RECORD OF ACADEMIC ACHIEVEMENT

The Evergreen State College - Olympia, Washington 98505

OFFICIAL TRANSCRIPT DOCUMENT

Ochoa, Meghan A — A00224040

Last, First Middle — Student ID

CREDENTIALS CONFERRED:

Bachelor of Science — Awarded 13 Jun 2008

TRANSFER CREDIT:

Start	End	Credits	Title
09/2004	08/2006	90	**South Puget Sound Community College**

EVERGREEN UNDERGRADUATE CREDIT:

Start	End	Credits	Title
09/2006	06/2007	33	**Molecule to Organism** ** 8 - Molecular and Cell Biology with Laboratory* *10 - Organic Chemistry I, II, and III with Laboratory* *2 - Virology with Laboratory* ** 9 - Biochemistry I and II with Laboratory* ** 4 - Research on Staphylococcal Bacteriophages*
04/2007	06/2007	4	**Undergraduate Research in Scientific Inquiry** **4 - Undergraduate Research in Phage Biology*
06/2007	09/2007	2	**Undergraduate Research in Phage Biology** **2 - Undergraduate Research in Phage Biology*
09/2007	06/2008	47	**Undergraduate Research in Scientific Inquiry** **8 - Undergraduate Research in Phage Biology* **8 - Undergraduate Research in Microbial Physiology and Biochemistry* **7 - Phage Biology* **4 - Molecular Methods* **4 - Science Writing* **8 - Techniques in Molecular Genetics and Microbiology and Molecular Genetics* **8 - Advanced Microscopy: Phase Contrast, Differential Interference Contrast and Confocal*
03/2008	06/2008	4	**Genetics** **4 - Genetics*

Cumulative

180 Total Undergraduate Credits Earned

The Evergreen State College - Olympia, Washington 98505

FACULTY EVALUATION OF STUDENT ACHIEVEMENT

Ochoa	Meghan	A	A00224040
Student's Last Name	First	Middle	ID Number

30305	Individual Learning Contract		
Program or Contract No.	Title		
	31-MAR-2008	13-JUN-2008	4
	Date began	Date ended	Qtr. Credit Hrs.

DESCRIPTION:
Faculty: Nancy C. Murray, Ph.D.

Genetics. This group contract in genetics covered basic principles in both classical and molecular genetics: independent assortment, chromosome theory, linkage and meiotic mapping, pedigree analysis, complementation, and epistasis in eukaryotes; recombination, complementation, and concepts in population genetics and developmental genetics. Students were required to attend two 1.5 hour lectures and one 2 hour workshop each week and complete and submit homework in a timely fashion. Reading, homework and workshop assignments were based on *Genetics: From Genes to Genomes* 3rd ed. by Hartwell et al. Workshops presented students with an opportunity to apply analytical and quantitative reasoning skills in solving word problems. Students were evaluated by four in-class examinations, homework and by their participation in workshops.

EVALUATION:
Written by: Nancy C. Murray, Ph.D.

Meghan entered the group contract in genetics with a strong background in the natural sciences and a desire to fill a hole in her upper division biology coursework. She had already taken some upper division biology and chemistry and has been engaged in independent laboratory research via the Evergreen Phage Laboratory. As a student, Meghan is conscientious hardworking. Meghan was also a model citizen of the program community. She attended all lectures and workshops and submitted all homework on time. Overall, she has done good work this quarter.

Meghan demonstrated a good evolution in her understanding of genetic principles. Initially, her background in Mendelian genetics was weak but she worked hard to learn the material and finished the quarter with a solid mastery of all of the material. In addition, it was evident that Meghan made the most out of the problem sets and this greatly enhanced her learning. During workshop, she was able to strike an appropriate balance with her peers between serving as an effective teacher or respectful learner. I believe that Meghan's work ethic, combined with her aptitude and enthusiasm for learning will ensure her success in all her future endeavors.

SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 4

*4 – Genetics

*indicates upper division science credit

July 23, 2008
Date

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

Ochoa	Meghan	A	A00224040
Student's Last Name	First	Middle	ID Number

10647, 20148, 30142	Undergraduate Research in Scientific Inquiry
Program or Contract No.	Title

24-SEP-2007	13-JUN-2008	47
Date began	Date ended	Qtr. Credit Hrs.

DESCRIPTION:
Faculty: Andrew D. Brabban, Ph.D.

The Undergraduate Research in Scientific Inquiry program can be taken for up to 16 credits per quarter. It is designed to provide a venue for advanced work in the sciences – either through participation in some aspect of an ongoing research program or through independent study of advanced topics of interest.

The Evergreen Phage Laboratory conducts primary research studying bacteriophages that infect pathogens of societal importance. Students within the lab are involved in all aspects of the work from experimental design to hands-on experimentation. Students spend at least 3 hours per week per credit doing research on their project, most of them part of our longstanding studies of bacteriophages -- viruses that specifically infect bacteria. Areas of emphasis include examining effects of host physiological state on phage infection; phage ecology, evolution and genomics; and the use of phage as antimicrobials, particularly to treat pathogenic *E. coli* and *Pseudomonas*. The students are responsible for all aspects of lab upkeep and for discussing techniques, results and journal articles in regular lab meetings, building their theoretical understanding and their skill at critical analysis along with their work on their research projects and presenting their results in the form of conference posters. They are evaluated on the basis of participation, technical and analytical skills, and the ability to document, apply and articulate what they are learning.

EVALUATION:
Written by: Andrew D. Brabban, Ph.D.

This year Meghan and her research partner took over a project on which we had only a few sparse data sets hinting at a level of complexity within the phage infection process, which had been overlooked. Specifically, she examined the co-infection of *Escherichia coli* O157:H7 by phage with distinct physiologies (CEV1, CEV2, CBA65, and CBA120). Some of these are close relatives with similar morphologies but have distinct differences in their DNA base modification/restriction systems, while others are both morphologically and genetically distinct, being from completely different phage families. The experiments required a great deal of advanced planning, followed by long focused and often intense periods, and finally a large amount of data collection and processing. Standard techniques that Meghan has become proficient in carrying out include: aseptic technique, media preparation, centrifugation, DNA electrophoresis and restriction digests, growing and titering bacterial and phage, dilution series, phage amplification, phage purification and lab management.

Meghan has proven to be an intelligent and dedicated member of our undergraduate research team. She is a consummate teamplayer who communicates well with other students and the faculty, articulating her ideas coherently and succinctly. Her diligence, responsibility and independence allowed her and her lab partner to work with little supervision for large portions of time. The research approach we took demanded that she spent extensive time in the laboratory preparing materials; both Meghan and her partner were highly organized, deliberate and careful in this component. This high level of pre-experiment preparation could clearly be seen in their experimental data. In support of their research Meghan also used a large array of different qualitative and quantitative instruments. She took the pre-requisite workshops and learned to use high precision microscopes (confocal, phase contrast, and scanning electron). She also became proficient in

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

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10647, 20148, 30142	Undergraduate Research in Scientific Inquiry		
Program or Contract No.	Title		
	24-SEP-2007	13-JUN-2008	47
	Date began	Date ended	Qtr. Credit Hrs.

the use of the Chef II Pulse-Field-Gel Electrophoresis apparatus. Like all lab projects this one was not without its problems; these problems provided an excellent learning environment for Meghan where she was able to apply all of the knowledge to troubleshoot both the methods and equipment used.

Throughout the year Meghan's experiments have yielded precise and reproducible data. This data was subsequently processed and presented graphically, illustrating her good math skills and her proficiency with the graphing program MicroCal Origin. Ultimately her excellent laboratory techniques have yielded significant new results that are exciting and will result in a conference presentation and a peer-reviewed paper in the near future. Outside of the lab Meghan read primary literature, engaged in discussions with the other lab members, and gave presentations to the group. Throughout the year Meghan and her lab partner developed and then wrote up protocols for this study, which will be included in the Phage Lab manual, including single step growth curves and how to make phage stocks.

