

Agenda for 23rd Academic Council Meeting

BBSBEC Fatehgarh Sahib

Date 22-11-2005



PUNJAB TECHNICAL UNIVERSITY
JALANDHAR

INDEX

	<u>Page</u> <u>No.</u>
23.1 To confirm the minutes of the 22 nd meeting of the academic council held at CT institute of Management & Technology, Jalandhar notified vide letter PTU/REG/5545 dated 13 th Sept 2005..	01
23.2 Correction in the proceeding of 22 nd meeting of Academic Council	01
23.3 Action taken report on the academic council meeting 20 th to 22 nd	01
23.4 To approve the degrees to be conferred in the 4 th convocation	01
23.5 To consider the issue of Merit Certificate / Medals to the merit holders of the university.	01
23.6 To report on admissions during session 2005 -06	02
23.7 To report on addition of new colleges during session 2005 - 06	02
23.8 To report on regional centres of the university	03
23.9 To report on construction activities of the university	04
23.10 To draw Academic Calendar for the year 2006 and for academic session 2006 -07	04
23.11 To discuss the issue of six months practical training for B.Tech students of 2004 and onwards batches	04
23.12 To approve composition of Boards of Studies	04
23.13 To review Academic Regulations - 2004, in its applicability for attendance criteria.	05
23.14 To brief on sports and culture activities of the university	05
23.15 To consider the syllabus and eligibility criteria for M.Tech (IT) course.	06
23.16 To consider the distribution of marks in B.Arch Programme	06
23.17 To inform about the fee structure for Non-AICTE courses running in the regular colleges	06
23.18 To consider payment to teachers for guiding seminars, projects and thesis	06
23.19 To consider transfer of students from regular mode to distance education mode	06

23.1 To confirm the minutes of the 22nd meeting of the academic council held at CT institute of Management & Technology, Jalandhar notified vide letter No. PTU/REG/5545 dated 13th Sept 2005.

23.2 Correction in the proceeding of 22nd meeting of Academic Council

Under ATR (22.2) the following corrections are applied

	Previous	Corrected
21.2 (b) & (c)	Dean academic informed the council that BOS for computer science and engineering, 17 and computer applications had a joint meeting and have arrived following decision	Dean academic informed the council that BOS for computer science and engineering, Information Technology and computer applications had a joint meeting and have arrived at a decision appended at Appendix – A1 & A2
22.3.2 d(iv)	Week	Weak

23.4 Action taken report on the academic council meeting 20th to 22nd

23.5 This is being discussed as agenda 23.11

22.3 A letter PTU/REG/5395 dated 6th September 2005 has been issued asking for additional affidavit in case of student opting to change their option of the regulation

23.6 To approve the degrees to be conferred in the 4th convocation

The academic council may consider and approve the award of the degrees of students eligible in the session 2004-05

Ph.D.	03 (For recommendation to BOG)
M.Tech.	20
B.Tech	2885
B. Pharmacy	234
MBA	952
MCA	517
BBA	64
BCA	159

23.7 To consider the issue of Merit Certificate / Medals to the merit holders of the university.

The list of such students is placed at Appendix – B.

The same is presented before the academic Council for approval.

23.8 To report on admissions during session 2005 -06

This year PTU conducted Combined Entrance Test for admission to the following courses:

- (i) B.Tech.
- (ii) B. Pharmacy
- (iii) B. Architecture

A total of 15908 applications were received and the examination was held on 3rd June 2005 in 54 Centres. 13400 candidates took the entrance test.

The details of admission made during session 2005 -06 is as under:

Course	Through Counselling	Management Quota
B. Tech. 1 st year	4273	4043
B. Tech. 2 nd year	753	959
B. Pharm 1 st year	366	629
B. Pharm 2 nd year	72	73
B.Arch.	24	116
BBA		715
BCA		1705
MBA	707	1215
MCA	199	529
HMCT		235
B.Sc. MLT		60
B.Sc. MLT (Lateral Entry)		51
B.Sc. (IT)		66
B.Sc. (ATHM)		276
M.Sc. (IT)		61
M.Sc. (ATHM)		282
M.Sc. (SIM)		31
M.Tech in University Regional Centres	177	

23.7 To report on addition of new colleges during session 2005 - 06

The following new colleges have requested for affiliation to PTU from the session 2005 - 06:

Engineering Colleges

1. Rayat & Bahra College of Engineering & Biotechnology, Kharar
2. Baba Hira Singh Bhattal Engineering College, Lehragaga

Hotel Management Colleges

1. K.C. College of Hotel Mgt. & Catering Technology, Nawanshahr*
2. Chandigarh College of Hotel Mgt. & Catering Technology, Landran

Pharmacy Colleges

1. Chitkara College of Pharmacy, Rajpura
2. Chandigarh College of Pharmacy, Kharar
3. Swami Vivekanand College of Pharmacy, Ramnagar

Management Colleges

1. GNA Institute of Management & Technology, Mehtiana, Phagwara

*Certain observations raised by the regulatory committee of the University for affiliation have hence been reported to be fulfilled. Revisit of the PTU team is scheduled in the current week.

23.8 To report on regional centres of the university

The Punjab Technical University has established fourteen Regional Centers with the objective to promote research and provide opportunity for young faculty members to do their Post Graduation and peruse Ph.D. The state has not many institutions offering PG courses in Engineering and Technology. The establishment of these centers would fill a gap of requirement of qualified faculty in the engineering and technical colleges of the state.

PG courses in the Regional Centers are being organized keeping in view the high standard of Technical Education.

There exists a provision of organizing additional funds from various Govt/ private institutions like (DST, TIFAC, TDB, AICTE, DRDO, CSIR, etc.) by the regional centers.

M. Tech. & M. Pharm Courses run by the University at its Regional Centres

- Instrumentation & Control Engg.
- Mechanical Engg.
- Food Technology
- Mechanical (Production)
- Production Engg.
- Electronics & Comm. Engg.
- Electrical Engg.
- Power Engg.
- Industrial Engg.
- Civil (Structural)
- Civil (Soil & Foundation)
- Environment Sciences
- Information Technology
- M. Pharm (pharmacology)

The following two new regional centers of Punjab Technical University have been established in the current session.

1. Lovely Institute of Technology
2. Indo Soviet Friendship College of Pharmacy

The courses offered in these two are as under:

- | | |
|---------|---------------------------------|
| M.Tech | (IT), Mechanical (Thermal Engg) |
| M.Pharm | (Pharmacology) |

23.9 To report on construction activities of the university

PTU has initiated the construction of its administrative complex in an area of about 75 acres. In phase I the university shall be constructing two administrative blocks. Front block comprising of G+3 floors shall house the senior management of PTU including the Vice Chancellor, Registrar, Deans, Seminar Halls, Reception and Student Facilitation Center and the rear block comprising of basement +G+7 floors will house the examination, Distance Education, Computer Center, Library, General Office, canteen stores etc. The two parts shall be constructed independently and simultaneously. The front part is likely to be completed within 11 months and whereas the 2nd part shall be completed in one and half years time. The approximate project cost of these two blocks has been worked out at Rs 40 crores. Services of Chief Engineer(construction) and others consultants for landscaping, fire fighting electrical, advisor for public health and HVAC have also been hired. Tender document and bidding drawings have been prepared by the Architects and the university is in the process of finalizing the contractor. Work is likely to start on 1st January 2006.

23.10 To draw Academic Calendar for the year 2006 and for academic session 2006 -07

Proposed academic calendar for the even semester of 2005 -06 and odd semester of 2006 - 07 is placed at Appendix - C.
The Council may approve

23.11 To discuss the issue of six months practical training for B.Tech students of 2004 and onwards batches

The distribution of training load between even and odd semesters has already been approved by the previous Board and distributed to all the colleges. Accordingly the training is being conducted in 6th / 7th semester. This has been done keeping in view the slots available in the industries as well as the academic workload in the institutions.

In the academic regulations 2004 it was decided to discontinue 6 month industrial training. The university has received lot of requests from the colleges to continue the same.

The matter is placed before the academic council for consideration.

23.12 To approve composition of Boards of Studies

The term of previous boards of studies expired in June 2005. New Boards of have been constituted as per the recommendations made by Khandpur committee. Details of the regulations for constituting the boards are placed at Appendix - D. The newly constituted Board is placed at Appendix- D1 for approval of the Council.

23.13 To review Academic Regulations – 2004, in its applicability for attendance criteria.

The recommendations of the sub-committee constituted in the 19th Academic Council were sent to BOG for approval and the same has been approved with some modifications and is reproduced below:

As recommended by Academic Council	As approved by BOG
<p>A student shall have to attend 75% of scheduled lecturers (theory & Practical independently) other wise he / she shall not be allowed to appear in that subject in the University Examinations. A student detailed in the course(s) would be allowed to appear in the subsequent University Examination only on having completed the attendance (when the course is offered as a Regular Course) in the said course (s) as per Rules.</p> <p>However, he / she will be allowed to appear in a maximum of 10 theory subjects in the University examination held at the end of the semester.</p> <p>Total number of years allowed to complete the programme shall be as per University Regulations.</p> <p>Subsequently, the Registrar may notify the decisions as approved by the BOG.</p>	<p>A student shall have to attend 75% of scheduled lecturers together with Theory & Practical, otherwise he / she shall not be allowed to appear in that subject in the University Examinations. A student detailed in the course(s) would be allowed to appear in the subsequent University Exam only on having completed the attendance in the subject, when the course is offered as regular course (s) as per rules."</p>

The matter is placed before the Council for reconsideration

23.14 To brief on sports and culture activities of the university

- The report is placed at Appendix – E
- Sports calendar for even semester (session 2005-06) is to be finalized during sports council meeting being convened shortly. However, the following date venue of the Annual Athletic Meet is proposed
 Dates: 10-03-2006 to 12-03-2006
 Venue: BBSEBC Fatehgarh Sahib
- The university also intends to organize Virasat Mela from 04-03-2006 to 05-03-2006. The purpose is to provide the students a platform to exhibit the culture of Punjab to create awareness of VIRASAT amongst masses.

The matter is placed before the academic council for approval.

23.15 To consider the syllabus and eligibility criteria for M.Tech (IT) course.

Board of studies of CSE/IT met on 10th November, 2005 and decided that the eligibility criteria for admission in M.Tech. (IT) should be either B.Tech. (CSE) or B.Tech. (IT). Regarding syllabus of M.Tech. (IT) it was decided that first semester of M.Tech. (IT) will be similar to M.Tech. (CSE). The Council may approve

23.16 To consider the distribution of marks in B.Arch Programme

In the 18th meeting of BOG it was decided that each paper of B.Arch Programme shall be of 100 marks out of which the candidate shall be examined for 50 marks on the basis of external paper setting & evaluation and 50 marks in each paper shall be assigned to internal assessment.

Board of studies of B.Arch Programme met on 11th November 2005 and felt the equal weightage cannot be given to all subjects of B.Arch Programme.

The council may like to reconsider this matter in the light of observations of Board of Studies

23.17 To inform about the fee structure for Non-AICTE courses running in the regular colleges

On the recommendations of Kang's committee the fee structure for the various Non-AICTE courses has been prepared and is appended at Appendix F to H for the information of all the members of the Academic Council

23.18 To consider payment to teachers for guiding seminars, projects and thesis

BCET, Gurdaspur has made a request to consider payment to teachers for guiding seminars and thesis of M.Tech students. as per the following rates:

Seminar	Rs 1500 per student
Project	Rs. 2500 per student
Thesis	Rs. 5000 per student

The item placed before the academic council for consideration

23.19 To consider transfer of students from regular mode to distance education mode

Doraha Institute of Management & Technology made a request to consider transfer of students from regular mode to Distance education mode within the university. The request is placed at Appendix J. The item placed before the academic council for consideration

Appendix - A(5)

PUNJAB TECHNICAL UNIVERSITY, JALANDHAR

Minutes of the meeting of the Board of Studies of Computer Applications held on September, 02, 2005 at 10:30 am

The meeting of Board of Studies of Computer Applications was held on 2nd September, 2005 at CT Institute of Management & IT, Jalandhar in which the following were present:

1. Dr. V.K. Arora, Dean (Academics), PTU
2. Prof. M.S. Seekree, Director, KMIT, Ludhiana
3. Dr. K.N.S. Kang, Director, PCTE, Baddowal
4. Dr. Manoj Sachan, Head, CSE, SUIET, Longowal
5. Dr. Ranjeev Kumar Chopra, AP, RIMT, Mandi Gobindgarh

The members of Board of Studies deliberated at length on various aspects of eligibility criteria for the admission to MCA course and decides as under:

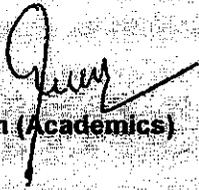
"All those candidates who have passed any recognized bachelor's degree of minimum three years duration with Mathematics / Statistics / Business Mathematics / Business Statistics / Quantitative Techniques as compulsory / optional / additional paper as one of the subjects either at 10+2 or at graduation level."


(Prof. M.S. Seekree)


(Dr. K.N.S. Kang)


(Dr. Manoj Sachan)


(Dr. Ranjeev Kumar Chopra)


Dean (Academics)

Minutes of the meeting of the Board of Studies of IT held on September, 02, 2005 at 9:00 am.

The meeting of Board of Studies of Information Technology was held on 2nd September, 2005 at CT Institute of Management & IT, Jalandhar in which the following were present:

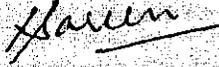
1. Dr. V.K. Arora, Dean (Academics), PTU
2. Prof. M.S. Seekree, Director, KIMT, Ludhiana
3. Prof. A.L. Sangal, Head, Computer Science & Engg. Deptt. NIT, Jalandhar
4. Ms. Manpreet Kaur, GNDEC, Ludhiana
5. Mr. Parminder Singh, GNDEC, Ludhiana

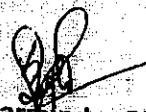
The members of Board of Studies deliberated at length on various aspects of eligibility criteria for the admission to M.Sc. (IT) and decides as under:

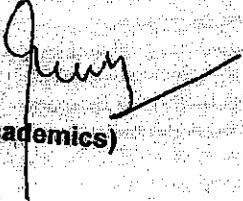
"All those candidates who have passed any recognized bachelor's degree of minimum three years duration with Mathematics / Statistics / Business Mathematics / Business Statistics / Quantitative Techniques as compulsory / optional / additional paper as one of the subjects either at 10+2 or at graduation level."


