3 u. (1st semester)
Course Description: Analog and digital control systems; Laplace transforms, Z-transforms; Frequency domain modeling; Time domain modeling; Time response; Frequency Response
Justification: To replace EE 101 and EE 135.

Correction to the course description of existing courses

1. Applied Physics 181: PHYSICAL ELECTRONICS I
   Prereq: Physics 104. 6 h. (3 lec, 3 lab) 4 u. (2nd semester)
   Course Description: Analysis of passive circuits; resonance & filters; semiconductor theory; noise theory; semiconductor devices & their applications; operational amplifiers & analog electronics; FET, MOSFET,CMOS, integrated circuits; electronic instrumentation.

   Justification: All analog electronics topics should be in this subject

2. Applied Physics 182: PHYSICAL ELECTRONICS II
   Prereq: App Physics 181. 6 h. (3 lec, 3 lab) 4 u. (1st semester)
   Course Description: Digital theory; logic & switching circuits; analog-digital conversion and multiplexing; computer hardware & interfacing; microprocessors & machine language programming; applications of microprocessors.

   Justification: All digital electronic topics should be in this subject.

Prepared by: Dr. Maricor Soriano, Dr. Vincent Daria, Dr . Carlo Mar Blanca,
Mr. Christopher Monterola, Ms. May Lim, Mr. Johnrob Bantang

APPENDIX G: COURSE OUTLINE FOR APPLIED PHYSICS 195

Applied Physics 195: Modern Control Systems
Prepared by: Dr Vincent Daria
Course Description: Application of control theory (frequency and time domain) to physical systems. Stability and performance: Bode, Nyquist, and root-locus diagrams. Representation in state space. Analog and discrete dynamical systems.

Introduction
Control systems: research and applications
Analysis and Design
Design process
Computer Aided Design

B. Modeling in the Frequency domain
Laplace Transform and properties
Transfer Function of Electrical networks
Transfer Function of Mechanical Systems
Modeling in the time domain
State-space representation
Conversion of transfer function to state-space representation
FIRST EXAM
Time Response
Poles, Zeros and System response
First order systems
Second order systems
System response with zeros
Laplace transform solution of state equations
Time response via computer simulation
Stability of control-system
Characteristic Equation using conventional and state-variable methods
Routh-Hurwitz Stability criterion
Nyquist Stability criterion
Bode-Diagram Approach
SECOND EXAM
Root Locus
Techniques
Design via Root Locus
Frequency Response
Techniques
Design via Frequency response
FINAL EXAM

Grading system

Exams		60%
Problems sets/Machine problems	30%	
Quizzes/Attendance		10%

References:
*N. Nise, **Control Systems Engineering**, Addison-Wesley, USA, (1995) (Main)*
R. Dorf and R. Bishop, **Modern Control Systems**, Addison-Wesley, USA (1998)
S. Shinner, **Modern Control System Theory and Design**, Wiley & Sons, USA (1992)

Appendix H: Course Outline for Applied Physics 195A

Applied Physics 195a: Modern Control Systems II
2nd Semester AY 2001-2002
Schedule: MTh, 830a-10a. PH 3115.
Instructor: May Lim (mlim@nip.upd.edu.ph)
Consultation Hours: M (10a - 12n), F (8:30a - 12n, 1p-4:30p) @ PH3230

Description: Digital Control Systems
Prerequisite: Analog Control Systems (AP195 (Modern Control Systems I) or equivalent

Recommended Books:
G. Franklin, J.D. Powell, M.L. Workman. Digital Control of Dynamic Systems 3/e. Addison Wesley Longman. 1998. ISBN 0-201-82054-4.
J. R. Leigh. Control Theory: a guided tour. Peter Peregrinus Ltd. 1992. ISBN 0-86341-241-6.

Recommended Links:
Control Tutorials for Matlab: http://www.engin.umich.edu/group/ctm/
The Integrator (Wolfram Research): http://integrals.wolfram.com
Table of Laplace Transforms: http://mathworld.wolfram.com/LaplaceTransform.html

Homepage: All class materials are at http://www.nip.upd.edu.ph/apl/ap195a

Grading System: 30% problem sets, 40% midterm exam, 40% final exam*
Problem sets are due in class a week after being distributed. Solutions must be done individually although discussion of the problem (do not copy solutions!) with me or your classmates is encouraged. The three lowest scores will be discarded and the three highest scores will be doubled.
*A perfect score in the final exam (comprehensive coverage) will result in a grade of 1.0 regardless of the scores in the midterms and problem sets.