To conclude Meghan is an enthusiastic student who really seems to love the practical application of science. Throughout the year, she worked with great commitment and her efforts have yielded some "beautiful" data sets. Both theoretically and practically, Meghan is developing into a highly competent researcher who should actively pursue science in graduate school.

SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 47

*8 - Undergraduate Research in Phage Biology
*8 - Undergraduate Research in Microbial Physiology and Biochemistry
*7 - Phage Biology
*4 - Molecular Methods
*4 - Science Writing
*8 - Techniques in Molecular Genetics and Microbiology and Molecular Genetics
*8 - Advanced Microscopy: Phase Contrast, Differential Interference Contrast and Confocal

*denotes upper division science credit

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Date

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

Ochoa	Meghan	A	A00224040
Student's Last Name	First	Middle	ID Number

40537	Undergraduate Research in Phage Biology
Program or Contract No.	Title

25-JUN-2007	01-SEP-2007	2
Date began	Date ended	Qtr. Credit Hrs.

DESCRIPTION:
Faculty: Andrew D. Brabban, Ph.D.

The Evergreen Phage Biology Laboratory conducts primary research studying bacteriophages that infect pathogens of societal importance. Students within the lab are involved in all aspects of the work from experimental design to hands-on experimentation. Students spend at least three hours per week per credit doing research on their project, most of them part of our longstanding studies of bacteriophages -- viruses that specifically infect bacteria. Areas of emphasis include examining effects of host physiological state on phage infection; phage ecology, evolution and genomics; and the use of phage as antimicrobials, particularly to treat pathogenic *E. coli* and *Pseudomonas*. The students are responsible for all aspects of lab upkeep and for discussing techniques, results and journal articles in regular lab meetings, building their theoretical understanding and their skill at critical analysis along with their work on their research projects and presenting their results in the form of conference posters. They are evaluated on the basis of participation, technical and analytical skills, and the ability to document, apply and articulate what they are learning.

EVALUATION:
Written by: Andrew D. Brabban, Ph.D.

Megan is an enthusiast student who seems to enjoy her time in the laboratory. Throughout the quarter, she worked with a great commitment and despite a number of problems, which are always present in any research project, her effort yielded results, both in terms of the research and her own education. Megan's love of lab work was most obvious in the way she would spend extensive time, above and beyond that needed for credit, in the laboratory working to the schedule of the project. Megan works well in both individual and team situations, and this was again obvious in this project, where she worked daily with other students and also alone. Specific skills that Megan developed were the central techniques of phage biology; the isolation, amplification, characterization and large-scale purification of phages. She also carried out a number of physiological studies of phages that infect pathogenic staphylococci and *E. coli*. Megan presented her work as a poster at the 17th Evergreen International Phage Biology meeting (Aug 2007), where it was warmly received by the participants. To conclude, Megan has learned a great deal and done good work. Further, she has developed an appreciation of the work required in scientific research and is fully prepared to make the commitment to those ends.

SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 2

*2 - Undergraduate Research in Phage Biology

(* - indicates upper division science credits)

September 24, 2007
Date

The Evergreen State College - Olympia, Washington 98505

FACULTY EVALUATION OF STUDENT ACHIEVEMENT

Ochoa	Meghan	A	A00224040
Student's Last Name	First	Middle	ID Number

30111	Undergraduate Research in Scientific Inquiry		
Program or Contract No.	Title		
	02-APR-2007	15-JUN-2007	4
	Date began	Date ended	Qtr. Credit Hrs.

DESCRIPTION:
Faculty: Elizabeth Kutter, Ph.D.

The Undergraduate Research in Scientific Inquiry program can be taken for up to 16 credits per quarter. It is designed to provide a venue for advanced work in the sciences – either through participation in some aspect of an ongoing research program or through independent study of advanced topics of interest.

