

New Mexico Tech Office of Academic Affairs

December 2007

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY

MEETING OF THE FACULTY SENATE

Tuesday, Dec. 4, 2007

4:00 P.M.

Workman 101

MINUTES

Call to order. Dr. Dave Westpfahl, Chair, called the meeting to order at 4:04 p.m. by calling for approval of the Faculty Senate Minutes of Nov. 6, 2007.

Approval of the minutes of Nov. 6 meeting. The minutes were approved following a motion by Dr. Johnson and a second by Dr. Cormack.

Announcements

Committee Reports

Honorary Degree and Awards Committee – Dr. Sharon Sessions stated that the committee has received a nomination from Dr. Van Romero for a Honorary Degree for Steve Torres specifically for his thirty years of service as a New Mexico Tech Regent and his lifelong support of New Mexico Tech. The committee has also received supporting letters from Dr. Larry Lattman, Dr. Stirling Colgate and Dr. Peter Anselmo. After careful review, the Honorary Degree and Awards Committee agree and ask the Faculty Senate for approval of an Honorary Degree, a PhD in Business Management for Steve Torres. Dr. Bowman seconded the motion. The nomination along with supporting materials will be made available in the Academic Affairs. This motion will be voted on in the February Faculty Senate Meeting.

Old Business

New Business

Graduate Council: Dr. Johnson brought Graduate Council items before the Faculty Senate for approval. He moved for adoption of changes for Earth and Environmental Science.

Geophysics Courses

New course

GEOP 546, Reflection Seismic Data Interpretation, 3 cr, 2 cl hrs, 2 lab hrs

Prerequisite: EARTH 445 or equivalent, graduate standing or consent of instructor.

Offered alternate years

An overview of the fundamentals of the geologic (both structural and stratigraphic) interpretation of 2D and 3D reflection seismic data. An introduction to seismic acquisition and processing and their effects on interpretation. Techniques covered include: well log to seismic ties, contour maps, fault plane maps, time-to-depth conversion, seismic sequence analysis, and workstation interpretation of 3D data. Designed for students with a range of earth science and engineering backgrounds. Shares lecture/lab with EARTH 446, but is graded separately and additional graduate-level work is required.

New course

GEOP 557 Reflection Seismic Data Processing, 3 cr, 2 cl hrs, 2 lab hrs

Prerequisite: EARTH 445 or equivalent, graduate standing or consent of instructor.

Offered alternate years

The computer application of digital signal processing to reflection seismic data from environmental, petroleum, and crustal surveys. Topics covered include: definition of survey geometries, data editing techniques, amplitude recovery, bandpass filtering, deconvolution, velocity analysis, F-K filtering, and migration. Shares lecture/lab with EARTH 457, but is graded separately and additional graduate-level work is required.

Hydrology Courses:

Change in course description

HYD 508, Flow and Transport in Hydrologic Systems, 3 cr, 3 cl hrs

Prerequisites: EARTH 440 and 510

Offered spring semester

Principles of flow and transport in groundwater aquifers, the vadose zone, and surface water bodies. Mass, momentum and energy conservation. Storage, compressibility, capillarity, and Darcy's law in porous media. Single phase, two phase and Richard's equations approaches to flow in porous media. Flow in fractures and streams. Transport of non-reactive chemical species by advection, diffusion and dispersion in porous and fractured media, and surface water bodies.

Principles of flow and transport in hydrological systems, including rivers, lakes, aquifers, the vadose zone, glaciers and the lower atmosphere. Fluid mechanical and thermodynamic properties, fluid statics, fluid dynamics, including mass, momentum and energy conservation, and transport of heat, particles and non-reactive chemicals with fluid flow. Single and multiphase laminar flow in porous and fractured permeable media. Turbulence and related topics that are of particular interest to hydrologists.

Change in course description

HYD 510, Quantitative Methods in Hydrology, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisite: MATH 231; Pre or Corequisite EARTH 440

Offered fall semester

Introduction to the physics of hydrology, including computational tools, presented in the context of hydrologic problem solving. General orthogonal curvilinear coordinates. Fluid dynamics equations and analytical and numerical solutions. Use of mathematical software to solve problems, test assumptions, and explore sensitivity to parameters. Structured programming.

Introduction to the methods of mathematical physics used in hydrologic science.

Presented in the context of mathematical models of water and energy balances, fluid flow, and heat & solute transport. Application to aquifers, the vadose zone, land-surface runoff, rivers, and the atmospheric boundary layer. Methods span advanced engineering calculus, including numerics and differential equations. Use of software (Matlab, Maple, and COMSOL Multiphysics) for problem solving and solution presentation. Programming with Matlab.

Change in course description

HYD 532, Vadose Zone Dynamics, 1 cr, 1 cl hr

Prerequisite: EARTH 440, EARTH 432, EARTH 442, HYD 510

Physical processes governing fluid, heat, and gas transport through the vadose zone. Application of the model HYDRUS1D for the evaluation of water flow and contaminant transport through the vadose zone.

Physical processes governing water and contaminant transport through the vadose zone. Transient unsaturated flow and transport and plant/water uptake. Application of the model HYDRUS1D for evaluation of water flow and contaminant transport through the vadose zone.

Prerequisite change

HYD 542, Hillslope Hydrology, 1 cr, 1 cl hr

Prerequisites: EARTH 440, EARTH 442, HYD 510

Physical processes governing water flow through hillslope systems and into receiving streams. Prerequisite change

HYD 543, Ecohydrology, 1 cr, 1 cl hr

Prerequisites: EARTH 440, EARTH 443, HYD 510,; Pre- or corequisite HYD 508

Interactions between terrestrial plants and water, nutrients, and light resources in semiarid environments. Ecohydrological processes, dynamics, and simple numerical models.

The motion was seconded by Dr. Stone. The motion passed unanimously.

Dr. Johnson moved for approval to delete courses that are no longer being taught by Computer Science Department. The motion was seconded by Dr. Bowman.

The following courses were introduced by a faculty member who has departed NMT

Delete

CS569-- Embedded Systems Design

Delete

CS570-- Real-Time Systems.

Dr. Sonnenfeld questioned whether deleting them from the curriculum because hiring problems for Computer Science. Dr. Soliman stated that the department removes them from the catalog to not mislead students that these courses will be offered. If the department should hire a faculty member to teach these courses, the course can then be developed by the new member and proposed for the catalog at that time.

The motion passed with one dissenting vote.

Dr. Johnson proposed adoption of a new course for Mechanical Engineering. The motion was seconded by Dr. Borchers.

New Course

MENG 547 Theory and Application of Pyrotechnic, 3 cr, 3 cl hrs

Prerequisite: MENG 545; or consent of instructor

Fundamentals of basic concepts of pyrotechnic. Thermo-mechanical/chemical aspects of pyrotechnics, formulation and mixing of pyrotechnic mixtures, application of pyrotechnic including illumination, tracers, incendiaries, delays, etc.

The motion passed.

