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(version 6/2/06)

PROJECT MANAGEMENT PLAN

for

CURRICULUM IMPROVEMENT PARTNERSHIP AWARD II

at Hartnell College

Project Name:

Engineering Program Upgrade with Project Management

TABLE OF CONTENTS

OVERVIEW

Hartnell College was a recipient of the three-year NASA-sponsored United Negro College Fund Special Programs (UNCFSP) Curriculum Improvement Partnership Award (CIPA) I program, and concluded that project with great success in January of 2005.

Nationally there are ten recipients to the Curriculum Improvement Partnership Award II (CIPA II) Program, of which Hartnell College is one. This program was officially signed on 9 January 2006 and initiated in February 2006. The funding for the Hartnell College award is $125,000, $125,000, and $150,000 for years one, two, and three, respectively, with years two and three contingent on Hartnell College CIPA performance and availability of NASA funding.

The CIPA II Project at Hartnell College, titled "Engineering Program Upgrade with Project Management," will build on the success of CIPA I and is viewed as a project under a Hartnell College strategic initiative.

The strategic initiative that this project supports is found on page 1 of the Hartnell College CIPA II Proposal in the paragraph that has the heading "Commitment to STEM."

> Hartnell College has made a major commitment to expanding and improving its science, technology, engineering, and mathematics (STEM) programs. . . . Enrolling, retaining, and transferring increased numbers of underrepresented students, particularly Latinos, in engineering majors is one of the college's long-term goals for STEM programs (Educational and Facilities Master Plan 1999-2010).

This document's major subject headings, which are listed in the Table of Contents, are taken directly from Sage Horizons Consulting's "Principles of Project Management," as are many of the subheadings. Supporting materials are also found in *A Guide to the Project Management Body of Knowledge* (3rd edition).

1. **PROJECT CHARTER**

1.1 Project Scope and Objectives

The strategic initiative of the College is to increase enrollment, retention, and transfer of underrepresented students in engineering majors. The ***Hartnell College Engineering Program Upgrade with Project Management*** will support our strategic initiative by:

- infusing principles of project management into all current engineering courses
- making the engineering curriculum more current and relevant to developments in modern technology.
- connecting our underrepresented students to university research early in their development.
- giving STEM students critical skills like project management that will give them an advantage when entering the workforce.
- working with our partners to develop internship support projects as critical platforms to launch our students into universities and the workforce.

NASA material and content related to project management and the agency's projects and strategic enterprises will be incorporated into the revised lecture courses and into new advanced courses, and applied to student internships and special projects. The program improvements resulting from new engineering curriculum will provide a significant advancement in scientific and engineering instrumentation and capacity at Hartnell College. Student-centered learning is an essential ingredient in this project and will allow students to gain experience on all aspects of an engineering project applied to real world situations.

Improvements to the engineering program will occur with the consultation of professionals from several key partner institutions. The partnerships will provide a level of expertise needed to ensure articulation of the courses, give students experience working with professionals in the field, and provide a pipeline for future internships. Due to the interdisciplinary nature of our strong partnerships, the tie between Astronomy and Engineering will be a recurring theme.

1.2 Project Authority

The chain of authority is:

- Dr. Edward Valeau, President-Superintendent
- Dr. Charlene Frontiera, Responsible Administrator, Dean of Math and Science
- Dr. Pimol Moth & Mr. Lin Sten, Co-PIs, STEM faculty
- Mr. Andy Newton, Partnership Liaison, Planetarium Director
- Dr. Jesse Cude, Curriculum Advisor, Budget Manager, STEM faculty
- Mr. Jim Riley, Project Management Advisor, STEM faculty

1.3 Deliverables

1.3.1 Curriculum Revision and Upgrade

This project will revise/update all the engineering courses to include project management, and create three new advanced engineering courses with lab and field activities, also to emphasize project management. The curriculum developed through this project will be designed in close consultation with the University of California at Santa Cruz (UCSC), one of Hartnell College's project partners. The new engineering courses will articulate with both the University of California and other California State University systems. The new/revised engineering courses will be a foundation for students to pursue a Bachelor of Science degree program in engineering and other closely related STEM majors. Descriptions of these courses as they are presently composed, and as they are envisioned to include project management, are detailed below:

Engineering 1 – Introduction to Engineering. *(Revise: Fall 06, Implement: Fall 07)*
Currently this course is an overview of the engineering profession. It also includes training in problem solution and the design process. We would like to begin our students' education in project management at Hartnell. Proposed revisions and upgrades to the engineering courses will provide engineering students with an introduction to project management. This will include at least a week of the course to be spent in covering all of the following topics in project management:

- Project life-cycle phases
- Individual and team roles
- Work breakdown structure
- Planning and scheduling
- Reviews and success criteria
- Risk management
- Project safety
- Earned value and performance indicators
- Configuration management
- Examples of project management failure

While all of these topics will be included in Engineering 1, some subset of these will be dealt with in more detail in each of the subsequent engineering courses.

Engineering 2 –Engineering Graphics/CAD. *(Revise: Fall 06, Offer: Fall 07)*
Currently this course includes principles and methods which are useful to modern engineering and technology, and which are used in determining space relations of points, lines, planes, and their combination. The course will be revised to include at least a week of material covering project management.

Engineering 4 – Materials Science. *(Revise: Spring 07, Offer: Spring 08)*
This course currently includes metallic and nonmetallic materials, atomic and crystalline structures, polymers, heat treatment, phase equilibria, and corrosion. The course will be revised to include at least a week of material covering project management.

Engineering 6 – Introduction to Circuit Analysis. *(Revise: Spring 07, Offer: Spring 08)*
This course currently covers basic circuit laws and network theorems. It also contains analysis of various types of DC and AC circuits, including RL, RC, and RLC circuit response—both transient and steady state. The course will be revised to include at least a week of material covering project management.

Engineering 8 –Engineering Statics. *(Revise: Fall 07, Offer: Fall 08)*
This course currently includes force systems, and equilibrium conditions for trusses, beams, and other simple structures. It includes algebraic, graphic, and vector solutions. The course will be revised to include at least a week of material covering project management.

Engineering 45 – Special Topics in Engineering. *(Design: Fall 06, Offer: Fall 07)*
Special Topics courses are 1-3 units of laboratory. 1 unit of lab requires 48-54 hours of lab time. Students would be mentored by a faculty member in a research laboratory environment. Special projects may also involve collaborations with our partner institutions and industry.

Engineering 7A – Project Management in Engineering. *(Design: Fall 07, Offer: Fall 08)*
This course will be the first semester of a two semester course giving students practical experience in Project Management. Engineering 7A is designed to enable a student, acting in concert with other students, to set up a project plan and management information system for an engineering project. In the laboratory component, students must meet in small groups to develop a complete project management plan for a new product. This plan will involve all aspects of project management presented in the lecture component of the course.

Students in this course will learn both project management skills and topics in rocketry design. They will have the opportunity to learn to work together as a team as well as collaborate with professionals from outside institutions. During this course, students must organize themselves into a team to design CanSat devices and possibly the rocket to launch the CanSats. CanSats are small, self-contained devices that are launched to high altitudes, deployed by parachutes, and mimic the functions of satellites orbiting Earth.

This course will be taught by Hartnell engineering faculty with additional support from professionals at the Naval Postgraduate School, members of the Tripoli Rocket Association (Central California Branch in Fresno), and experts from NASA-Ames. Students will work as a team to write up a detailed proposal to design the CanSat payload and launch vehicle.

Their proposal will include a summary to the basics behind rocketry, a statement of the relationship of their project to NASA interests and to the aerospace industry, design of the payload and high-powered rocket, assignment of roles, an equipment list, a budget,

plan of action, and a timeline. During this phase, the students will be given instruction on the basics of high-powered amateur rocketry, and will learn key concepts in project management with the emphasis on the methods used in engineering.

Project management topics that will be covered in the course will be:

- Project selection, acquisition, and development
- Developing and following a detailed work plan
- Developing and managing a project schedule and budget
- Controlling projects for quality
- Communicating effectively with the project team, client and supervisors
- Team building
- Anticipating and avoiding potential problems
- Developing networking skills
- Proposal writing

Engineering topics that will be covered in the course will be taken from the following list according to the time constraints of a 3-unit 1-semester course:

- Design and structure of rockets used by NASA
- Flight mechanics
- Chemistry of fuels
- Nozzle design
- Stress/strain
- Aerodynamics/stability control
- Heat transfer
- Fin design
- Stress interaction
- Flight data acquisition
- Data telemetry
- Physics of propulsion

Engineering 7B –Project Management in Engineering. *(Design: Spring 08, Offer: Spring 09)*
This course will be the follow-up to 7A. This semester's work will be focused on project plan execution and close out. Working in groups, students will use the tools of project management as they proceed to manufacture a new product. Students will utilize project planning guides and tools such as Microsoft Project. Each team will be responsible for reporting on their progress and challenges biweekly.

Students will work on building, operating, and testing their CanSats and rocket. Students will have access to computers, modeling software such as SPLASH and RockSim, and equipment and instruments for the fabrication of the rocket. In addition to working with engineering faculty at Hartnell, students will have the opportunity to work

closely with professionals from the Naval Postgraduate School, members of the Tripoli Rocketry Association, and scientists at NASA-Ames to construct a CanSat payload and high-power rocket. They will make regular trips to the Naval Postgraduate School and NASA-Ames to work with professionals on the design and fabrication of their rockets and Tripoli Central California Branch at Fresno to test and launch their rockets. After successful testing of their CanSat device and launch vehicle, students will enter their design in the ARLISS CanSat competition, which is held yearly at the end of summer in the Black Rock Desert in Nevada. The students will also participate in the October Skies launch event.

Feasibility Study for a Hartnell Engineering Academy at UCSC. *(Fall 06)*
Hartnell College's CIPA team will coordinate with the UCSC Jack Baskin School of Engineering to determine how to create a Hartnell Engineering Academy on-site at UCSC. The dean and faculty of the Jack Baskin School of Engineering have enthusiastically endorsed this concept.

The model, as it is currently being discussed, includes sending selected Hartnell students to work in laboratory settings side-by-side with Jack Baskin School faculty, post-doctoral students, graduate students, and undergraduate students. Our on-site students would then experience research in cutting-edge science early in their development. Additionally, this interaction would broaden their awareness and perspectives of career options that are becoming available in twenty-first century engineering.

1.3.2 Special Projects and Internship Opportunities

An important component of this project will be to provide motivated STEM students with opportunities to explore advanced topics of Project Management in Engineering through participation in special projects and internships with partner institutions. Some examples of these projects and/or internships are the following:

UCSC Baskin School of Engineering and the University Affiliated Research Center at NASA-Ames: Students can be apprentices to senior design projects at UC Santa Cruz on team-based projects such as:

- Technology Information Management Projects
- Air Traffic Control Systems at NASA-Ames
- Bio-Engineering and Bio-Medical Research Projects
- Micro Electronics and Nanotechnology

Students may also be placed in internships at NASA-Ames through the University Affiliated Research Center (UARC) there.

NASA-Ames: Aside from placement through the UARC, students will be placed in internships at NASA-Ames through direct contact with research groups there:

- Flight Hardware Development and Operations Lab
- Rovers, Projects, Hardware
- Project Columbia Super Computer
- Future Flight Central
- Thermo-Physics Facilities Branch
- Topics in Astrophysics

Center for Adaptive Optics: Through cooperative efforts between Hartnell faculty and CfAO, students can engage in a variety of adaptive optics activities and applications such as:

- Fabrication of Adaptive Optics Demonstrator
- Activities involving the Adaptive Optics Demonstrator such as:
  - Experiment with the beam's aberration by distorted glass or introducing turbulence.
  - Use several computational methods and observe quickness of correction, quality of correction, and error.
  - Write new centroiding methods, reconstruction routines, and merit-figuring components.
  - Change the optical layout of the system and experiment with different input beams, lens relay configurations, etc.
- Micro Electro Mechanical Systems (MEMS) software development for fabrication of adaptive optics actuators

Naval Postgraduate School: Students will work on special projects involving solid and liquid rocket design and operation and robotics. Also, there will be programming opportunities in the computer center.

Fremont Peak Observatory Association: Students will interact with and gain valuable advice from retired engineers who volunteer at the Observatory. During this internship, they will learn how to operate the 30 inch Challenger Telescope at the observatory, give public talks, and learn components of project management. They will work together to write a project plan to support the astronomical public observing program and present it to the volunteers at the Fremont Peak Observatory Association (FPOA) for approval. The components of their project plan will include:

- Scope Management Plan
  - define and set main objectives for the project
- Staffing Management Plan
  - define and assign roles for all persons or groups involved in the program
- Schedule Management Plan
  - create a task list
  - determine the approximate duration of each task
  - design a person or group to the task
  - determine who will work on what nights
  - decide on the program content for that evening
- Communication Management Plan

- create a contact list of team members and FPOA volunteers
- determine the best method of communication
- appoint a member to be the point person to communicate with FPOA volunteers

- Quality Management Plan
  - set up meeting times to discuss challenges, difficulties, suggestions, and progress of the project
- Risk Management Plan
  - discuss potential risks in the project
  - discuss troubleshooting methods to address problems when they occur

Other possibilities: We will also explore internships and special projects with other organizations:

- NASA's Stratospheric Observatory For Infrared Astronomy (SOFIA)
- Monterey Bay Aquarium Research Institute (MBARI)
- Monterey Institute for Research in Astronomy (MIRA)
- Model rocketry companies such as Estes
- Salinas Valley Memorial Hospital Imaging Technology Department (NASA partner)
- Local companies involved with construction or fabrication
- Regional aerospace companies
- Mentoring by local project managers
- Fleet Numerical

Furthermore, we will brainstorm ideas for internships and special projects with the Advisory Board and the Hartnell College Foundation Board of Directors.

1.3.3 Project Reports

These reports are detailed in Section 8.

