**Annual Assessment Report Template**

*This form is intended to facilitate reporting program outcomes assessment to accrediting agencies, Board of Trustees, Strategic Planning Committee, and other internal or external audiences.*

*The department mission statement, PLO’s, curricular map and multi-year assessment plan should be posted on the departmental website.*

**Department: Physics**

**Date: Sept 15, 2015**

**Department Chair:**

1. **A. Program Learning Outcome (PLO) assessment**

|  |  |
| --- | --- |
| **Program Learning Outcome** | **Christian Orientation** |
| **Who is in Charge** | **Kenneth Kihlstrom (chair)** |
| [**Direct Assessment Methods**](http://www.westmont.edu/_offices/institutional_portfolio/program_review/eeresources_assessment.html) | **Faith/Learning paper in senior seminar:**  The students in the senior seminar were required to write a faith/learning paper examining their views of the interactions of faith and science. The prompt for the assignment (which we have found to have made a huge difference) is found in Appendix A. The rubric used to evaluate the assignment is in Appendix B. We collected faith/learning papers from the last two years and had them evaluated both by the chair and by an alum of the physics department, averaging the results. In addition we had a second member of the department review the papers (Michael Sommermann) and we discussed the results. |
| [**Indirect Assessment Methods**](http://www.westmont.edu/_offices/institutional_portfolio/program_review/eeresources_assessment.html) | **None this year (scheduled for 2015-6)** |
| **Major Findings** | We were looking to have 70% reach the advanced level with 90% at the proficient level or above (our benchmarks). As shown in the bar graph, all reached the proficient level and while in some areas the 70% mark was reached for advanced, it was not true across the board and not true for the overall score. Still, the results were pretty encouraging. Beyond the numbers, however is the sense received from the papers that students think seriously and deeply about the issue of how faith intersects with the academic content they are learning. Fundamentally this is the goal of this learning outcome. |
| **Closing the Loop Activities** | In departmental discussions, we were pleased with the results for the most part. There was agreement that Warren Rogers has done an excellent job with the senior seminar discussions of science and faith and the students had put good thought into the process. We will look to beef up the faith/science component earlier in the program (especially in the General Physics (Ph 21-1st year) course and Modern Physics (Ph 25-2nd year course). |
| **Discussion**  We found using the updated prompt for the assignment corrected the problem we had in our last six-year report where we found the papers written to be shallow. But also in 2011 we felt they missed the point of demonstrating a developed, well thought-out world view of the interaction of their faith and science. Instead we got papers describing personal moments of faith more appropriate to a personal testimony. In these current papers they laid out with depth of though of how their faith and views of science have evolved over their time at Westmont. They described the faith they came in with as often being a close reflection of their parent’s faith and their views of science being heavily influenced by either their parents or their youth groups. But that at Westmont they found themselves thinking through these issues on their own as they were challenged by new ideas in both their religious studies classes as well as their science classes. The end result is they found their own faith, their own worldview. I should note while in most cases their Christian faith deepened and clearly became their own, in some cases students moved away from an orthodox Christian faith. But they expressed this journey well and also expressed appreciation for an atmosphere that was supportive and respectful of them personally and giving them space to make their own decisions. | |