Masters Degree Approval: Dr. Lorie Liebrock moved to approve a Masters Degree in Computer Science with Information Technology Option for Barry Gavrich who has completed all degree requirements as confirmed by the Graduate Dean, Dr. Dave Johnson. Dr. Soliman seconded the motion. Dr. Liebrock stated this Mr. Gavrich will be employed by the Space and Naval Warfare Command (SPAWAR) which will only accept completion of degree on his diploma before the his employment start date of December 10, 2007. Questions were raised to whether the Faculty Senate will be voting on degrees all during the year due to new hiring requirements. Dr. Zeman stated that the Academic Affairs Office has been seeing more and more request from students being employed by the Government, Federal agencies, and the national labs. Dr. Johnson proposed that the Faculty Senate develop a policy. Dr. Westpfahl returned to the motion on the floor and ask for approval of the granting of the Masters Degree of Barry Gavrich. The motion passed.

Dr. Johnson then moved to that the Faculty Senate accommodate recommendations for degrees three times a year as close to the end of the semester as possible. This would be scheduled the first Tuesday of the first week of classes of the Spring semester, the first week of classes for Fall, and finals week in May. Then Brian commented that this would add an extra FS meeting to the schedule. Dr. Borchers also stated that this would cause the Registrar's Office to have additional work, but Ms. Baca-Rivet reported that this would indeed increase the workload but could be accomplished. Dr. Borchers moved to table the motion for more input from the Vice President and President before voting on the matter. Dr. Stone seconded the motion. The motion to table until the February meeting passed.

Adjournment: Dr. Westpfahl adjourned the meeting at 4:25 p.m.

Respectfully submitted,

Debby Olguin

November 2007

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY

MEETING OF THE FACULTY SENATE

Tuesday, Nov. 6, 2007

4:00 P.M. Workman 101

MINUTES

1. **Call to order.** Dr. Dave Westpfahl, Chair, called the meeting to order at 4:05 p.m. Dr. Richard Sonnenfeld asked whether or not a quorum had been established. Emma Aafloy from Academic Affairs, using a hand count, ascertained that a quorum of 33 had been established, and the meeting continued.
2. **Approval of the minutes of October 2, 2007.** Dr. Robert Cormack moved for approval, followed by a second from Dr. Dave Johnson. The minutes were then approved as written.
3. **Announcements.**
 - **Dr. Peter Gerity, Vice President for Academic Affairs.** Gerity reminded faculty that Dec. 15 is the deadline for delivery of tenure packets to Debby Olguin in the Academic Affairs office. He also announced that the ABET site team visit to the Computer Science Department had been completed, with official notice to follow next July. Gerity commended the planning team, singling out Dr. Gillian Bond, Dr. Tom Engler and Dr. Osman Inal for their efforts. "We're looking at a positive outcome; there are no deficiencies at this point," Gerity added. He noted that the Computer Science Department's ABET accreditation would be re-indexed, along with Mechanical Engineering, for the next regularly scheduled ABET visit in 2010. Civil Engineering also is preparing for its first ABET visit in the fall of 2008.
 - **Owen Ellard, Librarian.** Library Director Ellard, with assistance from Joan Shedivy, Public Services, gave the Faculty Senate an update on the Library. Under circulation policies, the Library has extended its borrowing periods, instituted online renewals and eliminated fines. The Library now has EZPoxy, which provides remote access to web-based, licensed databases; LexisNexis, a site containing 360 full-text newspapers, both national and international; the IEEE ASPP package with 128 core journals available through IEEE Xplore; has added 128 Humanities journals to its JStar collection; and now has a site license to *The Chronicle of Higher Education*. Ellard said the Library is in the process of an extensive review of its journals, a two-year project, adding that he would like to learn from faculty what journals are necessary for their research. "Some may be no longer necessary; some you may wish to add," he said. The Library also will create a web page on proposed cancellations. Ellard said he is anxious to increase the technological side of the Library to provide areas large enough for student group projects.

4. Committee Reports.

a. Nominating Committee – Approval of Committee Membership (see attachment). Dr. Bill Stone moved to elect the slate of officers as proposed at the last meeting, followed by a second from Dr. Johnson. The motion passed. (Dr. Dave Westpfahl, re-elected chairman; Dr. Tom Engler, vice chair; and Dr. Richard Sonnenfeld, parliamentarian. The nominating list also included members of the Faculty Senate Standing Committees as posted on the Academic Affairs website.) Westpfahl asked that committees meet to designate a chair, and that all committees meet at least once a year and report back to the Senate.

5. Old Business. None.

6. New Business.

a. Council of Chairs Meeting – October 22, 2007 (Minutes Attached).

Gerity asked department chairs to present the proposed changes as approved by the Council of Chairs at its October meeting.

- **Materials and Metallurgical Engineering – Dr. Deidre Hirschfeld, chair.** Hirschfeld moved to accept a revised curriculum with reduced credit hours and an additional three “super” labs. Bowman seconded the motion. The motion was voted on and passed as follows:

OLD:

Minimum credit hours required - 134

The following courses are required:

- MATH 231 (4), 335 (3)
- ES 110 (2), 111 (3), 201 (3), 302 (3), 332 (3)
- MATE 101L (1), 202 & 202L (4), 235 & 235L (4), 301 (3), 314 (3), 350 (3), 351 (3), 382 (2), 431 (3), 441 (3), 442(3), 445 (3), 452 (3), 467 (2), 481 (3), 482 (3)
- METE 327 (3)
- Advanced basic science (3): CHEM 311, 331, 333 is recommended.
- Technical electives (6) Technical and advanced basic science electives must be chosen with the approval of the advisor.

NEW:

Minimum credit hours required 131

In addition to the General Degree Requirements (page 54), the following courses are required:

- MATH 231 (4), 335 (3)
- ES 110 (2), 111 (3), 201 (3), 302 (3), 332 (3) or EE 211 (3)
- MATE 101L (1), 202 & 202L (4), 235 & 235L (4), 301 (3), 310 (3), 311 (3), 314 (3), 350 (3), 351 (3), 410 (3), 445 (3), 481 (3), 482 (3)
- METE 327 (3)

- Advanced basic science (3): CHEM 311, 331, 333 or MATE 452 is recommended.
- Technical electives (12): Approved upper level MATE and METE courses. Up to 3 credit hours can be completed outside the department with the consent of the department. Approved non Materials department courses are: CHEM 311, 331, 332, 333, 443, ChE 443L, 470, 473, 475, CS 209, 476, MATH 254, 283, 382, 384, 410, 411, 415, OPT 300, 400, PHYS 301, 340, 444, CE 302, EE 212, 324, ES 316, 405, MENG 304, 421, ME 434.

BS in Materials Engineering with Metallurgical Engineering Option
Bachelor of Science Degree in Materials Engineering with Metallurgical Engineering Option

Minimum credit hours required—131

In addition to the General Degree Requirements (page 54), the following courses are required:

- MATH 231 (4), 335 (3)
- ES 110 (2), 111 (3), 201 (3), 302 (3), 332 (3) or EE211 (3)
- MATE 101L (1), 202 & 202L (4), 235 & 235L (4), 301(3), 310 (3), 311 (3), 314 (3), 350 (3), 410 (3), 445 (3), 481 (3), 482 (3)
- METE 326 (3), 327 (3)
- Advanced basic science (3): CHEM 311, 331, 333 or MATE 452 are recommended.
- Technical electives (12): Approved upper level MATE and METE courses.
- Electives to complete 131 credit hours

Credit for trigonometry or college algebra is not allowed for engineering students.