Undergraduate Research in Microbiology and Molecular Genetics can be taken for 4 -16 credits per quarter. Students spend at least 3 hours per week per credit doing research on their chosen projects, most of them part of our longstanding studies of bacteriophages -- viruses that specifically infect bacteria. Areas of emphasis include examining effects of host physiological state on phage infection; phage ecology, evolution and genomics; and the use of phage as antimicrobials, particularly to treat pathogenic *E. coli* and *Pseudomonas*. The students are responsible for all aspects of lab upkeep and for discussing techniques, results and journal articles in regular lab meetings, building their theoretical understanding and their skill at critical analysis along with their work on their research projects and presenting their results in venues such as the regional American Society for Microbiology meeting, held this year in Seattle. They are evaluated on the basis of participation, technical and analytical skills, and the ability to document, apply and articulate what they are learning.

EVALUATION:
Written by: Elizabeth Kutter, Ph.D.

Meghan and a colleague joined the phage lab this spring in parallel with their work in Molecule to Organism. They spent many long and productive hours in the lab, learning how to identify and characterize bacteria, how to work with phage, how phage interact with bacteria, stages of bacterial growth, and various methods to grow bacteria and phage. Her strongest area in scientific studies is clearly her lab work, and she feels appropriately confident in her ability to learn new lab techniques quickly, while understanding the reasons behind various procedures and effectively analyzing her data. She quickly developed the ability to work independently while not hesitating to ask when she has questions about procedures or concepts. She started out learning such basics as how to make media, overnight and day cultures, and sterile technique and was soon able to determine colony size and colorization, host range, and learned how to run growth curves and determine the different growth phases of the hosts. Their task in terms of their own project was complicated further at times since our lab focuses on phages of *E. coli* and *Pseudomonas* and we had previously done very little with phages of staph or other gram-positive bacteria, which often have very different properties. Thus, they learned basic techniques by assisting the lab group working on *E. coli* and then adapted methods for staphylococcus. Since the initial titer of the phage they isolated from Staph Phage Lysate was fairly low and the amount small, much time was put into finding an efficacious technique in which to amplify the phage and exploring various potential host strains. After several trials of techniques such as plate lysates, and one-step, and two-step liquid amplifications were deemed inadequate, they developed an amplification technique combining plaque and spot purification followed by liquid amplification. By the end of the quarter, they were able to run a growth curve on their own and amplify phages efficiently with full capability of being able to determine what worked, what didn't, how to fix things, and what to do next without supervision. They went on to prepare a very interesting poster on their work for the 17th Evergreen International Phage Biology meeting

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

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30111	Undergraduate Research in Scientific Inquiry		
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	02-APR-2007	15-JUN-2007	4
	Date began	Date ended	Qtr. Credit Hrs.

this summer, and to participate in putting on that meeting in a variety of very important and effective ways, in terms of both hard work and discussions with the 150 participants from around the world. We look forward very much to their continued work in the lab and to watching them develop further as scientists.

SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 4

*4 - Undergraduate Research in Phage Biology

*denotes upper division science credit

September 10, 2007
Date

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

Ochoa	Meghan	A	A00224040
Student's Last Name	First	Middle	ID Number

10131, 20102, 30101	Molecule to Organism		
Program or Contract No.	Title		
	25-SEP-2006	15-JUN-2007	33
	Date began	Date ended	Qtr. Credit Hrs.

DESCRIPTION:
Faculty: Lydia McKinstry, Ph.D., Clarissa Dirks, Ph.D. and James Neitzel, Ph.D.

The goal of this program was to examine how living organisms work at a variety of levels of scale, both in time and space. We looked at how these processes are governed by molecular structure, and the associated physical and chemical properties. Each student was expected to learn how to define scientific questions, design experiments, critically evaluate data, and make interpretations; in other words, to think as a scientist. Students were introduced to the structure of primary and review papers in the scientific literature and seminars were based on their reading and discussion of these papers. In winter quarter, a group project challenged students with designing a research study to investigate a specific biological or chemical question, submit a formal project proposal and give a team presentation on their designed study.

