

**INTERNATIONAL  
JOURNAL OF  
APPLIED SCIENCE  
AND  
TECHNOLOGY**

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## **From the Editorial Board**

Education is the manifestation of perfection in an individual. Perfection being a continuous process has no limits. Education encompasses both learning and teaching. It thus focuses on cultivation of skills.

The journal concentrates on new technical views, innovation and experience by academicians and professionals in the diverse fields of science and technology.

We are highly indebted to Dr. M.K.Sharma, Director, IIMT Engg. College, Meerut, for his continuous support, guidance and patronage.

The journal of IIMT is the testimony of our commitment towards academic excellence.

We extend our sincere appreciation to all the contributors of this issue and look forward to their continued association.

We shall be highly obliged if the readers send us their valuable suggestions, observations and comments to improve our future endeavours.

I am sure that all our readers will enjoy reading this issue.

**Dr. Deepa Sharma**  
Editor

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## **FOREWORD**

Keeping pace with the outstanding technological achievements of the twentieth century, revolutionary progress has been made in the field of Science and Technology. Today the strategies that presume complete global integration tend to place far too much emphasis on international standardization and scalar expansion. Levels of cross cultural integration are generally increasing and in many instances, setting new records but falling short of complete integration and will continue to do so for decades. What was built over centuries has been overcome by a completely new thought, practice & process in such a small period of time that organizations have failed to realize that mere existence does not guarantee success.

We at the IIMT Engineering College, Ganga Nagar, Meerut, are always interested to bring you the happenings and latest development in the area of Science & Technology. It gives me immense pleasure to bring the maiden issue of IIMT Journal of Science and Technology to you. This Journal provides an effective forum for the dissemination of technical and scientific knowledge, encouraging inter disciplinary research collaboration. It focuses on many facets of science and technology. It publishes original research papers on different aspects of engineering. I am highly thankful to those who have contributed to the journal. The aim of this journal is to expose the readers a variety of epistemologies. It strives to nurture and enhance the ability of professionals to conduct and publish scientific research and provide a venue for communicating and disseminating their findings.

We would like to express my sincere thanks to Honourable Shri Yogesh MohanJi Gupta, Chairman, IIMT Group of Institutions, Meerut, and respected Shri Abhinav Agarwal, GM, IIMT Group of Institutions, Meerut for their effective guidance, constant support and continuous encouragement without which this work would not have been possible.

Our thanks are due to Dr. Deepa Sharma, Deputy Director, IIMT Engineering College, Meerut, for her appropriate suggestion and support at every stage in the process of publication. Thanks are due to all departmental heads, contributors, and members of editorial board, publisher and others who supported and provided help during the process of publication. Hope this will enlighten all the latest traits & trends emerging in the field of Science and Technology.

**(Prof. M.K. Sharma)**  
**Editor in Chief**

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# EFFECTS OF HORMONE REPLACEMENT THERAPY (HRT) ON SERUM LIPOPROTEINS IN ASSOCIATION WITH VASCULAR DISEASE

**Deepa Sharma**  
**Associate Prof.**  
**Dept. of A.S.**

## **ABSTRACT**

Background: HRT induces antiatherogenic and beneficial effects in serum lipids and lipoproteins of postmenopausal women but the relationship between HRT and stroke risk is still debated due to contradictory results of various studies and unavailability of recent data.