1. **B. Program Learning Outcome (PLO) assessment**

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| **Program Learning Outcome** | **Knowledge/Critical Thinking:** |
| **Who is in Charge** | **Kenneth Kihlstrom (Chair)** |
| [**Direct Assessment Methods**](http://www.westmont.edu/_offices/institutional_portfolio/program_review/eeresources_assessment.html) | **Senior Seminar Science Paper:** The students in the senior seminar were also required to write a five page paper on a topic in science (but especially related to physics or engineering/physics) of their choice (prompt in Appendix A). The rubric used to evaluate this paper is given in Appendix B. We collected science papers from the last two years and had them evaluated both by the chair and by an alum of the physics department, averaging the results. In addition we had a second member of the department review the papers (Michael Sommermann) and we discussed the results. |
| [**Indirect Assessment Methods**](http://www.westmont.edu/_offices/institutional_portfolio/program_review/eeresources_assessment.html) | **None this year (scheduled for 2015-6)** |
| **Major Findings** | The topics chosen ranged from the practical (things like solar energy) to the edge of current understanding (e.g. dark matter). What was especially clear was a passion for the topics chosen as students showed great depth (for the most part) in their papers. They combined a pedagogical ability to explain to others with an enthusiasm to learn themselves. The numerical results are given below.  The goal (benchmark) was to have 60% be at advanced (or “exemplary”) and 80% be proficient or above. As shown in the graphs all papers were at the proficient level or above and close to 60% (or more) reached the advanced/exemplary level. Thus was roughly what we were hoping for. But more than this, there was the sense of the students embracing the paper writing showing both an enthusiasm for the science and also a breadth of knowledge. |
| **Closing the Loop Activities** | In departmental discussions, we were pretty satisfied with the results of the senior papers. Again we wanted to credit Warren Rogers’ leadership in senior seminar. On the basis of these results we were planning no major changes. We did discuss some possible changes based on results we’ve been seeing in the Major Field Exam results but this activity will be focused on next year so we’ll wait to discuss it then. |
| **Discussion:** The senior papers are only a slice of critical thinking but really demonstrate two separate issues. First there is the depth of thinking. Has their base of learning provided a foundation to allow them to take on a issue of current interest and allow them to do the issue justice. But second have they acquired a passion for learning that drives them to understand more than they currently know, not to get a grade but to know something more deeply because they care. | |

1. **C. Program Learning Outcome (PLO) assessment**

|  |  |
| --- | --- |
| **Program Learning Outcome** | **Communication Skills** |
| **Who is in Charge** | **Kenneth Kihlstrom (Chair)** |
| [**Direct Assessment Methods**](http://www.westmont.edu/_offices/institutional_portfolio/program_review/eeresources_assessment.html) | **Science Paper and Faith Learning Paper:** Both of these papers functioned primarily towards other learning outcomes but also give direct input to the communications SLO. For this we primarily look at the “Style/Mechanics” “Organization” and “Clarity” section of the rubrics |
| [**Indirect Assessment Methods**](http://www.westmont.edu/_offices/institutional_portfolio/program_review/eeresources_assessment.html) | **None this year (scheduled for 2015-6)** |
| **Major Findings** | Although both charts are given above, I am including them here as well.  And the Science Paper:  Looking first at the style/mechanics results from the two papers, we see this falls below our benchmark in both cases for “advanced” work (we were looking for 60-70% to be advanced/exemplary but it was really more around 50%. But for the second benchmark (percentage reaching proficient), all the papers reached this goal so overall we were pleased. On the issues of organization and clarity, the students exceeded our benchmarks in all cases. |
| **Closing the Loop Activities** | **When we discussed the Communications SLO results as a department we made no plans to change anything** |
| **Discussion:** On of the strengths of a liberal arts education is that even in technical fields like science and engineering there is serious attention given to people and communications skills. We seek to instill and expect to see in our students a good quality of writing (and speaking). This we do see. Virtually all of them leave Westmont as competent if not exceptional writers. | |

1. **Follow-ups**

|  |  |
| --- | --- |
| **Program Learning Outcome** | **Theoretical and Experimental Skills** |
| **Who is in Charge** | **Kenneth Kihlstrom (Chair)** |
| **Major Findings** | In 2013-14 we sent out an alumni survey which differed significantly from the alumni survey we did for the last six year report. This survey had been developed in response to recommendations from our external review, which had encouraged us to get alumni more involved in the program. Part of this was to get advice from the alums both for us and for the students. This process is applicable primarily to the Theoretical and Experimental Skills outcome but also (to a lesser extent) to the Knowledge/Critical Thinking outcome. The survey and the raw tabulation (done by the Chair) of responses appear as Appendix B. The major findings of this survey were as follows:   1. Several encouraged more engineering courses be added (fluid mechanics, a materials course, computer software packages (e.g. MatLab), CAD/Solidworks classes. On the physics side, a true physics mechanics (with Lagrangians & Hamiltonians) is needed. [Knowledge/Critical Thinking Skills Learning Outcome] 2. Skills needed to develop: Besides the already mentioned CAD/MatLab skills, there were also desires for focusing on teamwork, real world problems, communication skills (writing/oral), good lab book record keeping skills [Skills both communication and theory/experimental learning outcomes] 3. What they looked for in a potential hire: Professional looking resume (clear, concise, well organized); skills listed and demonstrated; clear motivation, a demonstration of confidence with a willingness to take risks and a willingness to learn; good people skills: teamwork, well rounded; evidenced based skills and accomplishments, what was done outside of school. [Critical Thinking and Skills learning outcomes] 4. Advice for students: more personal projects and internships (even if unpaid), team based projects, bring in alumni to talk to students, develop non-technical skills and list them on resume, get on the Institutional Technology team to gain skills, explore the big questions, focus early on internships and career preparation [Critical Thinking and Skills learning outcomes] |
| **Closing the Loop Activities** | Some of the suggestions are already being implemented (putting MatLab into our lab courses, adding a pure physics mechanics course, focusing on internships) in response to the six year report and the external review. This coming year we will organize the alumni advice and pass it on to the students. We have also been bringing in alums to talk to the students and present seminars. This has been very beneficial. We have been pushing internships especially for the engineering oriented students and most have been pursuing them. |
| **Discussion** This survey had a different purpose than the one we did for the last six year report (and will do next year). That one was looking for indirect evidence on several of our SLO’s. But this one was to both increase the interactions between alums and our current students as well as to give feedback as to what we can do differently to become better. The advice from our external review on this was both insightful and helpful | |