1.4 Milestones

1.4.1 Year One, 2006

- Partnership commitments, January
- Formation of the Program Advisory Board, February
- PIs attend Project Management Boot Camp, February
- Site visits to UCSC Baskin School of Engineering and CfAO, March
- PIs attend Project Management Forum, June
- First internship offerings at FPOA, NPS, and NASA-Ames, June
- Approval of Project Plan by NCSFP, June
- Input of Project Plan into Microsoft Project Professional, September
- Establishment of the Hartnell Engineering Academy at the Baskin School of Engineering, December
- Design Engineering 45, December

- Revision of Engineering 1 and 2, December

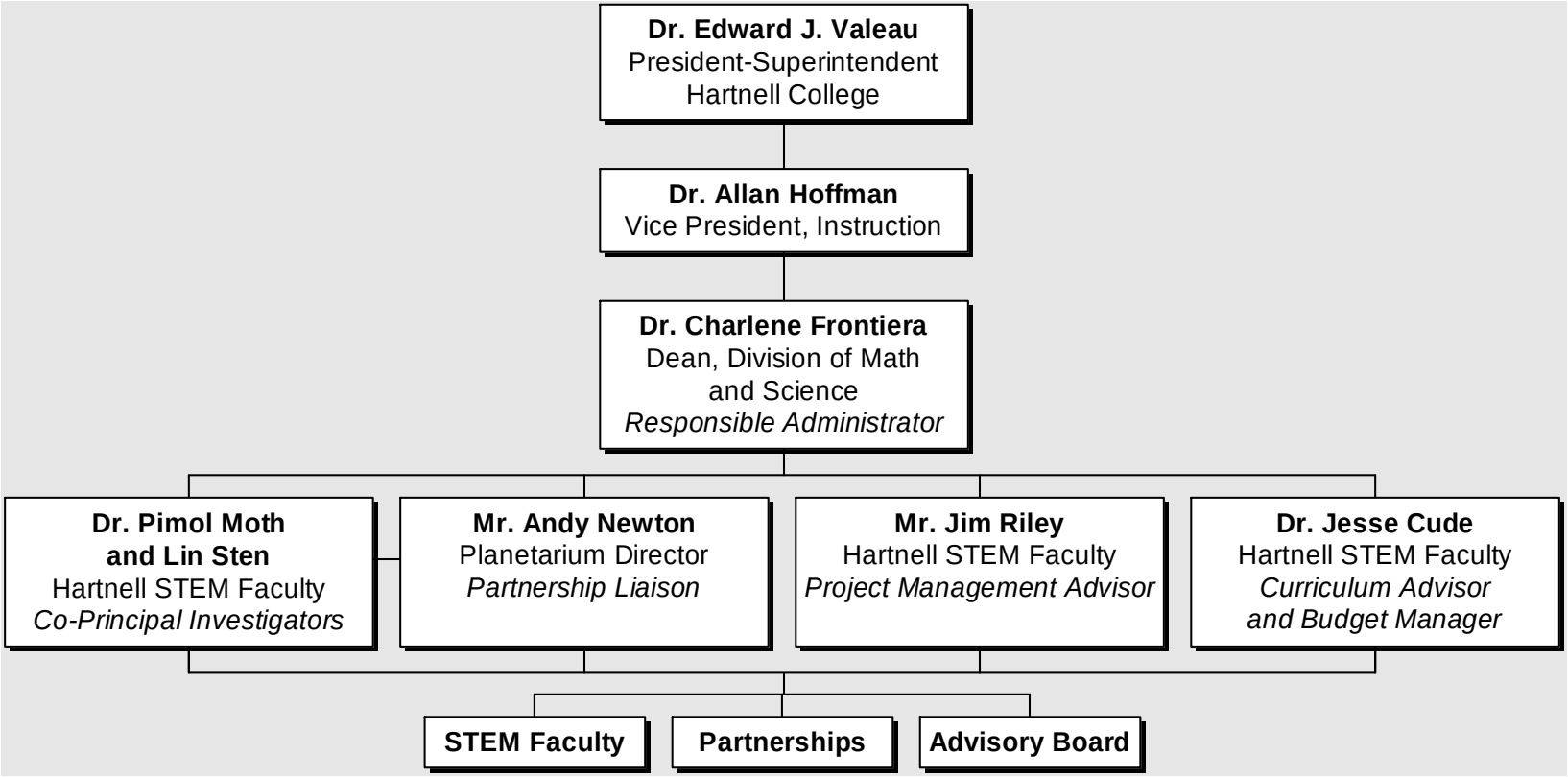
1.4.2 Year Two, 2007

- Design Engineering 7B, March
- Institutionalization of internships, May
- Revise Engineering 4 and 6, June
- First Offering of Engineering 45, June
- First Offering of Engineering 1 and 2 with Program Management, August
- Revise Engineering 8, December

1.4.3 Year Three, 2008

- First Offering of Engineering 4 and 6, January
- First Offering of Engineering 8 and 7A, August
- Project Closeout, December

2. PROJECT ORGANIZATION



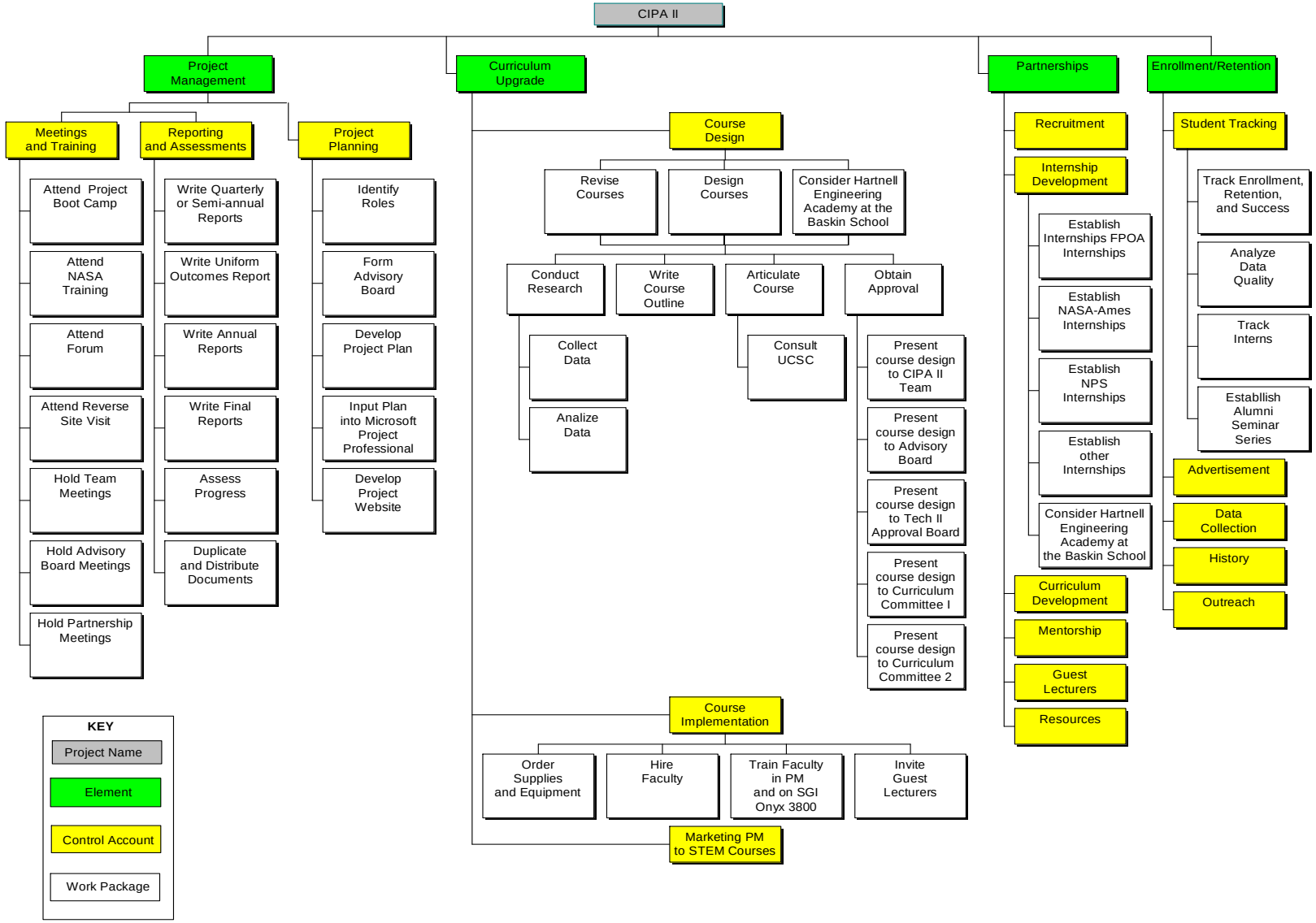
3. WORK BREAKDOWN STRUCTURE

This section is broken into two subsections. The first, Section 3.1, contains the charts showing The Work Breakdown Structure itself. The second, Section 3.2, contains the WBS dictionary, which gives alphabetical listings of all WBS elements, control accounts, and work packages; where necessary, additional descriptions for the various titles are given.

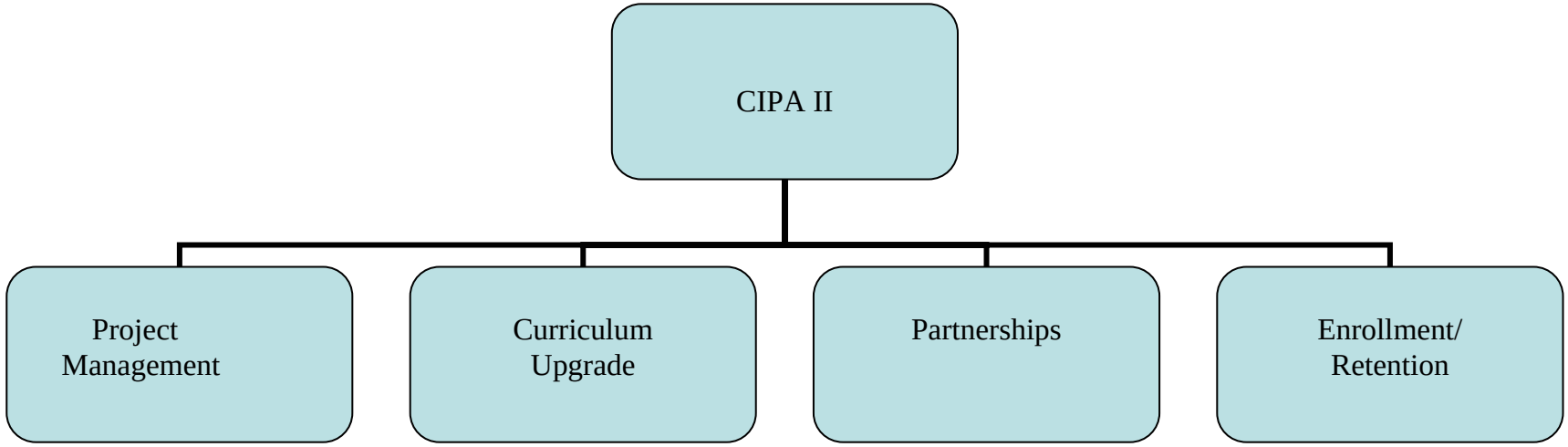
3.1 The Work Breakdown Structure

The work breakdown structure (WBS) is composed of at least four levels: the project, WBS elements, control accounts, and work packages. More levels are added where the work packages are broken down into tasks (also known as "schedule activities") and smaller work packages. The naming convention is that nouns are used for all levels down to the work packages, which are named with a verb and a noun.

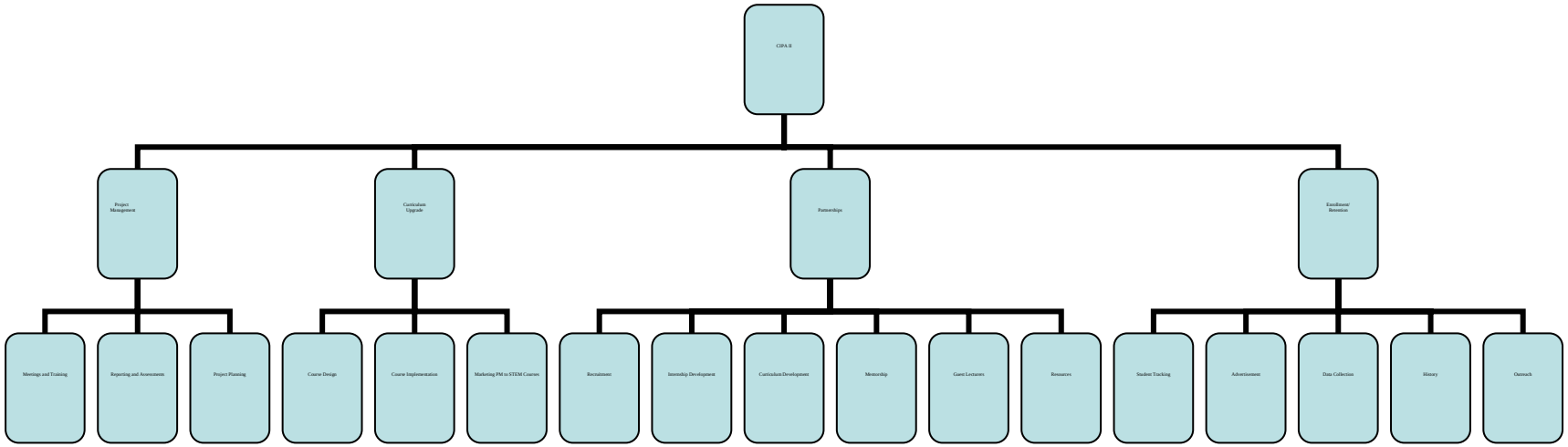
For clarity, the WBS is presented here in two forms. In the first form, the complete WBS is presented on a single page, that is, all four levels appear on the same page. In the second form, only two levels of the WBS are presented on each page (except on the two pages where three levels are shown), and each page is titled with the levels that are shown on that page.