All engineering majors are required to take the Fundamentals in Engineering (FE) exam as a requirement for graduation.

New Courses:

MATE 102L, Introductory Materials Engineering Laboratory, 2 cr, 3 lab hrs

See description for MATE101L with additional emphasis on exploration of career opportunities in Materials Science and Engineering.

MATE 103L, Introduction to Electron Microscopy, 1 cr, 3 lab hrs

Students will obtain a basic understanding of various techniques of electron microscopy including Scanning Electron Microscopy (SEM), Transmission Electron Microscopy, Auger Electron Spectroscopy (AES), Secondary Ion Mass Spectroscopy (SIMS), and Atomic Force Microscopy (AFM). Demonstrations of various applications of these techniques will be given.

MATE 104L, Introduction to Electron Microscopy, 2 cr, 3 lab hrs

See description for MATE 103L with additional emphasis on Electron Microscopy across multiple disciplines.

MATE 310 Processing and Microstructure Methods and Analysis 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites: MATE 202, MATE 235; or consent of instructor

Emphasis on the relationship between processing and microstructure. Processing techniques used to form metals, ceramics, polymers, and composites will be studied such as extrusion,

pressing, forging, rolling, casting, and joining. Elementary analysis techniques such as optical and electron microscopy will be used to illustrate the effect of processing on microstructure.

MATE 311 Thermal and Mechanical Methods and Analysis 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites: MATE 202, MATE 235; or consent of instructor

Emphasis on the use of thermal and mechanical techniques to both influence and measure the properties of metals, polymers, ceramics, and composites. Thermal techniques such as DSC, DTA, TGA, TMA, and dilatometry will be examined. Thermal processing and temperature measurement techniques will also be covered. Mechanical techniques such as viscometry, rheometry, strength/toughness testing, hardness testing, and fatigue will be covered. These thermal and mechanical techniques will be used to elucidate the relationship between properties and microstructure, relaxation mechanisms, lifetime predictions, phase transformations, chemical reactions, and synthesis.

MATE 410 Microstructural Characterization Methods and Analysis 3 cr, 2 cl hrs, 3 lab hrs

Prerequisite: Phys 122, MATE 202, MATE 235 or consent of instructor

Crystalline and non-crystalline materials are characterized using various types of scattering, diffraction, absorption and microscopy techniques. Methodologies such as x-ray diffraction, electron diffraction and microscopy are introduced for analyzing crystallographic and other structural properties of metals, ceramics, polymers and composites.

Delete Courses:

MATE 301L, Ceramics Lab

METE 327L, Physical Metallurgy Lab

MATE 382, Introduction to Engineering Design, 2 cr, 1 cl hr, 3 lab hrs

Revised Course Descriptions:

MATE 202L Materials Engineering I Laboratory, 1 cr, 3 lab hrs

Corequisite: MATE 202

Laboratory experiments addressing elementary design problems involving optimal use of materials. Designed to reinforce principles discussed in Mate 202.

MATE 446, Computer Simulation in Materials Science, 3 cr, 3 cl hrs

Prerequisite: MATH 231

Computer simulation techniques are introduced and applied to systems of interest to Materials Science. Monte Carlo and Molecular Dynamics methods are used to explore properties at the atomic level.

MATE 441, 441L, X-Ray Diffraction, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisite: PHYS 122

Properties and generation of X-rays, X-ray diffraction phenomena. Single-crystal and powder techniques for study of structure of metals and alloys, imperfections, stress, and strain.

MATE 481, 481L, Engineering Design I, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisite: Senior Standing MATE 382

Student design teams begin a year-long capstone design project.

The teams will identify project needs, establish goals, determine design requirements, produce alternate solutions, and perform detailed planning. Project initiation, periodic design reports and design reviews. Students, faculty, and distinguished visitors discuss subjects of current and/or long-range interest in various fields of materials.

Undergraduate students majoring in Materials Engineering are required to take MATE 481 and MATE 481L concurrently. (Same as METE 481)

Materials Engineering Program Changes:

- **New approach to labs will address elements of Materials Engineering in Processing, Thermal and Mechanical Methods and Microstructural Characterization methods across all elements, metals, ceramics, polymers and composites.**
- **Eliminate Jr. Design and incorporate engineering design elements in all 300 level courses. Incorporate Senior Seminar into Senior Design Class**
- **Allow electives outside of the department in order to allow undergrads to more specifically address interests.**

– **Electrical Engineering, Dr. Bill Rison standing in for Dr. Scott Teare, chair.** Rison asked for approval of one minor revision, changing CS 111 from a pre-requisite to a co-requisite. Johnson seconded the motion. The motion was voted on and passed as follows:

Previous Catalog:

EE 231, 231L, Digital Electronics, 4 cr, 3 cl hrs, 3 lab hrs

Prerequisite: ES 111 or CS 111.

Corequisites: EE 231 and 231L are corequisites of each other.

Normally offered fall semester

Foundation of combinational digital system analysis and design; including Boolean algebra, logic gates, and truth tables. Sequential digital design via finite state machines. Lab provides exposure to computer-aided design software and programmable logic hardware.

Proposed Change:

EE 231, 231L, Digital Electronics, 4 cr, 3 cl hrs, 3 lab hrs

Prerequisite: ES 111 or CS 111.

Corequisites: ES 111 or CS 111; EE 231 and 231L are corequisites of each other.

Normally offered fall semester

Foundation of combinational digital system analysis and design; including Boolean algebra, logic gates, and truth tables. Sequential digital design via finite state machines. Lab provides exposure to computer-aided design software and programmable logic hardware.

– **Psychology and Education Department, Dr. Mark Samuels, acting chair.** Samuels moved to accept two changes regarding the Bachelor of Science degree in Psychology. The motion was seconded by Dr. Gerity. It was put to a vote and passed as follows:

Bachelor of Science in Psychology

Minimum credit hours required—130

In addition to the general degree Requirements (page 54), the following courses are required:

- PSY 121 (3); 205 (4); 471 or 472 (1)
 - Two courses (with associated labs) chosen from among PSY 301 (4), 305 (4), 309 (4)
 - 15 additional credit hours in psychology
 - BIOL 111 (4), 112 (4), and at least six (6) upper-division credits in Biology, exclusive of BIOL 471 or 472
 - MATH 283 (3) or 483 (3)
 - CS 111 (4)
 - **At least four (4) additional credit hours beyond the general degree Requirements and the above Psychology Requirements selected from among: Biology, Computer Science, Chemistry, Mathematics and Physics.**
 - *Electives to complete 130 credit hours.*
-