Course Coverage.
1. Introduction
2. Review of Continuous Control
3. Introductory Digital Control
4. Discrete Systems Analysis
5. Sampled-Data Systems
6. Discrete Equivalents
7. Design Using Transform Techniques
8. Design Using State-Space Methods
9. Application: Optical Feedback Control

Appendix I: NIP Enrolment and Number of Graduates Data

1. First Semester AY 1992-1993

Course	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total
	M	F	M	F	M	F	M	F	M	F	
Physics	10	10	13	17	10	10	3	2	5	2	82
App Physics	11	10	29	7	15	3	16	9	13	3	116
Subtotal	21	20	42	24	25	13	19	11	18	5	
Total	41		66		38		30		23		198

Number of graduates at the end of the academic year: 17
5 (Physics) + 12 (App Physics)

2. First Semester AY 1993-1994

Course	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total
	M	F	M	F	M	F	M	F	M	F	
Physics	25	11	12	7	7	5	7	10	1	1	86
App Physics	18	10	11	8	26	12	18	6	14	4	127
Subtotal	43	21	23	15	33	17	25	16	15	5	
Total	64		38		50		41		20		213

Number of graduates at the end of the academic year: 22
3 (Physics) + 19 (App Physics)

3. First Semester AY 1994-1995

Course	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total
	M	F	M	F	M	F	M	F	M	F	
Physics	23	20	19	5	6	2	8	2	6	6	86
App Physics	23	9	9	6	5	3	23	9	16	3	127
Subtotal	46	29	28	11	11	5	31	11	22	9	
Total	75		39		16		42		31		213

Number of graduates at the end of the academic year: 10
5 (Physics) + 5 (App Physics)

4. First Semester AY 1995-1996

Course	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total
	M	F	M	F	M	F	M	F	M	F	
Physics	12	12	15	17	11	0	5	1	8	3	84
App Physics	15	3	16	4	7	8	7	4	32	11	107
Subtotal	27	15	31	21	18	8	12	5	40	14	
Total	42		52		26		17		54		191

Number of graduates at the end of the academic year: 26
5 (Physics) + 21 (App Physics)

5. First Semester AY 1996-1997

Course	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total
	M	F	M	F	M	F	M	F	M	F	
Physics	26	31	13	11	12	9	8	0	10	2	122
App Physics	6	16	16	3	13	0	3	8	22	4	91
Subtotal	32	47	29	14	25	9	11	8	32	6	
Total	79		43		34		19		38		213

Number of graduates at the end of the academic year: 15
6 (Physics) + 9 (App Physics)

6. First Semester AY 1997-1998

Course	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total
	M	F	M	F	M	F	M	F	M	F	
Physics	16	27	9	15	6	7	4	3	8	3	122
App Physics	19	12	17	21	10	2	0	11	13	9	91
Subtotal	35	39	26	36	16	9	4	14	21	12	
Total	74		72		25		18		33		213

Number of graduates at the end of the academic year: 13
3 (Physics) + 10 (App Physics)

7. First Semester AY 1998-1999

Course	1st Year		2nd Year		3rd Year		4th Year		5th Year		6th Year		Total
	M	F	M	F	M	F	M	F	M	F	M	F	
Physics	18	49	11	18	4	5	4	7	4	1	4	1	126
App Physics	28	39	15	18	11	14	8	3	10	0	7	5	158
Subtotal	46	88	26	36	15	19	12	10	14	1	11	6	
Total	134		62		34		22		15		17		284

Number of graduates at the end of the academic year: 16
9 (Physics) + 7 (App Physics)

8. First Semester AY 1999-2000

Course	1st Year		2nd Year		3rd Year		4th Year		5th Year		6th Year		7-8th Year		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Physics	19	41	13	36	10	8	8	6	2	4	2	0	2	0	151
App Physics	32	37	23	31	12	12	7	12	7	5	8	0	4	3	193
Subtotal	51	78	36	67	22	20	15	18	9	9	10	0	6	3	
Total	129		103		44		33		18		10		9		344

Number of graduates at the end of the academic year: 6
0 (Physics) + 6 (App Physics)

9. First Semester AY 2000-2001

Course	1st Year		2nd Year		3rd Year		4th Year		5th Year		6th Year		7-8th Year		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Physics	16	26	16	39	6	16	5	6	3	4	1	3	2	0	143
App Physics	16	25	27	25	16	14	11	23	1	1	3	5	8	1	176
Subtotal	32	51	43	64	22	30	16	29	4	5	4	8	10	1	
Total	83		107		52		45		9		12		11		319

Number of graduates at the end of the academic year: 22
5 (Physics) + 17 (App Physics)

10. First Semester AY 2001-2002

Course	1st Year		2nd Year		3rd Year		4th Year		5th Year		6th Year		7-8th Year		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Physics	14	39	15	18	9	20	6	8	5	3	3	4	2	1	147
App Physics	20	25	14	23	16	15	9	11	9	15	1	1	6	2	167
Subtotal	34	64	29	41	25	35	15	19	14	18	4	5	8	3	
Total	98		70		60		34		32		9		11		314

End of Report