RECORD OF ACADEMIC ACHIEVEMENT
The Evergreen State College - Olympia, Washington 98505

OFFICIAL TRANSCRIPT DOCUMENT

Johnson, Catherine Horner — A00044426
Last, First Middle — Student ID

Former Name(s): Horner, Constance Jean; Mc Carthy, Constance Jean; McCarthy, Constance Jean;

DEGREES CONFERRED:

Bachelor of Science — Awarded 15 Jun 1988

TRANSFER CREDIT:

Start	End	Credits	Title
06/1980	03/1985	18	**Whatcom Community College**
09/1983	08/1985	66	**Lower Columbia Community College**

EVERGREEN UNDERGRADUATE CREDIT:

Start	End	Credits	Title
09/1985	06/1986	48	**Matter and Motion** *8 - Calculus* *8 - Physics* *8 - Chemistry* *4 - Organic Chemistry* *4 - Chemistry/Physics Lab* *4 - Science Seminar* *4 - Critical Writing* *4 - Problem Solving and Structured Programming in Pascal* *4 - Principles of Biology*
09/1986	06/1987	48	**Physical Systems** **4 - Properties of Materials* **8 - Analytical Mechanics* **8 - Electromagnetic Theory* **4 - Thermodynamics* **4 - Modern Physics* **4 - Linear Algebra* **4 - Multivariable Calculus* **4 - Differential Equations* **4 - Seminar on the History and Philosophy of Science* **2 - Seminar on Science and the Human Condition* **2 - Seminar on Epistemology of Modern Science*
09/1987	12/1987	8	**Mathematical Systems** *4 - Mathematics and Culture* *3 - History of Mathematics through the 15th Century* *1 - English Composition*
01/1988	03/1988	11	**Math for Physics and Solar Design** **4 - Mathematical Methods in Physics* **3 - Solar Design* *4 - Topology*
03/1988	06/1988	5	**Cosmology II** *5 - Philosophy of Science*

Johnson, Catherine Horner — A00044426

Last, First Middle — Student ID

EVERGREEN UNDERGRADUATE CREDIT:

Start	End	Credits	Title
03/1988	06/1988	2	**Beginning Ballet I** *2 - Beginning Ballet*

Cumulative

206 Total Undergraduate Credits Earned

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

MC CARTHY	Constance	Jean	
Student's Last Name	First	Middle	ID Number

7213M	Beginning Ballet I			
Program or Contract No.	Title			
		4/88	6/88	2
		Date began	Date ended	Qtr. Credit Hrs.

Description:

This class offered students an opportunity to develop physical strength, control and coordination, and to achieve an awareness and appreciation of dance as an art form.

Evaluation:

Connie made great progress in ballet this quarter. She attended class regularly and so was able to build upon the continuation of classes until she had a thorough understanding of ballet technique at this level, including turnout, body and muscle control, strengthening and stretching the body, the ballet terms and exercises, musicality and grace in moving. She was an interested student, working to her utmost every class and concentrating with great self-discipline. She was anxious to learn all she could, and found it to be fun and challenging. Enthusiastic and respectful, Connie was a great pleasure to have in class.

Suggested Course Equivalencies (In Quarter Credit Hours): 2

2 - Beginning Ballet

Suzi Ferko
Faculty Signature(s)

Suzi Ferko
Faculty Name

6/88
Date

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

McCarthy	Constance	Jean	
Student's Last Name	First	Middle	ID Number

7298M	Cosmology II: The Philosophy of Physics		
Program or Contract No.	Title		
	4/88	6/88	5
	Date began	Date ended	Qtr. Credit Hrs.

DESCRIPTION:

Cosmology II: The Philosophy of Physics follows the evolution of cosmology in Western science, beginning with the Pythagoreans and proceeding through the decline of Greece and Rome, the Dark and Middle Ages, the Renaissance and Copernican Revolution, the Newtonian synthesis, the development of classical and modern physics, the philosophy of quantum mechanics, and the progress toward Grand Unification of physical laws including related philosophies.

The course presentation uses multi-media and basic experimental demonstrations. Students are required to produce four perspective drawings, a pendulum for doing basic experiments, a "black box" and a term paper on a topic related to the development of physics.

FACULTY EVALUATION OF STUDENT ACHIEVEMENT:

Connie was an excellent student in Cosmology II. Her background and class participation were most helpful. She produced an excellent set of perspective drawings, an imaginative "black box" and a fine term paper on the relationship of Greek mythology to the development of early scientific thinking.

SUGGESTED COURSE EQUIVALENCIES (IN QUARTER HOURS):

5 - Philosophy of Science

Frank Edge
Faculty signature(s)

Frank Edge
Faculty Name

6-20-88
Date

JUN 22

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INDIVIDUAL LEARNING CONTRACT

Qtr.	Credit Hrs.
Fall	
Wtr	11
Spr	
Smr	
Total	11

Student ID Number	Last Name	First	Initial
	McCarthy	Constance	J.