Organic Chemistry I, II & III with Laboratory – This component began with an intensive introduction to the theory of carbon chemistry and proceeded to complex reaction mechanisms and advanced approaches for the synthesis of organic molecules. The relationship between molecular structure and chemical behavior was particularly emphasized. Specific concepts included: electronic structure and bonding; organic acid and base chemistry; stereochemistry and nomenclature; electron delocalization, conjugation and resonance; unimolecular and bimolecular substitution and elimination reactions; electrophilic addition reactions of alkenes, alkynes and aromatic systems; nucleophilic addition and addition-elimination reactions of carbonyl containing compounds and aromatic rings; enolate alkylation, aldol and Claisen type reactions; oxidation and reduction reactions; simple organometallic chemistry and radical reactions; concerted processes of cycloaddition, rearrangement and elimination; mass spectrometry (GC-MS); and infrared (FT-IR) and nuclear magnetic resonance (FT-NMR) spectroscopies. The laboratory began with an introduction to the basic techniques of solubility, separation and purification. The techniques of distillation, extraction, and chromatography were applied in performing various reaction procedures. A 4-week individual qualitative analysis project challenged students to learn the instrumental techniques of spectroscopy (CG-MS, FT-IR and FT-NMR) and apply these methods in determining the structure of an unknown substance. Each student was expected to submit a formal laboratory report on the qualitative analysis of his or her unknown. The laboratory also presented students with an opportunity to read and dissect articles from the chemical literature and learn about the structure of chemical research reports. Student evaluations were based on performance on in-class exams and quizzes, homework assignments, content of individual laboratory notebooks, a qualitative analysis laboratory report, and participation in weekly workshops and seminars. **Textbook**: Solomons, T. W. G. and Fryhle, C. B. *Organic Chemistry* 8/e. New Jersey: John Wiley & Sons, Inc., 2004.

Molecular and Cell Biology with Laboratory – In this quarter students learned about the major biomolecules, with an emphasis on the structure of proteins, the organization and transfer of information encoded in nucleic acids, and the structures and functions found at cellular membranes. Specific topics included the nature and role of repetitive elements in genomes, membrane receptors and signal transduction, membrane transport and electrical properties of membranes, the cell cycle and its regulation, cellular changes found in cancer, and the cell cytoskeleton. Students were frequently asked to design and interpret experiments to understand these processes. A strong emphasis was based on learning to use bioinformatics tools, such as the retrieval and comparison of sequence information, examination of the 3-D structure of biomolecules, and the construction of evolutionary trees. This was achieved through several

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	25-SEP-2006	15-JUN-2007	33
	Date began	Date ended	Qtr. Credit Hrs.

computer workshops and assigned problems based on information students could obtain through the NCBI web portal. The laboratory included basic microbiological and molecular biological techniques, including sterile technique and the preparation of solutions. Students completed an Ames assay for mutagens, conducted microbial water-quality surveys, isolated plasmid and genomic DNA, did restriction digestion and agarose gel electrophoresis of DNA, investigated cells and tissues with histology, and examined the role of cytoskeleton components in phagocytosis. Students were often asked to refine or design aspects of experiments on their own. Student evaluations were based on in-class and take-home examinations, a formal laboratory paper, short writing and bioinformatics assignments, participation in weekly workshops, and the content of individual laboratory notebooks. **Textbook**: Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., and Walter, P. *Molecular Biology of the Cell* 4/e. New York: Garland Science, 2002.