(Prof. M.S. Seekree)


(Prof. A.L. Sangal)


(Ms. Manpreet Kaur)


(Mr. Parminder Singh)


Dean (Academics)

Ph.D

Sr	Regdno/ Rollno	Name	Fname	College/Institute	Specialization	Title of Thesis
1	07.03.03	SUSHMA GUPTA	K.L. BANSAL	SLIET, LONGOWAL	MATHEMATICS	CERTAIN DIFFERENTIAL SUBORDINATIONS AND THEIR APPLICATIONS TO UNIVALENT FUNCTIONS
2	04.05.02	ESAKKI MUTHU	SUBBAIAH PILLAI	SLIET, LONGOWAL	CHEMISTRY	STUDIES ON METAL COMPLEXES WITH SOME MULTIDENTATE AND MACRO CYCLIC LIGANDS
3	02.04.03	HARISH KUMAR	KEWAL KRISHAN SINGLA	SLIET, LONGOWAL	ELECTRONICS & COMM. ENGG.	PERFORMANCE ANALYSIS OF BROADBAND OPTICAL COMMUNICATION SYSTEMS WITH FIBER IMPAIRMENTS

The Case at Sr. no 3 of Mr. Harish kumar has been recommended by the Academic Council in its 20th meeting under item 20.6

SUMMARY OF THE THESIS ENTITLED
**CERTAIN DIFFERENTIAL
SUBORDINATIONS AND THEIR
APPLICATIONS TO UNIVALENT
FUNCTIONS**

SUBMITTED TO
**PUNJAB TECHNICAL UNIVERSITY
JALANDHAR (PUNJAB), INDIA**
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN
MATHEMATICS

By
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2004.

CERTAIN DIFFERENTIAL SUBORDINATIONS AND THEIR APPLICATIONS TO UNIVALENT FUNCTIONS

SUMMARY

The present thesis is divided into six chapters, the first one giving a brief introduction of certain subclasses of the univalent functions, various concepts used in the course of this study and a brief account of the work done.

We denote by \mathcal{H} , the class of functions analytic in the unit disc $E = \{z : |z| < 1\}$. Denote by \mathcal{A} and \mathcal{A}' , the subclasses of \mathcal{H} consisting of functions f which are normalized by the conditions $f(0) = f'(0) - 1 = 0$ and $f(0) = 1$, respectively. Also, let \mathcal{S} denote the family of functions in \mathcal{A} which are univalent in E .

A domain $D \subset \mathbb{C}$ (the extended complex plane) is said to be starlike with respect to $z = 0$ if $0 \in D$ and the linear segment joining 0 to every other point $w \in D$ lies entirely in D , that is, $tw \in D$ whenever $w \in D$ and $0 \leq t \leq 1$. A function f in \mathcal{S} is said to be starlike if, and only if, the domain $f(E)$ is starlike. The necessary and sufficient condition for a function $f \in \mathcal{A}$ to be starlike is

$$\operatorname{Re} \frac{zf'(z)}{f(z)} > 0, z \in E. \tag{1}$$

We denote by St , the subclass of \mathcal{S} consisting of starlike functions. For $0 \leq \alpha < 1$, let $St(\alpha)$ denote the subclass of \mathcal{A} whose members f satisfy the condition

$$\operatorname{Re} \frac{zf'(z)}{f(z)} > \alpha, z \in E. \tag{2}$$

Members of the class $S(\alpha)$ are called starlike functions of order α .

A function $f \in \mathcal{A}$ is said to be strongly starlike of order α , $0 < \alpha \leq 1$, if

$$\left| \arg \frac{zf'(z)}{f(z)} \right| < \frac{\alpha\pi}{2}, z \in E.$$

We denote the set of all such functions by $\tilde{S}(\alpha)$. Note that $\tilde{S}(1) \equiv S$.

A domain D in \mathbb{C} is said to be convex if the line segment joining any two points of D lies entirely in D , that is, $\lambda w_1 + (1 - \lambda)w_2 \in D$ whenever $w_1, w_2 \in D$ and $0 \leq \lambda \leq 1$. A function $f \in \mathcal{H}$ is said to be convex if it is univalent and $f(E)$ is a convex domain. It is well-known that the function f is convex if, and only if $f'(z) \neq 0$ and

$$\operatorname{Re} \left(1 + \frac{zf''(z)}{f'(z)} \right) > 0, z \in E. \tag{3}$$

The class of normalized convex functions, denoted by K , consists of all f in S for which $f(E)$ is convex. A special subclass of K is the class of convex functions of order β , $0 \leq \beta < 1$, and is defined as under:

$$K(\beta) = \left\{ f \in \mathcal{A}, \operatorname{Re} \left(1 + \frac{zf''(z)}{f'(z)} \right) > \beta, z \in E \right\}.$$

A function $f \in \mathcal{A}$ is said to be close-to-convex in E if there exists a real number α , $-\pi/2 \leq \alpha < \pi/2$, and a convex function g (not necessarily normalized) such that

$$\operatorname{Re} \left(e^{i\alpha} \frac{f'(z)}{g'(z)} \right) > 0, z \in E.$$

In addition, if f is normalized by the conditions $f(0) = 0 = f'(0) - 1$, then the class of close-to-convex functions is denoted by C . It is well-known that

$K \subset St \subset C \subset S$. Let us define

$$R(\alpha) = \{f \in \mathcal{A} : \operatorname{Re} f'(z) > \alpha, 0 \leq \alpha < 1, z \in E\},$$

with $R(0) = R$. It is known that the functions in $R(\alpha)$ are close-to-convex for $0 \leq \alpha < 1$ and hence univalent in E .

Let the functions f and g be analytic in E . We say that $f \prec g$ in E (in symbols, $f(z) \prec g(z)$ in E) if g is univalent in E , $f(0) = g(0)$ and $f(E) \subset g(E)$.

Let $\Psi : \mathbb{C}^2 \rightarrow \mathbb{C}$ and let h be a univalent function in E . If p is analytic in E and satisfies the first order (in analogy with the order of differential equation) differential subordination

$$\Psi(p(z), zp'(z)) \prec h(z), h(0) = \Psi(p(0), 0), z \in E, \tag{4}$$

then p is called a solution of the differential subordination (4). A univalent function q is called a dominant of the differential subordination (4) if $p \prec q$ for all p satisfying (4). The dominant \tilde{q} that satisfies $\tilde{q} \prec q$ for all dominants q of (4) is said to be the best dominant of the differential subordination (4).

A detailed treatment of the theory of differential subordination is available in the book entitled "Differential Subordinations-Theory and Applications", authored by S. S. Miller and P. T. Mocanu [7]. We state below a celebrated and powerful result of Miller and Mocanu [4] which played a crucial role in the development of the theory of differential subordination.

Let F be analytic in E and let G be analytic and univalent in \bar{E} except for points ζ such that $\lim_{z \rightarrow \zeta} F'(z) = \infty$, with $F(0) = G(0)$. If F is not

subordinate to G in E , then there exist points $z_0 \in E, \zeta_0 \in \partial E$ (boundary of E) and an $m \geq 1$ such that $F(|z| < |z_0|) \subset G(E)$, $F(z_0) = G(\zeta_0)$ and $z_0 F''(z_0) = m \zeta_0 G''(\zeta_0)$.

This beautiful result of Miller and Mocanu has played a pivotal role in our work also. Another concept, which has been extensively used in the present thesis is that of subordination chains [10, p.159]. We describe it below.

A function $L(z, t)$, $z \in E$ and $t \geq 0$ is said to be a subordination chain (or Loewner chain) if $L(\cdot, t)$ is analytic and univalent in E for all $t \geq 0$, $L(z, \cdot)$ is continuously differentiable on $[0, \infty)$ for all $z \in E$ and $L(z, t_1) \prec L(z, t_2)$ for all $0 \leq t_1 \leq t_2$. Following characterization of subordination chain has been used in most of the present work.

The function $L(z, t) : E \times [0, \infty) \rightarrow \mathbf{C}$ of the form $L(z, t) = a_1(t)z + \dots$ with $a_1(t) \neq 0$ for all $t \geq 0$, and $\lim_{t \rightarrow \infty} |a_1(t)| = \infty$, is a subordination chain if and only if $\operatorname{Re} \left[\frac{z \partial L / \partial z}{\partial L / \partial t} \right] > 0$ for all $z \in E$ and $t \geq 0$.

In the last two decades, a tremendous development has taken place in the field of differential subordination and its applications. A large number of articles (more than 300) have been written by various researchers working in this area. Even today it remains hot field of research and there remain many open problems. In the present work, we have made an attempt to explore the field of differential subordinations further and, as consequences, tried to unfold some hidden facts in univalent function theory. Using the sophisticated concept of subordination chains, we have been able to study certain differential subordinations, which when applied to univalent functions, yield some new sufficient conditions for univalence, close-to-convexity and star-

704

likeness. Moreover, certain known results pertaining to the classes S and C have been either strengthened or improved. A brief chapter-wise description of our work is given below.

Chapter 2. In the theory of univalent functions, several examples of non-autonomous differential subordination are available, e.g. Miller and Mocanu [5] proved that for a given function B , with $\operatorname{Re} B(z) \geq 0$ in E , if $p \in \mathcal{A}'$ satisfies the non-autonomous differential subordination

$$B(z)zp'(z) + p(z) < \frac{1+z}{1-z}, \quad z \in E,$$

then, $\operatorname{Re} p(z) > 0$ in E . Recently, Ponnusamy [11] investigated a non-autonomous differential subordination of the type

$$p(z) + \lambda(z)zp'(z) < \left(\frac{1+z}{1-z}\right)^\gamma, \quad z \in E,$$

where $p \in \mathcal{A}'$ and λ is a suitable complex function. The study of differential subordination related to a sector was initiated essentially by Miller and Mocanu [6], wherein they obtained conditions on α and β such that for $p \in \mathcal{A}'$,

$$p(z) + \lambda zp'(z) < \left(\frac{1+z}{1-z}\right)^\alpha \Rightarrow p(z) < \left(\frac{1+z}{1-z}\right)^\beta,$$

in E , where $\lambda > 0$ is a real number.

In this chapter, we study the more general non-autonomous differential subordination of the type

$$(p(z))^\rho \left[1 + \lambda(z) \frac{zp'(z)}{p^k(z)}\right]^\alpha < \left(\frac{1+z}{1-z}\right)^\eta, \quad z \in E, \quad (5)$$

and, for given α, β, δ and k , our aim is to find the largest number $\gamma_k, k = 1, 2, 3, \dots$, and conditions on the function $\lambda : E \rightarrow \mathbb{C}$ such that (5) implies

$$p(z) < \left(\frac{1+z}{1-z}\right)^\delta \text{ in } E.$$

We observe that our results unify almost all the previously known results related to the study of differential subordination in a sector. As applications of this differential subordination to univalent functions, we derive some new and interesting conditions for strongly starlikeness and close-to-convexity. We mention below, two interesting results obtained in this chapter:

(i) For a given $\delta, 0 < \delta < 1$, and $\eta, \eta > 0$, suppose that $\lambda(z) : E \rightarrow \mathbb{C}$ is a function satisfying

$$\frac{\delta |\lambda(z)| \cos \psi}{r + \delta |\lambda(z)| |\sin \psi|} \geq \eta, \quad z \in E,$$

where $|\psi - \text{Arg} \lambda(z)| = \frac{\delta \pi}{2}$ and $r = (1 + \delta)^{\frac{1+\delta}{2}} (1 - \delta)^{\frac{1-\delta}{2}}$.

If $f \in \mathcal{A}, f'(z) \neq 0$ in E , satisfies the differential subordination

$$(1 - \lambda(z)) \frac{zf'(z)}{f(z)} + \lambda(z) \left(1 + \frac{zf''(z)}{f'(z)}\right) < \left(\frac{1+z}{1-z}\right)^\gamma, \quad z \in E,$$

then,

$$\frac{zf'(z)}{f(z)} < \left(\frac{1+z}{1-z}\right)^\delta$$

in E i.e. $f \in \tilde{S}(\delta)$ in E , where $\gamma = \delta + \frac{2}{\pi} \arctan \eta$.

(ii) Let $\alpha \in [0, 1]$ be fixed and let $\delta \in (0, \delta_0]$, where δ_0 is the solution of the equation

$$\beta \delta \pi = 2\pi - \alpha \left(\frac{\pi}{2} + \arctan \eta\right)$$

for $\beta \geq 0$ and for a suitable fixed $\eta > 0$ such that $\lambda(z) : E \rightarrow \mathbb{C}$ satisfies

$$\frac{\delta \text{Re} \lambda(z)}{1 + \delta |\text{Im} \lambda(z)|} \geq \eta, \quad z \in E.$$

If a function $f \in \mathcal{A}$, $f'(z) \neq 0$ in E , satisfies

$$(f'(z))^\beta \left[1 + \lambda(z) \frac{zf''(z)}{f'(z)} \right]^\alpha < \left(\frac{1+z}{1-z} \right)^\gamma, \quad z \in E,$$

then,

$$f'(z) < \left(\frac{1+z}{1-z} \right)^\delta, \quad z \in E,$$

where,

$$\gamma = \beta\delta + \frac{2\alpha}{\pi} \arctan \eta, \quad 0 < \delta \leq \delta_0.$$

Chapter 3. The work of this chapter is motivated by recent papers of Padmanabhan [9] and Li and Owa [3]. Padmanabhan, in the said paper, studied the differential subordination of the type

$$\frac{zf'(z)}{f(z)} + \alpha \frac{z^2 f''(z)}{f(z)} < \frac{2\alpha(z^2 + 2z) + 1 - z^2}{(1-z)^2}$$

where $0 < \alpha \leq 1$ and $z \in E$ and proved that the functions $f, f \in \mathcal{A}$, satisfying above subordination are starlike in E . Li and Owa [3] proved that if $f \in \mathcal{A}$ satisfies the differential subordination

$$\frac{zf'(z)}{f(z)} + \alpha \frac{z^2 f''(z)}{f(z)} < \frac{1 - (1+\alpha)z}{1+z}, \quad z \in E,$$

for some $\alpha \geq 0$, then $f \in \text{St}$.