Sponsor No.	Sponsor
7776C	Hazel Jo Reed

Short Title	Beginning Date	Expected completion
Math for Physics and Solar Design	1/88	3/88

Subcontractor(s) and Title(s): Tom Grissom and Byron Youtz (instructors)

Objectives: to gain an understanding and working proficiency of the math encountered when solving advanced physics problems, to cover standard introduction to topology, and to design a solar home

F S J (S) — Circle One — Class Standing

Related academic preparation and work experience:

48 credits Physical Systems, upper division Physics at E.S.C.

Activities under this contract: Weekly classroom component — X Yes — No

Math Methods for Physics (4 credits): Student will read and work problems in Mathematical Methods in the Physical Sciences, and meet for four hours a week with other students to discuss material presented in the text and solve difficult problems.

Topology (4 credits): Student will complete required course work.

Solar Design (3 credits): Student will design, draw, analyze, and build a model of a solar home.

Support by the Sponsor and Subcontractor(s):

Tom Grissom will offer assistance with particularly difficult problems in Mathematical Methods in the Physical Sciences. Hazel Reed and Byron Youtz will give guidance in a class setting for topology and solar design respectively.

Procedures for evaluating completed contract:

Student will submit math methods portfolio at conclusion of quarter to Tom Grissom who will evaluate it. Solar design work will be evaluated by Byron Youtz. Both subcontractors will assist sponsor in writing evaluation. Hazel Reed will evaluate topology work.

Does this contract require the use of special resources, facilities and equipment, or carry special legal implications including compliance with the policy on "Human Subjects Review"? (If yes, attach clearances.) Yes ☐ No ☒

Constance Joan McCarthy Jan 5, 88	Date	Hazel Jo Reed	1/5/88
Student signature		Sponsor signature	Date
Byron L. Youtz		Thomas Grissom	1/5/88
Signature(s) of Subcontractor(s)			Date
Dean of Group signature			Date

ESCO3-004RI

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

MCCARTHY	Constance	J.	
Student's Last Name	First	Middle	ID Number

7776C	Math for Physics and Solar Design
Program or Contract No.	Title

1/88	3/88	11
Date began	Date ended	Qtr. Credit Hrs.

Within the Mathematical Systems program itself, Connie studied Topology. This was her first encounter with abstract, rigorous mathematics, and it was a real challenge. Not only the material itself, but the nature of the reasoning was unfamiliar. She did a good job of dealing with it. Her problem solutions became increasingly correct, reflecting a growing understanding of the basic concepts and of the techniques of formal mathematics. At this stage she has a reasonable informal understanding of the notions of sets, topologies, and continuous mappings of topological spaces. She also has an improved sense of proofs and their construction. I would encourage her to continue to sharpen her mathematical skills by pursuing further topics, given her lively intelligence and general talent for analytic thinking. As stands, she has achieved an appropriate level of understanding of the material we covered, needing only greater familiarity with it.

Faculty member Tom Grissom said of her work in Mathematical Methods in Physics:

> Under an independent study contract Constance McCarthy covered the material in the first six chapters of the text Mathematical Methods in the Physical Sciences, Mary L. Boas (Wiley, 1983). Connie met each week with two other students to discuss the material presented in the text and to work a representative number of the problems in each chapter. The topics covered included: infinite series, power series, complex variables, matrices and determinants, partial differentiation, multiple integrals and vector analysis. The evaluation of her work is based on the solutions which she submitted to the problems from the text.
>
> Some of the material was a review for Connie, based on the topics she covered last year in the math components of the program Physical Systems, but all of it extended her knowledge of the subjects and further developed her command of the mathematical techniques required in studying more advanced topics in physics and applied mathematics. Connie maintained a portfolio of problem solutions showing that she worked a significant number of problems illustrating the topics covered in each chapter of the text. Her solutions to the problems indicate that she has a good grasp of the mathematical techniques and can use them very effectively in analyzing and solving representative problems. Connie's written work has improved in neatness and overall organization and her approach to problem solving has become more methodical and systematic. Of the topics covered this quarter the material on multiple integration presented the most difficulty and represents the area

Faculty signature(s)

Hazel Jo Reed, Ph.D.

Faculty Name

Date

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

MCCARTHY	Constance	J.	
Student's Last Name	First	Middle	ID Number

7776C	Math for Physics and Solar Design		
Program or Contract No.	Title		
	1/88	3/88	
	Date began	Date ended	Qtr. Credit Hrs.

where Connie should concentrate her effort. To extend her knowledge of this material she primarily needs additional experience working more difficult problems. Connie has done very good work and is awarded full credit.