CIPA II
Project Management
Curriculum Upgrade
Partnerships
Enrollment/Retention
Meetings and Training
Reporting and Assessments
Project Planning
Attend Project Boot Camp
Attend NASA Training
Attend Forum
Attend Reverse Site Visit
Hold Team Meetings
Hold Advisory Board Meetings
Hold Partnership Meetings
Write Quarterly or Semi-annual Reports
Write Uniform Outcomes Report
Write Annual Reports
Write Final Reports
Assess Progress
Duplicate and Distribute Documents
Identify Roles
Form Advisory Board
Develop Project Plan
Input Plan into Microsoft Project Professional
Develop Project Website
Course Design
Revise Courses
Design Courses
Consider Hartnell Engineering Academy at the Baskin School
Conduct Research
Write Course Outline
Articulate Course
Obtain Approval
Collect Data
Analize Data
Consult UCSC
Present course design to CIPA II Team
Present course design to Advisory Board
Present course design to Tech II Approval Board
Present course design to Curriculum Committee I
Present course design to Curriculum Committee 2
Course Implementation
Order Supplies and Equipment
Hire Faculty
Train Faculty in PM and on SGI Onyx 3800
Invite Guest Lecturers
Marketing PM to STEM Courses
Recruitment
Internship Development
Establish Internships FPOA Internships
Establish NASA-Ames Internships
Establish NPS Internships
Establish other Internships
Consider Hartnell Engineering Academy at the Baskin School
Curriculum Development
Mentorship
Guest Lecturers
Resources
Student Tracking
Track Enrollment, Retention, and Success
Analyze Data Quality
Track Interns
Establlish Alumni Seminar Series
Advertisement
Data Collection
History
Outreach
KEY
Project Name
Element
Control Account
Work Package

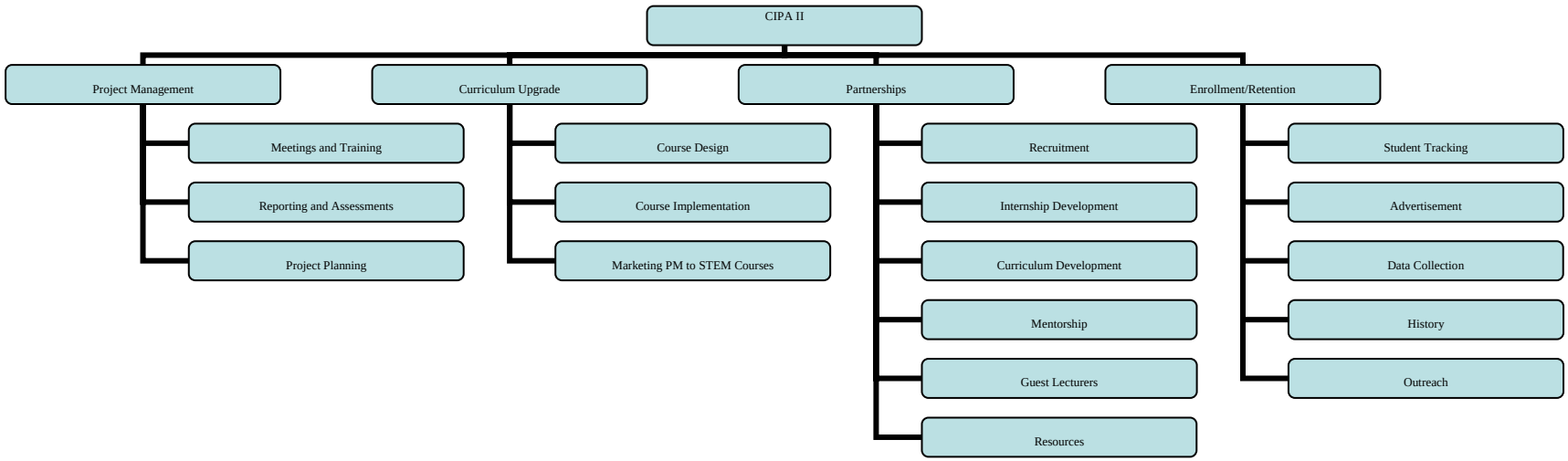
WBS Project and Elements



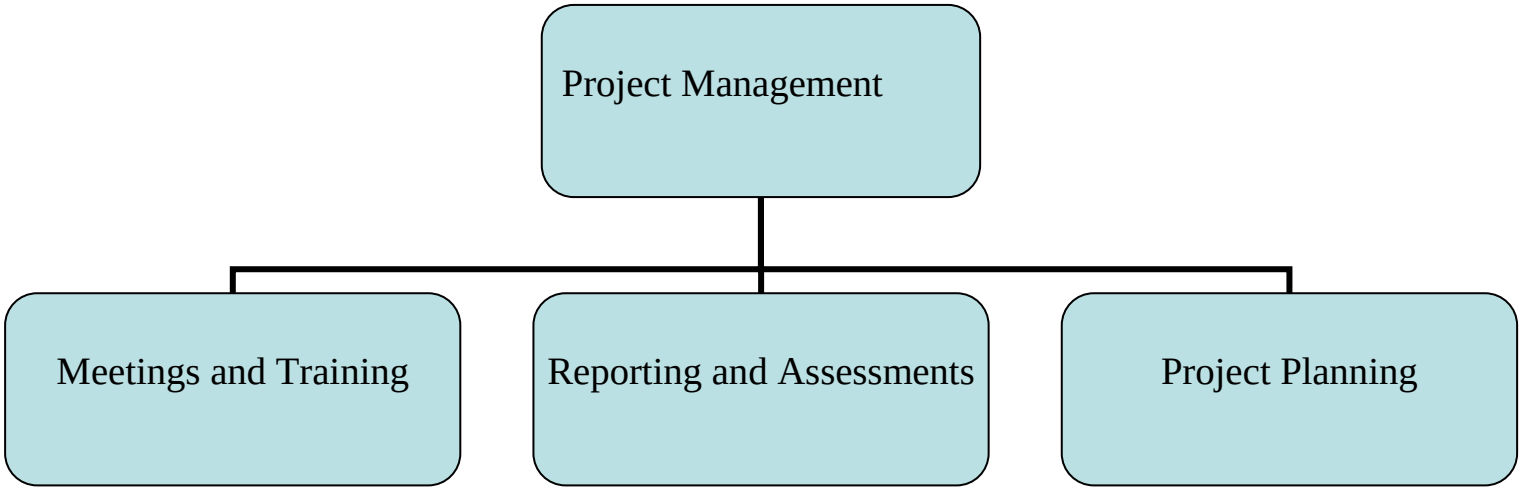
WBS Project, Elements, and Control Accounts



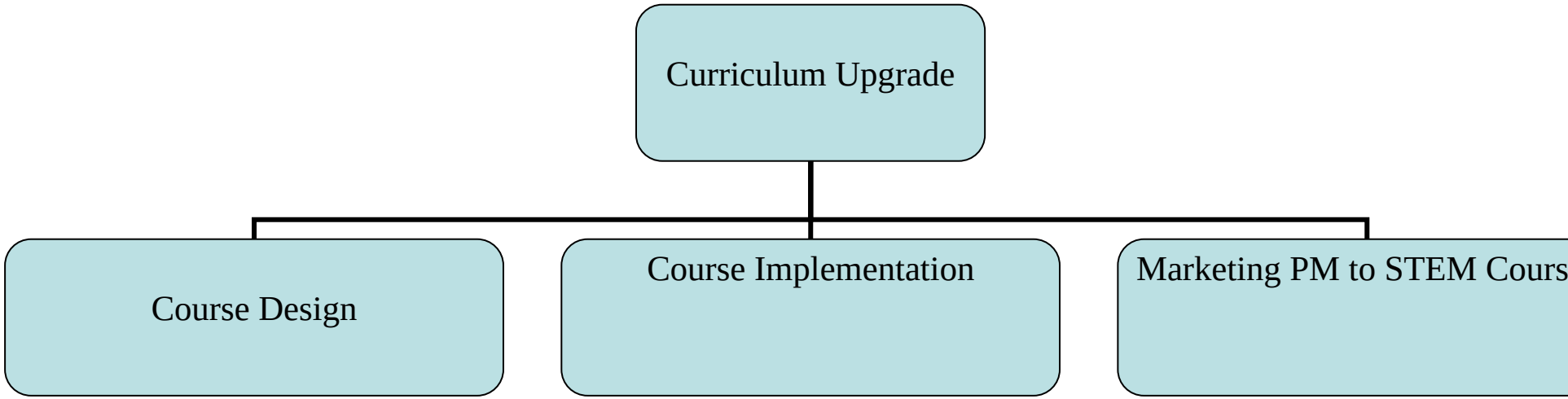
WBS Project, Elements, and Control Accounts



WBS Element and Control Accounts



WBS Element and Control Accounts



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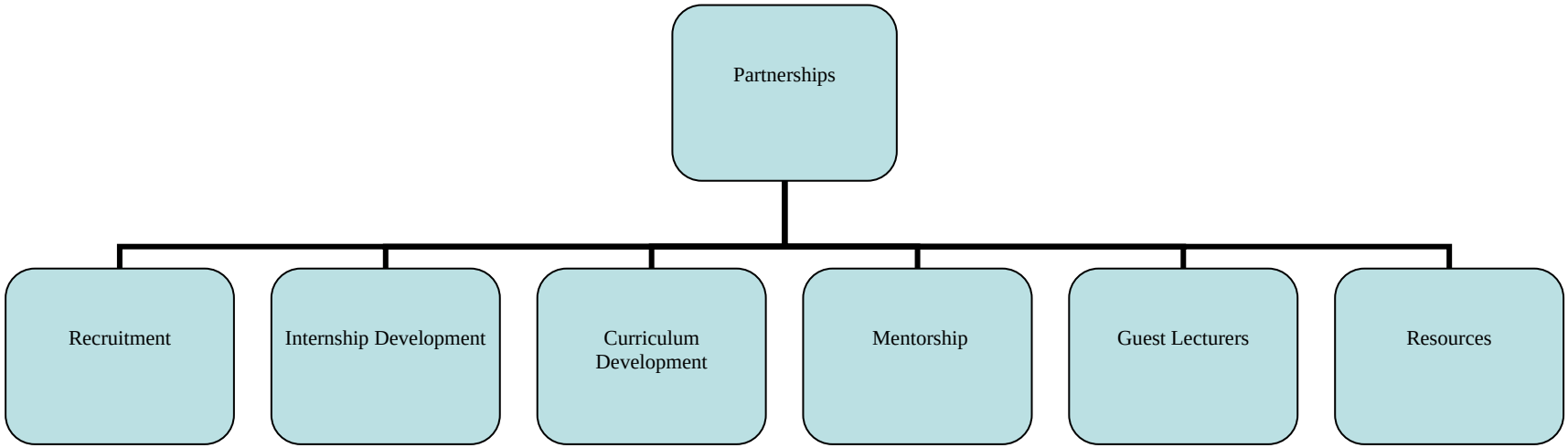
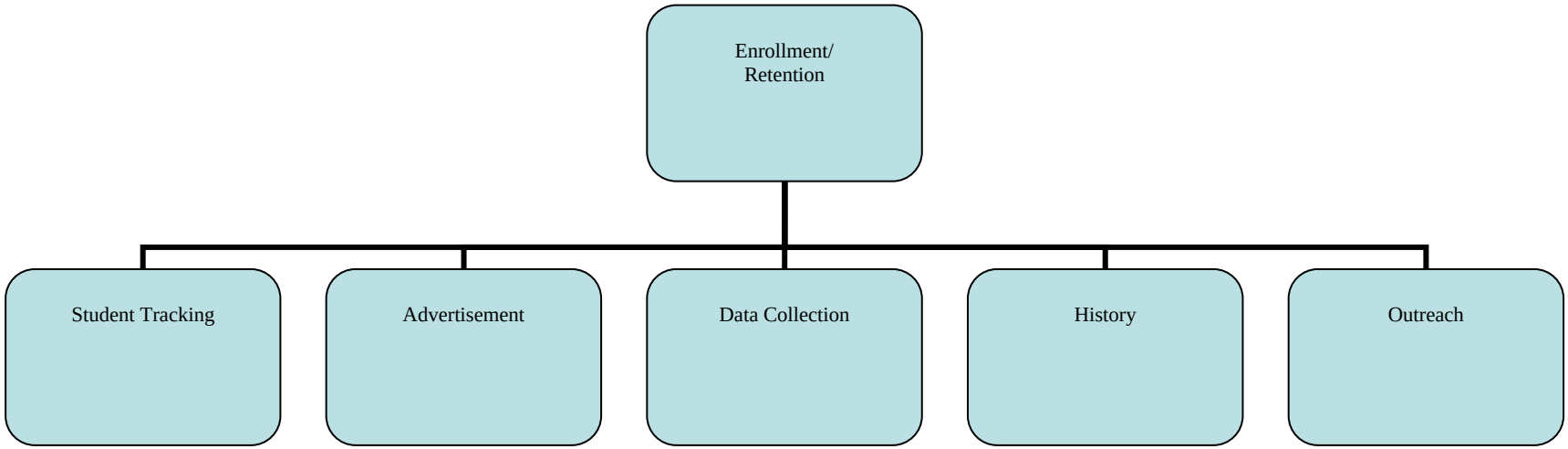
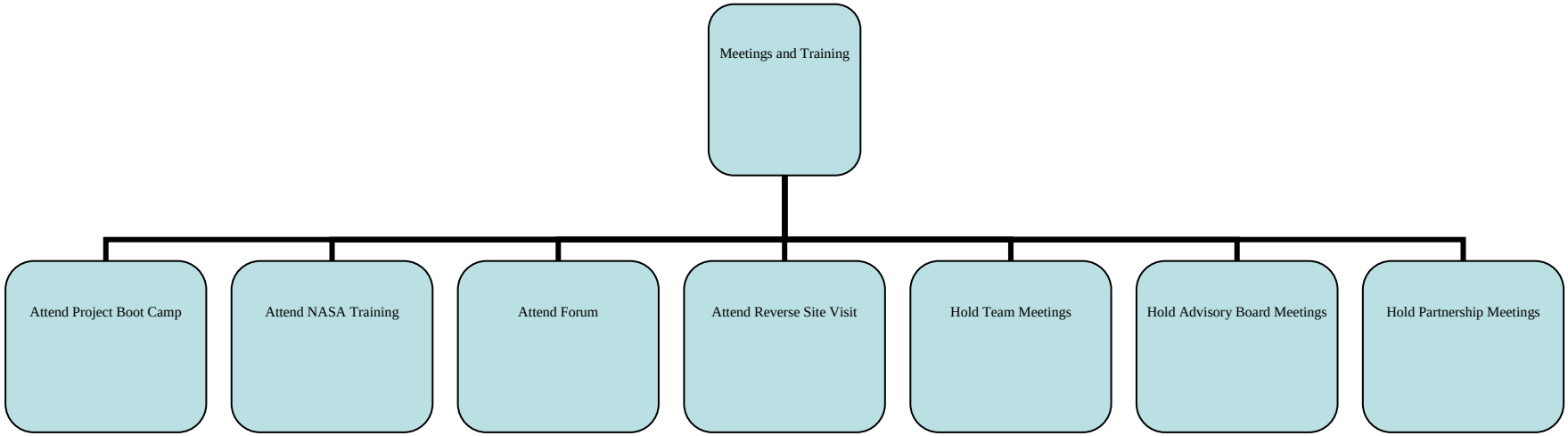