**III. Other assessment or Key Questions-related projects**

|  |  |
| --- | --- |
| **Project** | **None** |
| **Who is in Charge** |  |
| **Major Findings** |  |
| **Action** |  |
| **Discussion** | |

**IV.** **Adjustments to the Multi-year Assessment Plan (optional)**

|  |  |  |
| --- | --- | --- |
| **Proposed adjustment** | **Rationale** | **Timing** |
| **Moved Faith/Learning paper to this year (2014-5)** | **Since we were doing the science papers this year it seemed to make sense to do both** | **2014-5 instead of 2015-6** |
| **Moved analysis of lab abstracts from this year to next year** | **Chose to focus on Faith/learning papers instead** | **2015-6 instead of 2014-5** |

**V. Appendices**

Appendix A

Faith/ Learning Paper Prompt:

A 2-3 page paper reflecting on how your faith has developed in interaction with your education in physics and more broadly with science during their time at Westmont. Think of this along three lines:

1. How has your faith evolved during your years at Westmont, as a function of your education in physics and engineering,
2. What is your current world view, and how do faith and science contribute to this current view.
3. Name any particular individuals (authors, speakers, mentors ...) who have been influential in your faith development, and how.

Science Paper Prompt:

Each of you will choose a topic on which to write a 5 page minimum paper (5 pages of text, double spaced and more for figures, etc.), and to present this work to the class in a 20 minute presentation (15 minute presentation and 5 minutes Q and A). These presentations will be scheduled during class time near the end of the semester. The topic of this paper and presentation is somewhat open and dependent on your individual interests, but must include an intentional focus on the physics or engineering of an area of student's interest.