Constance also studied Solar Design through the Energy Systems program. Faculty member Byron Youtz commented on her work as follows:

> Connie participated in a portion of the Energy Systems program during the winter quarter of 1988. She had studied Design Drawing with us in the fall to be prepared for this architectural component of the winter quarter. She was given the opportunity to design a site-specific Passive Solar "Dream House" utilizing her previous Design Drawing experience. Floor plans, elevation drawings, and a perspective drawing were required. The text Passive Solar Construction Handbook by Winter Associates served as a reference for details in the design process. Analysis of the predicted operating characteristics of the house in the climate for which it was designed was accomplished utilizing a software program provided by Ecotope, Inc. called SUNDAY. This offered a method for analysis of heat loss and solar simulation in one or more of the eight geographical locations available. Finally, a construction board scale model (1/4" = 1 foot) was prepared and exhibited at the end of the quarter.
>
> Connie threw herself into this activity with great energy and pleasure. She designed an extremely complex house, incorporating a number of solar energy conversion and storage methods. Her drawings were clear and correctly done, presenting the viewer with quite a complete understanding of the arrangement and appearance of the house. Her model was very nicely done and fully revealed the complexity of her design. Connie had some difficulty in performing the SUNDAY analysis since she had not been trained in the fall quarter to carry out this type of calculation. But she persisted and has now learned the techniques required. Thus she has been able to predict the annual solar gain and auxiliary heating requirements of her house in both an east coast and a west coast setting. It has been a pleasure to work with Connie, share her pleasures in the design process, and help her through her frustrations with the energy analysis.

Equivalencies: *4 - Mathematical Methods in Physics
*3 Solar Design 4 - Topology *Denotes Upper Division Credit

Faculty signature(s)

Hazel Jo Reed, Ph.D.
Faculty Name

8/31/88
Date

Mathematical Systems

Program Description
Fall Quarter 1987

This is the first quarter of an advanced year long program which focuses on mathematical systems, their historical development, and the way in which they fit into one's general understanding of the world about one. Students in the History and Cognition of Mathematics portion studied the worldwide development of mathematics up to the 15th Century. There was an emphasis on the role of culture as a factor influencing the phrasing and direction of mathematical questions. There were weekly seminars based on the texts under consideration; lectures on mathematics, philosophy and logic of mathematics, and cultural issues; and workshops on these issues. Students wrote two papers based on library research dealing with a topic of their choice relevant to the program's concerns. They also worked numerous mathematical problems exemplifying the concepts and strategies employed at different historical periods being considered.

Primary Texts: Eves, Introduction to the History of Mathematics
Nakayama, Academic and Scientific Traditions in China, Japan, and the West
Collingwood, The Idea of Nature

Students enrolled in the Advanced Calculus portion of the program began a study of the theoretical basis of calculus. This included development of the real number system, sequences, functions and limits and continuous functions. Students were allowed to substitute an Applied Calculus course in place of Advanced Calculus.

Primary Text: Parzynski and Zipse, Introduction to Mathematical Analysis

Students enrolled in the Geometry portion of the program studied Euclidean and non-Euclidean geometry, with an emphasis on the historical evolution of the latter from the former. Recognition of Geometric thinking as well as axiomatics was emphasized.

Primary Texts: Euclid, Elements Book I and III (selections)
Greenberg, Euclidean and Non-Euclidean Geometries

Course equivalencies (in quarter hours):

3 - History of Mathematics through the 15th Century
4 - Mathematics and Culture
*4 - Advanced Calculus
1 - English Composition
4 - Foundations of Geometry

*Indicates upper division credit

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

MCCARTHY	Constance	Jean	
Student's Last Name	First	Middle	ID Number

7083G	Mathematical Systems		
Program or Contract No.	Title		
	10/87	12/87	8
	Date began	Date ended	Qtr. Credit Hrs.

Connie was one of the most energetic members of the seminar group, approaching discussions with enthusiasm and verve. Her ideas were sound and based on good reading of the texts at hand. She was very good at initiating discussions and especially effective taking issue with positions she disagreed with. This was always done in a friendly, refreshing manner and raised some of the more interesting points to come out in our meetings.

Connie is particularly interested in physics and used her first paper to explore the interconnectedness of the natural sciences and spiritual values. This topic fit in well with the program's interests at the time, focusing as we were on Oriental and Pythagorean schools of thought, in which the mythic significance of numbers is a central theme. Her paper articulated and raised interesting issues.

Her second paper was somewhat related, exploring the metaphysical question of whether mathematics is discovered or created by mathematicians. It is very well argued and documented and takes into account the crossfertilization of both processes, recognizing that mathematical developments, like other human endeavors, are the product of both innovation and discovery. She contends that both activities when pushed to their extremes tend to fuse.

These papers, like her seminar participation, show Connie to be an alert intelligence, one willing to do serious academic work and to speculate on the basis of that work. Her vitality and sense of humor added greatly to the program's success.

Equivalencies:

4 - Mathematics and Culture
3 - History of Mathematics through the 15th Century
1 - English Composition

Hazel Jo Reed

Faculty signature(s)

Hazel Jo Reed, Ph.D.