– **Mechanical Engineering Department, Dr. Sayavur Bakhtiyarov, chair.** (Prior to having Dr. Bakhtiyarov take the floor, Gerity explained that one measure proposed by the chair at the Council of Chairs meeting was not approved, as noted in the Minutes. The Council at that meeting had asked that a proposed increase of credit hours for a B.S. degree have more study and review.) Bakhtiyarov moved to accept a proposed 19-hour Minor in Biomedical Engineering degree, and a Minor in Mechanical Engineering. The biomedical engineering program includes a Senior Design Project, new courses and an explosives lab supported by EMRTC. Courses for the minor depend on the student's major. The motion was seconded by Johnson. When put to a vote, the motion passed as follows:

Minor in Biomedical Engineering

Minimum credit hours required – 19

The following courses are required:

BIOL 111, 111L, General Biology, 4 cr, 3 cl hrs, 2 lab hrs
BIOL 331, Cell Biology, 3 cr, 3 cl hrs
BIOL 351, Physiology I, 3 cr, 3 cl hrs
BIOL 352, Physiology II, 3 cr, 3 cl hrs

Two courses from:

MATE 351, Introduction to Polymeric Materials, 3 cr, 3 cl hrs
MENG 460, Introduction to Biomedical Engineering, 3 cr, 3 cl hrs
MENG 465, Biorheology, 3 cr, 2 cl hrs, 3 lab hrs
CHE 473, Polymer Materials Engineering, 3 cr, 3 cl hrs

MATE 516, Biomimetic Materials, 3 cr, 3 cl hrs
MENG 576, Biomedical Mechatronics, 3 cr, 3 cl hrs
MENG 489, Special Topics in Biomedical Engineering, 3 cr, 3 cl hrs

Senior Design Project:

Students, who are interested in a minor in Biomedical Engineering, will do their Senior Design Project in the Biomedical Engineering field. This is an opportunity for them to implement their learning in the mechanical engineering and life sciences fields to tackle a particular problem in the biomedical engineering field.

The Minor in Biomedical Engineering passed as proposed.

Dr. Bakhtiyarov proposed the adoption of the following new courses. The motion was seconded by Dr. Hossain. A question was raised on who would be teaching all the new courses proposed. Dr. Bakhtiyarov replied that he and an adjunct professor would teach the new courses.

New Courses:

EXPL 419L Explosives Testing and Diagnostic Techniques Laboratory, 1cr., 3 cl. hrs

Prerequisite: MENG 545 or EXPL 311 and EXPL 412 or consent of instructor.

Co-requisite: EXPL 419

An introduction to the explosive testing and data acquisition systems. Basic concepts of explosives initiation and the measurement/characterization of detonation effects. Experimental analysis of energetic materials and explosives devices utilizing various state-of-art testing equipment. Ultra-high speed camera, VISAR, shock measurement systems, etc. Analysis of material properties under high-pressure shock compression, and data interpretations.

MENG 460, Introduction to Biomedical Engineering, 3 cr, 3 cl hrs

Prerequisite: Sophomore classification or consent of instructor

An overview of research in biomedical engineering, biomechanics, biocompatibility, tissue engineering, biomedical instrumentation, and moral and ethical issues.

MENG 465, Biorheology, 3cr, 2 cl hrs, 3 lab hrs

Prerequisite: MENG 351L or consent of instructor

Concepts of rheology. Rheology of body fluids. Different rheological models of fluids and applications in diagnosis and treatment of diseases. Laboratory experiments of plasma and blood rheological characterization (viscosity, elasticity, plasticity, etc.).

AE 489, Special Topics in Aerospace Engineering, 3 cr, 3 cl hrs

AE 491, Directed Study, cr to be arranged

EXPL 489, Special Topics in Explosives Engineering, 3 cr, 3 cl hrs

EXPL 491, Directed Study, cr to be arranged

MENG 469, Special Topics in Biomedical Engineering, 3 cr, 3 cl hrs

Minor in Mechanical Engineering

Minimum credit hours required – 18

The following courses are required

At least eighteen (18) credit hours of ES or MENG courses and/or labs beyond those required for major. These courses and labs are subject to the approval of the Mechanical Engineering Minor Adviser.

– **Physics Department, Dr. Westpfahl, chair.** Westpfahl moved to accept renumbering freshmen Physics courses to reflect the different levels at which students enter the program. The motion was seconded by Johnson. When put to a vote, it passed as follows:

Physics proposes to renumber the current Physics 131 and 132, to become Physics 221 and 222, Comprehensive Physics I and II. The prerequisites would be Physics 121 and Math 131, or permission of the instructor. These courses contain a lot of modern physics, and would allow us to drop Physics 232 from the curriculum.

This would allow incoming students to start the study of physics at three points.

1. Poorly prepared students could start with Physics 109, which we are offering on an experimental basis. This is appropriate for students taking Math 103 or 104, and students with absolutely no previous study of physics.
2. Calculus-ready students could start with Physics 121, as they do now.
3. Very well prepared students could start in Physics 221, as they now start in Physics 131.

We note that transfer students who have already had the equivalent of Physics 121 and 122 can start with Physics 221.

– **Earth & Environmental Science, Dr. Rob Bowman, chair.** Bowman moved to accept a new undergraduate degree program, a proposed Petroleum Geology option, in response to great demand. Johnson seconded the motion. When put to a vote, it passed as follows:

Required Courses for Bachelor of Science in Earth Science with Petroleum Geology Option

- A 100-level EARTH course and associated lab (4)
- EARTH 201(4), EARTH 202 (4), EARTH 203 (4), EARTH 204 (4), EARTH 205 (1), EARTH 390 (3), EARTH 325 (3), EARTH 330 (3), EARTH 468 (3), EARTH 483 (2)
- PETR 101 (1), EARTH 370 (3), EARTH 385 (3), EARTH 440 (4), EARTH 445 (3), EARTH 447 (3), EARTH 453 (4), EARTH 460 (3), EARTH 484 (2), EARTH 485 (2)
- Any two of the following classes: EARTH 424 (3), EARTH 425 (3), EARTH 446 (3), EARTH 457 (3), EARTH 470 (3)

- MATH 283 (3) or 382 (3)
- Electives to complete 130 credit hours

Bowman proposed a second set of changes clearing up designations and other editorial revisions. The motion was seconded by Hossain. When put to a vote, it passed as follows:

Other Catalog Changes: Strikethrough = deleted text and Underline = inserted text

Clarification of lab requirement

Minor in Earth Science

Minimum credit hours required — 18

The following courses are required:

- One 100-level EARTH class and associated lab (4 hrs)
- Two classes from the following list: EARTH 201, 202, 203, or 204 (8 hrs)
- At least six hours 200 or above EARTH, GEOL, GEOP, GEOC, or HYD

Earth Science Courses

Prerequisite clarification

ERTH 201, Geobiology 4 cr, 3 cl hrs, 3 lab hrs

Prerequisite: a 100-level EARTH course and associated lab

Offered spring semester, odd numbered years

Consideration of life and its impact on the Earth System over the course of Earth history including its preserved geochemical and fossil remains, study of the observable geological effects of life processes and in turn the impact of geological, hydrological, and atmospheric effects on the origins and subsequent evolution of life. Field trips.