In this chapter, we consider a general differential subordination of the form

$$\frac{zf'(z)}{f(z)} + \alpha z^2 \frac{f''(z)}{f(z)} < \frac{zg'(z)}{g(z)} + \frac{\alpha z^2 g''(z)}{g(z)}, \quad (6)$$

where α is a complex number with $\text{Re } \alpha > 0$. We are interested in finding the conditions on the function g involved on the right hand side of (6) so that

it becomes the best dominant for the differential subordination (6). Choosing some distinguished functions as dominants, we obtain some interesting criteria for starlikeness. We note that most of the previous results in this direction are either improved or can be deduced as corollaries to our results. An interesting result obtained in this chapter is as under:

Let $\alpha, \alpha > 0$, be a real number. Assume that β is a real number such that

- (i) $0 \leq \beta < 1$ whenever $0 < \alpha \leq 1$; and
- (ii) $\beta \geq \frac{1}{2} - \frac{1}{2\alpha}$ for $\alpha > 1$.

For all $z \in E$, let $f \in \mathcal{A}$, $f(z) \neq 0$ in E , satisfy the differential subordination

$$z \frac{f'(z)}{f(z)} + \alpha \frac{z^2 f''(z)}{f(z)} \prec h(z),$$

where

$$h(z) = (1 - \alpha) \left(\frac{1 + (1 - 2\beta)z}{1 - z} \right) + \alpha \left(\frac{1 + (1 - 2\beta)z}{1 - z} \right)^2 + \alpha \left(\frac{2(1 - \beta)z}{(1 - z)^2} \right).$$

Then $f \in St(\beta)$.

If we write $h(z) = u + iv$, then $h(E)$ is the exterior of the parabola given by

$$v^2 = -\frac{(1 - \alpha(1 - 2\beta))^2(2 - 2\beta)}{\alpha(3 - 2\beta)} \left[u - \left(\alpha\beta \left(\beta - \frac{1}{2} \right) + \beta - \frac{\alpha}{2} \right) \right]$$

with vertex at $(\alpha\beta(\beta - \frac{1}{2}) + \beta - \frac{\alpha}{2}, 0)$.

Another differential subordination which has been investigated, in this chapter, is of the type

$$\frac{zf'(z)}{f(z)} \left[1 - \alpha + \alpha(1 - \lambda) \frac{zf'(z)}{f(z)} + \alpha\lambda \left(1 + \frac{zf''(z)}{f'(z)} \right) \right] \prec \frac{zg'(z)}{g(z)} \cdot \left[1 - \alpha + \alpha(1 - \lambda) \frac{zg'(z)}{g(z)} + \alpha\lambda \left(1 + \frac{zg''(z)}{g'(z)} \right) \right], \quad (7)$$

where f and g belong to \mathcal{A} and α is a complex number with $\text{Re } \alpha > 0$ and $\lambda, \lambda > 0$, is real. We obtain conditions which the function g must satisfy so that the differential subordination (7) implies $\frac{zf'(z)}{f(z)} \prec \frac{zg'(z)}{g(z)}$ in E . As a particular case, we obtain several criteria for starlikeness. As an example, we state below one such result:

For $\lambda > 0$, if $f \in \mathcal{A}$ satisfies

$$\frac{zf'(z)}{f(z)} \left[(1 - \lambda) \frac{zf'(z)}{f(z)} + \lambda \left(1 + \frac{zf''(z)}{f'(z)} \right) \right] \prec \left(\frac{1+z}{1-z} \right)^2 + \frac{2\lambda z}{(1-z)^2}, \quad z \in E,$$

then $f \in St$.

Chapter 4. In 1975, Hallenbeck and Ruscheweyh [2] proved that the best dominant for the differential subordination

$$p(z) + \frac{1}{\gamma} zp'(z) \prec h(z), \quad z \in E, \quad (8)$$

is the solution of the differential equation

$$q(z) + \frac{1}{\gamma} zq'(z) = h(z)$$

where $\gamma \neq 0$ is a complex number with $\text{Re } \gamma \geq 0$ and h is convex in E . Miller, Mocanu and Reade [8] established that instead of assuming h to be convex in E , the condition $\text{Re} \left[1 + \frac{zh''(z)}{h'(z)} \right] > -1/2$ in E , is sufficient to get the

same conclusion in above result. Here, in this chapter, using the technique of subordination chain, we show that above result holds even when, only q is taken to be convex in E . Note that in (8), convexity of q does not imply that h is convex (in fact, h is only close-to-convex) in E . In fact, we study a more general differential subordination

$$(p(z))^\alpha \left[1 + \frac{\gamma z p'(z)}{p(z)} \right]^\beta \prec h(z), \quad z \in E, \quad (9)$$

and prove the following result:

Let $\alpha > 0$, $\beta \in (0, 1]$ be real numbers and let γ be a complex number with $\operatorname{Re} \gamma > 0$. Suppose that the differential equation

$$(q(z))^\alpha \left[1 + \frac{\gamma z q'(z)}{q(z)} \right]^\beta = h(z), \quad z \in E,$$

where $q(0) = h(0) = 1$, has an analytic and univalent solution q such that $(q(z))^{\alpha/\beta}$ is convex in E . If $p \in \mathcal{A}'$, satisfies the differential subordination (9) in E , then

$$p(z) \prec q(z)$$

in E . Moreover, q is the best dominant for the differential subordination (9). It is also shown that the best dominant of the differential subordination (9) exists in the form of an integral. Making suitable choices for the functions p and q , and parameters α , β and γ , several new conditions which imply univalence or starlikeness of an analytic function in the unit disc, have been obtained. Some already known sufficient conditions also follow as particular cases of our results. We give below two of the interesting results obtained in this chapter:

(i) For $f \in \mathcal{A}$, $f'(z) \neq 0$ in E ,

$$1 + \frac{zf''(z)}{f'(z)} \prec 1 + \frac{2(1-\beta)z}{(1+(1-2\beta)z)(1-z)}, \quad z \in E, \tag{10}$$

implies $f'(z) \prec \frac{1+(1-2\beta)z}{1-z}$ in E .

(ii) Let b be a complex number with $|b| \leq \beta/\alpha \leq 1$. If a function $f \in \mathcal{A}$, $f(z)f'(z) \neq 0$ in E , satisfies the differential subordination

$$\left(\frac{zf'(z)}{f(z)}\right)^\alpha \left[2 + \frac{zf''(z)}{f'(z)} - \frac{zf'(z)}{f(z)}\right]^\beta \prec \frac{1}{(1+bz)^{\alpha+\beta}}, \quad z \in E,$$

then

$$\frac{zf'(z)}{f(z)} \prec \frac{1}{1+bz}$$

in E , i.e. $f \in St\left(\frac{1}{1+bz}\right)$.

Chapter 5. In 1917, Robinson [12] proved that if $g(z) + zg'(z)$ is in S and

$$f(z) + zf'(z) \prec g(z) + zg'(z), \tag{11}$$

in $|z| < 1$, then $f(z) \prec g(z)$ at least in $|z| < r_0 = 1/5$. S. Singh and R. Singh [14], in 1981, worked on this problem of Robinson and proved that the constant r_0 can be increased to $2 - \sqrt{3} = 0.268\dots$. Subsequently, in 1984, Miller, Mocanu and Reade [8] further increased this constant r_0 to $4 - \sqrt{13} = 0.394\dots$. Recently, Singh and Singh [13] pursued the problem initiated by Robinson in the case when $g \in K(\beta)$. In fact, they studied the cases when $g \in K$ and $g \in K(1/2)$ and found the largest discs for both the cases such that $f(z) \prec g(z)$ holds in these discs whenever (11) holds. In the

present chapter, we consider more general differential subordination of the type

$$f(z) + \beta(f(z))^2 + \alpha z f'(z) < g(z) + \beta(g(z))^2 + \alpha z g'(z), \quad z \in E, \quad (12)$$

where $f, g \in \mathcal{A}$ and α and β are suitably chosen real numbers. In particular, we show that the conclusion $f(z) < g(z)$ in the above-mentioned results of Singh and Singh [13] holds in the entire disc E and does not depend upon the order of convexity of the function g as claimed by them.

Chapter 6. For a fixed α and all $z \in E$, let $\mathcal{H}_\alpha(\beta)$ denote the family of functions in \mathcal{H} which satisfy

$$\operatorname{Re} \left[(1 - \alpha) f'(z) + \alpha \left(1 + \frac{z f''(z)}{f'(z)} \right) \right] > \beta,$$

where $\beta, 0 \leq \beta < 1$ be a given real number. Al-Amiri and Reade [1], in 1975, showed that the function $f \in \mathcal{H}_\alpha(0)$, $\alpha \leq 0$, satisfies $\operatorname{Re} f'(z) > 0$ in E , and hence is univalent in E . They were unable to settle the question of univalence for $\alpha > 0$ except for the case $\alpha = 1$, when, obviously, f is convex in E .

In the present chapter, we have made an attempt to study the univalence of $f \in \mathcal{H}_\alpha(\beta)$ in the case when $\alpha > 0$. We have shown that for $0 < \alpha < 1$, $\mathcal{H}_\alpha(\alpha)$ consists of univalent functions and that the functions f in $\mathcal{H}_\alpha(1/2)$ satisfy $\operatorname{Re} f'(z) > 1/2$ for all z in E and for all $\alpha \geq 0$. Further, we have investigated the class $\mathcal{H}_{\alpha,h}$ defined as under:

$$\mathcal{H}_{\alpha,h} = \left\{ f \in \mathcal{A} : (1 - \alpha) f'(z) + \alpha \left(1 + \frac{z f''(z)}{f'(z)} \right) < h(z) \right\},$$

for some analytic and univalent function h in E and $0 < \alpha \leq 1$. Our purpose is to obtain the largest domain $h(E)$ such that the functions in the class $\mathcal{H}_{\alpha, h}$ are close-to-convex in E . Some of the interesting criteria obtained in this chapter are as follows:

(i) Let $\alpha, 0 < \alpha \leq 1$, be some real number. If $f \in \mathcal{A}$ satisfies the differential subordination

$$(1 - \alpha)f'(z) + \alpha \left(1 + \frac{zf''(z)}{f'(z)} \right) \prec h(z), \quad z \in E,$$

where

$$h(z) = 1 + (1 - \alpha)az + \frac{\alpha az}{1 + az}, \quad 0 < \alpha \leq 1,$$

then $|f'(z) - 1| < a$ in E .

(ii) For real numbers α and a , where $0 < \alpha \leq 1$ and $-1 < a \leq 1$, let $f \in \mathcal{A}$ satisfy the differential subordination

$$(1 - \alpha)f'(z) + \alpha \left(1 + \frac{zf''(z)}{f'(z)} \right) \prec h(z), \quad z \in E,$$

where

$$h(z) = \frac{1 + (1 - \alpha)az}{1 - z} + \frac{\alpha az}{1 + az}.$$

Then $f'(z) \prec \frac{1+az}{1-z}$ in E .

(iii) Let $f \in \mathcal{A}$ be such that $f''(0) = 0$. If for a real number μ ,

$$\left| \frac{1 + \frac{zf''(z)}{f'(z)}}{f'(z)} - 1 \right| \leq \mu < 1 \quad (13)$$

then

(i) f and $zf'(z)$ are univalent in E .

(ii) $f \in \mathcal{H}_\alpha(0)$, whenever $\mu \leq \frac{1}{\sqrt{1+\alpha^2}}$.

(iii) f is convex in E , whenever $\mu \leq \frac{1}{\sqrt{1+\alpha^2}}$ and $|\alpha| \geq 1$.

Above result (iii) provides a sufficient condition for a normalized analytic function f with $f''(0) = 0$ to be a member of the class $\mathcal{H}_\alpha(0)$. Some of the graphics presented in this chapter show the power of differential subordination technique over other methods.

Most of the work contained in the present thesis has either published or accepted for publication in various journals (see S. Singh and S. Gupta [15,16,17,18] and V. Singh, S. Singh and S. Gupta [19]).

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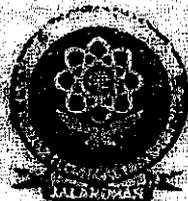
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SUMMARY

OF THE THESIS

Studies on Metal Complexes of Some Multidentate and Macrocyclic Ligands

submitted to



**Punjab Technical University
Jalandhar (Punjab), India**

For The Degree of
Doctor of Philosophy

in
CHEMISTRY

By •

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Summary

The coordination chemistry of polydentate and macrocyclic ligands has been the fascinating area of current interest to the inorganic chemists. These ligands form metal complexes with various metal ions, which are thermodynamically more stable than their open chain analogues. These complexes have potential applications in different fields like chemistry, biology, medicine and biotechnology etc.. Hence development of new macrocyclic ligands, their synthesis, structures and interaction with metals are of immense importance.

The present study deals with design and synthesis of a new tripodal face-capping amine ligand, its Schiff base derivative and some bridged 2,2'-bipyridyl ligands and study of their interaction with some transition metal and lanthanide ions in solution. Synthesis of two tripodal ligands having cyclohexane platform viz. *cis,cis*-1,3,5-tris(methylamino)cyclohexane (*tmach*) (L_1), *cis,cis*-1,3,5-tris((2-hydroxybenzilidene)aminomethyl)cyclohexane (*tmachsal*) (L_2) and three bipyridyl-bridged ligands, 1,2-bis(2,2':4',2''-bipyridyl-5-ylmethylsulfanyl)ethane ($C_2S_2bp_2$) (L_3), 1,3-bis(2,2':4',2''-bipyridyl-5-ylmethylsulfanyl)propane ($C_3S_2bp_2$) (L_4), 1,4-bis(2,2':4',2''-bipyridyl-5-ylmethylsulfanyl)butane ($C_4S_2bp_2$) (L_5) as shown in Figure 1 have been presented. Characterization of the ligands has been done through elemental analyses, UV-VIS, IR, 1H NMR, ^{13}C NMR and Mass spectral data.