Faculty Name

3/10/88

Date

PHYSICAL SYSTEMS
Fall, Winter, Spring -- 1986-87
Program Description

Physical Systems was a year-long program covering traditional fundamental subjects in physics, mathematics and engineering at the intermediate and advanced undergraduate level. Included were topics from classical mechanics, electromagnetic theory, thermodynamics, and modern physics. Classical mechanics was covered fall and winter quarters, with appropriate emphasis fall quarter on statics and the properties of materials to meet the statics and materials science requirements for 3/2 engineering students. Electromagnetic theory was added winter and spring quarters, thermodynamics was covered winter quarter, and modern physics was introduced spring quarter. Selected topics in linear algebra and multivariable calculus, including vectors, matrices, and ordinary and partial differential equations, were developed in conjunction with applications in physics. The emphasis fall quarter was on linear algebra. Multivariable calculus was covered winter quarter and differential equations in the spring.

The topics in physics were developed as part of a consistent and coherent view of the physical world. Along with that, in seminar we examined how our present concepts of the physical world developed, their limitations, and how they have influenced and been influenced by the larger culture and intellectual traditions of which they are a part.

In addition, each quarter students were allowed to pursue independent work in any of the components of the program, or individual projects in other areas of specific interest, for additional credit.

The program consisted of the following interrelated components:

FALL QUARTER

MECHANICS AND STATICS: an introduction to classical mechanics and engineering statics, including the laws of motion, the concepts of momentum, energy and work, the general principles of the equilibrium of forces, equilibrium of rigid bodies, and the analysis of structures. Four hours of lecture and problem sessions per week, weekly problem assignments, and a final examination. The texts were Fowles, Analytical Mechanics (Saunders, 4th edition), chapters 1-5, and Hibbeler, Engineering Mechanics: Statics (Macmillan, 3rd edition), chapters 1-8.

PROPERTIES OF MATERIALS: an introduction to the structure and properties of real materials, with an emphasis on their use in engineering applications. Topics covered included: engineering properties of materials; structure of materials; elastic moduli; yield strength; fracture, fatigue and creep; corrosion and wear. (This component meets the materials science requirement for 3/2 engineering students). Four hours of lecture and problem sessions per week, regular problem assignments, and a final examination. The text was Ashby and Jones, Engineering Materials (Pergamon).

MULTIVARIABLE MATHEMATICS: Topics in linear algebra and multivariable calculus including vectors, vector functions and differentiation, coordinate representations, matrices and linear systems of equations, determinants, vector spaces and linear transformations. Four hours of lecture and problem solving per week, weekly problem assignments, and a final examination. The text was Grossman, Multivariable Calculus, Linear Algebra, and Differential Equations (Academic Press, 2nd edition), chapters 1-3 and 7-9.

SEMINAR on FOUNDATIONS OF THE WESTERN SCIENTIFIC TRADITION: Weekly readings and discussions organized around the year-long central theme of the program, tracing how our present views of the physical world evolved, their implications and specific limitations, and how they are related to the culture and intellectual traditions of which they are a part. Readings for fall quarter included: Edward Hussey, The Pre-Socratics; Lucretius, De Rerum Natura; Plato: The Last Days of Socrates; Edith Hamilton, Three Greek Plays; Edward Grant, Physical Science in the Middle Ages; Thomas Kuhn, The Copernican Revolution; Richard Westfall, The Construction of Modern Science; Bertolt Brecht, Galileo; Jerome Lawrence and Robert E. Lee, Inherit the Wind; Descartes, Discourse on Method and The Meditations.

WINTER QUARTER

CLASSICAL MECHANICS: a continuation of the material covered fall quarter, including central forces and celestial mechanics, the dynamics of systems of particles, rigid body motion, Lagrangian and Hamiltonian mechanics, and the dynamics of oscillating systems. Four hours of lecture and problem sessions per week, weekly problem assignments, and a final examination. The text was Fowles, Analytical Mechanics, chapters 6-11.

ELECTROMAGNETIC THEORY: an introduction to the theory of electricity and magnetism, including Coulomb's Law, the electrostatic field, electric potential, Laplace's equation, multipoles, electrostatic fields in dielectrics, the electric displacement, electric currents and magnetic fields, the Lorentz force, the Biot-Savart Law and the magnetic vector potential. Four hours of lecture and problem sessions per week, weekly problem assignments, and a final examination. The texts were Griffiths, An Introduction to Electrodynamics (Prentice-Hall), chapters 1-5; and Schey, Div, Grad, Curl and All That (Norton).

THERMODYNAMICS: an introduction to classical thermodynamics, including equations of state, the first and second laws, the principle of entropy, and applications to simple physical and chemical systems. Two hours of lecture and problem sessions per week, problem assignments, and a final examination. The text was Sears and Salinger, Thermodynamics, Kinetic Theory, and Statistical Thermodynamics (Addison-Wesley, 3rd edition), Chapters 1-7.