Appendix B: Faith-Learning Writing Rubric

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Below Basic | Basic | Proficient | Advanced |
| **Ideas** | Shows minimal engagement with the topic, fails to recognize multiple dimensions & perspectives;  lacks even basic observations | Shows some engagement with the topic but without elaboration; offers basic observations but without original insight | Demonstrates engagement with the topic, recognizing multiple dimensions and/or perspectives; offers some insight | Demonstrates engagement with the topic, recognizing multiple dimensions and/or perspectives with elaboration and depth; considerable insight |
| **Support for Thesis** | Little or no evidence provided | Some evidence but not enough to develop argument in a unified way. Evidence may be inaccurate, irrelevant or inappropriate for the purpose of the essay | Evidence accurate, well documented, and relevant but not complete, well integrated, and/or appropriate for the purpose of the essay | Evidence accurate, well documented, relevant, complete, well integrated, and appropriate for the purpose of the essay |
| **Organiza-tion** | Organization is missing both overall and within paragraphs, Introduction and conclusion may be lacking or illogical. | Organization, overall and/or within paragraphs, is formulaic or occasionally lacking in coherence; few evident transitions. Introduction and conclusion may lack logic | Few organizational problems on any of the three levels (overall, paragraphs, transitions). Introduction and conclusion are effectively related to the whole. | Organization is logical and appropriate to assignment; paragraphs are well-developed and appropriately divided; ideas linked with smooth and effective transitions. Intro. and conclusion are effectively related to the whole. |
| **Style and Mechanics** | Multiple and serious errors of sentence structure; frequent errors in spelling, capitalization, punctuation hindering communication. No sign of proofreading | Sentences show errors of structure and little variety; errors of spelling, capitalization, punctuation cloud meaning. Insufficient proofreading | Effective and varied sentences; some errors in sentence construction; minor and rare errors in spelling, capitalization and punctuation | Each sentence structured effectively; rich and well-chosen variety of sentence styles and lengths; virtually free of mechanical errors |
| **Depth of World View** | Addresses neither faith nor science with personal or intellectual insight beyond platitudes or the trivial | Shows some insight in either faith or science but not both. Overly relies on the personal or intellectual to the expense of the other | Competently address both science and faith with insight and maturity. Displays knowledge of faith/science literature but brings own perspective | Provides a truly integrated view of science and faith, honoring both realms. Is able to support personal insights with wisdom from published literature. |
| **Overall** | In both content and writing quality the work is substandard | There is potential quality demonstrated but not sustained. | The writing and ideas combine to make an informative paper. | The insights demonstrated are remarkable and the writing is a pleasure to read. |

Appendix B: Physics Scientific Paper Rubric

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Below Basic** | **Basic** | **Proficient** | **Exemplary** |
| **Depth of Understanding of Physical Principles** | Contains mistakes of substance, misunderstands concepts | Accurately covers concepts on a level for a popular audience but nothing beyond | Describes nuances of the concepts and some applications | Shows thorough understanding from multiple sources. Provides info beyond the professor’s knowledge |
| **Integration of Various Branches of Physics** | Makes little effort to draw in the different branches of physics to the topic | Shows awareness of the how at least a couple of different areas come into play | Demonstrates how the various branches relate to the topic | Demonstrates the development of the field from the various sub-areas |
| **Mechanics of writing (Grammar, etc.)** | Poorly written with numerous mechanical mistakes and problems of grammar | Occasional mistakes, writing is readable but doesn’t flow very well | Few, if any, mistakes. Writing is fairly clear and straightforward | Writing shows an elegance of wording that draws the reader along. Enjoyable to read |
| **Clarity of Explanation** | Not clear the writer understands the topic. | There are basic explanations but do little to address obvious questions | The explanations are understandable to a reasonable reader. They anticipate questions and answer them | The explanations are clear and creative allowing the reader to have a good understanding on a first read |
| **Overall Quality** | Most categories rated as below basic. Clearly not much time and effort put into the paper | Categories range from below basic to proficient. Writer clearly gained knowledge in writing the paper | All areas at least basic with most in the proficient range. The knowledge gained by the writer is clearly expressed in the paper | All areas at least proficient. The paper in enjoyable to read and brings new knowledge to the reader (even a physics professor) |

****

** What course(s) would you recommend our students take that we don’t currently offer (or didn’t offer when you were here)?**

experience in Solidworks or AutoCad

materials class, Computer programming

MATLAB, C++, Solid Works, Solid Edge, Java, Ruby and/or LabVIEW

integration of physics and computers

EACH DISCIPLINE SHOULD WORK ON PRACTICAL APPLICATION IN ADDITION TO TEACHING THEORY.

Computer science from a scientist/engineer prospective

***Embedded programming seems to be needed at Raytheon***

*MATLAB and Excel.*

more specific engineering courses or an introduction to engineering

Technical writing for Engineers

digital design class preparation for doing embedded software breadboarded projects with little 8-bit microprocessors to interface to various peripherals

Verbal and written communication skills

Ability to work in teams

Problem solving sills

software tools like Matlab, SImulink, LabView, CAD sw, simulation/modeling/analytics SW.

CAD programming and Mathematica-type programs

Mechanics class focusing on Lagrangian mechanics is a must

Device Physics is a must have for people who work in the semiconductor industry

machine shop (or design class?)

Statistics with a Physical Science emphasis.