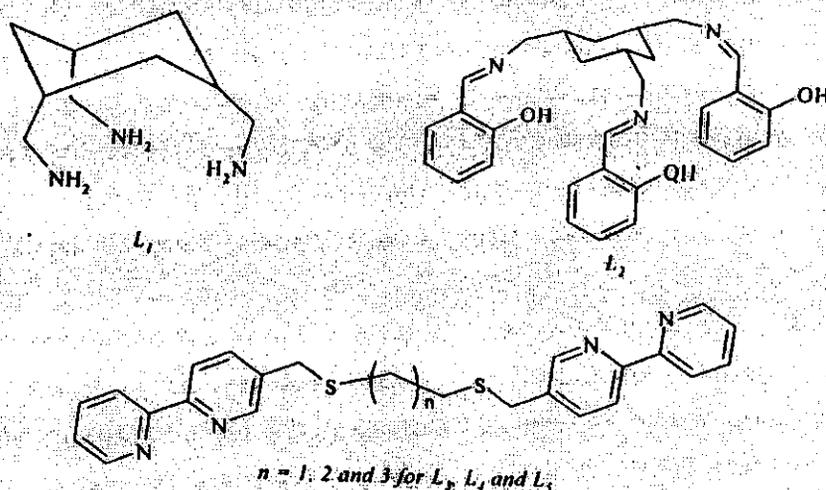


Figure 1 Ligands discussed in this thesis: L_1 , L_2 , L_3 , L_4 and L_5 .

The complexation behaviour of these ligands have been studied with some divalent transition metal ions viz., *Mn(II)*, *Fe(II)*, *Co(II)*, *Ni(II)*, *Cu(II)*, *Zn(II)* and trivalent lanthanide ions viz., *Lu(III)*, *Pr(III)*, *Nd(III)*, *Eu(III)*, *Gd(III)*, *Tb(III)*, *Er(III)*, *Yb(III)* and *Lu(III)* in solution by potentiometric and spectrophotometric methods (for *L₂*, *L₃*, *L₄* and *L₅* only). The protonation constants of the ligands and formation constants of their metal complexes have been calculated using computer programs Hyperquad-2000, pHAB and SPECFF. The trend of stability has been explained with aid of available theories. The results have been compared with other similar ligands. Probable geometries of the ligands as well as their metal complexes have been proposed through molecular modeling calculations using molecular mechanics.

The entire thesis has been divided into five chapters and each chapter is self-contained.

Chapter 1 is an introductory chapter, which describes the development of supramolecular chemistry, fundamentals of complex formations, expressions for stability constants and the factors determining stability constants. The computational development and the use of molecular modeling calculations for structural elucidation of the complexes have also been discussed.

Chapter 2 describes the synthesis, characterization of the ligand *cis,cis*-1,3,5-tris(methylamino)cyclohexane (*tmach*) (*L₁*) and study of its metal complexes with some transition metal and lanthanide ions by potentiometric method in aqueous medium. The first part of the chapter begins with literature survey on tripodal ligands and their complexes, which is followed by the experimental details for determination of protonation constants of *tmach* and stability constants of its metal complexes. The next part describes the discussion and interpretation of the results obtained with similar tripodal ligands. Lastly, the probable structures of metal complexes have been proposed on the basis of molecular modeling calculations.

Chapter 3 describes the synthesis, characterization of a tripodal Schiff base ligand *cis,cis*-1,3,5-tris((2-hydroxybenzylidene)aminomethyl)cyclohexane (*tmachsul*) (*L₂*), and its complexation with some transition metal and lanthanide ions by potentiometric and spectrophotometric methods in aqueous medium. The chapter begins with literature survey, which is followed by the experimental details for determination of protonation constants,

stability constants and then comparison of the results. Finally, the probable geometries of the metal complexes have been predicted through molecular modeling calculations.

Chapter 4 deals with the synthesis and study of three new bipyridyl bridged ligands viz. L_1 , L_2 and L_3 . The chapter describes determination of protonation constants of the ligands and stability constants of their metal complexes with some transition metal and lanthanide ions by potentiometric and spectrophotometric methods. Comparison is made with other ligands and the results are interpreted as in previous chapters. Finally, the molecular modeling calculations have been done to propose the probable geometry of the metal complexes.

Chapter 5 describes the scope for future work.

**PERFORMANCE ANALYSIS OF
BROADBAND OPTICAL
COMMUNICATION SYSTEMS WITH
FIBER IMPAIRMENTS**

(Ph. D. Thesis Abstract)

ABSTRACT

Optical communication is a relatively new and fast maturing field having terrific bandwidth and high quality of communication beyond comparison to any other available transmission medium. This technology has been growing at such a phenomenal pace that in a relatively short span of only a couple of decades, metamorphosed from a somewhat exotic research curiosity into a strong commercial reality it has accomplished the huge demand for bandwidth and longer transmission distance. Every day, there are new announcements of more and more fiber optic cable being deployed throughout the world and yet the cry for the greater capacity and faster access is growing louder. With all the improvement and advancement in the technology it is still a challenge to locally suppress the problem of impairments that limit the ability of the optical networks in realizing its vast technological potential. The photonic industry is thereby being driven to work upon the inherent impairments due to group velocity dispersion (GVD) and fiber nonlinearities degrading the system performance.

Plenty of work has been done in the past to compensate the dispersion effects limiting the bandwidth and transmission distance in optical communication systems. However, these investigations are being restricted to first-order dispersion effects only. Therefore, it is imperative to study the effect of second- and higher-order dispersion terms on the system performance. The impact of these terms should be analyzed and compensated to make paramount use of the bandwidth available with the optical communication systems. The shift from TDM (Time Division Multiplexing) to Wavelength Division Multiplexing (WDM) links and further to optical networks has only been feasible with the invention of

51

Erbium-Doped Fiber Amplifiers (EDFAs), which had removed the attenuation induced weakening of an optical signal as it travels down the optical fiber. With the use of EDFAs in WDM or Dense Wavelength Division Multiplexed (DWDM) systems and networks, the dispersion and fiber nonlinearities have become more decisive.

The research results presented here in through investigations are focused upon the effect of higher-order dispersion compensation in optical communication systems. The effect of higher-order dispersion compensation on, femto second Transform-Limited (TL) pulse generation by compensating linear chirp of Self Phase Modulation (SPM) spectra, intensity fluctuations due to Cross Phase Modulation (XPM) using Volterra Series method and Relative Intensity Noise (RIN) due to dispersive communication system are presented. It was felt that the study would be incomplete without the investigation of effects of higher-order dispersion compensation on the optical mm-wave Double Side Band (DSB) transmission systems, hence the same has also been presented in the last chapter.

In optical communication system the information carrier is a sequence of ultra short pulses, with a repetition rate of GHz generated by semiconductor laser diodes. In regard to the influence of higher-order effects of dispersion on the femto second TL- pulse by compensating linear chirp of SPM spectra in dispersion-shifted fibers the minimum propagation length and minimum pulse width and line width product has been investigated. It has been found that the minimum propagation length with first-order dispersion term is 23 m as reported earlier. It has been shown that if the higher-order dispersion effects are taken into consideration, this length reduces to 11.5 m. With the compensation of first-order dispersion term, this length can be enhanced to 6.8161×10^3 km. This length can be further improved to 6.0343×10^9 km by compensating first- and second-order dispersion terms together. The minimum pulse width and line width product

without dispersion, with dispersion including higher-order dispersion effects and with dispersion compensation have been found to be 0.44, 0.4418 and 0.4411 respectively.

The Fiber nonlinearities have not been fully analyzed and understood especially when other impairments like dispersion are also present. Their effects on the system performance can be analyzed by solving Non-Linear Schrodinger Wave Equation (NLSE).

The intensity fluctuations due to XPM in the presence of higher-order dispersion effects using Volterra Series method have been investigated. The impacts of XPM on the Channel Spacing, Transmission Distance and Frequency have been studied in the presence of higher-order dispersion terms. It is found that at frequency 5 GHz, the intensity fluctuation reduces to -56 dB from -47 dB with first-order dispersion compensation and this can be further improved with first- and second-order dispersion compensation to -58 dB. It has been observed that for the same fiber length, the intensity distortions improve to -700 dB from -310 dB with first-order dispersion compensation and this can be further improved with first- and second-order dispersion compensation to -990 dB. The variance for the time-synchronized system in the presence of higher-order dispersion effects has also been presented.

The intensity noise resulting from the phase modulation to intensity modulation conversion of laser phase can be major impairments in direct detection systems. The amplitude fluctuation characterized by RIN is the most important factor to be analyzed and evaluated. The improved theoretical investigation into RIN including the impact of second-order dispersion term for dispersive optical communication systems has been presented. It has been shown that the second-order dispersion term has no impact on RIN even at high noise frequencies as reported in the existing literature but with first-order dispersion compensation, the RIN can be dramatically reduced thereby improving overall

54

system performance. Further, the impact of fiber length and laser linewidth has been investigated for RIN. It has been shown that as the fiber length increases, the value of RIN increases but the improvement over RIN with first-order dispersion compensation decreases. Also with decrease in the value of laser linewidth, the RIN can be reduced to great extent.

In the finishing stage of the research work, the all-optical millimeter wave DSB based system has been analyzed in the presence of higher-order dispersion effects using Fiber Bragg Grating (FBG) and Optical Phase Conjugation (OPC) dispersion compensation techniques. The impact of higher-order dispersion compensation on normalized signal power and transmission distance has been investigated in DSB transmission. It is conclusively proved that if there is dispersion compensation, the normalized power gets increased thereby optimizing the overall system performance. It has been empirically evaluated that the first-order dispersion compensation has the major impact on the system performance in comparison to the second-order dispersion compensation. It has been found that the transmission distance can be enhanced by 10^3 and 10^6 if dispersion compensation is performed using first-order and a combination of first- and second-order respectively.

Therefore, the present work establishes performance analysis of broadband optical communication systems with fiber impairments focusing on higher-order dispersion effects. The research work reported in chapters III, V and VI of this thesis have been published in various refereed International Journals as per the list at page (6) and the work reported in chapter IV has been submitted for publication.

53

PUBLICATIONS IN REFEREED JOURNALS

This thesis includes following papers in refereed Journals

1. Harish Kumar, R.S. Kaler, T.S. Kamal and Ajay Kumar Sharma, "Femto Second Transform Limited Pulse Generation with Higher Order dispersion effects for Dispersion Shifted Optical Communication System," Taylor and Francis, Fiber and Integrated Optics Incorporating International Journal on Optoelectronics, vol. 22, no. 6, pp. 405-413, Dec. 2003.
2. Harish Kumar, R.S. Kaler, T.S. Kamal and Ajay Kumar Sharma, "Effect of third order dispersion term on Relative Intensity Noise (RIN) for dispersive optical communication system," Taylor and Francis, Fiber and Integrated Optics Incorporating International Journal on Optoelectronics, vol. 22, no. 4, pp. 263-274, July 2003.
3. Harish Kumar, R.S. Kaler, T.S. Kamal and Ajay Kumar Sharma, "Performance of optical DSB Signal Based Millimeter Wave communication system with the Effect of Higher order dispersion," International Journal of Optics Communication, Elsevier Science, pp. 197-205, vol. 222, issue 1-6, July 2003.
4. Harish Kumar, R.S. Kaler and T.S. Kamal, "Variance for XPM Time-Synhronized System with Higher-Order Dispersion Effects Using Volterra Series Method," Journal of BT Institution of Engineers (India) (Submitted for Publication).
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Sr	College	Position	Branch	Register/roll no.	Name	Exams	Marks Obtained	Max. Marks	%age
1	GZS, Bathinda	FIRST	Power Engineering	31605911	SANJU GARG	SOBIND RAM GARG	1553	2000	77.75
2	GNE, Ludhiana	SECOND	Power Engineering	31405969	CHAKRABARTY SINGH	RAJINDER SINGH	1532	2000	76.6
3	GNE, Ludhiana	THIRD	Power Engineering	21405901	MUNTAZEEA	SURINDER PAL	1269	1900	66.79
4	GNE, Ludhiana	FOURTH	Power Engineering	21405976	PARMINDER SINGH	SURINDER SINGH	1255	1900	66.05
5	GNE, Ludhiana	FIFTH	Power Engineering	21405928	PARMINDER SINGH	PARMINDER SINGH	1235	1900	65
6	GNE, Ludhiana	FIRST	Civil (Structural Engg.)	31405931	VARINDER SINGH	JASWINDER SINGH(NAGI)	1274	2000	63.7
7	GNE, Ludhiana	FIRST	Industrial Engg.	31407976	BALEWAL SINGH	MURIND SINGH	1467	2000	73.35
8	GNE, Ludhiana	SECOND	Industrial Engg.	21407037	PARMINDER SINGH	BIKAR SINGH	1319	1900	69.42
9	GNE, Ludhiana	THIRD	Industrial Engg.	21407050	PARMINDER SINGH	JASWANT SINGH	1316	1900	69.26
10	GNE, Ludhiana	FIRST	Mech (Production) / Prod Technol Engg	21411063	VARINDER KUMAR	PARKASH CHAND	1317	1900	69.32
11	GNE, Ludhiana	SECOND	Mech (Production) / Prod Technol Engg	21411054	AMRINDER KAUR	SEETAL SINGH	1313	1900	69.11
12	GNE, Ludhiana	THIRD	Mech (Production) / Prod Technol Engg	21411056	GAGANDEEP KAUSHAL	PAWAN KUMAR KAUSHAL	1185	1900	62.37
13	SLJET, Longowal	FIRST	Instrumentation Control Engg	32307805	JASPAL SINGH AJJLA	SHAMSHER SINGH AJJLA	1295	1800	71.94
14	SLJET, Longowal	SECOND	Instrumentation Control Engg	323038392	ASHU	R.K. KAULJA	1267	1800	70.38
15	SLJET, Longowal	THIRD	Instrumentation Control Engg	323038310	PARVINDER KAUR	SMRINDER SINGH	1186	1800	65.88
16	SLJET, Longowal	FOURTH	Instrumentation Control Engg	323038316	V.L. NARASIMHARAO	CHENNA KESHWARHA K	1165	1800	64.72
17	SLJET, Longowal	FIRST	Food Technology	32317833	ABHIRAM	K.S. RANA	1355	1900	71.32
18	SLJET, Longowal	SECOND	Food Technology	32317834	ABHIRAM	ABHIDEV GUPTA	1323	1800	73.5
19	SLJET, Longowal	THIRD	Food Technology	32317835	INDIYAN	R.K. YADAV	1288	1800	71.55
20	SLJET, Longowal	FOURTH	Food Technology	323178338	GAJANDEEP SINGH GHUMA	JASPAL SINGH GHUMAN	1231	1800	68.38