Virology with Laboratory – This component focused on the study of viruses with emphasis on molecular biology, genetics, and host interactions. The coverage was almost entirely on viruses that infect humans and cause serious disease. Students were required to comparatively analyze different viral family members from epidemiological and evolutionary perspectives. More specifically, for each taxonomic group, students were introduced to viral nomenclature, structure, mode of replication, pathogenesis, vaccines, and prophylaxis. Other topics included the use of viral vectors for gene therapy, outbreak monitoring, pandemic response plans, clinical descriptions, and diagnostic tests. Throughout their work, students were frequently asked to interpret experiments, understand the methodologies used, and design novel experiments. A strong emphasis was placed on reading primary literature and understanding the most recent scientific findings related to the viruses studied. For this reason, the course did not use a textbook, but rather relied only on the scientific literature. Students were evaluated for their performance on take-home and in-class exams, their work in the laboratory, and weekly workshop assignments.

Biochemistry I and II with Laboratory – The winter quarter of biochemistry emphasized acid-base chemistry, the properties of amino acids and proteins, and enzyme kinetics. Specific topics included acid-base properties of amino acids, the relationships between amino acid type and folded protein structures, and methods for determining the primary sequence and structural details of proteins. Detailed studies were focused on the heme oxygen carrying proteins, immunoglobulins, and serine proteases. Other experimental techniques for studying proteins, including those based on immunochemistry, were also covered. Students were expected to gain competence in bioinformatics tools and molecular visualization tools in studying proteins. The Michaelis-Menten kinetic model and the major types of enzyme inhibition were also introduced. In the spring quarter this material was used to examine the metabolism of carbohydrates and lipids in detail. This included the structures and functions of mitochondria, chloroplasts, and the reactions of photosynthesis. The regulation of these processes, their associated energetic changes, and their role in the overall physiology of the organism was continually stressed. Assessment was based on in-class exam and take-home exams, problem sets, and short quizzes. Students were also required to write a final integrative paper on a specific metabolite. In conjunction with the Molecular Biology and Virology laboratory portions of the program, students gained hands-on practice at techniques such as recombinant cloning, bacterial cell transformation, replica plating, protein expression, SDS-PAGE, and protein purification. **Textbook**: Berg, J. M., Tymoczko, J. L., and Stryer, L. *Biochemistry* 6/e, New York: W.H. Freeman, 2006.

Undergraduate Research Project in Chemistry or Biology – In spring quarter, students worked in small collaborative groups to conduct experimental research projects and deepen their understanding of a topic or

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10131, 20102, 30101	Molecule to Organism		
Program or Contract No.	Title		
	25-SEP-2006	15-JUN-2007	33
	Date began	Date ended	Qtr. Credit Hrs.

question relevant to material covered in the program. Each research project required students to utilize scientific literature in formulating a hypothesis, design experiments to test the hypothesis and analyze experimental data. In order to demonstrate effective scientific communication skills, each group gave a formal presentation of their findings to the larger program community at the end of the quarter.

EVALUATION:
Written by: James J. Neitzel

Meghan enrolled in Molecule to Organism to increase her knowledge in chemistry and biology, and to prepare herself for a career in teaching. Meghan's self-evaluation will provide additional information about her learning and person growth while in the program. In summary, Meghan has made some progress in learning chemistry and biology these quarters. Throughout the program and the year her work in laboratory has been one of her strongest areas. As the year has progressed she has also started to develop a reasonably good ability to synthesize material from all of the program components in examining scientific questions.

At times she struggled with meeting deadlines. She made a strong commitment to correcting this, and she made good progress in this aspect of her study. Her work in the spring quarter demonstrated more consistency in the timely completion of quality work.

Her work with her project proposal team and presentation, examining some uncharacterized *Staph* phages, outlined a very interesting experiment. The initial proposal was not as carefully edited as it needed to be and lacked some focus. However, the proposal presentation corrected much of this lack of focus and presented a clearer and more convincing story. This proposal was turned into a very competent series of experiments in the spring quarter. Meghan clearly found her niche here. She was virtually always in the laboratory, and she had a hand in every aspect of this work. She was able to find and develop methods, and analyze and trouble shoot experiments as the group progressed. They clearly made progress in determining the host range and growth patterns of these phages, and made an outstanding presentation to the community about the origins and significance of this work, as well as their results. Several long time phage researchers described this as an excellent presentation.