Prerequisite clarification

ERTH 202, Earth Surface Processes and Landforms, 4 cr, 3 cl hrs, 3 lab hrs

Prerequisites: Any EARTH 100 level class and associated lab

Offered fall semester, odd numbered years

A study of the interactions between the atmosphere and the internal heat of the Earth which result in the development of landscapes observable at the Earth's surface today. Topics will include atmospheric circulation, climate, fluvial processes, and the record of paleoclimate contained in the landscape. Field trips

Prerequisite clarification

ERTH 203, Earth's Crust: Materials, Processes, and Dynamics, 4 cr, 3 cl hrs, 3 lab hrs

Prerequisite: a 100-level EARTH course and associated lab

Offered spring semester

Overview of the evolution of the crust of the Earth, the major rock types and processes that form it, and the main methods used to study it. Topics include: mineralogy, igneous, sedimentary and

metamorphic petrology, structural geology, subsurface fluid flow, and petroleum geology. Field trips.

Prerequisite clarification

ERTH 204, Introduction to Whole Earth Structure and Composition, 4 cr 3 cl hrs, 3 lab hrs

Prerequisite: a 100-level EARTH course and associated lab

Offered fall semester, even numbered years

Introduction to geophysical and geochemical methods used to study the deep Earth. Formation, composition and internal structure of the Earth, plate tectonics, gravitational and magnetic fields, heat flow and thermal history, earthquakes, and interaction of Earth systems with emphasis on the crust, mantle and core. Introduction to mantle convection, geochemical reservoirs, and mantle plumes. Field trips.

Prerequisite clarification

ERTH 205, Earth Science Practicum, 1 cr, 3 lab hrs

Prerequisite: a 100-level EARTH course and associated lab

Offered fall semester, odd numbered years

Instruction and practice in computational methods used to solve Earth science problems. Simple ways to describe physical processes mathematically, then approximate them numerically. Introduction to spreadsheets and graphics programs. Review of math and statistics.

Prerequisite clarification

ERTH 206, Fundamentals of Earth's Crust, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisite: a 100-level EARTH course and associated lab

Offered spring semester

Overview of the evolution of the crust of the Earth, the major rock types and processes that form it, and the main methods used to study it. Topics include: mineralogy, igneous, sedimentary and metamorphic petrology, structural geology, subsurface fluid flow, and petroleum geology. This course is for non-majors only. Earth Science majors must enroll in EARTH 203. Meets concurrently with EARTH 203, but course work differs. Field trips.

Deleted course

ERTH 319, Igneous and Metamorphic Petrology, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites: EARTH 211 and 318; or consent of instructor

Offered spring semester

Occurrence, classification, and origin of igneous rocks. Origin of magmas. Principles of metamorphism; classification of metamorphic rocks; metamorphic fabrics, and microstructures; metamorphic facies and interpretation of paleotectonic environments. Field trips.

Prerequisite change and added semester offered

ERTH 325, Near-Surface Geophysics, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites: PHYS 121; EARTH 101 a 100-level EARTH course and associated lab

Offered fall semester even numbered years

Theory and practice of geophysical methods for exploring the shallow subsurface, with emphasis

on electromagnetic methods including resistivity, EM conductivity, ground-penetrating radar, and magnetic field strength. Applications to environmental hazards, hydrogeological features, and/or archaeology are emphasized in a hands-on, field-oriented approach.

Deleted course

ERTH 337, Stratigraphy and Paleontology, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisite: EARTH 102

Offered fall semester

Introduction to stratigraphic principles; survey of geologically important invertebrate biota preserved as fossils; their modes of preservation, collection techniques, taxonomy, paleobiology, paleoecology, and biostratigraphic utility. Field trips.

Deleted course

ERTH 353, Structural Geology, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites (Earth Science majors): EARTH 102 & 102L; EARTH 317, 318 or 319; PHYS 121 or 131; or consent of instructor

Prerequisites (Mineral Engineering majors): ME 360 & 360L; PHYS 121 or 131; or consent of instructor

Corequisite (Mineral Engineering majors): ME 462

Offered fall semester

Study and interpretation of geologic structures. Processes of fracturing, faulting, folding, and flow of rocks; stress and strain; and elementary concepts of tectonics. Lab includes solution of map problems and use of stereographic projections. Field trips.

Prerequisite change

ERTH 370, Formation Evaluation, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisite: PHYS 122

Corequisite: EARTH 353 203

The qualitative and quantitative interpretation of electric, sonic, and radioactive well logs. Physical and electrical properties of saturated rock. Formation testing and analysis. Laboratory exercises in log reading and interpretation. Preparation of subsurface maps for estimation of reserves. (Same as PETR 370)

Prerequisite change

ERTH 409, Soil Geomorphology, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites: EARTH 306 202 and 405; or consent of instructor

Offered spring semester, alternate years

Discussion of the use of soils to interpret the rate and timing of geomorphic processes and changing environmental parameters. Field trips.

Deleted course

ERTH 420, Advanced Igneous Petrology, 3 cr, 3 cl hrs

Prerequisite: EARTH 319

Offered on demand

Application of phase diagrams, experimental petrology, and field and petrographic relationships to the origin of magmas. Field trips.

Prerequisite change

ERTH 424, Sedimentary Petrography, 3 cr, 4 lab hrs

Prerequisite: ERTH 318 202, 203

Offered spring semester, alternate years

Petrographic analysis and interpretation of sedimentary rocks, with emphasis on siliciclastics. Topics include: grain identification and provenance, identification of diagenetic minerals and textures, and interpretation of porosity and permeability characteristics.

Prerequisite change

ERTH 430, Active Tectonics, 3 cr hrs

Prerequisites: ERTH 306, 353 202, 203

Offered alternate years

Study of Quaternary faults, including basic field techniques, tectonic geomorphology from fault scarps to mountain fronts, patterns of faulting, structural analysis of faults in alluvium, relation of surface to subsurface structures, paleoseismology, and review of Quaternary dating methods.

Change in course description

ERTH 442, Vadose Zone Processes, 1 cr, 1 cl hr

Prerequisite: ERTH 440

Offered spring semester

Multiphase flow, potentials and water retention, transient flow problems, plant/water uptake
Physical processes governing water movement between the land surface and the groundwater table. Capillarity, potentials and water retention, unsaturated flow.

Name and prerequisite change; added semester offered

ERTH 445, Exploration Geophysics I Exploration Seismology, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites: PHYS 121 or equivalent; ERTH 101 a 100-level ERTH course and associated lab; upper-class standing

Offered fall semester, odd numbered years

An introductory course on seismic refraction and reflection imaging of the subsurface, including methods of data acquisition, processing, and interpretation in two and three dimensions.

Designed for students with a range of earth science and engineering backgrounds.