Sr	College	Position	Course	Register/Roll No	Name	Exempt	Marks Obtained	Max. Marks	%age
1	PCTE, Baddowal	FIRST	M.B.A.	322543648	PHILPA SINGHANIA	RAVINDER KUMAR R SINGH	2853	3200	89.16
2	GNIMT, Ludhiana	SECOND	M.B.A.	322483500	SURKHA JAIN	SATINDER JAIN	2826	3200	88.31
3	APJM, Jalandhar	THIRD	M.B.A.	322423160	HARTICA NAYYAR	ARUN NAYYAR	2818	3200	88.06
4	PCTE, Baddowal	FOURTH	M.B.A.	322543630	PARDEEP JAIN	BRUJAL	2797	3200	87.41
5	PCTE, Baddowal	FIFTH	M.B.A.	322543587	GANGANDEEP KAUR	BAHABER SINGH	2779	3200	86.84
6	PCTE, Baddowal	SIXTH	M.B.A.	327052	PARUL GOYAL	MOHINDER PAUL GOYAL	2767	3200	86.47
7	PCTE, Baddowal	SEVENTH	M.B.A.	322543618	MONIKA BANSAL	HARI CHAND BAN SAL	2763	3200	86.34
8	L.M. Phagwara	EIGHTH	M.B.A.	322443361	PARUN GUPTA	VINOD GUPTA	2745	3200	85.78
9	PCTE, Baddowal	NINETH	M.B.A.	322543575	AMAN SETHI	KEVAL KRISHAN SETHI	2736	3200	85.5
10	GNIMT, Ludhiana	TENTH	M.B.A.	322493555	SAMNEET KAUR	PARBANS SINGH	2732	3200	85.38
11	BGCET, SANGRUR	FIRST	M.C.A.	279210719	GURPREET KAUR	GURDAS SINGH	3454	3900	88.56
12	PCTE, BADDOWAL	SECOND	M.C.A.	254210310	DEEPA KOCHAR	ASHOK KOCHAR	3443	3900	88.28
13	GNIMT, LUDHIANA	THIRD	M.C.A.	249210271	MONIKA MATTA	ASHOK MATTA	3434	3900	88.05
14	PCTE, BADDOWAL	FOURTH	M.C.A.	254210314	GURPREET KAUR	CHARANDEET SIN GH	3408	3900	87.26
15	APJM, JALANDHA	FIFTH	M.C.A.	242210087	RAADHIKA GHOPRA	NARESH KUMAR GHOPRA	3393	3900	87
16	PCTE, BADDOWAL	SIXTH	M.C.A.	254210827	MANPREET KAUR M	MANPREET SINGH	3386	3900	86.82
17	L.M. PHAGWARA	SEVENTH	M.C.A.	244210171	DEEPIKA THAKUR	SATWANT SINGH	3372	3900	86.45
18	SICS, BADHANI	EIGHTH	M.C.A.	273210658	GAURAV MAHAJAN	MOKESH MAHAJA N	3371	3900	86.44
19	APJM, JALANDHA	NINETH	M.C.A.	242210108	VANDETA SOOD	SUNDER SHAM SO OD	3368	3900	86.36
20	APJM, JALANDHA	TENTH	M.C.A.	242210072	KANIKA SOOD	RAM KRISHAN SO OD	3356	3900	86.05
21	PCTE, Baddowal	FIRST	B.C.A.	254230489	GURJOT KAUR	GURPAL SINGH	3825	4200	91.07
22	PCTE, Baddowal	SECOND	B.C.A.	254230468	ANUREET GILL	SIMER PAUL SING H GILL	3695	4200	87.98
23	PCTE, Baddowal	THIRD	B.C.A.	254230451	AABHA ANEJA	NARINDER KUMA R ANEJA	3609	4200	85.93
24	GNIMT, Ludhiana	FOURTH	B.C.A.	248230324	DEINDER SINGH	BALBIR SINGH	3597	4200	85.64
25	GNIMT, Ludhiana	FIFTH	B.C.A.	249230363	R PANESAR	KAMALJIT SINGH	3593	4200	85.55

28	GGNIMT, Ludhiana	EIGHTH	B.C.A.	2482230332	PASKARAN SINGH KALSI	AMARUJIT SINGH KALSI	3533	4200	84.17
29	GGNIMT, Ludhiana	NINETH	B.C.A.	248230347	SHEELY SHARMA	O.P. SHARMA	3509	4200	83.55
30	GGNIMT, Ludhiana	TENTH	B.C.A.	248230348	SHIV SHANKAR	RAJA RAM	3496	4200	83.24
31	GGNIMT, Ludhiana	FIRST	B.B.A.	248241171	KAWALPREET KAUR	HARDEEP SINGH PURI	3099	3600	86.08
32	GGNIMT, Ludhiana	SECOND	B.B.A.	248241176	RICHA JAIN	SUBHASH CHANDER JAIN	2986	3600	82.94
33	GNIMT, Ludhiana	THIRD	B.B.A.	249241198	VAISHALI	PREM NATH KHATTA	2936	3600	81.56
34	PCTE, Baddowal	FOURTH	B.B.A.	254241230	INDERPREET KAUR GOONER	KEHARCHAND SINGH KOONER	2916	3600	81
35	GGNIMT, Ludhiana	FIFTH	B.B.A.	248241186	GAUTAM GARG	KEWAL KRISHAN	2903	3600	80.64
36	PCTE, Baddowal	SIXTH	B.B.A.	254241220	DEEPTI MAHAJAN	RAMESH MAHAJAN	2895	3600	80.42
37	LIM, Phagwara	SEVENTH	B.B.A.	244241132	NAVLEEN BINDRA	PARYINDER SINGH BINDRA	2858	3600	79.39
38	APIIM, Jalandhar	EIGHTH	B.B.A.	242241110	MANDEEP SAINI	GURUCHARAN SINGH	2800	3600	77.78
39	PCTE, Baddowal	EIGHTH	B.B.A.	254241249	SORABH BAJAJ	R.K. BAJAJ	2800	3600	77.78
40	SSIMT, Dinanagar	NINETH	B.B.A.	240241090	SONAM DUTTA	ASHWANI KUMAR	2786	3600	77.39
41	GNIMT, Ludhiana	TENTH	B.B.A.	249241195	PARINITA	DEEPTA SURJIT SINGH	2768	3600	76.89

GNDEC, Ludhiana	TENTH	B.Tech	ECCE	174941303	HARSIMRAT KAUR	HAARDEV SINGH	16909	21100	80.12
AJIT, Pandkot	FIRST	B.Tech	EIE	111062636	CHANDER SHEKHAR	PREM KUMAR	17103	21300	80.3
ALIT, Pandkot	SECOND	B.Tech	EIE	211068338	GEETIKA AGGARWAL	BALRAJ AGGARWAL	11702	15100	77.5
IET BHADDALROPAR	THIRD	B.Tech	EIE	117062795	SUNNY KHATRI	SH. ASHOK KUMAR KHATRI	16241	21300	76.25
IET BHADDALROPAR	FOURTH	B.Tech	EIE	117062765	ANTIMA JASSI	SH. OMPARKASH JASSI	16085	21300	75.52
IITT, Pojewal	FIFTH	B.Tech	EIE	111062807	DEVESH KUMAR	KAUSHAL DUTT SHARMA	15820	21300	74.27
IET BHADDALROPAR	SIXTH	B.Tech	EIE	117062779	KIRANDEEP KAUR	SH. NARINDER SINGH	15752	21300	73.95
IET BHADDALROPAR	SEVENTH	B.Tech	EIE	117062755	MITHUN SINGLA	SH. RAKESH KUMAR	15670	21300	73.57
GTBK IET, Chhapianwali	EIGHTH	B.Tech	EIE	115062743	NIDHI SAHNI	SUNIL SAHNI	15339	21300	72.01
IET BHADDALROPAR	NINTH	B.Tech	EIE	117063189	BARINDERPREET KA	JOGINDER SINGH	15196	21300	71.34
GTBK IET, Chhapianwali	TENTH	B.Tech	EIE	215062733	ADITYA JAIN	VIPIN JAIN	10722	15100	71.01
GNDEC, Ludhiana	FIRST	B.Tech	Electrical Engg.	114052235	BARPREET KAUR	GURMEJ SINGH	17322	21200	81.71
IET BHADDALROPAR	SECOND	B.Tech	Electrical Engg.	117052467	SWARNI PREET KAUR	SH. HARMOHINDER SINGH	17231	21200	81.28
GNDEC, Ludhiana	THIRD	B.Tech	Electrical Engg.	114052278	GUNEET KAUR PASRI	JP SINGH PASRICHA	16656	21200	78.57
GTBK IET, Chhapianwali	FOURTH	B.Tech	Electrical Engg.	114052309	NAVDEEP DHAWAN	VIJAY KUMAR DHAWAN	16509	21200	77.87
LLRIET, Moga	FIFTH	B.Tech	Electrical Engg.	119052000	ROHIT DAVER	ANWAN DEEP DAVER	16373	21200	77.23
SSRIET, Derabassi	SIXTH	B.Tech	Electrical Engg.	224053310	AMARPREET SINGH	MARBANS SINGH	11528	15000	76.85
LLRIET, Moga	SEVENTH	B.Tech	Electrical Engg.	119052001	RUCHIJE SETHI	SUSHIL SETHI	16262	21200	76.71
IET BHADDALROPAR	EIGHTH	B.Tech	Electrical Engg.	117052469	JAAGDEEP SINGH	SH. SATPAL SINGH	16246	21200	76.63
GNDEC, Ludhiana	NINTH	B.Tech	Electrical Engg.	114052295	MANDEEP KAUR DHA	GURMAIL S DHALIWAL	16203	21200	76.43
GNDEC, Ludhiana	TENTH	B.Tech	Electrical Engg.	114052274	ANALI GUPTA	KULWANT RAI GUPTA	16194	21200	76.39
SBSCEI, Ferozepur	FIRST	B.Tech	Industrial Engg.	222078357	RAJMEET SINGH	MANJEET SINGH	11588	14400	80.47
SBSCEI, Ferozepur	SECOND	B.Tech	Industrial Engg.	222078356	KAJWAL JEET SINGH	HARDEEP SINGH	10982	14400	76.26
BBSBEC, FATEHGARH	FIRST	B.Tech	IT	212088363	PUNEET MITTAL	JAI BHAGWAN MITTAL	11827	14400	82.13
GNDEC, Ludhiana	SECOND	B.Tech	IT	114083140	INDERVIR SINGH	PARMINDER SINGH	16458	20600	79.89
IET BHADDALROPAR	THIRD	B.Tech	IT	117083263	VISHAL JULKA	SH. N.K. JULKA	16455	20600	79.88

NAME	REGISTRATION NO.	EDUCATION	BRANCH	IT	ICHA	ROLL NO.	MARKS	PERCENTAGE
MIMPET, Malout		B.Tech	IT	11703233	RICHA	16412	20600	79.6
IET, BHADDAL (ROPA R)		B.Tech	IT	120144391	ASHISH GIRDHAR	16373	20600	79.48
R/IEIT, Nawanshahr		B.Tech	IT	11703224	MEHAK KRISHAN	16244	20600	78.85
GGSCET, Farwandi, Sabo		B.Tech	IT	12303333	DEEPTI SONI	16243	20600	78.84
IET, BHADDAL (ROPA R)		B.Tech	IT	12701233	DEVYAM BHARDWAJ	16195	20600	78.62
MIMIT, Malout		B.Tech	IT	11703224	SEEMU DHUNNA	16080	20600	78.06
IET, BHADDAL (ROPA R)		B.Tech	Mechanical Engg.	12003333	RAJINDER KAUR	11228	14400	77.97
SUSCET, Mohali		B.Tech	Mechanical Engg.	11711233	SAURABH AGGARWA	17681	21500	82.24
IET, BHADDAL (ROPA R)		B.Tech	Mechanical Engg.	12511233	VIKAS MAINGI	17359	21500	80.74
GZS, Bathinda		B.Tech	Mechanical Engg.	21711233	MOHIT SINGLA	11935	15300	78.01
IET, BHADDAL (ROPA R)		B.Tech	Mechanical Engg.	11611233	SEKHAWANT SINGH	16318	21500	75.9
GNDCE, Ludhiana		B.Tech	Mechanical Engg.	21711233	ABHISHEK AGNIHOT			
SBSCEIT, Faridkot		B.Tech	Mechanical Engg.	1141138	SANVEEL SINGH	11591	15300	75.76
GZS, Bathinda		B.Tech	Mechanical Engg.	12211465	KAPIL DEV MITTAL	16257	21500	75.61
BCET, Gurdaspur		B.Tech	Mechanical Engg.	1161138	RUPINDER SINGH	16215	21500	75.42
GNDCE, Ludhiana		B.Tech	Mechanical Engg.	1131137	VIKAS RAJWA	16160	21500	75.16
GZS, Bathinda		B.Tech	Mechanical Engg.	2131137	PARPREET SINGH	11478	15300	75.02
GNDCE, Ludhiana		B.Tech	Production Engg.	1180369	AMIT GARG	16128	21500	75.01
GNDCE, Ludhiana		B.Tech	Production Engg.	2131137	ANANT SAHNI	11034	14500	76.1
SBSCEIT, Faridkot		B.Tech	Production Engg.	1141233	SHIBET SINGH CHA			
GZS, Bathinda		B.Tech	Production Engg.	2212845	HARMANPREET	15606	20600	75.76
GZS, Bathinda		B.Tech	Textile Engg.	1161137	ANSHUL JAIN	10871	14500	74.97
GZS, Bathinda		B.Tech	Textile Engg.	11613419	NAMIKATA GARG	16159	21900	73.79
GZS, Bathinda		B.Tech	Textile Engg.	116134925	PEUSH SIKKA	5519	21900	70.86
GZS, Bathinda		B.Tech	Textile Engg.	116134328	SALONI GUPTA	5222	21900	69.51
S/ IET, Longowal		B.E.	Chemical Engg. (Spl. in Polymer Tech.)	223027549	SARABJIT KAUR	3809	21900	63.05
S/ IET, Longowal		B.E.	Chemical Engg. (Spl. in Polymer Tech.)	223027557	SURINDER PAL SHARMA	5900	5200	75
S/ IET, Longowal		B.E.	Chemical Engg. (Spl. in Polymer Tech.)	223027557	S/ S.K. SHARMA	3807	5200	73.21