WBS Element and Control Accounts



WBS Control Account and Work Packages



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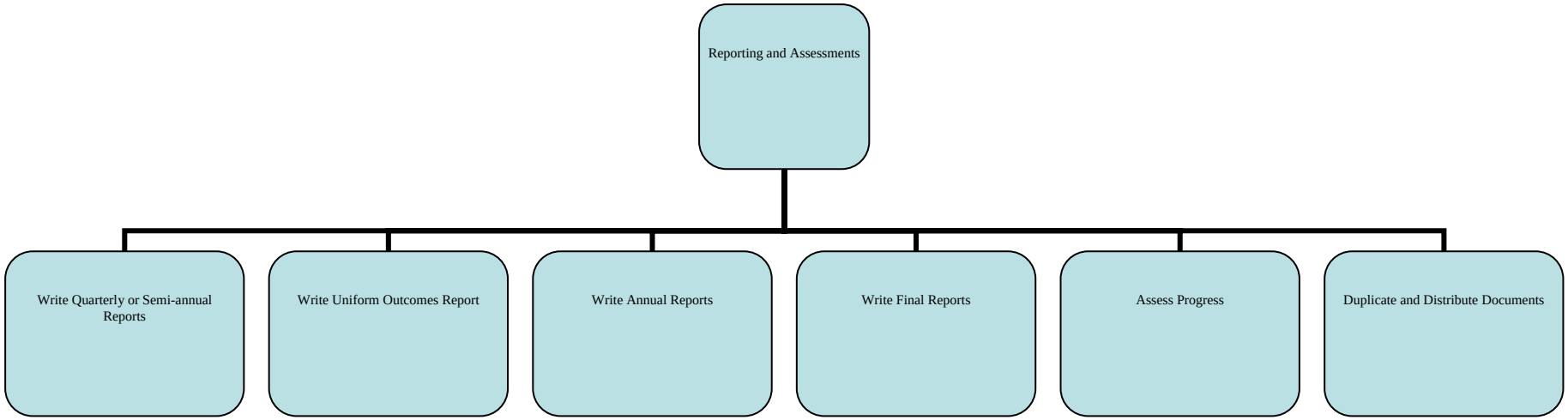
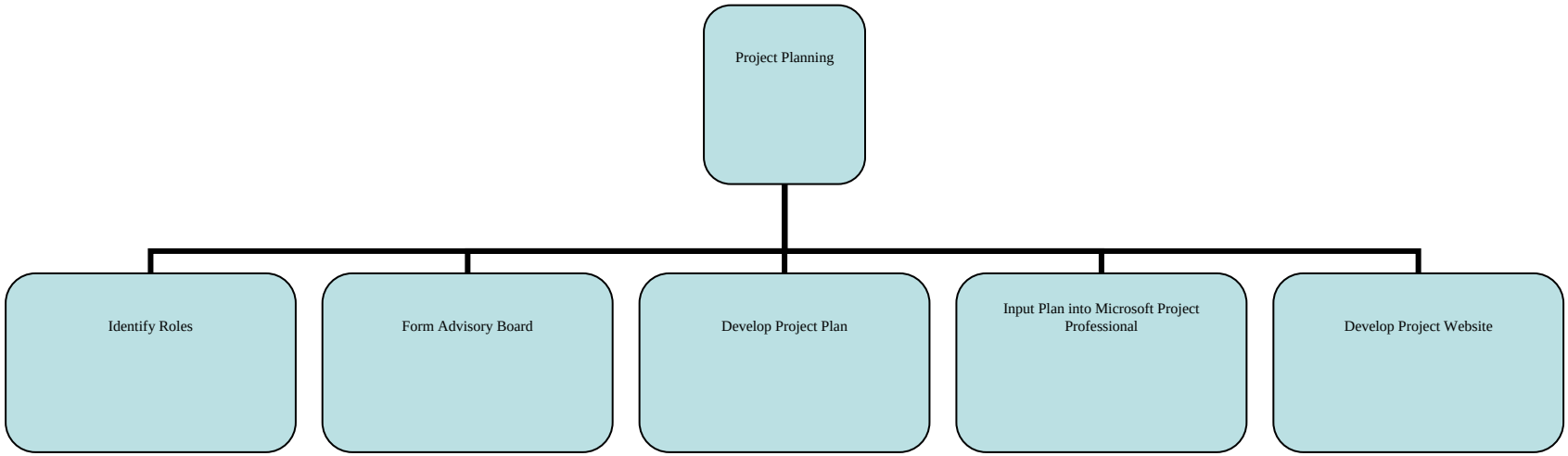
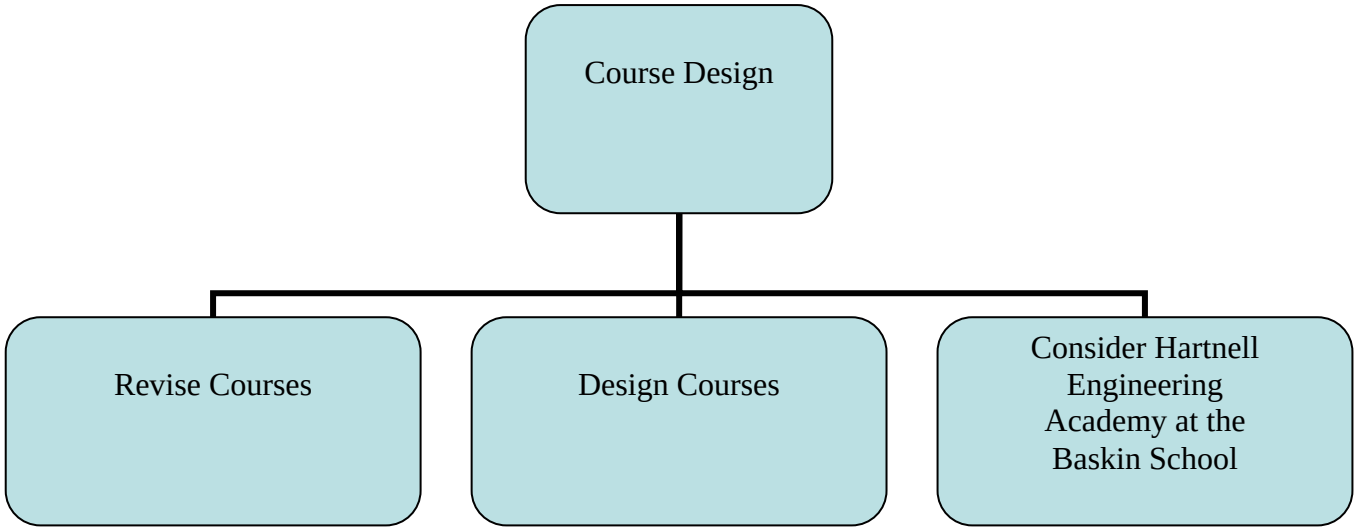


WBS Control Account and Work Packages



WBS Control Account and Work Packages



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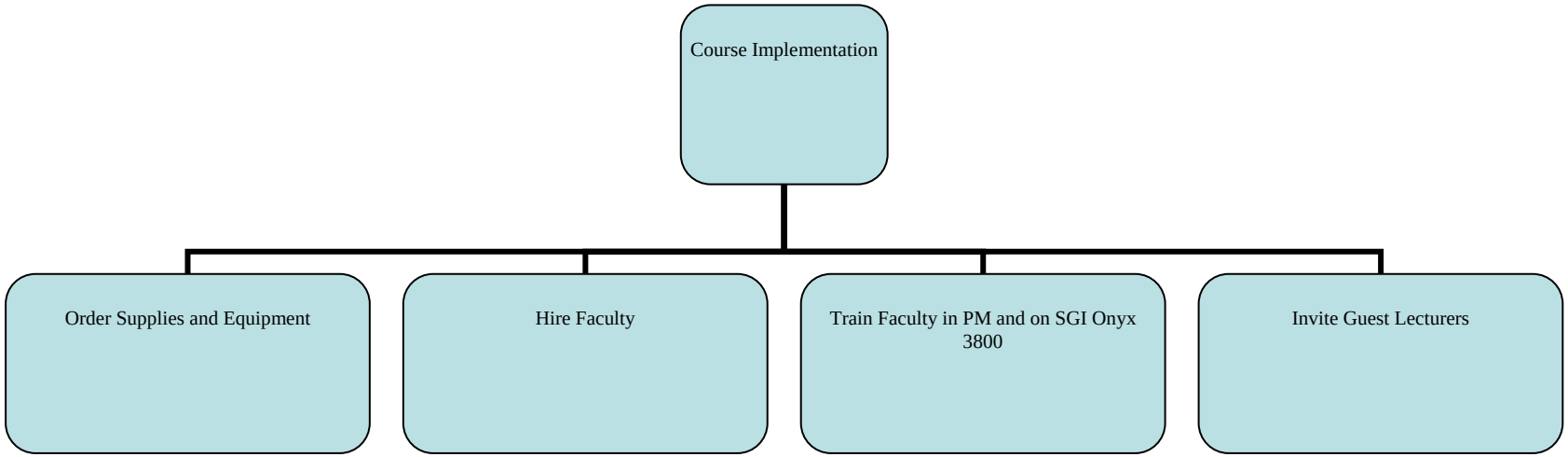
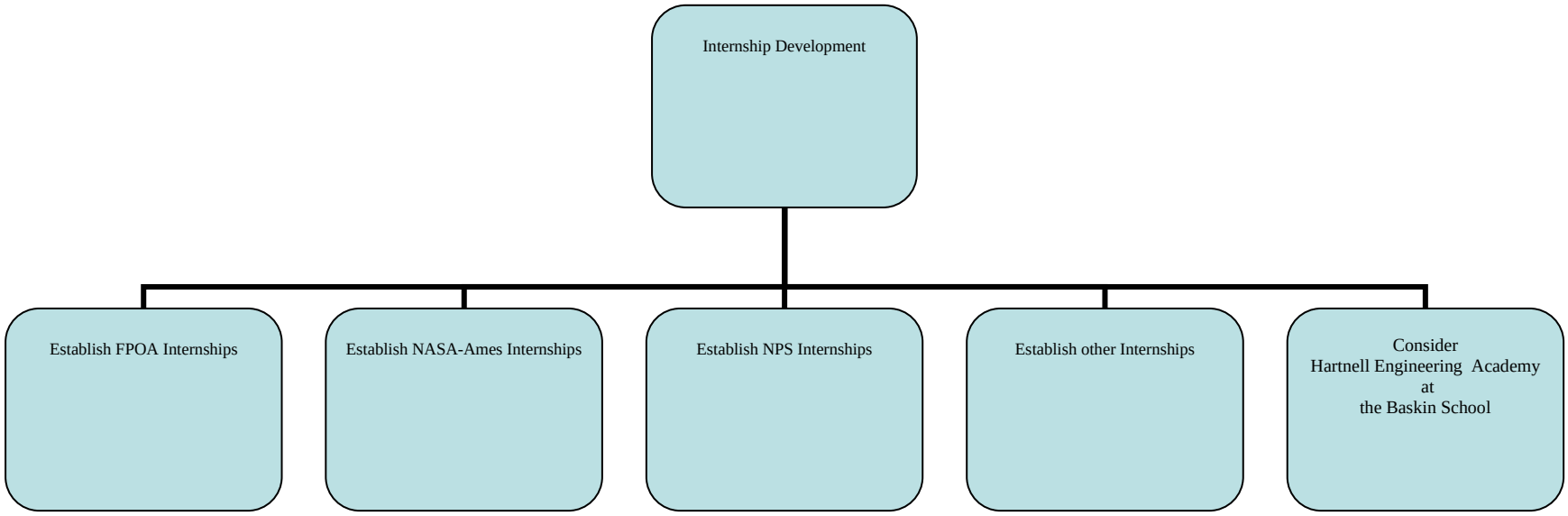