Prerequisite change

ERTH 448, General Geophysics, 3 cr, 3 cl hrs

Prerequisites: PHYS 122 or equivalent; ERTH 101 a 100-level ERTH course and associated lab; upper-class standing

An introduction to the general field of solid earth geophysics. Subjects covered are the origin of the earth; structure and internal properties of the earth; gravity, magnetic, and temperature fields of the earth; origin of the earth's atmosphere, hydrosphere, and surface features.

Prerequisite change

ERTH 450, Cave and Karst Systems, 3 cr, 3 cl hrs

Prerequisites: CHEM 121 & 122; and either ERTH 101 a 100-level ERTH course and

associated lab or BIOL 111

Offered spring semester, even years

A system-based study of caves and karstic terrains over time including formation mechanisms (speleogenesis), hydrology, geochemistry, mineralogy, and geomicrobiology. Emphasis on caves as interactive microcosms cross-cutting many disciplines. Shares lecture with GEOL 550, but is graded separately.

Added semester offered

ERTH 453 Advanced Structural Geology, 4 cr, 3 cl hrs, 3 lab hrs

Prerequisites: EARTH 203; PHYS 121 or 131; MATH 131

Offered alternate years Offered fall semester, odd numbered years

Elements of fault, fold, and rock mechanics; strain analysis and inference of stress in Earth's crust; construction of balanced, kinematically viable cross sections; brittle and ductile shear-sense

indicators in faults and shear zones. Shares lecture and lab with Geol 553 but graded separately.

Prerequisite change

ERTH 456, Volcanology, 3 cr, 2–3 cl hrs, 1–3 lab hrs

Prerequisite: EARTH 319 380 or consent of instructor

Offered on demand

Study of volcanic processes, eruptive products and their mechanism of formation. Volcanic hazards and the environmental impact of volcanism. Field trips to nearby volcanic fields.

Prerequisite change

ERTH 460, Subsurface and Petroleum Geology, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisite: EARTH 317 or 318 203 or 206 or consent of instructor

Offered spring semester

Principles and techniques of subsurface geology with emphasis on subsurface mapping, facies analysis, fluid-related rock properties, composition, movement and entrapment of subsurface fluids (oil, natural gases, water), and petroleum source rocks. Laboratory work emphasizes subsurface analysis and mapping with logs, cuttings, and cores. Applications to hydrocarbon exploration and development.

Prerequisite change and semester correction

ERTH 463, Geology of the Colorado Plateau, 3 cr, 2 cl hrs, field trips

Prerequisites: EARTH 318 203; or consent of instructor

Offered spring fall semester

Discussion of geology, archeology, and ecology of the Colorado Plateau, emphasizing the Canyonlands region. Geological topics include geomorphology, sedimentology, tectonics, igneous rocks, and surficial processes. Field trips are an important part of the course, and hiking is required.

Prerequisite change

ERTH 468, Evolution of the Earth, 3 cr, 3 cl hrs, field trip

Prerequisites: EARTH 318, 319, 337 201, 202, 203, 204

Offered spring semester

Origin of the solar system and of the earth; the evolution of continents, atmosphere, and oceans; comparative planetary evolution; tectonic regimes in geologic history. Field trip required.

Prerequisite change

ERTH 480, Field Methods in Earth Science, 6 cr

Prerequisites: EARTH 318, 319, 337, 353 203, 380, 385

Offered summers (6 weeks)

Collection, processing, and interpretation of field data developed by geologic mapping in sedimentary, igneous, and metamorphic terrane. Presentation of geologic reports involving maps, cross sections, and sample data.

Bowman then moved to accept new courses, two of which will be taught by Dr. Catherine Snelson, a new faculty member in geophysics. The motion was seconded by Hossain. When put to a vote, the motion passed as follows:

New course

ERTH 446, Reflection Seismic Data Interpretation, 3 cr, 2 cl hrs, 2 lab hrs

Prerequisite: EARTH 445 or equivalent, upper-class standing, or consent of instructor.

Offered spring semester, even numbered years

An overview of the fundamentals of the geologic (both structural and stratigraphic) interpretation of 2D and 3D reflection seismic data. An introduction to seismic acquisition and processing and their effects on interpretation. Techniques covered include: well log to seismic ties, contour maps, fault plane maps, time-to-depth conversion, seismic sequence analysis, and workstation interpretation of 3D data. Designed for students with a range of earth science and engineering backgrounds.

New course

ERTH 447, Depositional Systems and Basin Analysis, 3 cr 3 cl hrs

Prerequisite: EARTH 202 and EARTH 203

Offered fall semester

Discussion of the spectrum of modern and ancient depositional environments and their relationships to tectonic settings. Shares lecture with GEOL 547, but is graded separately.

New course

ERTH 457 Reflection Seismic Data Processing, 3 cr, 2 cl hrs, 2 lab hrs

Prerequisite: EARTH 445 or equivalent, upper-class standing, or consent of instructor.

Spring semester, odd numbered years

The computer application of digital signal processing to reflection seismic data from environmental, petroleum, and crustal surveys. Topics covered include: definition of survey geometries, data editing techniques, amplitude recovery, bandpass filtering, deconvolution, velocity analysis, F-K filtering, and migration.

New course

ERTH 464, Field Geology and Ecology of New Mexico, 3 cr

Prerequisites: EARTH 201, 202, 203

Investigation of the geologic and ecologic history of New Mexico. Covers techniques for observing, describing and interpreting rocks and native plant communities in the field. Numerous local field trips and at least two weekend field trips. Moderate hiking is required.

– **Computer Science Department, Dr. Hamdy Solimon.** Dr. Solimon moved to adopt changes related to pre-requisites. Hossain seconded the motion. When put to a vote, the motion passed as follows:

OLD:

CS 342, Formal Languages and Automata, 3 cr, 3 cl hrs

Prerequisite: MATH 221

Regular expressions. Regular, context-free, context-sensitive and unrestricted grammars and languages. Finite and pushdown automata. Turing machines, recursive and recursively enumerable languages. Decidability and the halting problem.

CS 344, Design and Analysis of Algorithms, 3 cr, 3 cl hrs

Prerequisites: CS 122; MATH 221

Interplay of data structures and algorithms. Time and space complexity of algorithms. Design paradigms and analysis techniques. Fundamental algorithms; combinatorial and graph algorithms; numerical algorithms. Introduction to the theory of NP-completeness.

NEW:

CS 342, Formal Languages and Automata, 3 cr, 3 cl hrs

Prerequisite: MATH 221 with a grade of C or better

Regular expressions. Regular, context-free, context-sensitive and unrestricted grammars and languages. Finite and pushdown automata. Turing machines, recursive and recursively enumerable languages. Decidability and the halting problem.

CS 344, Design and Analysis of Algorithms, 3 cr, 3 cl hrs

Prerequisites: CS 122; MATH 221 with a grade of C or better

Interplay of data structures and algorithms. Time and space complexity of algorithms. Design paradigms and analysis techniques. Fundamental algorithms; combinatorial and graph algorithms; numerical algorithms. Introduction to the theory of NP-completeness.

b. Graduate Council Meeting – October 16, 2007 (Minutes attached).

