```
%%% ENCODING UTF-8
\documentclass[article,11pt]{amsart}
%\usepackage[textwidth=5cm,textheight=5cm]{geometry}
%ALE: edit this file

\voffset=-78pt
\oddsidemargin = -10pt
\marginparwidth = -30pt
\textwidth = 495pt%486pt
\textheight = 900pt

%% Arial-like fonts
%\renewcommand{\rmdefault}{calibri}
%\renewcommand{\sfdefault}{calibri}

\usepackage{color}
\usepackage{ graphicx}
\usepackage{amsmath}
\usepackage{amssymb}
%\usepackage{bm}
%\usepackage{verbatim}
% \newtheorem{Theorem}{Theorem}
% \newtheorem{Lemma}{Lemma}
% \newtheorem{Proposition}{Proposition}
% \newtheorem{Corollary}{Corollary}
% \newtheorem{Remark}{Remark}
% \newtheorem{Definition}{Definition}
% \newtheorem{Conjecture}{Conjecture}

% \def\s{\subseteq}
% \def\forces{\Vdash}
% \DeclareMathOperator{\chr}{Chr}
% \DeclareMathOperator{\cf}{cf}
% \DeclareMathOperator{\ap}{AP}
% \DeclareMathOperator{\fa}{FA}
% \DeclareMathOperator{\dom}{Dom}
% \DeclareMathOperator{\card}{Card}
% \def\br{\blacktriangleright}
% \DeclareMathOperator{\G}{G}
% \DeclareMathOperator{\Gal}{Gal}
% \DeclareMathOperator{\C}{C}


%\usepackage{tabularx}
%\usepackage{graphicx}
\usepackage{setspace}
%\pagestyle{empty}
%\newenvironment{xcomment}{}{}
%\onehalfspacing
%\doublespacing
\setstretch{1.5}
%\theoremstyle{definition}
%\newtheorem{defn}[thm]{Definition}

\begin{document}
%\thispagestyle{empty}
% \ \\
```

Commented [K1]: This file shows my changes and comments. The tex file has already been uploaded to the project.

%
%\fontsize{14bp}{16pt}\selectfont

\begin{flushright}{Application No. 1116/24 \\PI1 Name: Shai Gul}\end{flushright}
\fontsize{13pt}{15pt}\selectfont
\begin{center}{Scientific abstract~~, ~~ -- Advanced Mathematics and Industrial Design:~~,~~ A Symbiotic Relationship}
\end{center}
\fontsize{11bp}{14pt}\selectfont
%\vspace{.20in}
\noindent
The connections between mathematics and f~~F~~ields such as ~~mathematical ~~physics, ~~mathematical- ~~biology, and ~~of course the connection to ~~computer science of course ~~are ~~are natural ones. In this ~~proposition~~proposal, I would like provoke a new symbiotic relationship between industrial design and abstract mathematics with the following three ~~concealed ~~ulterior goals.
The f~~F~~irst goal is~~,~~ to show how abstract mathematics concepts can be powerful tools ~~to ~~for ~~the ~~a designer~~,~~ and can be `activated' ~~for ~~to meet the designer's demands, as detailed in ~~`Dynamical tilying'~~Aim 3 below.
%, which unfurtunately.
%Unfortunately, I believe that most of industrial designers, shy away from advanced mathematics, viewing it as a complicated, abstract field that is only related to quantity. In doing so, they miss out on the added value that intermediate mathematics can bring to their curriculum, studies and careers.
~~Second~~In addition~~ly~~, to formulate new theoretical ideas, mathematicians are always seeking inspiration~~ to formulate new theoretical ideas~~. In my opinion, design has ~~a lot~~much to offer, and aesthetics is a good example that ~~in a way~~ may, in a certain sense, define mathematics (Aim 2)~~, see below `Gradient topology'~~.
Lastly, undergraduate mathematics students need to be educated to become problem solvers~~, where~~ who can tackle the problems ~~can be raised~~that arise in various fields. I encourage my mathematics students ~~in mathematics ~~to ~~take part~~participate in design--math collaborations to ~~show how powerful~~demonstrate the power of their ~~major ~~primary ~~studying ~~field of study.
~~I intend~~My intent is to turn ~~these ~~abstract mathematical concepts into vivid visualizations~~, with~~ using the right construction and materials (Aim 1). I will demonstrate, with the help of my team, the utility of our visualization approach in three academic fields that seemingly have ~~not much~~little in common with math~~:~~ (art~~/~~, design, and music~~, ~~) but indeed have ~~a ~~powerful symbiotic relationships.
%%%%%% Begin alternative text
%%%%%% This follows the order of the aims below. Please check if it would be a better alternative for this introduction.
% First, undergraduate mathematics students need to be educated to become problem solvers who can tackle the problems that arise in various fields. I encourage my mathematics students to participate in design--math collaborations to demonstrate the power of their primary field of study.
% Hence, my aim is to turn abstract mathematical concepts into vivid visualizations using the right construction and materials (Aim 1). I will demonstrate, with the help of my team, the utility of our visualization approach in three academic fields that seemingly have little in common with math (art, design, and music) but indeed have powerful symbiotic relationships.
% In addition, to formulate new theoretical ideas, mathematicians are always seeking inspiration. In my opinion, design has much to offer, and aesthetics is a good example that may, in a certain sense, define mathematics (Aim 2).