WBS Control Account and Work Packages



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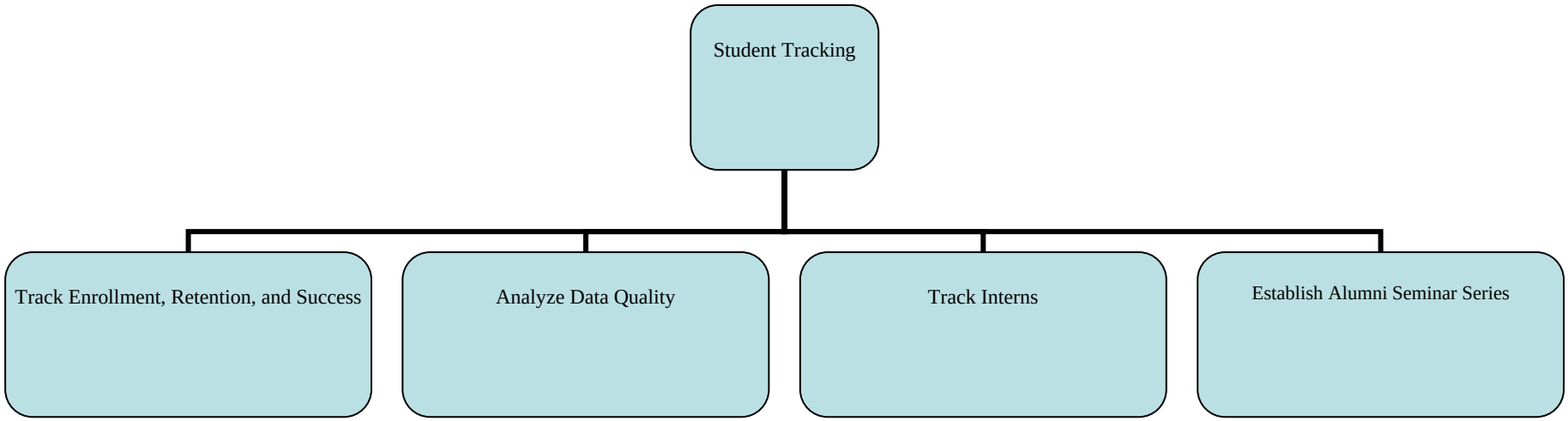
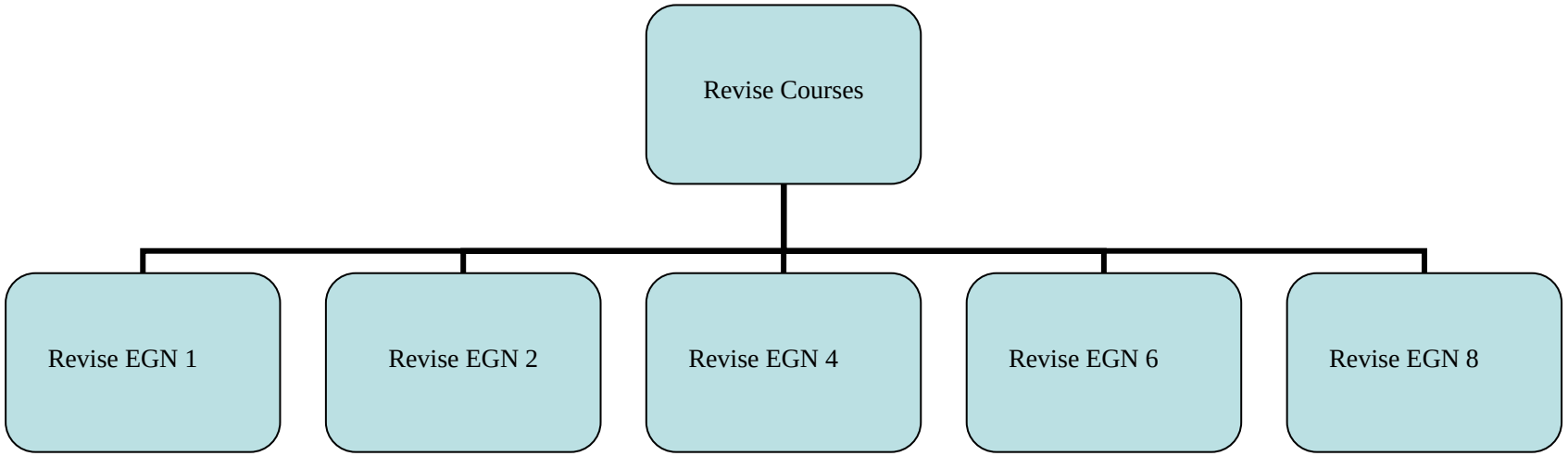
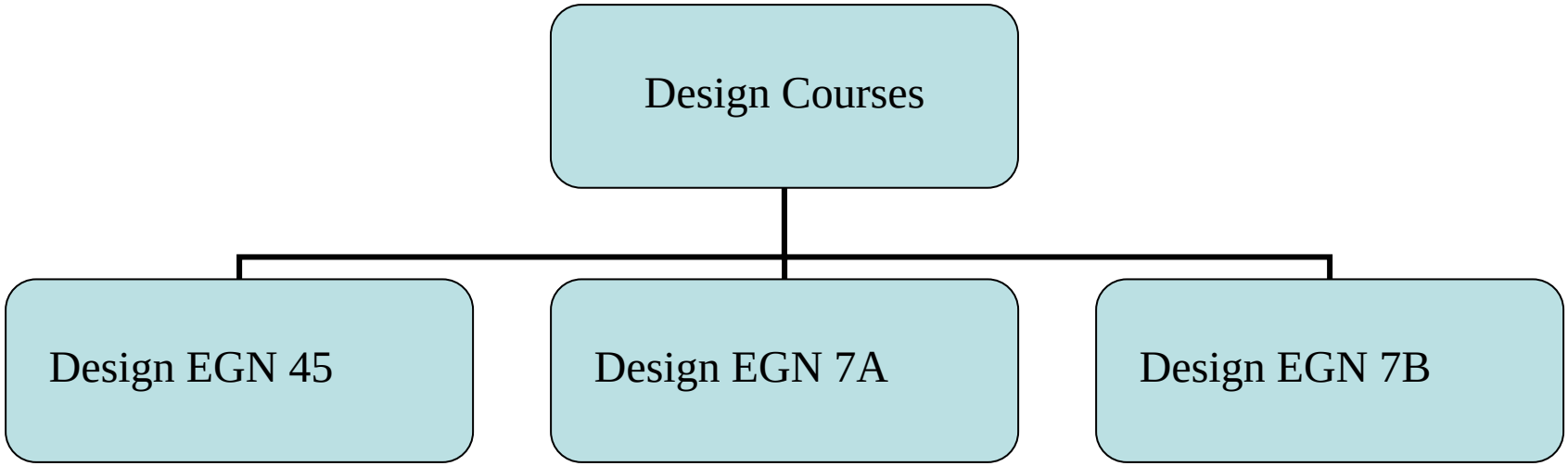


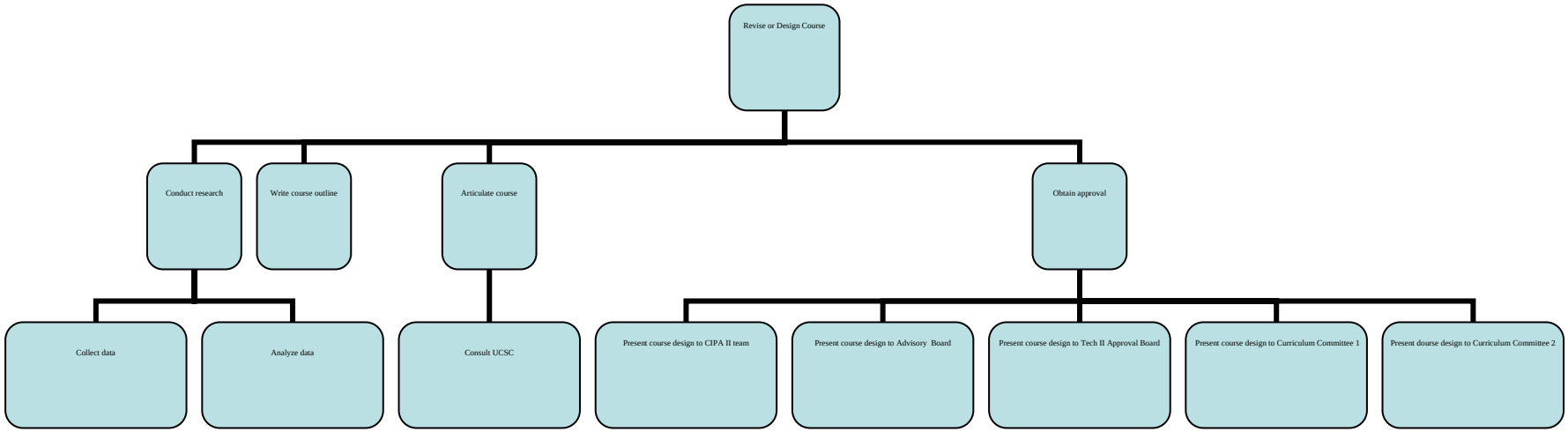
WBS Work Package and Tasks



WBS Work Package and Tasks



Under each of the 8 Tasks (also known as “schedule activities”) labeled Revise EGN 1, Design EGN 45, etc.,
we have the following identical structure of subtasks.



3.2 WBS Dictionary

The WBS dictionary is an alphabetical listing of Elements, Control Accounts, and Work Packages. This allows for quick referencing and for definitions where needed.

3.2.1 WBS Dictionary for the Elements

Curriculum Upgrade
Partnerships
Project Management
Enrollment/Retention—A major thrust of the project is to increase enrollment, retention, and success of students in engineering courses, and in STEM courses generally, here at Hartnell College.

3.2.2 WBS Dictionary for the Control Accounts

Advertisement—With regard to increasing enrollment, an important part of our success will depend on making the public aware of what engineering courses (and other STEM courses) are offered at Hartnell, particularly with regard to project management.
Course Design
Course Implementation
Curriculum Development—Partner institutions will be involved in curriculum development to assure that articulation requirements are met.
Data Collection
Guest Lecturers—Guest lecturers will be invited from the STEM community to educate and inspire our students.
History--This is the research and promulgation at Hartnell College of the history of STEM culture among the indigenous peoples of the Americas.
Internship Development
Marketing PM to STEM Courses—There are many places in which project management principles can be informally infused into the presently existing STEM curriculum.
Meetings and Training
Mentorship—Mentorship of students
Outreach—Together with the Advertisement and History control accounts, this control account is part of the effort to increase community awareness of the engineering program at Hartnell, and consequently to increase enrollment in STEM courses at Hartnell.
Project Planning
Recruitment—This refers to partners and partnerships.
Reporting and Assessments
Resources
Student Tracking

3.2.3 WBS Dictionary for the WBS Work Packages

Assess Progress
Analyze Data Quality—Analyze the quality of enrollment, retention, and success data.
Attend Forum—This is the CIPA II Project Management Forum at which attendance is required by UNCFSP.
Attend NASA Training
Attend Project Boot Camp—This is the CIPA II Boot Camp at which attendance is required by UNCFSP.
Attend Reverse Site Visit
Consider Hartnell Engineering Academy—A feasibility study will be done for the Hartnell Engineering Academy at the Jack Baskin School of Engineering at UCSC.
Design Courses--EGN 45, EGN 7A, EGN 7B are the prospective engineering courses to be designed.
Develop Project Plan
Develop Project Website
Duplicate and Distribute Documents
Establish FPOA Internships
Establish NASA-Ames Internships
Establish NPS Internships
Establish other Internships
Form Advisory Board
Hire Faculty
Hold Advisory Board Meetings
Hold Partnership Meetings
Hold Team Meetings
Identify Roles
Input Plan into Microsoft Project Professional
Invite Guest Lecturers
Order Supplies and Equipment
Revise Courses—EGN 1, 2, 4, 6, and 8 are the prospective engineering courses to be revised.
Track Enrollment, Retention, and Success
Track Interns
Train Faculty in PM and on SGI Onyx 3800
Write Annual Reports
Write Final Reports
Write Quarterly or Semi-annual Reports
Write Uniform Outcomes Report

4. RESOURCES

CIPA II Team

- Dr. Edward Valeau, President-Superintendent
- Dr. Charlene Frontiera, Responsible Administrator, Dean of Math and Science
- Dr. Pimol Moth & Mr. Lin Sten, Co-PI, STEM faculty
- Mr. Andy Newton, Partnership Liaison, Planetarium Director
- Dr. Jesse Cude, Curriculum Advisor, Budget Manager, STEM faculty
- Mr. Jim Riley, Project Management Advisor, STEM faculty

Partner Institutions

The importance of the partner organizations, and particularly the people who represent them, cannot be overemphasized. NASA has particularly recognized the value of Hartnell's partnerships with advanced institutions. Under CIPA I, Hartnell established partnerships with the Center for Adaptive Optics at UCSC, NASA-Ames, and Konica Minolta. These partnerships helped to provide valuable expertise, resources, and networks, which continue to be useful in our efforts to promote the growth of the program. Under CIPA II, Hartnell will continue to build new partnerships and network with established ones.

The College has already confirmed participation from:

- Jack Baskin School of Engineering, University of California, Santa Cruz (UCSC)
- Center for Adaptive Optics (CfAO), an NSF Science and Technology Center at UCSC
- University Affiliated Research Center at NASA-Ames (UARC), Mountain View, CA
- Naval Postgraduate School (NPS), Monterey, CA
- Fremont Peak Observatory Association (FPOA), San Juan Bautista, CA
- Developing Effective Engineering Pathways (Project DEEP), an NSF outreach program for the Jack Baskin School

These partnerships will include, but are not limited to, cooperating on the development of curriculum for all courses, lab, and field activities; ensuring that all courses meet University of California and California State University articulation requirements; creating special projects and internship opportunities for students; providing seamless transition between the community college and the university; cooperating on minority student recruitment and support in science, technology, engineering, and math programs (using both institutions' Math, Engineering, and Science Achievement (MESA) programs as links and models); and ensuring updated transfer agreements are in place.

We will also work collectively with other CIPA II award recipients.

Partnership Representatives

- Dr. Michael Isaacson, Acting Dean, Jack Baskin School of Engineering at UCSC & Science Director of University Affiliated Research Center at NASA-Ames
- Ms. Lisa Hunter, Education and Human Resource Director, CfAO
- Mr. Mark Ammons, Graduate Student, Astronomy Department, UCSC
- Mr. Bautista Fernandez, Graduate Student, Engineering Department, UCSC
- Dr. Christopher Brophy, Mechanical and Astronautical Engineering Faculty, NPS
- Mr. Doug Brown, Vice President, Board of Directors, FPOA

Hartnell College STEM Faculty

At Hartnell there are 30 equivalent full-time STEM faculty. These personnel will be available to CIPA II as the need arises.