**KEY WORDS:** Combined cyclic hormone replacement therapy, Continuous combined hormone replacement therapy, Lipids, Apolipoproteins (A-1 & B). Lipoprotein (a). Postmenopausal women. stroke

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# WORLD'S BIGGEST AND COSTLIEST MACHINE: LARGE HADRON COLLIDER (LHC) TO UNRAVEL MANY MYSTERIES OF UNIVERSE AND HUNT GOD PARTICLE

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and

**R.P. Pandey**

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# A Throttle Based Approach to Mitigate Distributed Denial of Service (DDOS) Attacks

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## ABSTRACT

Distributed Denial of Service (DDOS) is now one of the most significant kinds of security threats in the internet. Through this form of attack the available resources are engaged to such a level that it ceases to provide service to the legitimate users. Internet services have been the major victim of various forms of this attack with complete network faces sharp reduction in performance. In a coordinated manner sheer volume of packets are being sent from a distributed set of locations with sole purpose being the consumption of both computational or communication resources of the network resulting graceful degradation of network performance. In this paper, an overview of the DDOS problem attack, defense principle and how the gap between the problem and possible mitigation could be resolved through the application of queuing mechanism over optimum throttle algorithm has been proposed.

**Keywords :** Internet Security, Denial of Service, Distributed Denial of Service, Queuing approach, throttle algorithm.

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# Design of Power Plant Using Solid Waste as Fuel Based on DFC/Gas Turbine Hybrid System

*Bhanu Pratap Singh<sup>1</sup>, D.P. Singh<sup>2</sup> & Neelam Singh<sup>3\*</sup>*

## **Abstract**

*In the paper the design of power plant based on direct fuel cell with biogas as the fuel with the gas turbine hybrid system (DFC/GT HYBRID SYSTEM) is used to meet the energy requirements of Industrial Township more than 6MW.*

*Here we have given a method for generating electricity from solid waste, fuel which is free of cost, to fulfill our task we have used principles of various fields of mechanical engineering, non conventional energy resources, fuel cell, biogas plant, simulation techniques from operation research to select the most feasible option. We have taken relevant data from biogas plant C.B. Ganj, Bareilly. Biogas has been selected as source of power here because of its easy availability and less noise.*

*The working principle of process route of biogas operated DFC/GT Hybrid System is firstly the garbage that is directly collected from the garbage source site which is transported to central garbage store, where several methods are employed to separate out the organic biomass, only 50% of the material could be easily picked up by manual methods. Majority of the method is mixed mud and shoot which is concentrated by using techniques like drying the moisture and other volatile non combustible components. Then transported in biogas plant where slurry is prepared and fed into biogas plant. The biogas thus produced is sent to the direct fuel cell through the pipes and the DC power supply is converted to 3-Phase AC Supply and fed to the bus bars.*

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# INVENTORY MODEL FOR TIME DECAY ITEMS WITH STOCK DEPENDENT DEMAND AND PARTIAL BACKLOGGING UNDER INFLATION

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## Abstract

In the present paper an attempt has been made to incorporate the effect of deterioration with stock dependent consumption rate, shortages under inflationary condition. The competitive nature of the market has been accounted for by taking partial-backlogging into consideration. The model is being taken for a finite planning horizon. Constant deterioration is entirely non-realistic and unachievable phenomenon. Hence we have taken variable deterioration in our study.

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# "NASCENT CONTINGENCY PLANS FOR BUSINESS CONTINUATION AGAINST DISASTER (EARTH QUAKE)

—Disaster Management—

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## ABSTRACT

*Business facts stored in the databases are very crucial and important for organizations want to gain edge over others in the current scenario. As we know that business is losing important financial facts due to natural hazards as well as man made hazards. These days databases are distributed and important financial facts are spread and replicated over more than one sites, hence increasing the risk and redundancy. We are introducing here an approach, using which one can reduce the risk of losing information due to natural hazard (Earth quake). The only drawback what we realize here is the percentage success of Earth Quake predictions.*

---

# Evaluating Effectiveness of Mutation Testing For Object Oriented Programmes

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## ABSTRACT

The program mutation is a testing technique that assesses the quality of test input data by examining whether the test data can distinguish a set of alternate programs from the program under test. Mutation testing measures how good our tests are by inserting faults into the programs under test and mutants were created by injecting real faults in programs. Each fault generates a new program, a mutant that is slightly different from the original. The idea is that the tests are adequate to if they detect all mutants. This paper describes an empirical study performed to evaluate the effectiveness of object oriented test strategies using the mutation method. The test sets for the experimental system are generated by our own object oriented specific mutation technique which is termed as Mutation of class and Method overloading.