MULTIVARIABLE MATHEMATICS: Topics in the calculus of multiple variables, including differentiation of functions of two or more variables, partial derivatives, directional derivatives and the gradient, maxima and minima, multiple integration, volume and surface integrals, line integrals, divergence and curl of a vector field, Green's Theorem, Stoke's Theorem, the Divergence Theorem, and

Taylor's Theorem in n variables. Four hours of lecture and problem sessions per week, weekly problem assignments, and a final examination. The text was Grossman, Multivariable Calculus, Linear Algebra, and Differential Equations chapters 4-6 and 10.

SEMINAR on FOUNDATIONS OF THE WESTERN SCIENTIFIC TRADITION: Readings for winter quarter included: Bacon, The Great Instauration and New Atlantis; Loren Eiseley, The Man Who Saw Through Time; Hume, An Inquiry Concerning Human Understanding; Kant, Prolegomena to Any Future Metaphysics; Morris Kline, Mathematics: The Loss of Certainty; Ilya Prigogine and Isabelle Stengers, Order Out of Chaos; Darwin, The Origin of Species (abridged); Einstein, Relativity; Dostoyevsky, Notes from Underground.

SPRING QUARTER

ELECTROMAGNETIC THEORY: a continuation of the material covered winter quarter, including magnetostatic fields in matter, magnetization, Ohm's Law, Faraday's Law, Maxwell's equations, Poynting's theorem, the wave equation and electromagnetic radiation. Four hours of lecture and problem sessions per week, weekly problem assignments, and a final examination. The text was Griffiths, An Introduction to Electrodynamics, chapters 6-9.

MODERN PHYSICS: selected topics in the development of physics during the 20th century, including the special theory of relativity, waves and particles, quantum mechanics and the Schrodinger equation; the Bohr atom, quantum theory of the hydrogen atom, and atomic and molecular structure. Four hours of lecture and problem solving sessions per week, weekly problem assignments, and a final examination. The text was Arya, Elementary Modern Physics (Addison-Wesley), chapters 1-8.

DIFFERENTIAL EQUATIONS: Topics in the solution of ordinary differential equations, including first- and second-order linear equations, homogeneous and nonhomogeneous equations, Enbr equations, higher-order linear equations, matrices and systems of differential equations, infinite series and sequences, Taylor and Maclaurin series, and partial differential equations. Four hours of lecture and problem-solving sessions per week, weekly problem assignments, and a final examination. The text was Grossman, Multivariable Calculus, Linear Algebra, and Differential Equations, chapters 11-13.

SEMINAR on THE HUMAN EXPERIENCE IN THE 20TH CENTURY: Weekly readings and discussions relating specifically to the conditions and world-view of the 20th century. Readings included: Gribbin, In Search of Schrodinger's Cat; Ortega y Gasset, The Revolt of the Masses; Rubenstein, The Cunning of History; Heilbroner, An Inquiry into the Human Prospect; Camus, The Myth of Sisyphus; Sartre, Existentialism and Human Emotions; Thoreau, Civil Disobedience; Lawrence and Lee, The Night Thoreau Spent in Jail; Jeffers, The Double Ax; Hemingway, The Old Man and the Sea; Frisch, Man in the Holocene.

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

McCARTHY	Constance	Jean	
Student's Last Name	First	Middle	ID Number

6086G	Physical Systems
Program or Contract No.	Title

10/86	6/87	48
Date began	Date ended	Qtr. Credit Hrs.

Connie has worked extremely hard this year, made good progress and done very good work in all aspects of the program. Throughout the year she has been one of the most enthusiastic participants in the program, faithfully attending the lectures and problem-solving sessions, always at seminar, and always interested and attentive and deeply involved. Connie is motivated by a genuine and deep-seated curiosity about physical phenomena and was not easily satisfied with overly simple explanations of things. And she exhibited an admirable perseverance and determination to concentrate as much learning into one year as possible.

At times Connie found the work challenging, even difficult, primarily due to the extremely analytical nature of the material and the general level of mathematical sophistication assumed in its presentation and development. The difficulty was not so much conceptual in nature as procedural. Connie usually had an immediate grasp of fundamental concepts, but found the process of analyzing a problem for the easiest and most direct route to a solution more elusive at first. She had a tendency to rely too much on brute force techniques, which often became mired down in mathematical details. However, Connie has good analytical skills, and as she progressed she steadily improved in her ability to analyze problems. By the end of the year she was successfully doing work which she had found more difficult in the beginning, and her later problem solutions were much more direct and efficient. She has made outstanding progress in her problem-solving skills, and there is no question of her ability to do the work.

Connie did her best work each quarter in math. She has a fine natural aptitude for math, and her solutions to the homework exercises showed a good grasp of the fundamental concepts and principles, and the ability to apply them to the solution of representative problems. She did equally well on the examinations. She experienced the most difficulty with the material in analytical mechanics and electromagnetic theory, where many of the concepts were quite abstract, and the general level of mathematical sophistication the most demanding, but managed to do good work nevertheless. In thermodynamics and modern physics she found the concepts equally abstract, but the general level of difficulty of the problems somewhat less. Her final exam in Properties of Materials indicated a thorough understanding of the basic concepts used to describe the engineering properties of materials.