Stats

Stat Mech

CAD program (Solidworks w/ mechanics, PSPICE w/ circuits and electronics)

Matlab for mathematical simulation research and design

Labs or classes for learning coding for microcontrollers (Raspberry Pi - though it’s not really a microcontroller, or Arduino)

emphasize the circuits class a bit more, basic programming (PC/tablet/whatever

*Fluid Mechanics or Physics of Fluids*

A business class or two would have been useful for life and career. Another computer science class would also have been helpful.

*Materials Science & Engineering (using, for example, Callister's MS&E text)*

*- Introduction to Computational Methods (I.e. Essentials of Computational Chemistry, Theories and Models by Cramer)*

*- Introduction to Nanomaterials*

*- Physics of Energy-Related Materials*

Design for Manufacturing class (DFM or DFMA)

** What specific skills do you recommend we foster?**

drafting and CAD

MATLAB

oscilloscope usage

Design Thinking.  Identifying and solving real world problems.

hands on extracurriculars, competing in competitions for Robotics, Hackathons, Build Teams

Problem solving

THE 3-2 ENGINEERS RAN CIRCLES AROUND THE 4 YEAR ENGINEERING STUDENTS AT WASHINGTON UNIVERSITY IN REGARDS TO LEADERSHIP, VERBAL SKILLS AND OTHER PEOPLE SKILLS

"Learning how to learn" and scientific computing

***Java, C++, Intro to Circuit Design.***

*critical thinking and problem solving*

*networking and business skills*

*Connecting students with entrepreneurs and businesses*

Team building, team management and team dynamics.

Practical debugging and troubleshooting strategies

Grit.

library research and to write well. LabView, Mathematica, Matlab, and so forth

basic programming, matlab, 3D cad software skills

communication!  Writing, writing, writing, Know the generational differences in technology use/perspective

add an Engineering Management track that mixes engineering and business courses

Programming experience, Physics Labs a bit too guided, having students design their own experiments

I feel well served by the problem solving and fundamental understanding skills that were fostered at Westmont

MATLAB and even Solidworks or some other CAD program

problem solving.

The ability to learn/teach yourself. email etiquette,  writing to get to the point (with no jargon).

problem solve and think critically. foundation of Christian values

looking for graduate with top-notch technical  
degrees in fields like physics \*and\* lots of computing experience

Python and R are at the top of the list. In some sectors Matlab

Critical thinking and how to work through a problem using limited information

Communication skills. Knowing how to write well is always important in anything you do; also rudimentary public speaking skills

How to do novel experimental design (not just to measure the speed of light with an interferometer but to answer a question for which you could publish a paper using an interferometer).

CAD design (mechanical and electrical), machining, and soldering, Solidworks, working in a team and communication (both relational and technical

*keep on, keeping on'*

*More communication skills*

Communication. Communication. Communication.

experience presenting and communicating

- good habits for record keeping (lab notebooks, data analysis)

- use of scientific software such as Origin, MatLab, SolidWorks

- proficiency with Microsoft Office is assumed

working on the shop/manufacturing floor is invaluable

** Do you have or know of internship opportunities?**

Yes DL

several internship opportunities that go through DoE / LANL

TrueVision Systems

we have a mature internship program at Princess Cruises with roles that cover all aspects of the business. Each summer we bring in about 100 interns. Few would be in the engineering side, other than naval architecture, but plenty in finance, marketing, legal, and other commercial areas.

** Do you use LinkedIn for business connections? Some other resource?**

LinkedIn (2) and Facebook LinkedIn is pretty much the standard

I hate LinkedIn

personal connections win absolutely

***Facebook***

*Westmont Alumni directory is also very helpful*

** Are you open to students contacting you to learn about your career path?**

love to, Yes. Totally - they can reach out to via email ([konrad.jug@gmail.com](mailto:konrad.jug@gmail.com))

***embedded programming, C++, Radar, and anything to do with Electronic Warfare (frequencies, techniques, etc).  Cybersecutiy seems to be a booming field also***.

** What do you look for on a potential intern and/or employee’s resume?**

Resumes need to have as many skills as possible that have to do with the desired job. No student should have a universal resume. call after you apply

Personal interest and drive in a topic

rudimentary research experience or advanced lab helps for an intern.

a high GPA (usually 3.5+, but I'd recommend 3.75+), leadership in student organizations, and job experience (not necessarily technical, although you need more than yard work

some ability / experience with programming.