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# Process Planning of Micro Electro-Chemical Machining Process

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## ABSTRACT

Process planning is the schematic determination of the sequence of the operation by which a product is to be manufactured economically and completely. In the present work, an attempt has been made, to develop a software package which will generate the manufacturing process sheet. For this purpose, a software package is developed using C<sup>++</sup> programming language.

The process sheet is generated by selecting the operation and machine tool from the software menu. These details are required in essence to generate the process sheet by computer, through a prewritten program. In this software package several options are given such as modification, viewing the past data etc. so that these can be changed frequently when needed, it makes flexible to use. The developed system is interactive and simple in use. It provides a quick and efficient method for generating process sheet.

***Keywords:*** *Micro Electro-Chemical Drilling, Process Planning.*

# "Comparative study of different electrode materials in a dielectric medium (Castrol oil)"

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## ABSTRACT

Electrical Discharge Machining (EDM) has been recognized as an efficient production method for precision machining of electrically conducting hardened materials. In this study, Experiment were performed to determine parameter effecting surface roughness (SR) along with structural analysis of surface with respect to material removal and electrode wear parameter. Experimental work conducted on AISI D204 die steel with copper, brass and stainless steel as tool electrode with Castrol oil as dielectric fluid. The data compiled during experimentation has been used to yield responses in respect of material removal rate (MRR), relative electrode wear (REW) and surface roughness (SR). Detailed analysis of structural features of machined surface was done by using optical microscope to understand the mode of heat effected zone (HAZ), which alternatively affects structure of machined workpiece and hence tool life. While investigating electric discharge machining (EDM) surface by microscopic views, it was observed that molten mass has been removed from surface as ligaments and sheets. In some cases, it is removed as chunks, which being in molten state struck to surface. All three specimens machined by different electrodes showed different microstructure of heat effected zones (HAZs).

**Keywords:** Surface Roughness, Relative Electrode Wear, Electric Discharge Machining, AISI D204 (Die Steel Material) etc.

---

# ANALYSIS OF HYSTERISIS CURRENT CONTROLLED PARMANENT MAGNET SYNCHRONUS MOTOR DRIVE

**Hemant Tiwari\***  
**Alok Ranjan Singh\*\***

## ABSTRACT

*This paper deals with the detailed modelling of a permanent magnet synchronous motor drive system in Simulink. Field oriented control is used for the operation of the drive. The simulation includes all realistic components of the system. This enables the calculation of currents and voltages in different parts of the inverter and motor under transient and steady conditions. The losses in different parts are calculated, facilitating the design of the inverter.*

*A closed loop control system with a Proportional Integral (PI) controller in the speed loop has been designed to operate in constant torque and flux weakening regions. Implementation has been done in Simulink. A comparative study of hysteresis and Pulse*

*Width Modulation (PWM) control schemes associated with current controllers has been made in terms of harmonic spectrum and total harmonic distortion. Simulation results are given for two speeds of operation, one below rated and another above rated speed.*

---

# Comparative Study Of Security Mechanisms Of Heterogeneous Networks In OWA

- Paramjeet Rawat<sup>1</sup> , Ruchi Bhatnagar<sup>2</sup> , Jyoti Gupta<sup>3</sup> , Anupriya Sharma<sup>4</sup>**  
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## ABSTRACT

The ever-increasing demand of users for various wireless communication services has led to the development and the co-existence of different, and often incompatible, wireless networks. Each one of these wireless networks has its own unique application and characteristics, as compared to other networks. Moreover, each network continues to evolve individually, most frequently not in a coordinated manner with other networks, further reducing compatibility among these networks. An integrated security mechanism is one of the key challenges in the open wireless network architecture (OWA) because of the diversity of the wireless networks in OWA and the unique security mechanism used in each one of these networks. The overall security of the network is as strong as its weakest component; integration of the overall security mechanism in OWA is of primary importance. In this paper, we comparatively analyze the unique network-centric features and security mechanisms of various heterogeneous wireless networks that are expected to be a part of OWA.