Connie has been one of the more active and enthusiastic participants in seminar. Her seminar journals reflect a careful and thoughtful consideration of each of the reading selections. In the discussions Connie showed that she can deal with

Faculty signature(s)

THOMAS GRISSOM, Ph.D.
Faculty Name

Date

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

McCARTHY	Constance	Jean	
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6086G	Physical Systems			
Program or Contract No.	Title			
		10/86	6/87	
		Date began	Date ended	Qtr. Credit Hrs.

complex issues in depth, on a multitude of levels. She understood the relevance of each of the selections to an overall theme, or themes, and stayed focused on relevant issues. Her seminar style was to summarize and restate as a means of focusing attention on unresolved points and of identifying new directions, which she was able to do very effectively. And she was equally comfortable discussing selections from literature, history, philosophy, or science. For the Cutting Edge Colloquium lecture series in spring quarter, dealing with epistemology in modern science, Connie wrote a paper on the role of models in scientific perception, which traced that theme through each of the lectures. Not only was it well written, but it showed good insight into the metaphorical nature and limitations of scientific thinking.

Connie's work this year in Physical Systems has given her a broad overview as well as some in-depth exposure to topics traditionally covered in the undergraduate curriculum in physics and math. She has acquired a good basis for further study.

SUGGESTED COURSE EQUIVALENCIES (in quarter hours) - Total: 48

*4 - Properties of Materials
*8 - Analytical Mechanics
*8 - Electromagnetic Theory
*4 - Thermodynamics
*4 - Modern Physics
*4 - Linear Algebra
*4 - Multivariable Calculus
*4 - Differential Equations
*4 - Seminar on the History and Philosophy of Science
*2 - Seminar on Science and the Human Condition
*2 - Seminar on Epistemology of Modern Science

* Indicates upper division credit

Thomas Grissom
Faculty signature(s)

THOMAS GRISSOM, Ph.D.
Faculty Name

7/27/87
Date

MATTER AND MOTION

Program Description

1985/86

This three-quarter long coordinated studies program was designed for science majors and other students with a serious interest in the natural sciences. Its major goal was to provide a solid introduction to calculus, physics, chemistry, chemistry/physics lab, and a seminar dealing with the impact of science and technology on society. Students were allowed to take parts of the program or to substitute other courses for program components, depending on their backgrounds and individual needs.

DESCRIPTION OF PROGRAM COMPONENTS

CALCULUS

Three quarters, taught by G.S. Kutter, Ph.D.

Text: Edwin J. Purcell and Dale Varberg, Calculus with Analytic Geometry, 4th Edition, Prentice-Hall, Inc., 1984.

Fall Quarter: Introduction to functions and limits, derivative, and integral.

Credit: 4 quarter hours

Winter Quarter: Differentiation and integration of transcendental functions, techniques of integration.

Credit: 4 quarter hours

Spring Quarter: Indeterminate forms and improper integrals, infinite series, Taylor expansion, differentiation and integration in n-space.

Credit: 4 quarter hours

PHYSICS

Three quarters, taught by G.S. Kutter, Ph.D.

Text: Hans C. Ohanian, Physics, W.W. Norton & Co., 1985.

Fall Quarter: Mechanics: Units, kinematics in one and several dimensions, Newton's laws, energy, dynamics of a rigid body, gravitation, harmonic oscillator.

Credit: 4 quarter hours

Winter Quarter: Thermodynamics: Temperature, pressure, internal energy, entropy, first and second laws of thermodynamics, Carnot cycle. Electrostatics: Electric charge, force and field, Gauss's law, electostatic potential, capacitors, electric current, Ohm's law, DC circuits.

Credit: 4 quarter hours

Spring Quarter: Electromagnetism: Magnetic force and field, Ampere's law, Faraday's law, electromagnetic radiation. Quantum Mechanics: Black body radiation, photoelectric effect, Compton effect, Bohr's theory of the hydrogen atom, introduction to the Schrödinger equation. Selected topics from astrophysics.

Credit: 4 quarter hours

CHEMISTRY

Two quarters, taught by Clyde H. Barlow, Ph.D.

A full-year sequence of topics in general chemistry was covered in two quarters using calculus where appropriate. Material was presented in a combination lecture-workshop format.

Text: Dickerson, Gray, Darensbourg and Darensbourg, Chemical Principles, 4th Ed., Benjamin-Cummings, 1984.

Fall Quarter: Atoms, ions, and molecules; conservation of mass and energy; gas laws and kinetic theory; chemical equilibrium; solution equilibrium; periodic properties; quantum theory and atomic structure; electronic structure and description of the elements.

Credit: 4 quarter hours

Winter Quarter: Lewis Structure and VSEPR method; diatomic molecules; polyatomic molecules; energy and enthalpy; entropy and free energy; free energy and equilibrium; phase change and colligative properties; electrochemistry; kinetics.