SLIET, Longowal	THIRD	B.E.	Geometrical Engg. (Spl. in P bymer Tech)	223027546	RAJESH KUMAR	JAGDISH KUMAR	3736	5200	71.85
SLIET, Longowal	FOURTH	B.E.	Chemical Engg. (Spl. in P olymer Tech)	223027552	SOMESH BHAMBHI	K.S. BHAMBHI	3466	5200	66.65
SLIET, Longowal	FIRST	B.E.	Computer Science & Engg.	223037621	SHALIZA GARG	BHOIRAJ GARG	4192	5200	80.62
SLIET, Longowal	SECOND	B.E.	Computer Science & Engg.	223037578	ESHA GUPTA	RAM GOPAL GUPTA	4066	5200	78.19
SLIET, Longowal	THIRD	B.E.	Computer Science & Engg.	223037606	PRITYANKA GUPTA	L.C. GUPTA	4063	5200	78.13
SLIET, Longowal	FOURTH	B.E.	Computer Science & Engg.	223037600	MEHA	SUBHASH GARG	4033	5200	77.56
SLIET, Longowal	FIFTH	B.E.	Computer Science & Engg.	223037620	SAURAV	FAQIR CHAND	3970	5200	76.35
SLIET, Longowal	FIRST	B.E.	Electronics & Communic ation Engg.	223047652	RAJINDER GARG	BRJ MOHAN GARG	3975	5200	76.44
SLIET, Longowal	SECOND	B.E.	Electronics & Communic ation Engg.	223047633	ANKUR AGRAWAL	SURENDRA KUMAR AGARW AL	3945	5200	75.87
SLIET, Longowal	THIRD	B.E.	Electronics & Communic ation Engg.	225047660	VISHAL SAINI	RAKESH KUMAR SAINI	3890	5200	74.81
SLIET, Longowal	FOURTH	B.E.	Electronics & Communic ation Engg.	223047655	SHWETA SHARMA	VINOD KUMAR SHARMA	3867	5200	74.37
SLIET, Longowal	FIFTH	B.E.	Electronics & Communic ation Engg.	223047615	BIRPAL MANESH	SURJEET SINGH MANESH	3832	5200	73.69
SLIET, Longowal	FIRST	B.E.	Food Technology	223177800	SIMMI DEVI	SATISH KUMAR	3882	5200	74.65
SLIET, Longowal	SECOND	B.E.	Food Technology	223177833	GANESH KUMAR MAN SAL	SURINDER PAUL	3877	5200	74.56
SLIET, Longowal	THIRD	B.E.	Food Technology	223177803	SUCHI GARG	SURINDER PAL GARG	3801	5200	73.1
SLIET, Longowal	FOURTH	B.E.	Food Technology	223177745	DEBASIS PANDA	AMARESH PANDA	3662	5200	70.42
SLIET, Longowal	FIFTH	B.E.	Food Technology	223177809	VIKAS BANSAL	CHANDER MOHAN BANSAL	3654	5200	70.27
SLIET, Longowal	FIRST	B.E.	Instrumentation Engg.	223067670	KULDEEP KUMAR	TARA CHAND	4090	5200	78.65
SLIET, Longowal	SECOND	B.E.	Instrumentation Engg.	223067673	NEERAJ SINGLA	ASHOK KUMAR	3895	5200	74.9
SLIET, Longowal	THIRD	B.E.	Instrumentation Engg.	223067678	SANJAY SINGAL	ASHOK KUMAR SINGAL	3845	5200	73.94
SLIET, Longowal	FOURTH	B.E.	Instrumentation Engg.	223067671	MOHIT GARGI	KRISHAN LAL GARGI	3792	5200	72.92
SLIET, Longowal	FIFTH	B.E.	Instrumentation Engg.	223067686	SHIV SHANKER	DEVINDER KUMAR	3704	5200	71.23
SLIET, Longowal	FIRST	B.E.	Mechanical (Spl. in Mfg /Welding Engg)	223117764	RANJAN KUMAR	R SHWAR SINHA	3919	5200	75.37

Sl. No.	NAME	REGISTRATION NO.	EDUCATION	TECHNICAL QUALIFICATION	EXPERIENCE	DATE OF JOINING	DATE OF LEAVING	REASON FOR LEAVING	STATUS	
1	SHRI. LONGOWAL	22311737	B.E.	Mechanical (Spl. in Mfg. Welding Engg)	22311737	ABHOY CHANDRA	SHEO DAHIN PRASAD SINGH	3813	5200	73.33
2	SHRI. LONGOWAL	22311755	B.E.	Mechanical (Spl. in Mfg. Welding Engg)	22311755	LAKHMI SINGH	JILEY SINGH	3807	5200	73.21
3	SHRI. LONGOWAL	22311721	B.E.	Mechanical (Spl. in Mfg. Welding Engg)	22311721	PIYUSH RANJAN	SHAMBHU SHARAN SHRIVA STAWA	3739	5200	71.9
4	SHRI. LONGOWAL	22311730	B.E.	Mechanical (Spl. in Mfg. Welding Engg)	22311730	SUPREET SINGH	YOGINDER SINGH	3700	5200	71.15
5	GZS, Bathinda	1623205	B.Architecture	Bachelor of Architecture Engg.	1623205	RAMANDEEP KAUR	MANJIT SINGH	17635	23200	76.01

B. Pharmacy

Sr	College	Position	Course	Regdno/Roll no.	Name	Fname	Marks Obtained	Max.Marks	%age
1	Govt. College Amritsar	FIRST	B. Pharmacy	18625004	ANU PRIYA	SUBHASH CHANDER	5997	7500	79.96
2	BIS, Moga	SECOND	B. Pharmacy	19025175	LAJWINDER KUMAR	PAWAN KUMAR	5684	7500	75.79
3	SD, Barnala	THIRD	B. Pharmacy	19625435	MANEESH	DURGA DUTTI	5645	7500	75.27
4	PJR, Hoshiarpur	FOURTH	B. Pharmacy	18825079	DINESH KUMAR	NARAIN DASS	5626	7500	75.01
5	Akal College, Sangrur	FIFTH	B. Pharmacy	19525398	JASPREET KAUR	GURMEET SINGH	5583	7500	74.44
6	ISF, Moga	SIXTH	B. Pharmacy	19125216	DEEPIKA PURI	SATISH PURI	5578	7500	74.37
7	ASBASJS, Bela	SEVENTH	B. Pharmacy	19325314	ANIL KUMAR	JIA LAL	5571	7500	74.28
8	Akal College, Sangrur	EIGHTH	B. Pharmacy	19525394	BHAWNA SAINI	DHARAM PAUL SAINI	5546	7500	73.95
9	Akal College, Sangrur	NINETH	B. Pharmacy	19525408	VIKAS GUPTA	JAGRUP LAL GUPTA	5535	7500	73.80
10	ASBASJS, Bela	TENTH	B. Pharmacy	19325347	VIKAS SHARMA	JAI GOPAL SHARMA	5497	7500	73.29

PROPOSED ACADEMIC CALENDAR - 2006

Event	Even Semester (2005 -06)	Odd Semester (2006 -07)
Academic Session <i>(in case where the last date of regular examination is after 2nd January, 2006 the classes should start from immediately following Monday)</i>	02-01-2006 to 12-05-2006* *Number of days falling short of 90 should be compensated by making Saturdays working.	01-08-2006 to 02-12-2006
Last date for document submission/ verification		Within 07 days from last date of admission
I Mid Semester test	17-18-19 Feb., 2006	14-15-16 Sept., 2006
II Mid Semester test	01-03-04 Apr., 2006	02-03-04 Nov., 2006
III Mid Semester test	11-12-13 May, 2006	04-05-06 Dec., 2006
End Semester Exam	16-05-2006 to 30-05-2006	11-12-2006 to 23-12-2006
Institutional Training / Workshop Training	31-05-2006 to 22-07-2006	
Break for students who go for workshop training	23-07-2006 to 31-07-2006	
Staff Vacation	1-06-2006 to 22-07-2006	24-12-2006 to 31-12-2006
Sports Meet	10 - 12 March, 2006	
Cultural Festival		Oct - Nov., 2006
Even semester 2006 -07	Starts at 01-01-2007	

CHAPTER I

REGULATIONS REGARDING CONSTITUTION AND FUNCTIONS
OF BOARD OF STUDIES

1. There shall be one Board of Studies for each of the disciplines/ specialization. The Board shall be common for undergraduate and postgraduate courses (of all types) of the discipline and shall exercise an integrated view of the discipline.
2. The BOS shall be common for all forms of education and degrees in a particular discipline.
3. There shall be one Board of Studies for Sciences, which shall include Physics, Chemistry, Mathematics and Communication Skills.
4. There shall be one Board of Studies for studies of subjects that are additional in the discipline eg. Humanities.

A. Constitution

5. Each Board of Studies shall consist of
 - a. A Chairman, to be nominated by the Vice Chancellor from amongst the senior /most Professors in the concerned disciplines in the affiliated Colleges/ Departments of the University by rotation. An advisory Committee shall be appointed if Professors/ Assistant Professor are not available. In case of new/emergent disciplines the Chairman could be from outside the PTU System.
 - b. Chairman of the previous Board
 - c. Three Professors
 - d. Four Asstt. Professors
 - e. Three experts from outside PTU System (not below Professor/ Asstt. Professor)
 - f. Two representatives of Industries
 - g. Dean (Acad) - Convenor

The Chairman is authorised to co opt any expert whose contribution is considered to be useful.

B. Functions

6. The Board of Studies shall perform the following functions :-
 - (i) To recommend the curriculum and courses of Studies including the text books/ reference books for various subjects of Undergraduate Studies and Postgraduate Studies.
 - (ii) To recommend a panel of paper setters, internal and external examiners for Undergraduate and Postgraduate Courses.
 - (iii) To frame, wherever necessary, model papers for the guidance of paper setters.
 - (iv) To recommend a list of periodicals, reports etc., pertaining to the subject concerned.

PTU- REGULATIONS

Date approved

COPY NO. - _____

- (v) To recommend the list of equipment, and the norms for the recruitment of Technical Staff.
 - (vi) To recommend measures for the periodical assessment and improvement of the standards of Undergraduate and Postgraduate Studies.
 - (vii) To act as a consultative body in regard to all references made to it and to bring to the notice of concerned authorities any matter connected with subjects under the purview of the Board.
 - (viii) To recommend panel of Editors for preparation of anthologies.
 - (ix) To deal with any other matter referred to it.
 - (x) To establish equivalence of curriculum in the studies of the discipline.
7. Tenure of each Board of Studies shall be for a period of 3 years.
 8. The Chairman shall call meeting of the Board of Studies as and when considered necessary. But not less than two meetings must be held in academic year and the gap between two meetings shall not be more than 180 days.
 9. 50% of the total members of the Board of Studies shall form the quorum.
 10. Board of Studies may transact business either at a meeting or by circulation, if considered necessary.