*Work experience and specific classes, Statics*

Mostly soft skills, a well-rounded person, a good framework of knowledge, the ability to learn, work independently and in a team

Layout.  The content tells me less than the presentation.  Time invested in graphic representation is time best spent.

Participation in Free Software projects would be a big plus

their LinkedIn and look at recommendations

what work and research experience they had, and what classes they took while in school. I'd look for experience both with computers / lab test equipment and also with hands-on non-tech jobs like construction. communicating effectively

Communicate respect and confidence without letting it slip into false humility or self-deprecation. Demonstrate not only your technical skills (languages, software, etc.), but also your ability assets (organization, diplomacy, sociability, etc.) and examples of those sorts of things.  “Problem-solver” tells me nothing.

This screening includes appropriate degree field, grade point average, and experience (if applicable). This screening ensures that potential candidates possess whatever technical skills are required for the position.

Experience.  Communication skills.  Eagerness to learn.

Quality publications (especially first author), Stanford/Cal, and personal referrals.

cover letter.  Also, persistence and follow-up emails / calls were also key.

teamwork is the most important skill an applicant needs

primarily some demonstration of critical thinking. In an interview it is primarily a genuine attitude and what they are saying. Not a false bravado. A sense that they know who they are and are grounded in something.

experience working in multiple  
programming languages (Python, JavaScript) along with software  
engineering skill such as testing, documentation, version control  
systems and working in small teams.

strong recommendation letter written by someone who is trusted by the committee

look for hard working, willing to take risks, interests in something else besides school

Intern: software tool experience (so if the internship is for a drafting position then experience designing things in SolidWorks is a big plus; if it’s mathematical modelling using Matlab then Matlab/Octave experience is key).

*Clear written communication, initiative, vision.  The resume and cover letter should clearly state, paint a picture or make the case, why the student and potential intern wants this particular internship, what they would bring to it, and what they hope to receive from it.*

*Willingness to try new things and learn critical thinking*

I would look for evidence-based abilities and accomplishments, Nearly all of the technical skills I use on my job I picked up on the job; companies are generally happy to train. What they can't train is motivation.

Important attributes for success at PNNL include desire to learn, ability to self-direct (work without constant supervision), flexibility, ability to communicate, ability to work well with others, respect for safety culture and corporate/government policy compliance

For Intern I was looking for a candidate that knew how to have an organized and professional looking resume (no spelling or grammar errors, clear, succinct, etc.). I also looked for any "hands-on" type work experience or hobbies (bicycle mechanic, model airplanes, robotics, etc.). For employee resumes I look for similar things but would also expect some directly related (or easily transferable) work experience. Multiple very short work assignments (less than a year) were always troublesome

** What advice do you have for us or for the students?**

more personal projects

get hands-on experience any way you can. Do unpaid internships if need be

Start with the big questions to create context and engagement. (Eg What is best way to get to sustainable energy? What is dark matter?) 2. Get students engaged with people outside the school.  Alumni is a good start, but don't stop there.

In the long run, money is less likely to help you lead a good life than learning to be a student of God's creation is

LIFE LONG LEARNING, GIVING AND RELATIONSHIP BUILDING

Getting involved in research early is key

*ABET rating*

Keep things simple.  Explore your interests first.  The rest (grades, career options, etc) will follow.  Get people to pay you to do what you like to do.

getting on John Rodkey's IT team is a wonderful opportunity

talk to the people running the Dos Pueblos  
Engineering program for advice on pulling together some exciting team-based  
projects without a large budget

internships or summer research jobs

non-technical aspects of business as well such as finance (cost and schedule drive most things these days), team building, communication, problem solving, flexibility, and manufacturing processes.

Not every job will be the ideal, but know your deal breakers.

Obtain techical skills in the classroom and to the extent possible, outside the classroom (e.g., research with professors, publishing articles, participation in conferences)

Spend time developing "non tecnical" skills Include such experince and skills in the resume.

Top is internships, followed by project-based coursework where the student demonstrates a deep understanding of concepts behind a project and challenges overcome during the project.

Using summers wisely can really set you up well for the future.

Keep up the good work, and do continue to publish at the undergraduate level.

practical aspects and opportunities (ie internships)

Maybe even make an internship a requirement (or at least highly encouraged) and start talking about it during sophomore year?  It would be cool to get the office of life planning involved too.