Meghan demonstrated an overall fair understanding of the biological concepts and skills presented to her during the fall quarter in molecular and cell biology. Her exam performances indicated that she has made *progressive improvement this fall quarter--her later exams were a significant improvement over her earlier* work. Her project work later in the year indicated that she could use much of this material in a new context.

In biology laboratory her notebook was extremely well organized and complete. It was very easy to follow her actions and thinking. Her methods and collected data are quite clear, and she can use drawings to very effectively illustrate what she is observing. During the fall quarter she began to use her discussion and conclusion sections to link her observations to related theory. There was still room to continue progress in increasing the depth of her post-lab discussions. During the winter quarter the high level of detail and completeness in her notes has continued, and she greatly improved the depth and level of her conclusions and discussions.

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Her work in biochemistry in the winter quarter began well and she ended strongly--her last problem set was very good, and indicated a clear understanding of the major topics, including enzyme kinetics and heme proteins. She is generally comfortable with providing accurate quantitative detail. This portion of the program was clearly her strongest work in the winter quarter. The high quality of her work continued in the spring quarter, in which she consistently demonstrated a very solid understanding of the metabolic pathways covered.

She performed very poorly in Virology; she did not consistently demonstrate that she grasped the concepts presented to her. She did fairly well on her first exam, indicating that she understood the replication strategies, enzymatic activities, and evolution of HIV; she also demonstrated an ability to analyze data and design good experiments. Nonetheless, she really struggled on the mid-term and final, showing that she did not fully understand the epidemiology and pathology associated with several viruses studied.

Meghan demonstrated a fair overall understanding of the concepts presented to her in fall organic chemistry. She clearly showed that she understands topics such as stereochemistry and nomenclature, but she still struggled with competing reactions and in explaining mechanisms. In the winter quarter she had a very weak understanding of alkene reactions and organic acid-base chemistry. The winter final exam did show some improvement in understanding of mechanisms and carbonyl chemistry. She had difficulty in recognizing functional groups transformations and the details of drawing organic mechanisms. Meghan's work in spring quarter organic chemistry was weak overall, with her homework stronger than her exams. Her first exam and homework responses showed a very weak understanding of enolate alkylation and aldol type reactions. She demonstrated a fair understanding of resonance, aromaticity and aromatic substitution chemistry as evidenced by the mid-term but some of her responses still lacked some detail. She ended the quarter by demonstrating a good understanding of the advanced concepts of molecular orbital symmetry and its relationship to stereochemistry in concerted reaction processes.

Her work in the organic laboratory consistently has been the strongest aspect of her work in chemistry. Her notebook was very good and logically organized. She clearly uses her notebook as a learning tool, especially at the end of the quarter. She worked very well with others in workshop and made valuable contributions to discussions.

Meghan's qualitative analysis report in winter quarter demonstrated excellent writing skills and reflected a very good understanding of spectroscopy and structure elucidation. This was probably her best work in chemistry for this quarter.

SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 33

* 8 - Molecular and Cell Biology with Laboratory
10 - Organic Chemistry I, II, and III with Laboratory
2 - Virology with Laboratory
* 9 - Biochemistry I and II with Laboratory
* 4 - Research on Staphylococcal Bacteriophages

*denotes upper division science credit

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Date

EVERGREEN

The Evergreen State College • Olympia, WA 98505 • www.evergreen.edu

EVERGREEN TRANSCRIPT GUIDE

Accreditation: The Evergreen State College is fully accredited by the Northwest Commission on Colleges and Universities.

Degrees Awarded: The Evergreen State College awards the following degrees: Bachelor of Arts, Bachelor of Science, Master of Environmental Studies, Master of Public Administration and Master In Teaching. Degree awards are listed on the Record of Academic Achievement.