***Keywords- OWA, Wireless Networks, Security, Heterogeneous Networks***

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# DATA QUALITY MEASUREMENT ON MULTIPLE DATA SETS

**Archana Jain**

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Objective: Quantitative estimation of data quality is used to identify the presence of data quality is used to identify the presence of data defects and the level of harm caused by these defects on multiple data sets.

Methodology: Data quality estimation can be impartial or contextual on the multiple data sets. This quantitative estimation methodology is demonstrated with example of student relationship management using large number of data samples from the real world data sets. Various steps are involved in estimating the data quality.

Conclusion: On comparing the two estimations when the result comes it offers the capacity of understanding hidden truths for directing quality maintenance efforts and prioritizing quality improvement solutions for multiple datasets.

**Keywords and Phrases:** Data quality, databases, total data quality management, information value, student relationship management , SRM.

---

# DESIGN OF RFID PASSIVE TAG ANTENNA FOR COMMERCIAL APPLICATIONS USING IE3D SOFTWARE

*Mr. Deshraj\*, Mr. Munish Kumar\*\**

**ABSTRACT:-** At the very simplest level, Radio Frequency Identification (RFID) technologies allow the transmission of a unique serial number wirelessly, using radio waves. The two key parts of the system that are needed to do this are the RFID 'tag' and the 'reader'; attaching an RFID tag to a physical object allows the object to be 'seen' and monitored by existing computer networks and back-office administration systems. This paper covers the designs and optimization of antenna for RFID tags at UHF and microwave frequency such design will focus on the specific characteristics of RFID application current development of RFID antenna that meet the objective size reduction advance design technique for size reduction such as meander line structure example will be discussed. The basic need in RFID is to miniaturize the size of tag, which contains the antenna and an IC.

**Keywords:-** Micro-strip Patch Antenna, RFID, Meander Line structure

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# METHODOLOGY FOR EFFECTIVE IMPLEMENTATION OF A QUALITY MANAGEMENT SYSTEM FOR SMALL AND MEDIUM SIZED ORGANISATIONS IN DEVELOPING COUNTRIES

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## **Abstract**

Totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs is quality. The concept of quality underlying ISO 9000 is meeting customer's requirements.

Quality Management establishes Quality policy, Quality objectives and allocates responsibilities within the organization for achieving the above. The means used are Quality Planning, Quality Control, Quality Assurance and Quality Improvement

The ISO 9000 model of Quality system is built upon the principles of achieving customer's satisfaction by preventing non-conformity at all stages in the supply chain. If the right tasks are carried out, right the first time, there will be no waste; costs will be at a minimum and profits at maximum.

Considering these facts, the subject Quality System becomes more and more important for developing countries where these things are lacking in the system and are very much required for maintaining the quality, whereas developed countries have already crossed these stages and are looking for further advancements and may opt for still more stringent Quality Systems.

### **Key Words-**

Quality System; ISO 9000; Accreditation; Certification; Quality Model; Quality Management; Implementation.

---

# Reliability Centered Maintenance for High Profitability

**Professor M. K. Sharma <sup>1</sup>**

## **ABSTRACT**

The operating costs over the lifetime of a equipment can be significantly influenced by the effectiveness of the maintenance systems. Reliability Centered Maintenance (RCM) is a systematic approach to quantitatively assess the need to perform or revise the preventive plans. Potential benefits from application of RCM concepts have been proven by the aerospace industry and may be applied to mining industries too. RCM focuses on the system function, functional failures, dominant failures and their effect. It uses a decision tree to classify the criticality and identify applicable and significant items. Once the significant items are identified their maintenance intervals can be estimated to maintain their designed reliability.