Project Advisory Board

- CIPA II Team
- Dr. Michael Isaacson, Baskin School/UARC
- Ms. Lisa Hunter, CfAO
- Ms. Barbara Love, UCSC Articulation Officer
- Dr. Christopher Brophy, NPS
- Dr. Ignacio Pando, Hartnell STEM Counselor
- Ms. Beverly Grova, Hartnell Dean of Institutional Advancement
- Mr. Andy Newton, Board Chair, CIPA II Partnership Liaison

NASA Administrative Fellowship Program (NAFP) fellows

The NAFP fellows are GS13 employees, trained in project management, and are available to communicate by telephone and e-mail, visit Hartnell College, and possibly to come for a semester to teach at Hartnell College at no cost to Hartnell or the grant.

United Negro College Fund Special Programs (UNCFSP)

The Integrated Communications Technology Center (ICTC) of the UNCFSP serves as a portal for access to the sophisticated SGI Onyx 3800 computer, which will be available to the CIPA II grantees for application to any CIPA related projects.

MESA

MESA supplies STEM students with support services such as tutoring, supplemental instruction, academic excellence workshops, and group study.

Money

NASA CIPA II funds ($125,000 in the first year, contingent $125,000 in the second year, contingent $150,000 in the third year) will supply the main funding for this project. There will be ancillary institutional support through Hartnell College funds. It is probable that leveraged funds will arise through partnerships. Donor funding is also a possibility.

Facilities

Lectures and labs will be assigned to our 'smartest' laboratory in Merrill Hall, M8. M8 was designed to support our engineering circuits lab. Additional equipment, hardware, and software will be added to specifically support the aims of this project. Students may also have access to advanced level laboratory facilities at UCSC and NASA-Ames.

Equipment

Current Hartnell College equipment, equipment to be purchased as part of CIPA II grant (course specific purchases), UNCFSP Integrated Communications Technology Center (ICTC), and equipment based at partner institutions.

Administrative

Reproduction, trip planning, business services, office space, clerical supplies, etc.

5. SCHEDULE MANAGEMENT

5.1 Project Activities

Sources of project activities are the WBS, the Scope Statement, and page 127 of the PMBOK. Many of our work packages are not broken down into activities; consequently, many of our work packages are taken as the activity to be inserted into Microsoft Project.

5.2 Activities Logical Sequence and Duration

The Gantt chart view shows the logical sequence and duration of the work packages and activities associated with them. This is shown in Table 5-1.

Table 5-1: Gantt Chart

ID		Task Name	Duration	Start	Finish
1		CIPA II Project	0 days	Sun 1/1/06	Sun 1/1/06
2		CA: Project Planning	0 days	Sun 1/1/06	Sun 1/1/06
3		Identify Roles	1 day	Mon 1/30/06	Mon 1/30/06
4		Form Advisory Board	99 days	Mon 1/30/06	Thu 6/15/06
5		Develop Project Plan	142 days	Mon 1/30/06	Tue 8/15/06
6		Input Plan into Microsoft Proje	81 days	Fri 5/26/06	Fri 9/15/06
7		Develop Project Website	153 days	Mon 1/30/06	Wed 8/30/06
8					
9		CA: Reporting and Assessme	0 days	Sun 1/1/06	Sun 1/1/06
10		**Write Quarterly Reports**	**138 days**	**Wed 4/5/06**	**Fri 10/13/06**
14		Duplicate and Distribute Docu	1 day	Mon 10/16/06	Mon 10/16/06
15		**Write Semi-annual reports**	**270 days**	**Thu 7/5/07**	**Tue 7/15/08**
18		Duplicate and Distribute Docu	1 day	Wed 7/16/08	Wed 7/16/08
19		Write Uniform Outcomes Rep	1 day?	Mon 1/30/06	Mon 1/30/06
20		Duplicate and Distribute Docu	1 day	Tue 1/31/06	Tue 1/31/06
21		**Write Annual Reports**	**267 days**	**Mon 1/22/07**	**Tue 1/29/08**
24		Duplicate and Distribute Docu	1 day	Wed 1/30/08	Wed 1/30/08
25		Write Final Report(s)	14 days	Tue 2/10/09	Fri 2/27/09
26		Duplicate and Distribute Docu	1 day	Mon 3/2/09	Mon 3/2/09
27		Assess Progress	1 day?	Mon 1/2/06	Mon 1/2/06
28					
29		CA: Meetings and Training	0 days	Sun 1/1/06	Sun 1/1/06
30		Attend Project Boot Camp	5 days	Mon 2/20/06	Fri 2/24/06
31		Attend Forum	4 days	Mon 6/5/06	Thu 6/8/06
32		Attend NASA Training	1 day?	Mon 1/2/06	Mon 1/2/06
33		Attend Reverse Site Visit	1 day	Thu 3/9/06	Thu 3/9/06

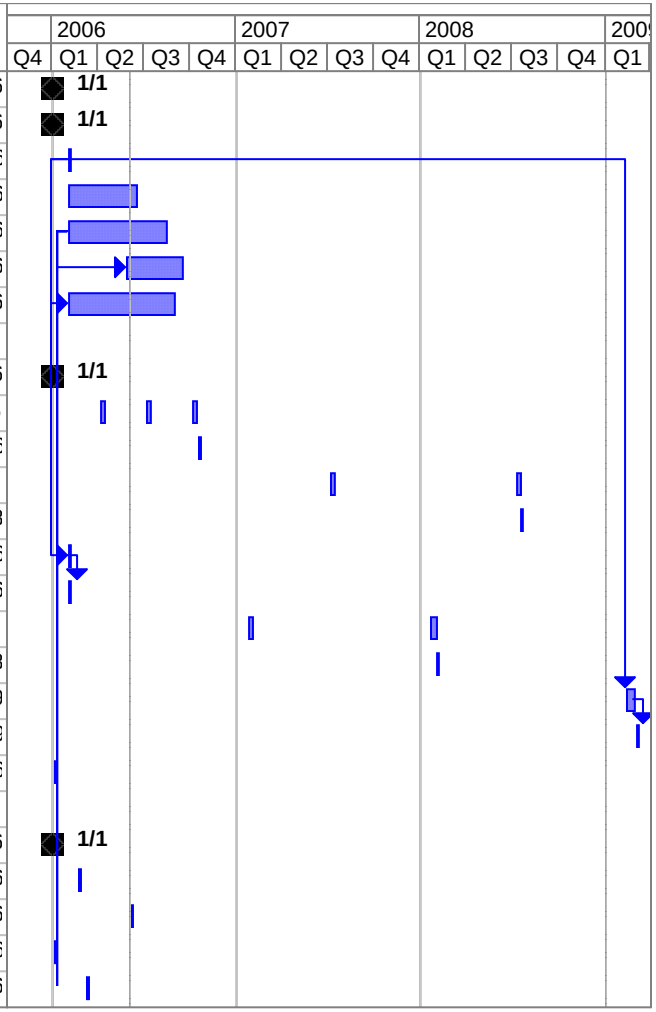


Table 5-1 (continued): Gantt Chart

ID	Task Name	Duration	Start	Finish
34	**Hold Team Meetings**	**783 days**	**Mon 1/30/06**	**Mon 1/26/09**
114	**Advisory Board Meetings**	**786 days**	**Mon 1/2/06**	**Thu 1/1/09**
122	**Hold Partnership Meetings**	**868 days**	**Mon 2/6/06**	**Mon 6/1/09**
134				
135	CA: Course Design	0 days	Sun 1/1/06	Sun 1/1/06
136	Revise EGN 1	86 days	Mon 9/4/06	Sun 12/31/06
137	Offer EGN 1	1 day?	Mon 8/20/07	Mon 8/20/07
138	Revise EGN 2	86 days	Mon 9/4/06	Sun 12/31/06
139	Offer EGN 2	1 day?	Mon 8/20/07	Mon 8/20/07
140	Revise EGN 4	110 days	Tue 1/2/07	Mon 6/4/07
141	Offer EGN 4	1 day?	Wed 1/16/08	Wed 1/16/08
142	Revise EGN 6	110 days	Tue 1/2/07	Mon 6/4/07
143	Offer EGN 6	1 day?	Wed 1/16/08	Wed 1/16/08
144	Revise EGN 8	131 days	Fri 6/15/07	Fri 12/14/07
145	Offer EGN 8	1 day?	Fri 8/15/08	Fri 8/15/08
146	Design EGN 45	185 days	Mon 4/3/06	Fri 12/15/06
147	Offer EGN 45	1 day?	Wed 8/15/07	Wed 8/15/07
148	Design EGN 7A	88 days	Wed 8/15/07	Fri 12/14/07
149	Offer EGN 7A	1 day?	Fri 8/15/08	Fri 8/15/08
150	Design EGN 7B	100 days	Tue 1/15/08	Mon 6/2/08
151	Offer EGN 7B	1 day?	Thu 1/15/09	Thu 1/15/09
152	Consider Hartnell Engineering	90 days	Mon 5/15/06	Fri 9/15/06
153				

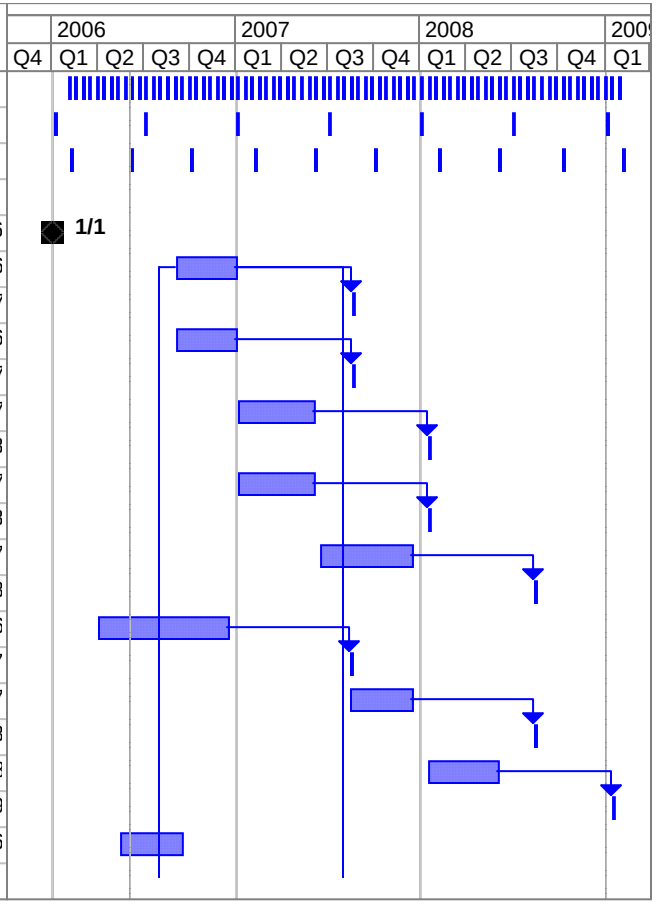


Table 5-1 (continued): Gantt Chart

ID		Task Name	Duration	Start	Finish
154		CA: Course Implementation	0 days	Sun 1/1/06	Sun 1/1/06
155		Order Supplies	598 days?	Mon 9/4/06	Mon 12/15/08
156		Hire Faculty	360 days	Wed 8/1/07	Mon 12/15/08
157		Train Faculty in PM and on S	753 days	Mon 1/30/06	Mon 12/15/08
158		Invite Guest Lecturers	749 days	Fri 2/3/06	Mon 12/15/08
159					
160		CA: Marketing PM to STEM (	0 days	Sun 1/1/06	Sun 1/1/06
161		Work Package	753 days	Mon 1/30/06	Mon 12/15/08
162					
163		CA: Recruitment	0 days	Sun 1/1/06	Sun 1/1/06
164					
165		CA: Internship Development	0 days	Sun 1/1/06	Sun 1/1/06
166		Establish FPOA Internships	773 days	Mon 1/2/06	Mon 12/15/08
167		Establish NASA-Ames Interns	773 days	Mon 1/2/06	Mon 12/15/08
168		Establish NPS Internships	773 days	Mon 1/2/06	Mon 12/15/08
169		Establish Other Internships	773 days	Mon 1/2/06	Mon 12/15/08
170					
171		CA: Curriculum Development	0 days	Sun 1/1/06	Sun 1/1/06
172					
173		CA: Mentorship	0 days	Sun 1/1/06	Sun 1/1/06
174		Work Package	678 days	Mon 5/15/06	Mon 12/15/08
175					
176		CA: Guest Lecturers	0 days	Sun 1/1/06	Sun 1/1/06
177		Work Package	749 days	Fri 2/3/06	Mon 12/15/08
178					