PUNJAB TECHNICAL UNIVERSITY, JALANDHAR
CONSTITUTION OF VARIOUS BOARD OF STUDIES

TERM: July 1, 2005 - June 30, 2007

Discipline	Chairman	Previous Chairman	Professors (Two)	Assistant Professors (Four)	Outside experts (Three)	Industry Experts (Two)
Applied Sciences	Dr. B.K. Kangoo SUIET, Longowal	Dr. S.S. Dhillon, SUIET, Longowal	Dr. A.K. Tyagi, SBSCEI, FZR Dr. N.N. Sharma, SSCET, Bachhant	Dr. Pritpal Singh, RIMT, Mandi Gobi Dr. S.K. Shrivastava, BCET, Gurdaspur Dr. Gursharan Singh, GZSCEI, Bathinda Dr. K.S. Khatun, SUIET, Longowal	Dr. K.K. Raina, Prof. TIET, Patiala Prof. A.K. Narula, IP Univ. Delhi Dr. SBS Mishra, Prof. NIT, Jai	- Punjab Chemical Pharmaceutical Ltd., Chd - Mohemaysi IIS Science Pvt. Ltd. Gurgaon
Architecture	N.K. Tyagi, RIMT Mandi Gobindgarh	Dr. Narinder Singh, GGS, Talwandi Sabo	Dr. S.S. Bais CIET, Rajpura Dr. S.S. Sakhon, IGC, Ahlaur	Ms. Sushanda Kapoor, IGC, Ahlaur Ms. Prabjot Kaur, GZS, Bathinda Sh. Gurpreet Singh, IET Bhudolal Ms. Swati Bhatia, GIET Rajpura	Prof. R.K. Jain, Prof. IIT, Roorkee Sh. P.S. Mahora, GNDU, Asr Sh. Vijay Uppal, Chief Arch. Shimla	- MS Arch Group & Associates New Delhi - MS C.P. Kureja & Associates New Delhi
Civil Engg. & Env. Sci. & Engg.	Dr. S.K. Goyal RIMT Mandi Gobi	Dr. S.K. Goyal RIMT Mandi Gobi	Dr. S.C. Sharma, GZSCEI, Bathinda Dr. S.K. Bansal, BCET, Gurdaspur	Dr. J.N. Jha, GNDEC, Ludhiana Dr. Archana Malik, GZS Bnd Sh. Sanjay Goyal, DAVIET, Jai	Dr. Meenak Kumar, TIET, Patiala Dr. Parag Aggarwal, IIT Roorkee Sh. S.K. Sharma, PEC Chandigarh	M/S Kajuria Ceramic Ltd. N. Delhi M/S Ciko Tech. Ltd. N. Delhi
Chemical Engineering	Dr. M.S. Saini, SUIET Longowal	Dr. M.S. Saini, SUIET Longowal	Dr. Boddh Raj, IIT, Pojweal	Dr. Preetinder Pal, SBSCEI, FZR Dr. P.P. Janda SUIET, Longowal Dr. Anil Shrivastava, SUIET, Longowal Dr. Balwant Kaur, BCET, Gurdaspur	Dr. M. Gupta, Prof. & HOD, Mt. Jai Dr. Paragjit Singh, PU, Chd Dr. S.C. Jain, PU, Chd Dr. S.K. Mahal, TIET, Patiala	- Indian dyeing & Finishing Mill LTD. LDH. - Metro Tyres LTD, LDH - Bharti Varnaspati allied India LTD
Biotechnology/ Bio info / Bio Med / Food Tech	Dr. V.K. Angra, PTU, Jalandhar	Dr. R.C. Sobti, PU, Chandigarh	Dr. Mukhtiar Singh, BIS, Gagra Dr. B.C. Senter, SUIET	Dr. D.C. Sarwan, SUIET Dr. Paragjit Singh, Panesar, SUIET Sh. Raminder Singh, Sr. Soldier, Jalandhar Ms. Sukal Kaur, SUS, Tangori	Dr. P.C. Sharma, IP Univ, Delhi Dr. Narinder Des, TIET, Patiala Dr. Pritpal, PU, Chandigarh	- Thaper food Ltd. LDH - Thaper agro Ltd.
Computer Sci. & Engg / Bio Med Information Tech.	Dr. J.S. Sohal, LCET Katakailan	Dr. J.S. Sohal, LCET Katakailan	Dr. H.K. Grewal, GNDEC, Ludhiana Dr. M.S. Sekhri, KMIT, Ludhiana	Sh. S.K. Gogia, BCET, GSP Dr. Savina Bansal, GZSCEI, Bathinda Dr. Harjit Sandhu, RIMT, Mandi Gobi Sh. Parminder Singh, GNDEC, LDH	Dr. Chandan Singh, Prof. Pbi Unal Pradesh Sh. A.L. Sangal, AP, NIT, Jai Dr. Kapurjit Singh, GNDU Regional Centre, Jalandhar	- Bharat Telecom Ltd. LDH - HCL Information Ltd, Nozda - IBM Global Services N. Delhi
Electrical Engineering	Dr. C.S. Rao, SVIET	Dr. R.K. Bansal, GZSCEI, Bathinda	Dr. H.K. Buttar, GNDEC, Ludhiana Dr. J.S. Dhillon, SUIET, Longowal	Sh. Lakhwinder Singh, BBSCEI, Fatejgarh sahib Sh. S.S. Sam, GNDEC, LDH. Dr. Yashinder Singh, GZSCEI, Bathinda Sh. Sukhinder Sharma, DAVIET, Jai	Prof. S.K. Jain, NIT Kurukshetra Prof. S. Chatterjee, TITI, Chandigarh Dr. R. Jha, NIT, Jalandhar	- Siemens, Sector 34A, Chandigarh - Trital Chd Floor, Sector 17E, Chandigarh - Insel Rectifiers Pvt. Ltd. N. Delhi
Electronics & Comm. Engg/ Applied EIE & ICE	Dr. I.S. Huddara KC CET, Nawanshahar	Dr. T.S. Kamal, SUIET, Longowal	Prof. I.K. Kataria, SVIET, Ramnagar Dr. Sanjay Manwaha, SUIET, Longowal	Sh. Nirmit Singh, Grewal, GNDEC, LDH Sh. Manoj Kumar, DAVIET, Jalandhar Sh. Bhupinder Verma, IET, Bhudolal Sh. Gurpal Singh, BBEC, F. Sahib	Dr. A.R. Sharma, NIT, Jalandhar Dr. A.K. Chatterjee, TIET Patiala Dr. S.S. Pathak, TITI Chandigarh	- Quarek Electronics India Pvt. Ltd, Mohali - CMC Ltd. N. Delhi - Abit Electronics Pvt. Ltd. N. Delhi

Discipline	Chairman	Previous Chairman	Professors	Assistant Professors	Outside Experts	Industry Experts
Mech. Engg. / Production Engineering / Industrial Engineering / Training and General Fitness Textiles Engineering	Dr. H.S. Sagar, SBSCET, Puchiana	Dr. R.P. Singh, RIET, Raunajra	Dr. H.B. Sharma, SBSOET, FZR Dr. Sahibul Singh, GNDEC, Ludhiana Dr. R.K. Gupta, CIET, Rajpura	Dr. Rajesh Kumar, SUJET, Longowal Sh. Sandeep Singh, RIMT, Manohar Sh. Paranjit Singh, GNDEC, Ludhiana Dr. Bala Singh, GZSOET, Bathinda	Dr. Rakesh Chandra, NIT, Jalandhar Dr. S.K. Mohapatra, TIET, Patiala Dr. Vijay Jadhav, TIET, Patiala Dr. R.N. Naulina, PEC, Chd.	- Avon Cycles Ltd. Ldh - GNA, Mohiana - RCF, Kapurthala - Vardhman Group of Companies, Ludhiana - J.K. Textile Engg. Works, Amritsar
Pharmacy/MLT	Dr. S. Ghosh, NIT, Jalandhar	Dr. S. Ghosh, NIT, Jalandhar	Dr. G.D. Bansal, CEC, Landran	Sh. S.K. Sinha, NIT, Jalandhar Dr. Gurabharan Singh, GZSOET, Bathinda Sh. Parvinder Paul, GZS Bathinda	Dr. O.P. Singh, PAU, Ludhiana Dr. J.N. Chakravarti, NIT, Jalandhar Dr. P.K. Banerjee, Deptt. of Text Engg., IIT Delhi	- Punjab Chemical & Pharmaceutical Ltd. - Surya Pharmaceutical Ltd, CHD - Allied Chemical Pharmaceutical N.Delhi
Computer Applications	Dr. R.D. Bishraja, ISFO, Moga	Dr. R.L. Gupta, Bela	Dr. A.K. Singh, SVIET, CHD. Dr. Manoj Kumar, CIET, Rajpura Dr. D.N. Prasad, SCP, Nangal	Ms. Anamika Gupta, SVIET, Chd. Dr. Nihalinder Singh, BIS, Gagra Ms. Anamooz Kaur, GISIT Ms. Sahinderjit Kaur, GHG, Gurgaon Sachar	Dr. V.K. Kapoor, Prof. PU, Chd Dr. Manjit Singh, Prof. Pbi, Uni. Patiala Dr. Harjit Singh, PU, Chandigarh Prof. Gagan Kaur, J.H. New Delhi Dr. A. Sagar, PU, Chandigarh Dr. Mahant Singh, BGSIMSR, Bhd	- GNC Ltd. 4, Mang, N.Delhi - IBM Global Services, N.Delhi - Sun micro Systems India Pvt Ltd
Business Admn.	Dr. P.P. Gupta, GUMT, Mohali	Dr. M.S. Sekra, KIIT, Ludhiana	Dr. J.S. Sohal, LCET, Katankalan	Sh. R.K. Chopra, RIMT, Mandgobindgarh Sh. Arindan Singh, BCET, Gurdaspur Sh. Karanvir Singh, PCTE, Bathinda Sh. Kariminder Singh, GUMT, Mohali	Dr. Gurdip Singh, Pbi, Univ. Regional Centre, Tabernool Sebo Dr. S.K. Gupta, UBS, PU, Chd Dr. Anand Singh, Sahu, GNDU, Asr	- Right Click software Solution LDH.
Hotel Mgt. & Service Industry	Dr. K.N. Kaur, PCTE, Beddowal	Dr. B.B. Tandan, GUMT, Mohali	Dr. B.S. Bhatia, Director, RIMT Dr. R.S. Gupta, Dornik, Inst. of Mgt. & Technology Dr. Balram Dogra, APV, Jai	Ms. Sheeniam Priyadarshan, OMT, Mohali Sh. P.P. Singh, PCTE, Bathinda Dr. Ajay Prasad, APJ, Jalandhar Sh. Kariminder Singh, GUMT, Mohali	Sh. Anil Kaur, GM, Hotel Radisson, Jalandhar Dr. G.M. Ghuman, IIM, Gurdaspur Sh. Dinesh Nain, Principal, JHMT, Sri Nagar Dr. Sushma Gupta, Govt College for women, Ludhiana	- Hotel Radisson, Jalandhar - Mejerda Park Plaza, LDH.

Brief Report

Inter college debating competition sponsored by IAPPD New Delhi was organized in five bases. PTU being the collaborator with IAPPD planned these competitions. Zone Wise all the 110 PTU affiliated institute were invited to participate in this event. Zone wise these competition were held at following four venues

1. DAV Institute of Engineering & Technology Jalandhar
2. Rayat institute of Engineering & Information Technology, Railmajra Distt. Nawanshahr
3. Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib
4. Adesh Institute of Engineering & Technology Faridkot

Three teams from each Zone were selected to participate in the final Inter-Zonal debating competitions. This Inter-Zonal final competition was held at Shaheed Udham Singh College of Engineering & Technology Tangori. Chief Guests in all the venues applauded the level of debating skills amongst students. Dr. N.S. Tiwana Executive Director Punjab State Council for Science & Technology at Rayat institute of Engineering & Information Technology, Railmajra Distt. Nawanshahr emphasized the role of youth in building of a nation. Sh. VARINDER KATARIA Ex. M.P. at Shaheed Udham Singh College of Engineering & Technology, Tangori advised the students to be practical in controlling the increase of population. He showed a great concern to the people living below poverty line in India.

Results of the competitions held above were declared as under:

Name of Institute	Name of students	Position
Bhai Gurdas Institute of Engineering & Technology, Sangrur	1. Joy Chaudhary 2. Shrutika	First
Guru Teg Bahadur Khalsa Institute of Engineering & Technology, Malout	1. Parminderpreet Kaur 2. Rajesh	Second
Bhai Maha Singh College of Engineering, Muktsar	1. Megha 2. Sachu	Third
Beant College of Engineering & Technology, Gurdaspur	1. Mr. Ved Chugh 2. Mr. Dawar Dedmari	First
DAV Institute of Engineering & Technology Jalandhar	1. Ms. Monika Sharma 2. Mr. Varun Garg	Second
Ramgarhia Inst. Of Engineering & Technology, Phagwara	1. Mr. Deepak Singh Chauhan 2. Mr. Mandleshwar Mishra	Third
Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib	1. Shabnam Arora 2. Jagnoor Singh	First
Chitkara Institute of Engineering and Technology	1. Sakshi Arora 2. Neha Arora	Second
Shaheed Udham Singh College of Engineering & Technology Tangori	1. Zoravar Singh	Third

	Engineering & Technology, Tangori	2. Kangan Arora	
Zone D	Rayat institute of Engineering & Information Technology, Railmajra Distt. Nawanshahr	1. Mr. Shivinder Pratap Singh 2. Mr. Aviral Vyas	First
	Indo Global College of Engineering & Technology, Abhipur	1. Ms. Natasha Kaushal 2. Ms. Damanjot Kaur	Second
	Gain Jyoti Institute of Management & Technology, Mohali	1. Ms. Priya Verma 2. Mr. Gaurav Prashar	Third
Final	Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib	1. Shabnam Arora 2. Jagnoor Singh	First
	Chitkara Institute of Engineering and Technology	1. Sakshi Arora 2. Neha Arora	Second
	Beant College of Engineering & technology, Gurdaspur	1. Mr. Ved Chugh 2. Mr. Dawar Dedmari	Third

In finals PTU team was also selected to represent at North Zone Inter University debating competition to be held at New Delhi, organized by IAAPD. The name of the selected students were as under:

- | | |
|------------------|---|
| 1. VARUN GARG | DAV Institute of Engineering & Technology Jalandhar |
| 2. JAGNOOR SINGH | Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib |

Also two students were selected to represent PTU team in the National level debating competition to be held at P.U.CHD from 22/09/05 to 24/09/05. The names of the students selected were as under:

- | | |
|---------------|---|
| SAKSHI ARORA | Chitkara Institute Engineering & Technology, Vill Jansala |
| DAWAR DEDMARI | Beant College of Engineering & technology, Gurdaspur |

These student participated in the above said debate on HIV AIDS at Punjab University Chandigarh from 22/09/05 to 24/09/05. Although they couldn't win any position in this competition but their performance was adjudged at par with best of the debtors. Photographs are being sent by courier.

PUNJAB TECHNICAL UNIVERSITY, JALANDHAR

Dated : 17-11-05

Report of Sports Activities of Academic Session -2005-06.