## **KEY WORDS**

Reliability Centered Maintenance, Preventive Maintenance, Functional Failures, Designed Reliability, Profitability.

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<sup>1</sup> Professor & Head, Department of Mech. Engg. IIMT, College of Engineering, Meerut.  
MAINTENANCE CONCEPTS

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# Innovation Strategies for Value Creation and Effective Management”

by **Mitushi jain**

## **Introduction**

In the wake of Globalization, ‘Value Creation’, ‘Creativity’, ‘Effective and efficient Management’ have become the key factors. It is of prime importance to have sustainable innovative strategies for better management. In the contemporary business environment, human resource (HR) is an indispensable input for organizational effectiveness. Hence, an effective management of human resource has an important role to play in the performance and success of organizations. Competitive pressures have encouraged organizations to be proactive in diagnosing HR problems and to adopt more innovative HR practices since these were no longer a matter of trend, but rather of survival.

Keywords: Human Resource policies and practices, Contemporary HR initiatives

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# STAR FORMATION IN STARBURST GALAXIES

**\*Mrs.Pratibha Singh**  
(Associate professor)

**Abstract:-** *Some of the basic properties of star formation in star-burst galaxies are reviewed. I discussed triggering and termination mechanisms in starbursts and provide estimates of star formation rates Galaxies with ongoing star formation at low and high redshift are compared.*

**Key words:** *ISM: HII regions -galaxies: star clusters -galaxies: interaction -galaxies: starburst -galaxies: stellar content*

---

# A REVIEW OF GAS TURBINE POWER PLANT SYSTEM BASED ON CHEMICAL LOOPING COMBUSTION

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**Abstract:** A power plant based on chemical-looping combustion offers both a possibility of high net power efficiency and easier and less costly separation of the greenhouse gas CO<sub>2</sub>. This is due to the way the oxidation of the fuel takes place. Instead of oxidizing the fuel with oxygen from the combustion air, the fuel is oxidized by an oxygen carrier, i.e., an oxygen-containing compound. The oxygen carriers are metal oxides like NiO, Fe<sub>2</sub>O<sub>3</sub> and Mn<sub>3</sub>O<sub>4</sub>. The reduced oxygen carrier is in the next step reoxidized by air in a second reactor and then recirculated to the first reactor. In this way, fuel and air are never mixed and the fuel oxidation products CO<sub>2</sub> and water leave the system un-diluted by air. All that is needed to get an almost pure CO<sub>2</sub> product is to condense the water vapour and remove the liquid water.

Chemical-looping combustion (CLC) is also claimed to reduce the fuel exergy destruction in the over-all reaction of combustion of the fuel. This gives a possibility to increase the net thermal efficiency of gas turbine based power system such as combined cycle.

This paper gives an introduction to chemical-looping combustion and application of the chemical looping combustion (CLC) method in natural

gas-fired combined cycles for power generation with CO<sub>2</sub> capture. A CLC combined cycle consisting of single CLC-reactor system, an air turbine, a CO<sub>2</sub>-turbine and a steam cycle has been designated as the base-case cycle. A review of the thermodynamic performance of various combined cycles using CLC combustion along with CO<sub>2</sub> capture are reported in this paper.