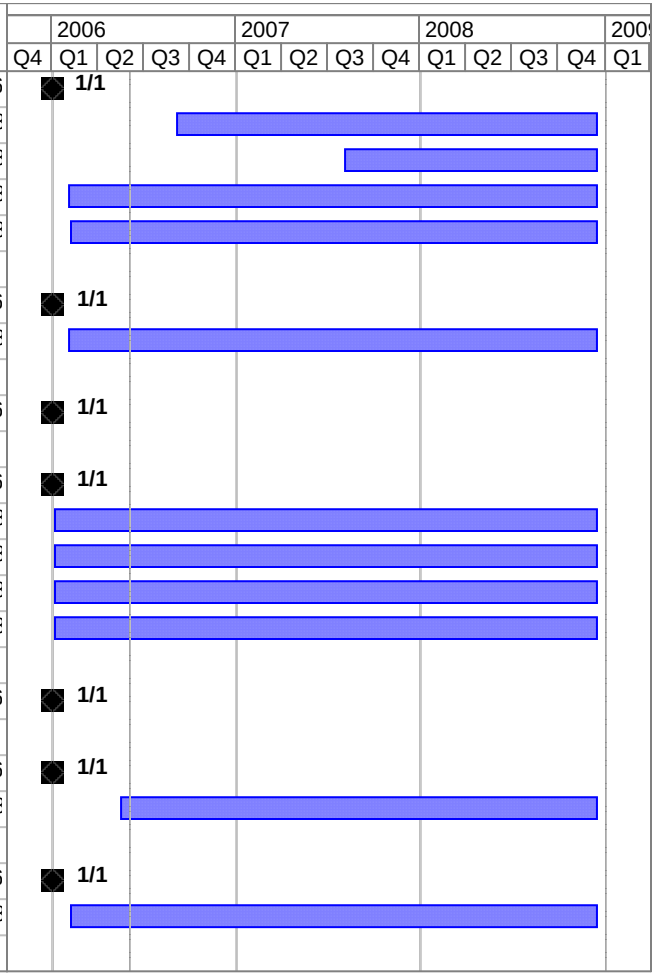
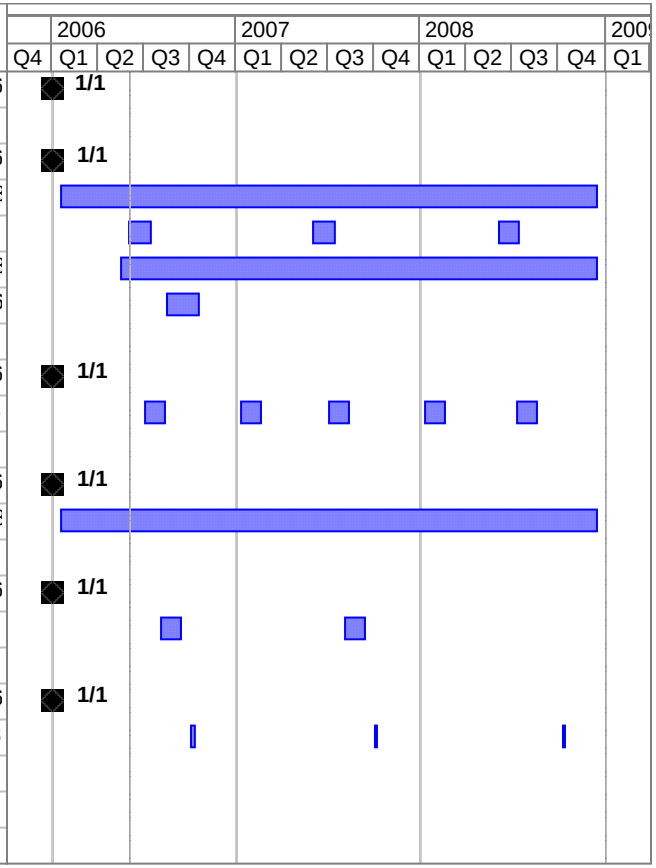


Table 5-1 (continued): Gantt Chart

ID		Task Name	Duration	Start	Finish
179		CA: Resources	0 days	Sun 1/1/06	Sun 1/1/06
180					
181		CA: Student Tracking	0 days	Sun 1/1/06	Sun 1/1/06
182		Track Enrollment, Retention,	763 days	Mon 1/16/06	Mon 12/15/08
183		**Analyze Data Quality**	**553 days**	**Thu 6/1/06**	**Thu 7/10/08**
187		Track Interns	678 days	Mon 5/15/06	Mon 12/15/08
188		Establish Alumni Seminar Se	44 days	Tue 8/15/06	Sun 10/15/06
189					
190		CA: Advertisement	0 days	Sun 1/1/06	Sun 1/1/06
191		**Work Package**	**557 days**	**Mon 7/3/06**	**Fri 8/15/08**
197					
198		CA: Data Collection	0 days	Sun 1/1/06	Sun 1/1/06
199		Work Package	763 days	Mon 1/16/06	Mon 12/15/08
200					
201		CA: History	0 days	Sun 1/1/06	Sun 1/1/06
202		**Work Package**	**292 days**	**Tue 8/1/06**	**Tue 9/11/07**
205					
206		CA: Outreach	0 days	Sun 1/1/06	Sun 1/1/06
207		**Work Package**	**532 days**	**Mon 10/2/06**	**Fri 10/10/08**



5.3 Activity Network Diagram

The activity network diagram is an alternative view (as opposed to the Gantt chart viewpoint) of the activity data entered into Microsoft Project, which uses the precedence diagramming method (PDM). The PDM viewpoint is created automatically from the data that has already been entered to create the Gantt chart. The PDM chart for our project is at present too simplistic to add value at this time, and so it is not included here.

5.4 Critical Path

The critical path can easily be created using Microsoft Project after the Gantt chart is complete. Our project's critical path will lie in the course revisions and designs.

6. COST MANAGEMENT

6.1 Budget Detail Year One

Direct Labor

a. Salaries, wages (each position to be funded)	
Co-Principal Investigator (2) $1000/month x 12 months x 2 faculty	$ 24,000
Partnership Liaison (1) $500/month x 12 months	$6,000
Curriculum Advisor (1) $500/month x 12 months	$6,000
Project Management Advisor (1) $500/month x 12 months	$6,000
Other Faculty Support (1) $300/month x 12 months	$3,600
Clerical (1) $300/month x 12 months	$3,600
b. Fringe benefits	
Rate x Salaries (faculty) Co-PIs @30% others @ 15%	$ 10,440
Rate x Salaries (clerical)	$540
Rate x Salaries (students)	$ 0
Subtotal, direct labor	***$ 60,180***

Item CIPA II Request

a. Internships	
Jack Baskin School of Engineering (0)	$0
NASA-Ames (1 in-kind)	$0
NPS (4 @ $500 ea)	$2,000
CfAO (2 in-kind)	$0
FPOA (6 @ $500 ea)	$3,000
Subtotal, internships	***$5,000***
b. Equipment	
Wireless desktops for engineering design lab (10 @ $1400 ea)	$14,000
Dreamweaver website software	$280
Microsoft Project Professional (8 licenses)	$720
Server with networking software	$3,500
PMBOK manual (3 @ $50)	$150

c. Supplies

Circuits Simulation Software Package	$10,000

d. Copying, faxing N/A; in-kind from college

e. Office Space N/A; in-kind from college

Subtotal, equipment and supplies	***$28,650***

f. Travel

Travel to required conferences –	
CIPA training;	
Field trips to NASA/Ames,	
UC Santa Cruz and the Naval	
Postgraduate School	
Hotel $150/night x 15 = $2250; (2 co-PIs)	$4,500
Per Diem $50/day x 15 = $5750; (2 co-PIs)	$1,500
Mileage $25/day x 15 = $375; (2 co-PIs)	$750
Airline Tickets $700/ticket x 6	$4,200
Subtotal, travel	***$10,950***
Total Direct Costs, Year 1:	**$104,780**
Facilities and Administration Costs	
a. Indirect Costs	$10,400
Contingency	$9,820
SUBTOTAL (estimated costs), Year 1:	**$125,000**

6.2 Budget Detail Year Two

Direct Labor

a. Salaries, wages (each position to be funded)

Co-Principal Investigator (2)	$ 24,000
$1000/month x 12 months x 2 faculty	
Partnership Liaison (1)	$6,000
$500/month x 12 months	
Curriculum Advisor (1)	$6,000
$500/month x 12 months	
Project Management Advisor (1)	$6,000
$500/month x 12 months	
Other Faculty Support (1)	$3,600

$300/month x 12 months	
Clerical (1)	$3,600
$300/month x 12 months	

b. Fringe benefits

Rate x Salaries (faculty)	$ 10,440
Co-PIs @30% others @ 15%	
Rate x Salaries (clerical)	$540
Rate x Salaries (students)	$ 0

Subtotal, direct labor	***$ 60,180***

Item CIPA II Request

a. Internships

Jack Baskin School of Engineering (4@ $500 ea)	$2,000
NASA-Ames (3 in-kind)	$0
NPS (4 @ $500 ea)	$2,000
CfAO (2 in-kind)	$0
FPOA (6 @ $500 ea)	$3,000
Other Internships (tbd)	$3,000

Subtotal, internships	***$10,000***

b. Equipment

Adaptive Optics Demonstrator	$20,000
Wireless desktops for engineering design lab (2 @ $1400 ea)	$2,800

c. Supplies

Software (CAD modeling, Flight simulation and analysis)	$ 6,970
Payload supplies (sensors, telemetry, structural components)	$ 3,000
Rocket components and supplies:	
Rocket design kits for design lab (first year)	$ 3,000
Propellant chemicals, fiberglass, igniters, transponders, nozzles, avionics, etc.)	$ 2,000

d. Copying, faxing N/A; in-kind from college

e. Office Space N/A; in-kind from college

Subtotal, equipment and supplies	***$37,770***

f. Travel

Travel to required conferences –
CIPA training;
Field trips to NASA/Ames,
UC Santa Cruz and the Naval

Postgraduate School	
Hotel $150/night x 6 = $900; (2 co-PIs)	$1,800
Per Diem $50/day x 6 = $300; (2 co-PIs)	$600
Mileage $25/day x 6 = $150; (2 co-PIs)	$300
Airline Tickets $700/ticket x 4	$2,800
Subtotal, travel	***$ 5,500***
Total Direct Costs, Year 2:	**$113,450**
Facilities and Administration Costs	
a. Indirect Costs	$5,400
Contingency	$6,150
SUBTOTAL (estimated costs), Year 2:	**$125,000**

6.3 Budget Detail Year Three

Direct Labor

a. Salaries, wages (each position to be funded)	
Co-Principal Investigator (2)	$ 24,000
$1000/month x 12 months x 2 faculty	
Partnership Liaison (1)	$6,000
$500/month x 12 months	
Curriculum Advisor (1)	$6,000
$500/month x 12 months	
Project Management Advisor (1)	$6,000
$500/month x 12 months	
Other Faculty Support (1)	$3,600
$300/month x 12 months	
Clerical (1)	$3,600
$300/month x 12 months	
b. Fringe benefits	
Rate x Salaries (faculty)	$ 10,440
Co-PIs @30% others @ 15%	
Rate x Salaries (clerical)	$540
Rate x Salaries (students)	$ 0
Subtotal, direct labor	***$ 60,180***

Item CIPA II Request
a. Internships

Jack Baskin School of Engineering (6@ $500 ea)	$3,000
NASA-Ames (3 in-kind)	$0
NPS (4 @ $500 ea)	$2,000
CfAO (2 in-kind)	$0
FPOA (6 @ $500 ea)	$3,000
Other Internships (tbd)	$7,000
Hartnell Engineering Academy at the Baskin School: (10 students @ $500 each, 2 instructors $4,000 each)	$13,000
Subtotal, internships	***$28,000***

b. Equipment

Wireless desktops for engineering design lab (2 @ $1400 ea)	$2,800
Field laptop for launch telemetry and data analysis	$3,000
Flat screen display monitor	$5,000

c. Supplies

Software (CAD modeling, Flight simulation and analysis)	$ 6,970
Payload supplies (sensors, telemetry, structural components)	$ 3,000
Rocket components and supplies:	
Rocket design kits for design lab (first year)	$ 3,000
Propellant chemicals, fiberglass, igniters, transponders, nozzles, avionics, etc.)	$ 2,000

d. Copying, faxing N/A; in-kind from college

e. Office Space N/A; in-kind from college

Subtotal, equipment and supplies	***$ 25,770***

f. Travel

Travel to required conferences – CIPA training; Field trips to NASA/Ames, UC Santa Cruz and the Naval Postgraduate School	
Hotel $150/night x 6 = $900; (2 co-PIs)	$1,800
Per Diem $50/day x 6 = $300; (2 co-PIs)	$600
Mileage $25/day x 6 = $150; (2 co-PIs)	$300
Airline Tickets $700/ticket x 4	$2,800
NAFP Travel	$5,000
Subtotal, travel	***$10,500***
Total Direct Costs, Year 3:	**$124,450**

Facilities and Administration Costs **a. Indirect Costs**	$10,400
Contingency	$15,150
SUBTOTAL (estimated costs), Year 3:	**$150,000**

6.4 Cost Control

Cost control for this project is based on the project scope statement and the WBS. Thus, it depends on several features: most importantly, in Sections 6.1, 6.2, and 6.3 we have estimated all costs; also, we have a Budget Manager and a Responsible Administrator, both of whom will have the obligation to watch expenditures and monitor the budget.

7. RISK MANAGEMENT

7.1 Identify and Prioritize Risks

By definition, risks include opportunities (positive impacts) and threats (negative impacts). In this section, we have chosen to address only the threats to our project since they could potentially cause our project to fail and must, therefore, be given close attention. The potential risks, ranked in order of their probability of occurrence, for this project are:

1. qualified faculty and expertise to teach new and upgraded curriculum
2. enrollment and/or retention in new and upgraded curriculum
3. passing courses through curriculum committee on time
4. willingness of partners to buy in on special projects and internships
5. funding for support of special projects and internships
6. understanding of project management by faculty and PIs
7. CIPA project team unity

7.2 Estimate Probability of Occurrence and Impact

The probability of occurrence for the risks listed in Section 7.1 and its impact on cost, time, scope, and quality are assessed in Table 2. The probability and impact for each risk is ranked on a relative scale given by the descriptors: "very low", "low", "moderate", "high", and very "high". The definitions of these descriptors are summarized in Table 1 and are modeled after Figure 11-5 in the PMBOK Guide.

Table 1. Defined Conditions for Descriptors Used to Rate Risks

	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Probability	.05	.10	.20	.40	.80
Cost	Insignificant Cost Increase	< 10% Cost increase	10-20% cost increase	20-40 % cost increase	> 40 % cost increase
Time	Insignificant Time Increase	< 5% time increase	5-10% time increase	10-20% time increase	> 20% time increase
Scope	Scope Decrease Barely Noticeable	Minor areas of scope affected	Major areas of scope affected	Scope reduction unacceptable to UNCFSP	Project end item is effectively useless
Quality	Quality Degradation Barely noticeable	Only very demanding applications are affected	Quality reduction requires UNCFSP approval	Quality Reduction unacceptable to sponsor	Project end item is effectively useless

Table 2. Risks Rating Using Descriptors*

RISK #	PROBABILITY OF OCCURRENCE	COST IMPACT	TIME IMPACT	SCOPE IMPACT	QUALITY IMPACT
1	high	very high	very high	high	high
2	moderate	very low	low	moderate	low
3	moderate	very low	very high	high	high
4	very low	high	high	moderate	moderate
5	very low	very high	low	moderate	moderate
6	very low	low	high	very high	very high
7	very low	low	very high	very high	very high

*This table is modeled after Figure 11-5 from A Guide to the Project Management Body of Knowledge.