The Council of PTU approved the Sports Calendar for session 2005-06. This calendar was followed in letter and spirit, by all the Institutions. The following Inter-College tournaments were organized as under (Annexure 'A')
 and dignitaries present during above mentioned tournaments were as under:

Sport	Institute Winning 1 st Position	Institute Winning 2 nd Position	Institute Winning 3 rd Position	Dignitaries Present
Yoga (MEN)	SBSCT, Fzr	BCET, Gurdaspur	BBCET, Fatehgarh Sahib BCET, Gurdaspur	H.B.Sharda
Yoga (WOMEN)	SBSCT, Ferozpur	GNDEC Ludhiana		
Cross Country (MEN)	SBSCT, Padihana	GNDEC Ludhiana	RCET, Phagwara	Dr. S.K. Salwan Dr. M.S. Grewal
Cross Country (WOMEN)	DAVIET, Jalandhar	RCET, Phagwara	SBSCT, Padihana	Baba Malkiat Singh Sh. Bhadar Singh
Power Lifting (MEN)	RIET, Phagwara	GTBK, Malout	CEC, Landran	Sh. Pritam Singh Bhogal
Weight Lifting (MEN)	GNEC, Lud.	CEC, Landran	RIET, Phagwara	Er. R.K. Dhawan Dr. M.S. Saini
Best Physique (MEN)	GNEC, Lud.	CEC, Landran, GTBK, Malout	SUCET, Tangori	Er. R. Sachdeva
Table Tennis (MEN)	I.E.T., Bhaddal	DAVIET, Jalandhar	R.I.E.T., Railmajra, Nawanshahr	Dr. R.P. Singh
Table Tennis (WOMEN)	R.I.E.T., Railmajra	I.E.T., Bhaddal	SLIET, Longowal	Dr. R.P. Singh
Swimming (MEN)	I.E.T., Bhaddal	S.B.S.C.E.T, Fzr.	GNDEC Ludhiana	Mr. Gopal Sharma
Swimming (WOMEN)	GNIMT, Ludhiana	CIET, Rajpura	GNDEC, Lud.	Dr. M.S. Grewal
Hockey (MEN)	I.E.T., Bhaddal	DAVIET, Jalandhar	R.I.E.T., Railmajra, Nawanshahr	Dr. R.P. Singh Dr. S.K. Salwan
Hockey (WOMEN)	R.I.E.T., Railmajra, Nawanshahr	I.E.T., Bhaddal	SLIET, Longowal	Dr. M.S. Grewal
Kabbadi N/S (MEN)	BBSBEC, Fatehgarh Sahib	BMSCE, Mukisar	I.E.T., Bhaddal	Dr. R.P. Singh
Foot Ball (MEN)	SBSCT, Padihana	GNDEC, Ludhiana	I.E.T., Bhaddal	Prof. S.B. Singh Dr. Indrajit Singh
Badminton (MEN)	CIB&T, Patiala	I.E.T., Bhaddal	AJE & T, Faridkot	Dr. D.S. Heera
Badminton (WOMAN)	IET, Derabai	I.E.T., Bhaddal	GNDEC Ludhiana	Dr. D.S. Heera
Basket Ball (MEN)	DAVIET, Jalandhar	SUSCET, Tongri	BKSIEC, Asr	Dr. M.S. Grewal
Basket Ball (WOMEN)	DAVIET, Jal	GNEC, Lud.	CIET, Rajpura	Pro. Ajmar Singh Saish Kumar Hezari Lal Sharma
Hand Ball (MEN)	DAVIET, Jal.	GNEC, Lud.	RIET, Nawanshahr	Ishwar Chander Sharma Kulwinder Singh Khara DSPD, Jal.
Hand Ball (WOMEN)	GNEC, Lud.	DAVIET, Jal.		Er. R. Sachdeva
Lawn Tennis (MEN)	R.I.E.T., Railmajra	B.C.E.T., Gurdaspur	S.B.S.C.E.T, Fzr.	Dr. M.S. Grewal, S.K. Bansal
Lawn Tennis (WOMEN)	Railmajra			Dr. M.S. Grewal
Cycling (MEN)	BBSBEC, Fatehgarh Sahib	GNEC, Lud.		
Cycling (WOMEN)	GNIMT, Lud.	GNEC, Lud.		Dr. Lal Singh Brar

In all these tournaments a great enthusiasm by participants and supporters were witnessed. University aims to maintain growth rate of participation of all the Institute in most of the Sports Events in the coming years.

Fee Structure for BBA / BCA / B.Sc.(IT) / B.Sc. (ATHM) Courses

Sl. No.	Head	Fee (in Rs.)		
		Annual	Odd Semester	Even Semester
1.	Tuition Fee	14,000/-	7,000/-	7,000/-
2.	Development Charges	2,500/-	1,250	1,250
3.	Securities (Refundable) :			
	College Security*	500/-*	--	--
	Library Security*	500/-*		
4.	Other Charges:			
	Admission Fee			
	Library Fee	500/-	250/-	250/-
	Computer Development Fund & Internet Services	200/-	100/-	100/-
	Sports & Recreation Admission Fee	1,000/-	500/-	500/-
	Club Admission Fee	50/-	25/-	25/-
	Magazine & Library activities	50/-	25/-	25/-
	Medical & Health Care Fee	200/-	100/-	100/-
	Medical & Health Care Fee	100/-	50/-	50/-
	Souvenir Fee	100/-	50/-	50/-
	Student Welfare Fund and Aid fund			
	Periodical Test Fee	50/-	25/-	25/-
	Library Book replacement Fee	200/-	100/-	100/-
	Library Book replacement Fee	50/-	25/-	25/-
	A V Aids	150/-	75/-	75/-
	Identity Card	50/-	25/-	25/-
	Sports Fee	100/-	50/-	50/-
	Club Fee	100/-	50/-	50/-
	Student Amenities Fee	200/-	100/-	100/-
	Alumni Association & house charges			
	Placement Charges	100/-	50/-	50/-
	Industrial Visits	500/-	250/-	250/-
	Case Study Material	250/-	125/-	125/-
	Case Study Material	500/-	250/-	250/-
	University Related Fee (To be remitted to the University)	575/-**	575/-**	-
6.	Hostel Charges:			
	Room Rent	1200/- Per Annum (a) Single Seater 1200/- P.A. per student (b) Two Seater 900/- per student (c) Three Seater 600/- per student Room with more more than 3 seats 400/- P.A. per student		
	Other charges (Water supply, fan rent, electricity charges and security charges)	600/- P.A.		
	Hostel maintenance Fund (Hostel & Mess Establishment charges)	600/- P.A.		
	Mess equipment & Utensil Fees	100/- P.A.		

* To be paid at the time of admission only.

**Rs. 575/- for first year and Rs. 275/- for subsequent years.

Note : Fee is to be charged semester-wise.

Fee Structure for B.Sc. (MLT) Course

Sl. No.	Head	Fee (In Rs.)		
		Annual	Odd Semester	Even Semester
1.	Tuition Fee	23,000/-	11,500/-	11,500/-
2.	Development Charges	3,500/-	1,750	1,750
3.	Securities (Refundable) :			
	College Security*	1000/-*		
	Library Security*	1000/-*		
4.	Other Charges:			
	Admission Fee	500/-	250/-	250/-
	Library Fee	200/-	100/-	100/-
	Computer Development Fund & Internet Services	1,000/-	500/-	500/-
	Sports & Recreation Admission Fee	50/-	25/-	25/-
	Club Admission Fee	50/-	25/-	25/-
	Magazines & Library activities	200/-	100/-	100/-
	Medical & Health Care Fee	100/-	50/-	50/-
	Souvenir Fee	100/-	50/-	50/-
	Student Welfare Fund and Aid fund	50/-	25/-	25/-
	Periodical Test Fee	200/-	100/-	100/-
	Library Book replacement Fee	50/-	25/-	25/-
	A.V Aids	150/-	75/-	75/-
	Identity Card	50/-	25/-	25/-
	Sports Fee	100/-	50/-	50/-
	Club Fee	100/-	50/-	50/-
	Student Amenities Fee	200/-	100/-	100/-
	Alumni Association & House charges	100/-	50/-	50/-
	Placement Charges	500/-	250/-	250/-
	Industrial Visits	250/-	125/-	125/-
	Lab Charges	2500/-	1250/-	1250/-
5.	University Related Fee (To be remitted to the University)	575/-	575/-**	--
6.	Hostel Charges:			
	Room Rent			1200/- Per Annum (d) Single Seater 1200/- P.A. per student (e) Two Seater 900/- per student (f) Three seater 600/- per student Room with more more than 3 seats 400/- P.A. per student 600/- P.A.
	Other charges (Water supply, fan rent, electricity charges and security charges)			600/- P.A.
	Hostel maintenance Fund (Hostel & Mess Establishment charges)			600/- P.A.
	Mess equipment & Utensil Fees			100/- P.A.

* To be paid at the time of admission only.

**Rs. 575/- for first year and Rs. 275/- for subsequent years.

Note: Fee is to be charged semester-wise.

Fee Structure for M.Sc. (IT) / M.Sc. (ATHM) / M.Sc. (SIM) Courses

Sl. No.	Head	Fee (in Rs.)		
		Annual	Odd Semester	Even Semester
1.	Tuition Fee	17,000/-	8,500/-	8,500/-
2.	Development Charges	2,500/-	1,250	1,250
3.	Securities (Refundable):			
	College Security*	500/-*	--	--
	Library Security*	500/-*		
4.	Other Charges:			
	Admission Fee	500/-	250/-	250/-
	Library Fee	200/-	100/-	100/-
	Computer Development Fund & Internet Services	1,000/-	500/-	500/-
	Sports & Recreation Admission Fee	50/-	25/-	25/-
	Club Admission Fee	50/-	25/-	25/-
	Magazine & Library activities	200/-	100/-	100/-
	Medical & Health Care Fee	100/-	50/-	50/-
	Souvenir Fee	100/-	50/-	50/-
	Student Welfare Fund and Aid fund	50/-	25/-	25/-
	Periodical Test Fee	200/-	100/-	100/-
	Library Book replacement Fee	50/-	25/-	25/-
	A V Aids	150/-	75/-	75/-
	Identity Card	50/-	25/-	25/-
	Sports Fee	100/-	50/-	50/-
	Club Fee	100/-	50/-	50/-
	Student Amenities Fee	200/-	100/-	100/-
	Alumni Association & house charges	100/-	50/-	50/-
	Placement Charges	500/-	250/-	250/-
	Industrial Visits	250/-	125/-	125/-
	Case Study Material	500/-	250/-	250/-
5.	University Related Fee (To be remitted to the University)	575/-**	575/-**	--
6.	Hostel Charges:			
	Room Rent		1200/- Per Annum	
			(a) Single Seater 1200/- P.A. per student	
			(b) Two Seater 900/- per student	
			(c) Three seater 600/- per student	
			Room with more more than 3 seats 400/- P.A.	
			per student	
	Other charges (Water supply, fan rent, electricity charges and security charges)		600/- P.A.	
	Hostel maintenance Fund (Hostel & Mess Establishment charges)		600/- P.A.	
	Mess equipment & Utensil Fees		100/- P.A.	

* To be paid at the time of admission only.

** Rs. 575/- for first year and Rs. 275/- for subsequent years.

Note : Fee is to be charged semester-wise .

DORAHA INSTITUTE OF MANAGEMENT & TECHNOLOGY

Approved by : A.I.C.T.E., Ministry of H.R.D. Govt. of India, New Delhi
Affiliated to Punjab Technical University, Jalandhar

DORAHA, DISTRICT LUDHIANA - 141 421

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to DIMT - 273

Dated 17th Nov, 2005

Discussed in Academic Council

The Dean Academics
Punjab Technical University
Jalandhar

Subject: Agenda Item for Twenty Third meeting of Academic Council

To consider transfer of students from Regular mode to Distance Education Mode within the University.

Dear Sir,

Respectfully, I beg to state that in 19th Academic Council it was decided not to allow transfer of students from regular mode to Distance Mode. The decision was taken in the light of student (Parkash Singh) MBA regular student of 2001-03 batch who had exhausted the maximum permissible time period to complete MBA i.e. 3 years for regular mode and requested for transfer to distance mode for availing further three years in distance mode.

Now there are some students who have cleared all the papers of MBA 1st and 2nd Semesters and have got jobs as computer teachers in Govt. Schools. These students want to complete their MBA degrees and also do not want to leave the govt. jobs offered to them since they are not from very well to do families, hence they cannot complete M.B.A. in regular mode. They have not exhausted the maximum permissible time i.e. 3 years. They should be allowed to shift to Distance Education Mode in 2nd year with the condition that they will complete the course within 3 years. The syllabus in both distance as well as regular mode is same.

Supplementary agenda

To consider representation received from GNIMT, Ludhiana regarding difficulties arising due to extension of 1st semester upto 24th December 2005. Copy of the letter is appended. The council may like to consider this item

11.11.2005 17:46 FAX #11612772026

GNIMT

4001



Guru Nanak Institute of Management & Technology

Gujranwala Campus, Model Town, Ludhiana - 141 002 (India)

(An ISO 9001:2000 Certified & ARCTE approved Institute affiliated with PTU Jalandhar)

Ref.:

Date: 21-11-05

The Registrar
Punjab Technical University
Adj. B.Ed. Trg. College
Ladlowli Road
Jalandhar

SUBJECT: ACADEMIC CALENDAR 2005-06

Sir,

Please refer to your Notification No. PTU/Reg/Notification/23 dated 11.11.2005 on the subject cited above.

The extension of 1st Semester upto 24 December 2005 is going to create difficulties as under:

- a) The examination of 3rd, 5th and re-appear is going to start w.e.f. 12.12.2005 and it shall not be possible to run the classes in the same premises when the examination is going on because as per University rules no outsider is supposed to come to the Examination Centre.
- b) There is no clear-cut separate faculty for 1st, 3rd and 5th Semesters. The same faculty is to conduct the examination and take the classes of the 1st Semester, which cannot be done simultaneously.

It is, therefore, requested that either the entire Semester may be extended upto 24.12.2005 or it should finish together on any suitable date and then the examination for the 1st Semester may be held in the morning and 3rd and 5th Semesters in the evening without giving too many holidays in between the papers and examination may finish in time so that the even Semester can be started well