**Keywords:** Power generation, Chemical looping combustion, CO<sub>2</sub> capture, Combined cycle, Reheat turbine.

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# Corporate Social Responsibility & Sustainable Development

(Working Paper)

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**Abstract:**

The Sanskrit saying ‘Atithi Devo Bhav’, means – ‘the one who comes to you for being served, should be taken to be as God’, is considered as the highest order of responsibility, be it to individuals or to the society. Thus, the phrase Social Responsibility has its roots in Indian context. Corporate social responsibility (CSR) is a term describing a company's obligation to be accountable to all of its stakeholders in all its operations and activities. CSR has several strategic implications. The first is that CSR can be an integral element of a firm's business and corporate-level differentiation strategies. Therefore, it should be considered as a form of strategic investment. Even when it is not directly tied to a product feature or production process, CSR can be viewed as a form of reputation building or maintenance. A second strategic implication of the firm's perspective is that one can generate a set of predictions regarding patterns of investment in CSR across firms and industries. In particular, the focus is on issues relating to industry evolution, market structure, firm dynamics, and the role of asymmetric information in the context of CSR. Thus, the present exploratory research focuses the Corporate Social Responsibility as a determinant of market strategic issues, with the various dimensions of CSR and its relevance for emerging markets, it also throw light on redesigning marketing paradigms for the global competition.

**Key words:** Corporate social responsibility, differentiation strategies, emerging markets, redesigning marketing paradigms, global competition

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# Globalization of Higher Education with Computer Applications

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**Abstract:**

The term “Globalization” represents the international system that is shaping most societies today. It is a process that is “Super Charging” the interaction and integration of cultures, politics, business and intellectual elements around world. Globalization means more competition, not just with other companies in the same city or the same region. For this purpose, Computer plays the vital role and higher education is needed. Higher education is the way for implementing and developing Science, Technology and playing the important role in modernization and globalization. By this, we can easily face the new challenges throughout the world. Globalization is a very real phenomenon that is transforming the world economic system including nearly all aspects of production, distribution and other business processes. Getting IT jobs are easier through the higher education in Computer Applications. In Computer Applications, software or hardware are needed for all types of designing, research, training, production etc. Globalization of software and IT services means that some IT jobs will be done abroad. It is in globalization has regularly developed new ideas, methods, technology, software and products. By this type of implementation, the world economy has to be affected. Globalization helps developing countries by creating jobs and sending money into the Economy of the developing country. It is not only changes the economic system but also give impact on higher education.

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## **Guidelines for Authors**

### **Preparation of Manuscript**

**1. Title of Paper**

**2. Author(s), name (s), status, email ID**

**3. Abstract describing the context and scope of the paper**

The abstract is to be in fully-justified italicized text as it is here, below the author information. Use the word “Abstract” as the title, in 12-point Times New Roman, boldface type, centered relative to the column, initially capitalized. The abstract is to be in 11-point, single-spaced type, and should be of about 200-250 words. Leave two blank lines after the abstract, then begin the main text.

**4. Keywords:** We would like to encourage you to list your keywords in this section (not more than 6 words)

**5. Main text:** Double Column, organized into logical sections and 12 points font size in Times New Roman.

S.I unit should be used.

Mathematical symbols should be typed or neatly handwritten.

**6. Table and Figures Center Align:** These should be numbered consecutively throughout the text. Figure captions are to be below the figures. Table titles are to be centered above the tables.

**7. References:** References cited in the paper should be numbered sequentially in order of citation and given in the text by superscript numerals, with a reference list, in numerical order at the end of the paper. List and number all bibliographical references in 9-point Times New Roman, single-spaced with 10-point interlining spacing, where appropriate, include the name (s) of editors of referenced books.

[i] A.B. Smith, D.D. Jones and E.F. Roberts, “Article Title”, Journal, Publisher, Location, Date, pp. 1-10.

[ii] Jones, C.D., A.B. Smith, and E.F. Roberts, Book Title, Publisher, Location, Date.

**8. Total number of pages should preferably be 8-10**

**Page Size:** (A4 (8.27 x 11.69) without page number

Page Margin: Top = 1, Bottom = 1, Left = 1, Right = 1

Font Face: Times New Roman

Font Size: For Title – 14 pt. Bold & Title Case

Font Size: For Sub title – 12 pt. Bold & Title Case

Font Size: For Text – 12 pt.

Line Space: For Text 1 line space

**All pages should be without page number, Header/Footer Text.**