Graduate Dean Johnson moved for approval of a 16-credit program in hydrology, a post-graduate certification program. Bowman seconded the motion. When put to a vote, the motion passed as follows:

Proposal for a Graduate Certificate Program in Hydrology

The Hydrology Certificate program is aimed at earth science professionals who wish to increase their qualifications in Hydrology without completing a graduate degree.

The program is intended to provide the fundamentals of atmospheric, surface, and subsurface hydrology while leaving sufficient flexibility to focus on areas of particular interest to the individual.

The Certificate requires a minimum of 16 credit hours of graduate and upper division course work. The course requirements are as follows:

- EARTH 440 and EARTH 440L Hydrological Theory and Field Methods (4 cr.)
- HYD 510 Quantitative Hydrology (3 cr.)
- EARTH 441 Aquifer Mechanics (1 cr.)
- EARTH 442 Vadose Zone Processes (1 cr.)
- EARTH 443 Atmospheric Dynamics and Rainfall Processes (1 cr.)
- Six additional credits of 500-level Hydrology coursework (6 cr.)

7. Adjournment. Westpfahl adjourned the meeting at 4:30 p.m.

*Respectfully submitted,
Valerie Kimble*

October 2007

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY

MEETING OF THE FACULTY SENATE

Tuesday, October 2, 2007

4:00 P.M.

Workman 101

MINUTES

1. Call to order. Dr. Dave Westpfahl, Chair, called the meeting to order at 4:10 p.m.

2. Approval of the minutes of September 4, 2007. A motion was made to approve the minutes, followed by a second. The minutes were approved as written.

3. Announcements.

a. Faculty Compensation for External Funding (see attachment)

Dr. Van Romero, Vice President for Research and Economic Development, told the Senate that at the 2005 Retreat, the Board of Regents voiced concern over faculty turnover, and how to better recruit and retain faculty who won't leave after a few years. One obvious answer is salary compensation; however, Romero said, Tech's "hands are tied" because the state of New Mexico funds academic salaries. When comparing Tech faculty salaries to its peers, the differential is 10- to 12 percent lower for Tech. Romero explained that Regents are considering a plan whereby faculty academic salaries would be viewed as salary earned from a tenure standpoint. Salary rates could increase by 20 percent when working on external funding. "The draft policy has been reviewed, and will pass muster with federal auditors," Romero said.

Romero said the Regents wanted feedback from faculty. The plan would be implemented on a trial basis for one year. "If it works out, we'll put the final policy in place," he said. Romero used as an example a faculty member with an academic salary who garnered NSF funding for the summer. That faculty member, he said, would be paid at a rate 20 percent higher than his/her academic contract. He then stood for questions.

In reply to the first inquiry from the floor, Romero said the new policy has nothing to do with Tech's consulting policy. In reply to a question about how the 20 percent figure was arrived at, he replied that the institute would like to see a 5- to 10 percent increase for faculty, hopefully for the three-month summer period. "The 20 percent looks big, but when you sum it all up, it's really not," said Romero. Tech President, Dr. Daniel H. López, said the figure was a Higher Education Department (HED) data point. "Research universities in New Mexico are 12 percent below their peers," Lopez said. "Anything that is going to increase salaries up to 12 percent is going to be better than what we have now."

Romero explained that Regent Richard Carpenter wanted to ensure that the policy not interfere with the tenure process. He asked rhetorically: "What if you're working on tenure, but not doing service? It would be up to the academic vice president to make the decision as to whether or not you qualify." Romero said a faculty member seeking external funding would need his request approved by the academic vice president and department chair. "It only works well when there are checks and balances between academics and research," explained Dr. Peter F. Gerity, Vice President for Academic Affairs. The governance was set up to ensure faculty are making satisfactory progress toward tenure, so that research activities would support rather than interfere with that progress.

"It sounds like a fine policy," commented Dr. Tom Kieft, who also thanked López for his continuing efforts to bring Tech salaries up to its peers. The salary issue is the number-one priority of the Council of Presidents, said López, who serves as the board's president. Five percent has become standard, he said. "It's not bad, but it's not a catch-up percentage," he added. If adopted, there would be some disparities in opportunities through no fault of the disciplines themselves. For example, it would be difficult for faculty in Humanities to get a large contract. Meanwhile, some employees of EMRTC, the Bureau of Geology and PRRC do teach, but are primarily researchers. "These are the kinds of issues that should be aired," López said.

When Romero was EMRTC director, the engineering staff would be given raises while there was money available to do so. But, he emphasized, he could not raise salaries higher than those of faculty. "As faculty salaries are raised, then others can be, too," he said. "Are all federal agencies going to buy in?" asked Dr. Brian Borchers. "DCAA is the only auditor," replied Romero. "The others will accept that." Dr. Rob Bowman asked why Gerity or a department chair would deny a faculty request. "Is this a way to punish (them)?" Responded Gerity, "It's a way to recruit good people. you can't buy a mineral or petroleum engineer - we need a competitive wage to recruit against that tide, and the markets keep changing." Gerity added that it's a "huge investment" to recruit new faculty.

When asked for an example of why the faculty request for external funding would be denied, Romero replied with the following scenario: The tenure committee for a young faculty member sees some problems with his/her teaching. The committee would like the member to focus more time on teaching rather than research. Or, said Gerity, most often the teaching is good, but the person needs to get the research going. "There are checks and balanced between the chair and the vice president, so we can keep a handle on things," Gerity said. Maybe a new faculty member isn't ready for the added duties. "There are lots of reasons to say no," he said.

"I'm all for people getting paid more, but are we now rating research 20 percent more than teaching?" asked Dr. Bill Stone. "No," replied Romero. "The state has a formula for equipment and the same thing for academic salaries," he said. "I'm just concerned about what that's saying," said Stone. The bigger issue, said Dr. Lynda Walsh, is that Humanities faculty teach a three-three load not designed to denigrate teaching. Romero reiterated: "For all the state's university presidents), the number one priority on their list every time is higher faculty salaries. .What comes out (of the Legislature) is disbursed across the board among faculty and staff," Romero said. "We control the level of buy-out," he continued. "There is no blanket approval." Romero added, to laughter: "You guys aren't here for the money anyway. . . .If you want to make more money, go to work for GE."

López told faculty this is his 15 th year trying to establish salary standards at Tech that are at last in the range of its peers. "If we don't do something, I'm afraid we won't demonstrate the critical nature of this issue to the Legislature," he said. Romero, addressing Humanities faculty, encouraged them to work with their colleagues, and become a part of their research efforts. The NSF, he said, likes to see cross- disciplinary efforts. "There's room for Humanities in a lot of this, especially TC, in purely scientific research grants," Romero said.

López said the policy won't go to Regents until sometime next year. "There ought to be a vote," he said, as to how faculty feel about it. Romero agreed. "We'd like to take a consensus back to the Board, along with what issues might pop up," he said.

b. Institute Software Support and Policies

Borchers spoke on behalf of Dr. Rick Aster, who was to speak on behalf of Library Director Owen Ellard, who was on leave. In their absence, the matter did not go forward.

c. Library Announcement - B. Borchers.