7.3 Risk Analysis and Response Strategies

In this section, we will analyze each risk separately and determine response strategies to address the risks with a rating of "moderate" or higher should they occur.

1. qualified faculty and expertise to teach new and upgraded curriculum

We rated the probability of this risk as "high" because, currently, we do not have a full-time engineering instructor employed at Hartnell. We offer several engineering courses that are taught by instructors who are knowledgeable on the subject area of engineering, but they typically divide their time between the engineering courses and either math or computer science courses. Thus, when we design a new engineering course, it might be difficult to identify a qualified instructor to teach it.

The most risky courses we have planned in our new course curriculum are the Engineering 7A/7B series. Here, students will work as a team to build and launch payloads from rockets. This course is risky because we currently do not have anyone who would have expertise in that area. We would need to rely heavily on the expertise of the professionals from our partnership with NPS. However, it is currently unclear as to whether we will be able to identify an instructor to teach the courses. We could also possibly identify a NAFP fellow who has expertise on rocketry to be a visiting fellow to our school. If we can secure a commitment from the fellow to teach at Hartnell College for at least a year or possibly two, we would be able to establish a stronger foundation for the course.

We are also currently conducting a feasibility study for the establishment of the Hartnell Academy at the Baskin School of Engineering, which we discuss in Section 1.3. With this option, students would be able to have access to state of the art equipment and facility as well as learn from individuals who are experts in their field. This is an attractive alternative to designing new engineering courses at Hartnell considering that we may not have the faculty to teach them. We have already received an enthusiastic

response from Michael Isaacson, the representative from UCSC's Jack Baskin School of Engineering, at the suggestion of the academy. We are currently assessing the feasibility and logistics of such a program.

2. enrollment and/or retention in new and upgraded curriculum

We rated the probability of this risk as "moderate". Initially, when we offer new engineering courses such as the EGN 45 Special Projects course, there might be low enrollment in these courses since students may not be aware of the offering. However, this will not affect the quality of such a course since these courses are designed for students to work one-on-one with the instructor or advisor. Students will learn more and receive more attention in a smaller classroom environment. However, we will ensure that students are aware of such courses by heavily marketing the courses. Some of our marketing strategies will be to post flyers about the course, inform instructors and counselors about the course so that they can encourage students to enroll, and announce the course in Physics Club meetings.

3. passing courses through curriculum committee on time

We rated this risk as "moderate". This risk is related to Risk #1 because the process of designing and passing courses through the curriculum committee will be immensely slowed down if we are not successful in identifying faculty who have the expertise to teach the new courses. As discussed in Risk #1, we have begun a feasibility study on the establishment of the Hartnell Academy at the Baskin School of Engineering as a response to this risk.

We have also set up a program advisory committee to give us feedback and advice as we design the new courses. The program advisory committee members (listed in Section 4) will ensure that the courses we develop will articulate with four year universities.

4. willingness of partners to buy in on special project and internships

We rated the probability of this risk as "very low" because the strength of our CIPA II grant lies in our strong partnerships with local universities and industry. We had already developed these strong relationships with our partners during the CIPA I grant. We are continuing this tradition with the CIPA II by maintaining existing partnerships and developing new ones. The representatives from our partnerships are very committed in collaborating with us to provide mentorship for our students in the special projects and internships.

5. funding for support of special projects and internships

We rated this risk as "very low" probability because we have a wealth of resources at our disposal provided by our partners. Although the CIPA II grant will be our primary and largest source of funding for this project, our partners will provide additional resources, which may take the form of state-of-the-art facilities and equipment and/or expertise and

matching funds. During the CIPA I grant, we were fortunate to receive large amounts of matching funds from our partners. We foresee the same level of commitment and resource matching from our partners in this project.

6. understanding of project management by faculty and PIs

We rated this risk as "very low" because we have faculty on campus who have received project management training in industry. Two of them belong to our CIPA II team. Additionally, in order to minimize this risk, we have strategically chosen to have two PIs instead of one in this project. With two PIs attending the project management training sessions sponsored by NCSFP and NASA, we will be more likely to be successful in infusing the proper project management content into the engineering curriculum.

When we infuse project management into the engineering course curriculum, Jim Riley, the CIPA II project management advisor, will be the instructor to teach the project management component of the courses. He has had several years of experience in project management in industry. He will be also be advised by the Co-PIs of the CIPA II. The instructor and co-PIs have all received copies of A Guide to the Project Management Body of Knowledge .

7. CIPA II project team unity

We rated this risk as "very low" because the members of our CIPA II project team are all 100% committed to ensuring the success of the project. During the first half year of the CIPA II grant, the members of the team have worked together exceptionally well to carry out the requirements of the grant. Our team is very diverse. We have members who have been employed at Hartnell for over 20 years, members who are new to the school, and members who have had project management training in industry. The diverse makeup of the team is a great strength of the project as each member adds to the project with their expertise and insights. Another strength of the project is the excellent communication between team members. Team members meet on a regular basis at a set time (almost once a week) to discuss the progress of the grant.

Our current responsible administrator, Dr. Charlene Frontiera, who has been a valuable asset and advocate of the project will be leaving Hartnell at the end of June, 2006. We are in the process of hiring a new dean for Math/Science/Nursing. We anticipate Board approval for the hire of the new dean on June 6th, 2006. Dr. Frontiera will start training the new dean on June 7th. There will be a learning curve and a period of adjustment for the new hire. However, given that our current team is very united in the project's mission, we foresee that the overall unity of the team will remain strong despite the potential risks associated with a new hire.

8. PROJECT REVIEW AND REPORTING

Sources of information about this section are the following: NASA and UNCFSP RFP CIPA II pages 14-15; Hartnell College CIPA II Proposal pages 12-13; and the CIPA II "Principal Investigator Handbook."

The formative evaluation process will provide a regular source of program feedback and performance information. The formative evaluation will assist in guiding on-going decision-making by the co-PIs, advisory board, dean, faculty, and others in implementing the project. The formative process will use qualitative and quantitative instruments and activities to gather data and track project progress.

The summative evaluation process will measure overall program effectiveness against stated goals and objectives and will make an overall assessment of project success. Through this process, sufficient evaluative and assessment information will be gathered so as to determine the future of the program and recommendations of needed changes. A summative report will be written by a professional outside evaluator. The summative process will use qualitative and quantitative instruments and activities to assess progress in implementing the project and achieving stated goals and objectives.

Most reports will be submitted to and reviewed by UNCFSP and NASA personnel. The dissemination section gives details on who will receive various reports.

8.1 Contents, Formats, and Due Dates for Reports

It cannot be overemphasized that reports will be delivered on time. The PIs are held responsible for getting this done.

In addition to individual format requirements for various required reports, there are format guidelines that will be followed for all reports. These guidelines (regarding fonts, page size, references, cover sheets, etc.) are given on page 7 of the CIPA II "Principal Investigator Handbook."

Reports include at least those that are due according to the following schedules.

<u>Quarterly, semi-annual, and annual reports</u>

These reports shall (1) describe major grant activities over the preceding program period, (2) describe the extent to which the project goals are being, or have been, attained; and (3) identify major challenges and problems and explain how they are being addressed. Grantees are strongly encouraged to submit reports that include both qualitative and quantitative data.

The format of the quarterly and semi-annual reports is given in the CIPA II "Principal Investigator Handbook." These reports will be no longer than five (5) pages, not counting supporting documentation.

A fiscal report will be part of the annual report. Grantees are strongly encouraged to make use of pictures when appropriate. The annual report format and annual fiscal report format are given in the CIPA II "Principal Investigator Handbook." Annual reports will be no longer than fifteen (15) pages, not counting supporting documentation.

14 April 2006, quarterly report (covering January-March)
14 July 2006, quarterly report (covering April-June)
13 October 2006, quarterly report (covering July-September)
31 January 2007, annual report (covering January-December)
15 July 2007, semi-annual report (covering January-June)
31 January 2008, annual report (covering January-December)
15 July 2008, semi-annual report (covering January-June)

Final report
The final report will include a final fiscal report and must not be longer than thirty (30) pages, not counting supporting documentation. The final report format and the final fiscal report format are given in the CIPA II "Principal Investigator Handbook." Two (2) final reports must be submitted in a bound hard copy.

The final report (covering the 3-year project) is due sixty (60) days after the end of the grant period, meaning that it is due by the end of February 2009.

Uniform Outcomes Reports
These reports pertain to the extent to which NASA is achieving its goal of increasing participation of minority colleges and universities in NASA's sponsored research and education programs and activities. All NASA Minority University Research and Education Program (MUREP) PIs and PIs at minority institutions (MIs) are required to report the results of their grants for the previous fiscal year. Performance Outcomes is a web-based data collection system designed to facilitate that reporting. These reports will be reviewed by NASA personnel, and their information will be used to support NASA's reports to OMB, the White House, Congress, and the American public.

end of academic year, (tbd) 2007
end of academic year, (tbd) 2008
end of academic year, (tbd) 2009

Additional reports may be required according to impromptu needs and requirements of NASA or UNCFSP.

Other reports
Hartnell College might have need of occasional internal reports that will serve to help create the above listed reports, help us understand the degree of progress or success of the project, or otherwise give us institutional insight into the over-all affect of our CIPA and possibly other combined or related activity.

8.2 Dissemination

Dissemination of information about this project is not limited to the above reports; however, the following groups are identified for minimum reporting purposes, and to make certain that the requirements of the project are met.

Group A: NASA, UNCFSP, external evaluator, Hartnell College CIPA II team
Group B: President of Hartnell College
Group C: Hartnell College CIPA II website manager, Hartnell Office of Instructional Research, CIPAII Advisory committee
Group D: other Hartnell College STEM faculty
Group E: the other 106 Community Colleges in California, libraries, public and private organizations

The reports to UNCFSP may (preferably) be filed by e-mail at CIPA@uncfsp.org Alternatively, these reports may be filed by conventional mail: The United Negro College Fund Special Programs Corporation, 2750 Prosperity Ave., Suite 6000, Fairfax, VA 22031, ATTN: CIPA Project Manager . [Does UNCFSP always take responsibility for sending the report forward to NASA?]

All other report recipients will receive reports as attachments to e-mail.

Table 3. Report Dissemination

	Quarterly	Semi-Annual	Annual	Final	Uniform Outcomes
Group A	X	X	X	X	X
Group B			X	X	X
Group C		X	X	X	X
Group D			X	X	X
Group E					X

8.3 Authorship

Any part of or the whole Hartnell CIPA II team will be involved in the authorship of reports. Nonetheless, the co-PIs will be the contacts for all reports. Beginning with the initial drafting and authorship, successive drafts will be tracked by date and time.

8.4 Methods of Project Evaluation

Methods of evaluation may differ between those reports that are required by UNCFSP or NASA and those that are required for internal purposes. Since the thrust of the project is to upgrade the engineering curriculum, particularly to include project management, and to increase student enrollment and retention in STEM courses, with an end goal of transferring more students to four-year engineering programs, progress on those issues will be used in the evaluations. The general nature of evaluations is covered in the following paragraphs.

Hartnell College will implement regular evaluations, at least in conjunction with those required reports described above, and perhaps more frequently.

Evaluation will be based on at least what is requested in the guidelines provided by UNCFSP.

With regard to student tracking, it will be necessary to track engineering student enrollment, retention, and success, and to compare at least the enrollment with that of the whole student body of Hartnell College. Due to many economic and other unforeseen factors, Hartnell College's success with engineering curriculum might need to be normalized against some other measure.

Internal evaluations will include, as a minimum, the direct issues of budget, schedule, and risks.

9. PROJECT CLOSEOUT PLAN

At the completion of the NASA-CIPA II project titled "Engineering Program Upgrade with Project Management" at Hartnell College, some of the activities described in this project plan will come to a close. On the other hand, the results of the upgrade will continue.

There will be closure on the following items:

- The budget will be zeroed, documented, and verified by Hartnell's Chief Financial Officer, the CIPA team budget manager, and the responsible administrator.
- All mandatory reports will be filed with NASA and UNCFSP.
- There will be an exit/conclusion signing.
- The CIPA team will make a presentation at the final NASA project review.
- Project materials will be filed with the Hartnell Research Office.
- A Hartnell College contact person will be assigned for continuing interaction with NASA and CIPA II regarding outcomes of the project after it is finished, including engineering enrollment figures in subsequent years.
- The CIPA Advisory Board and CIPA team will hold a debriefing, and will review and evaluate the outcomes of the project.
- A specific closeout plan activity that will be ongoing throughout the project is the inclusion of the Hartnell Research Office on the dissemination list for the annual project reports.

The continuation generally will be due to the momentum created by the project, and also will be due to the institutionalization of the upgrade. The continuation is composed of the following:

- The upgraded engineering curriculum will be institutionalized.
- The engineering program will be articulated for transfer into UCSC Jack Baskin School of Engineering and other four-year programs.
- Internships and special projects will continue.
- Recruitment and outreach will continue.
- The Hartnell Engineering Academy at the Jack Baskin School of Engineering will continue.
- The curriculum and project model will be disseminated to interested institutions.
- Tracking of transferred Hartnell graduates will continue.
- It is anticipated that the college will hire a full-time engineering faculty person with a background that fits the goals of this project, and if such a hiring occurs, it will be into an institutionalized position that will continue after the cessation of the CIPA II grant.
- Hartnell College's upgraded reputation with potential engineering students will continue.
- STEM faculty will have an increased awareness of project management.