Never sell your abilities or aptitude short, always be looking for new skills

Bringing in alumni to help coach students or open doors is great

Live on campus, Don't work on problem sets alone; working in groups is more effective AND better preparation for the real world.

Christus primatum tenens

more personal projects

get hands-on experience any way you can. Do unpaid internships if need be

determination (i.e. resilience and drive) and creativity

Acquiring design skills and building something is the most important qualification

*Keep making them use Excel. Encourage interpersonal and public speaking courses*

I would advise students to explore [educational] opportunities, such as for grad school, on the internet and use Westmont training to gain a strong fundamental baseline that can be used to branch out into many other fields.

interviewing techniques.

Appendix C: Excel Spreadsheet Scores for the Faith Learning Paper and the Science Paper

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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|  |  |  |  |  |  |  |  |  |  |  |  |
| Faith Learning Paoer |  |  |  |  |  |  |  |  |  |  |  |
|  |  | Grade | Ideas | SupportThesis | Organization | Style/Mech | Depth World View | Overall |  |  |  |
|  | 3.5-4.0 | Advanced | 8 | 8 | 8 | 5 | 3 | 4 |  |  |  |
|  | 2.5-3.49 | Proficient | 3 | 3 | 3 | 6 | 8 | 7 |  |  |  |
|  | 1.5-2.49 | Basic | 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |
|  | 0=1.49 | Below Basic | 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Faith learning individual paper scores: | | |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Average Scores | TB | EL | AB | SG | TS | LP | RS | AQ | NT | DB | AG |
| Ideas | 3.5 | 3.5 | 3.5 | 3.5 | 3 | 3.5 | 4 | 3 | 2.5 | 3.5 | 3.5 |
| Support | 3 | 4 | 4 | 4 | 3 | 3.5 | 4 | 3.5 | 3.5 | 3 | 4 |
| Organization | 3.5 | 3.5 | 4 | 4 | 3 | 3.5 | 4 | 2.5 | 3.5 | 3 | 4 |
| Style/Mech | 3 | 3 | 3.5 | 3 | 3.5 | 3 | 3.5 | 3.5 | 4 | 3 | 3 |
| Depth | 3 | 2.5 | 3 | 3 | 2.5 | 3.5 | 4 | 2.5 | 3.5 | 2.75 | 3 |
| Overall | 3.2 | 3.4 | 3.6 | 3.5 | 3 | 3.4 | 3.9 | 2.9 | 3.4 | 3 | 3.5 |
|  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Science Paper Scores |  |  |  |  |  |  |  |  |  |  |  |
|  | Grade | Depth | Integration | Writing Mechanics | Clarity | Overall |  |  |  |  |  |
| 3.5-4.0 | Advanced | 7 | 6 | 6 | 8 | 6 |  |  |  |  |  |
| 2.5-3.49 | Proficient | 4 | 5 | 5 | 3 | 5 |  |  |  |  |  |
| 1.5-2.49 | Basic | 0 | 0 | 0 | 0 | 0 |  |  |  |  |  |
| 0=1.49 | Below Basic | 0 | 0 | 0 | 0 | 0 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Science paper individual paper scores: | | |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Names | TB | EL | AB | SG | TS | LP | AH | Sam | NT | DB | AG |
| Depth | 3.5 | 3.5 | 3.5 | 3.5 | 3 | 4 | 4 | 3 | 3.5 | 2.5 | 2.5 |
| Integration | 3.5 | 3.5 | 2.5 | 3.5 | 4 | 4 | 3 | 3 | 3.5 | 2.5 | 3 |
| Mechanics | 3.5 | 3.5 | 3 | 3 | 3 | 4 | 4 | 3 | 3.5 | 3 | 3.5 |
| Clarity | 4 | 3.5 | 3.5 | 4 | 3.5 | 4 | 4 | 3 | 4 | 2.5 | 2.5 |
| Overall | 3.6 | 3.5 | 3.1 | 3.5 | 3.4 | 4 | 3.75 | 3 | 3.6 | 2.6 | 3 |

1. Prompts or instruments used to collect the data
2. Rubrics used to evaluate the data
3. Relevant assessment-related documents/samples (optional)