Credit: 4 quarter hours

INTRODUCTION TO ORGANIC CHEMISTRY One quarter, taught by Robert Ronzio, Ph.D.

Text: Solomons, Organic Chemistry, 3rd Ed., Chapters 1-8, John Wiley and Sons, 1984.

This course focused on carbon-carbon bonding, molecular orbital theory and general properties of alkanes and alkenes. Basic principles of organic reactions were discussed in the context of free radical, elimination, and substitution reaction mechanisms. The fundamentals of stereochemistry were introduced.

CHEMISTRY/PHYSICS LAB Two quarters taught by Clyde H. Barlow, Ph.D.

Experiments were selected from chemistry and physics with the following emphases: Quantitative lab technique, maintenance of a lab notebook, analysis of results, development of independence in lab, use of laboratory computers and instrumentation.

Fall Quarter: Gravimetric and volumetric methods; stroboscopic analysis of acceleration; conservation principles with ballistic pendulum; determination of the Faraday; atomic absorption analysis of calcium.

Winter Quarter: Real time operating system (RMX) on an Intel 310 computer; Pascal programming for data collection and analysis, bomb calorimetry; pH titration; kinetics by absorption spectroscopy.

SCIENCE SEMINAR Two quarters taught by Clyde H. Barlow and G.S. Kutter

This two-hour weekly seminar focused on the relationship between science and society, both in the modern world and in the past. The seminars were led by student moderators. During the winter quarter, each student wrote a term paper.

Books read and discussed:

James Burke, Connections, Little, Brown & Co., 1978.

Robert Jungk, Brighter Than a Thousand Suns (A Personal History of the Atomic Scientists), Harcourt, Brace, Jovanovich, Pub., 1958.

Aristotles's Physics, Richard Hope (translator), University of Nebraska Press, 1961.

Selected readings from 1985/86 issues of Scientific American.

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FACULTY EVALUATION OF STUDENT ACHIEVEMENT

MCCARTHY	Constance	Jean	
Student's Last Name	First	Middle	ID Number
5176P	Matter and Motion		
Program or Contract No.	Title		

10/85	6/86	48
Date began	Date ended	Qtr. Credit Hrs.

Connie is a junior in college, with an interest in the physical sciences. To this end, she enrolled this past year in our Matter and Motion coordinated studies program, taking courses in the natural sciences and mathematics. Connie's performances in these subjects were as follows:

CALCULUS

Connie did superbly in this course. She showed a great deal of determination, worked very hard, and acquired a thorough working knowledge of the material covered. She placed consistently near the top of the class on all exams and problem sets.

PHYSICS

Connie worked hard in this class and acquired a fine understanding of the material covered. She generally placed in the upper third of the class on the exams and problem sets, which was the result of steady work habits, good motivation, and regular class attendance. I was particularly impressed by her cheerfulness and her fine talent for quantitative reasoning.

CHEMISTRY

Connie did very good to excellent work throughout the year in chemistry. Her understanding and performance continued to increase as the class progressed into the more difficult topics in chemical bonding and chemical thermodynamics. Her assignments were complete, prompt, and correct. Connie's success in chemistry clearly prepare her for more advanced work.

INTRODUCTION TO ORGANIC CHEMISTRY

Constance is working toward a B.S. degree. This course will help provide a strong science base for graduate studies. Constance learned the basic principles of organic chemistry covered this quarter. She completed most homework assignments. Her quiz scores were average. She did very well on the modterm exams, but somewhat below average on the final exam. Overall, a solid performance.

CHEMISTRY/PHYSICS LAB

Connie's work in lab fall quarter was excellent. She has well-developed observational abilities and applies them to her experimentation. Her discussion sections for experiments contained some insights that were clearly gained from the effort she had applied to the study of the system. Winter quarter she applied herself to the application of lab computers for data collection, interpretation, and

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Faculty signature(s)

G. Siegfried Kutter, Ph.D.
Faculty Name

Date

Suggested Course Equivalencies (in quarter hours)

MCCARTHY	Constance	Jean	
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presentation. She did an excellent job of learning the RMX operating system for the Intel computers, writing experimental control programs in Pascal, and using these programs during the course of experiments involving bomb calorimetry, chemical kinetics, and pH titrations.

SCIENCE SEMINAR

Connie was a most active and conscientious participant in the Matter and Motion seminar. She was always well prepared, participated with interest and skill in the discussions, and showed much support for her fellow students. Connie has a very lively and imaginative mind and she contributed greatly to making our seminar discussions interesting and challenging. During the winter quarter Connie wrote a term paper on "Extraterrestrial Intelligence: Scientific and Philosophical Points of View." The paper was thoroughly researched and quite detailed. The one problem I detected in Connie's writing was her difficulty with limiting what she says, though her final paper was much improved in this regard compared to the earlier draft.

Connie also enrolled in two additional courses in the Fall -- Principles of Biology I, and Problem Solving and Structured Programming in Pascal; and in the Spring she enrolled in a Seminar on the Craft of Writing a Critical Essay on Scientific Issues. The descriptions for these courses and evaluations of her work in them follow.