Educational Philosophy:

Our curriculum places high value on these modes of learning and teaching objectives:

- Interdisciplinary Learning
- Collaborative Learning
- Learning Across Significant Differences
- Personal Engagement
- Linking Theory with Practical Applications

Our expectations of Evergreen Graduates are that during their time at Evergreen they will:

- Articulate and assume responsibility for their own work
- Participate collaboratively and responsibly in our diverse society
- Communicate creatively and effectively
- Demonstrate integrative, independent, critical thinking
- Apply qualitative, quantitative and creative modes of inquiry appropriately to practical and theoretical problems across disciplines, and,
- As a culmination of their education, demonstrate depth, breadth and synthesis of learning and the ability to reflect on the personal and social significance of that learning.

Our students have the opportunity to participate in frequent, mutual evaluation of academic programs, faculty and students. In collaboration with faculty and advisors, students develop individual academic concentrations.

Academic Program

Modes of Learning: Evergreen's curriculum is primarily team-taught and interdisciplinary. Students may choose from among several modes of study:

- **Programs:** Faculty members from different disciplines work together with students on a unifying question or theme. Programs may be up to three quarters long.
- **Individual Learning Contract:** Working closely with a faculty member, a student may design a one-quarter-long, full-time or part-time research or creative project. The contract document outlines both the activities of the contract and the criteria for evaluation. Most students are at upper division standing.
- **Internship Learning Contract:** Internships provide opportunities for students to link theory and practice in areas related to their interests. These full- or part-time opportunities involve close supervision by a field supervisor and a faculty sponsor.
- **Courses:** Courses are 2-6 credit offerings centered on a specific theme or discipline.

The numerical and alpha characters listed as Course Reference Numbers designate modes of learning and are in a random order.

Evaluation and Credit Award:

Our transcript consists of narrative evaluations. Narrative evaluations tell a rich and detailed story of the multiple facets involved in a student's academic work. A close reading of the narratives and attention to the course equivalencies will provide extensive information about student's abilities and experiences. Students are not awarded credit for work considered not passing. Evergreen will not translate our narrative transcript into letter or numeric grades.

Transcript Structure and Contents: The Record of Academic Achievement summarizes credit awarded, expressed in quarter credit hours. Transcript materials are presented in inverse chronological order so that the most recent evaluation(s) appears first.

Credit is recorded by:

Quarter Credit Hours:	Fall 1979 to present
Evergreen Units:	1 Evergreen Unit (1971 through Summer 1973) equals 5 quarter credit hours
	1 Evergreen Unit (Fall 1973 through Summer 1979) equals 4 quarter credit hours

Each academic entry in the transcript is accompanied by (unless noted otherwise):

- The Program Description, Individual Contract or Internship Contract which explains learning objectives, activities and content of the program, course or contract.
- The Faculty Evaluation of Student Achievement provides information on specific work the student completed and about how well the student performed in the program or contract.
- The Student's Own Evaluation of Personal Achievement is a reflective document written by the student evaluating his or her learning experiences. Students are encouraged but not required to include these documents in their official transcript, unless specified by faculty.
- The Student's Summative Self Evaluation is an optional evaluation summarizing a student's education and may be included as a separate document or as a part of the student's final self- evaluation.

Transfer credit for Evergreen programs, courses and individual study should be awarded based upon a careful review of the transcript document including the course equivalencies which are designed to make it easier for others to clearly interpret our interdisciplinary curriculum. These course equivalencies can be found at the conclusion of each of the Faculty Evaluation of Student Achievement.

The college academic calendar consists of four-eleven week quarters. Refer to the college website (www.evergreen.edu) for specific dates.

This record is authentic and official when the Record of Academic Achievement page is marked and dated with the school seal.
All information contained herein is confidential and its release is governed by the Family Educational Rights and Privacy Act of 1974 as amended.
If, after a thorough review of this transcript, you still have questions, please contact Registration and Records: (360) 867-6180.