Commented [K2]: I suggest this alternative because “relationship” has a more general nuance than “relation,” which is better for the general concept referred to in the title.

Commented [K3]: I heavily edited this for flow. Please check it still conveys your meaning.

% My final goal is to show how abstract mathematics concepts can be powerful tools for a designer and can be `activated' to meet the designer's demands, as detailed in Aim 3 below.
%%%%% end alternative %%%%%
~~These are the purposes researches~~In detail, the three aims of this proposal are as follows:

\noindent

\begin{enumerate}
\item \textbf{Aim 1: Definition and c~~Classifying ~~lassification of~~and defining~~ songs as three-dimensional objects~~ (Aim 1)~~}. Can a given song in Western music be modeled as a collection of curves or~~,~~ surfaces, or even be defined as a tangible object? If they can indeed ~~can ~~be modeled in a pure mathematical fashion, can we sort songs ~~by ~~according to an equivalence relation? This research will involve~~s~~ music, industrial design, differential geometry, algebra, and topology.
 \label{enum:1}
 \item \textbf{Aim 2: Gradient topology~~ (Aim 2)~~}.
 A g~~G~~radient is an important concept in mathematics, and surprisingly, this concept is also well defined from a designer's point of view as a ~~soft~~ gradual change in color~~-changing~~ (which contains the mathematical definition) in a given image.
%   \begin{figure}[htp]
% \begin{center}
% %\hspace*{-2cm}
% \includegraphics[scale=0.2]{Figures/tmp.png}
% \end{center}
% \vskip -0.1in
% \caption{A classical visual gradient in gray color space. In this case can be considered as the fundamental polygon of a cylinder. since the upper side and the lower side are in the same color direction.}
% \label{fig:basic_gradient}
% \end{figure}
% \begin{figure}[htp]
% \centering
% %\vskip -0.8in
%   \includegraphics[width=0.4\textwidth]{Figures/tmp.png}
%   %\vskip -0.8in
% %Images/
% \caption{A gradient which is defined in the gray color space. In this case can be considered as the oriented square of a cylinder.}
%   \hspace*{2cm}
%   \vskip -0.1in
% \label{fig:cylider}
% \end{figure}
~~As a~~To mathematicians, this simple design~~-~~ gradient, although it has a geometrical property, ~~reminds us ~~is similar to the construction of a cylinder from the respective fundamental polygon, which is obtained by attaching the ~~the ~~identical edges. This observation has led us to think is it possible to define design~~-~~ gradients for different topological surfaces.
% (torus, Klein bottle, etc.), and if the answer is yes, can we give an upper and lower bound to the number of each gradient that exists for each topological surface.

Commented [K4]: I suggest moving the aims to the beginning of the heading, but this is a stylistic change. If you prefer them at the end in brackets, that is fine.

This research will involve~~s~~ design, topology, combinatorics, and complexity; ~~and~~ all ~~is~~ are influenced by design concepts.

\item \textbf{Aim 3: Defining dynamical tiling~~'~~s in industrial design~~ (Aim 3)~~}.
It turns out that algebraic structures can help designers in the planning ~~steps~~ stages ~~to know~~determine if a dynamical transformation of the components in a design can be obtained~~, all by~~simply by using a respective mechanism ~~which~~ that defines movement between different patterns/arrangements, each of which accomplishes a different goal.
% It can be applied to folding tables (reduction and expansions), lightning systems (exposure and hiding), and more.
I intend to generalize this result to spherical patterns and especially ~~for~~ geodesic domes. This research will involve~~s~~ design, mechanics, differential geometry, and groups.
\end{enumerate}

% \textcolor{red}{
% We believe that our project will showcase how intermediate mathematics can give a new point of view on artistic ideas, thereby encouraging Humanities students to explore non-trivial ideas in mathematics. We are driven by the conviction that, with the right approach, audiences that dislike quantitative mathematics will be fascinated by other aspects of mathematics, such as topology and algebra. In doing so, we hope to encourage undergraduates to add math tools to their "toolbox" as a means to enrich their knowledge, widen their perspective on their work, and maximize their artistic and career potential. Our vision is that this research will lead to the incorporation of math-visualization practices into non-math study courses with the hope that it will improve attitudes to math and non-math students' inclination to adopt math approaches or even incorporate math studies into their undergraduate curriculum. }

\end{document}