SEMINAR in CRAFT OF WRITING A CRITICAL ESSAY ON SCIENTIFIC ISSUES
(Instructor: Joanne Witke)

Description: The purpose of this seminar was to help students put their thoughts into written words with clarity and readability. The seminar met for two hours each week; in addition, one-half hour weekly sessions were available to students to talk about the project each was exploring for a final paper. The first three weeks were devoted to setting forth and defining the elements of an essay; conjointly, as practice, brief essays were written on assigned topics from a current issue of Scientific American. Subsequent meetings were given over to discussing a range of subjects primarily from Scientific American, Science, The New York Times' Tuesday "Science Section," and The New York Review of Books' articles on science. These materials were supplemented with selections from Thomas Kuhn's The Structure of Scientific Revolutions and Noam Chomsky's Syntactic Structures expounding his theory of language. In analyzing the varied articles, the focus was on literary aspects relating to structure; development of the central idea; style; tone; and author's contribution to the particular science involved.

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Faculty signature(s)

G. Siegfried Kutter, Ph.D.

Faculty Name

Date

Suggested Course Equivalencies (in quarter hours)

The Evergreen State College · Olympia, Washington 98505

FACULTY EVALUATION OF STUDENT ACHIEVEMENT

Student's Last Name	First	Middle	ID Number
MCCARTHY	Constance	Jean	

Program or Contract No.	Title	Date began	Date ended	Qtr. Credit Hrs.
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Evaluation: Connie was an articulate and a perceptive student. She asked excellent questions and gave enthusiastic support to the opinions expressed by others in the seminar. Her first essays reflected a good control of language, but she needed to work on integrating facts into a unified piece of critical writing. Her final project was a piece of solid research on a controversial subject. She explored the extent to which Kirlian photography has scientific evidence. Her paper on this topic was exemplary--well developed with supplementary illustrations and photographs. Clearly, Connie has learned how to put an argumentative edge on an issue, formulate it into a thesis, and bring it to an effective conclusion.

PROBLEM SOLVING AND STRUCTURED PROGRAMMING IN PASCAL
(Instructor: George Dimitroff)

Description: There was a strong emphasis placed on the development of good problem solving strategies and programming style. The texts used were Problem Solving and Structured Programming in Pascal by Elliot B. Koffman, and Conceptual Blockbusting by James Adams. A PLATO system of CAI exercises and instructional modules was utilized in teaching the course along with a weekly three-hour workshop and a weekly lecture. Topics in the Pascal programming language that were covered included arrays, records, loops, procedures and functions, and an introduction to files.

Evaluation: Overall, Connie did very good work this quarter. She learned to write neat, easy-to-read programs and to document them fully. Her work shows that she has also learned the problem-solving strategies that we have stressed in this course, and that she uses them to great advantage whenever she has a Pascal program to write. Her project was an ambitious undertaking to write a program that would be able to use the gas laws to solve for one or two unknowns when all of the values of the other variables were known. She did a very good job with this project.

PRINCIPLES OF BIOLOGY I (Instructor: Burton S. Guttman)

Description: This was the first quarter of a standard three-quarter introductory sequence. Topics covered included basic biological concepts, general biological structure and organization, principles of ecology, and the process of evolution. Text: Guttman and Hopkins, Understanding Biology.

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Faculty signature(s)
G. Siegfried Kutter, Ph.D.
Faculty Name

Date

Suggested Course Equivalencies (in quarter hours)

The Evergreen State College · Olympia, Washington 98505

FACULTY EVALUATION OF STUDENT ACHIEVEMENT

Student's Last Name	First	Middle	ID Number
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Evaluation: Constance McCarthy did very high quality work in biology this quarter. She is very enthusiastic and intellectually curious, and shows an intense need to understand everything. Her answers to exam questions were generally very good, with only minor lapses that were easily corrected. She worked diligently and consistently in the lab.

To summarize, I'd like to say that Connie is an intelligent, hardworking, and very conscientious young woman. She has a very lively mind, and many interests, including the sciences, archeology, humanities, and music. She also is very articulate, enjoys wide-ranging discussions, and always interacts comfortably with students and faculty.

This past year has been an exceptionally successful one academically for Connie. She has matured greatly in her quantitative and analytic skills and she has acquired much new information. I wish her well in her pursuit of a science career.

Suggested Course Equivalencies (in quarter hours)

Suggested Course Equivalencies (in quarter hours) - Total: 48

8 - Calculus
8 - Physics
8 - Chemistry
4 - Organic Chemistry
4 - Chemistry/Physics Lab
4 - Science Seminar
4 - Critical Writing
4 - Problem Solving and Structured Programming in Pascal
4 - Principles of Biology

Faculty signature(s)

G. Siegfried Kutter, Ph.D.
Faculty Name

JUL 9 RECD

Date 7/8/86

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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.