On behalf of the Library, Borchers announced a talk on Thursday, Oct. 18 at the Skeen Library featuring Dr. Thomas Bowles, Science Advisor to Gov. Bill Richardson. Dr. Bowles will deliver the keynote speech at the meeting here of the State Library Association.

d. Socorro Chamber of Commerce - C. Tiegs.

Tiegs was speaking on behalf of Aster on marketing Tech to diverse audiences, and raising awareness among potential students. The Chamber also can help departments recruit and retain faculty. Tiegs said the Chamber prepares packets with information on Socorro schools and other local amenities. Chamber representatives can even meet with individual families, and help set up meetings with the schools, or with Realtors, "to help them get a taste of the community," said Tiegs. "The information packets can be custom to your needs," she added. Faculty can contact either Aster or Tiegs, both members of the Chamber Board of Directors; or they can contact the Chamber directly.

e. Tanja Pietrass.

Dr. Pietrass announced a workshop on Nov. 8 on how to avoid bias in the classroom. Interested faculty are asked to RSVP to Pietrass by email.

f. Luz Barreras - Course Offerings.

Registrar Barreras reminded faculty that all course offerings are due October 1, and that she is awaiting a response from five departments. "Please submit course offerings ASAP," she said, adding that offerings would be filled on a first-come, first-served basis. P.J. Carter also is working on a final exam schedule, she said. No response from faculty on the schedule will be interpreted as a "yes," Barreras said. Otherwise, "let us know," she said. The schedule will be posted on the Registrar's website and sent to department secretaries. Barreras also reminded faculty that Tech has adopted a two-year catalog schedule, but that any changes would be posted online. Mid-term grades are open on BanWeb, and summer grade verifications are due soon, she said.

g. Dr. Gerity.

Gerity reminded faculty that final tenure packets are due December 15, and that ABET will be making a site visit to the Computer Science Department next week. He also thanked the faculty who had signed up for the Ray Landis teaching workshop on October 5. "We have 24 so far," Gerity said. "If you'd like to attend, let Debby (Olguin) know."

h. Richard Sonnenfeld - American Association of University Professors.

Dr. Sonnenfeld announced that non-tenured faculty can join the association for half-price. Sonnenfeld read the statement of purpose. "It's a really good organization," he said. "The main thing they do is censure institutes that do not respect academic freedom." New Mexico Highlands University was censured by the group, Sonnenfeld added.

4. Committee Reports.

a. Nominating Committee - Voting on Officers.

Dr. Tom Kieft, chairman of the Nominating Committee, cited a revised list of nominees for various committees. "We've taken care of the discrepancies," he said, referring to errors in the list of nominees presented at the Sept. 4, 2007 meeting. Kieft moved to accept the list of nominees, followed by a second from Borchers. Dr. David B. Johnson noted that he did not recognize any of the members of the Distance Education Committee as having served before. The motion passed.

Kieft then read four proposed changes to the Standing Rules of the Faculty Senate, with the last being the most radical, he said. This change would require certain committees to meet and report back to the Senate at least once a year. Kieft moved for approval, and again Borchers seconded the motion. Bowman made a motion to table the issue, with a second from Dr. Dave Raymond. Bowman's motion failed on a hand- count vote. Stone noted that the role of Ombudsman had fallen under the umbrella of the Institute Senate, but that "this group has taken over appointing them." Dr. Mark Topliff reminded the group that the Director of the Library should be added as an ex-officio member of the Committee on Campus Computing. The motion passed. (The updated Standing Rules were posted at:
http://externalweb.nmt.edu/aaffairs/faculty%20senate%20officers_standing%20comm_2007-2008.htm

5. Old Business. None.

6. New Business

a. Graduate Council Meeting - Minutes

Graduate Dean Johnson introduced catalog changes, the first a proposal for a Graduate Certificate Program in Electrical Engineering. Johnson said the New Mexico Council of Graduate Deans has convinced the HED of the program's merit, and that Gerity would have to reassure the HED as well. The EE Department was first to respond, Johnson said, and on behalf of the Graduate Council, he moved for approval of the proposal. Borchers seconded the motion.

Proposal for a Graduate Certificate Program in Electrical Engineering

The Electrical Engineering graduate certificate program is aimed at practicing engineers wanting to increase their exposure to electrical engineering at the graduate level while not being tied to a degree program. The program is designed to provide a rigorous upgrade to the student's skills in electrical engineering while focusing on topics of interest to the student.

The certificate program requires a minimum of 16 credit hours of graduate course work. The course

requirements are:

- . EE521 Measurement and Instrumentation (4 credits)
- . One 4 credit electrical engineering graduate course
- . One 3 credit or higher electrical engineering course at either graduate or upper undergraduate level.
- . One 3 credit or higher graduate course in either mathematics, physics, engineering or computer science.
- . EE590 Independent Study (2 credits) supervised by a member of the electrical engineering department.

During discussion, Johnson noted that the department chair would have to approve a student's two-credit Independent Study course as part of the certification program. "So the only channel for oversight is the department chair?" asked Dr. Penny Boston. "Correct," responded Johnson. "The department chair *and* faculty." Johnson said the EE Department planned to begin recruiting students immediately following HED approval. The motion passed.

The second change was to add two new catalog courses to the Materials and Metallurgical Engineering Department. Johnson moved for approval, followed by a second from Borchers. The motion passed.

ADD: MATE 501, Foundations of Materials, 3cr

Prerequisite : Graduate standing *or* consent of instructor

This course introduces the fundamental elements of metals, ceramics, polymers, and composites to graduate students with undergraduate degrees from disciplines other than Materials Engineering.

ADD: MATE 575, Introduction to Nano Materials, 3 cr, 3 cl hrs

Prerequisite : Graduate standing *or* consent of instructor

An introduction to physical basics of nanosystems, physics and chemistry of nanostructure synthesis and fabrication. Other topics include: semiconductor nanostructures, magnetic nanostructures and spintronics, molecular nanostructures, electron transport in nanosystems, optical effects in nanosystems, nanomachines,

nanoscale biological assemblies, nanocomposite materials.

Kieft returned to announce the results of the paper balloting. Faculty Senate officers for 2007 - 2008 are: Chairman, Dr. Dave Westpfahl; Vice Chairman, Dr. Tom Engler; and Parliamentarian, Dr. Richard Sonnenfeld.

The meeting was adjourned at 5:10 p.m.

Respectfully submitted,

Valerie Kimble

September 2007

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY

MEETING OF THE FACULTY SENATE

Tuesday, Sept. 4, 2007

4:00 P.M.

Workman 101

MINUTES

1. **Call to order.** Dr. Dave Westpfahl, Faculty Senate President, called the meeting to order at 4:05 p.m. by calling for approval of the Faculty Senate Minutes of May 11, 2007.
2. **Approval of the minutes of May 11,2007.** The minutes were unanimously approved.
3. **Ann ouncements**
 - a. Introduction of New Faculty Members, Faculty Members and Department Chairs:
Dr. Ingo Janser, Assistant Professor of Chemistry

Dr. Jeff Altig, Assistant Professor of Chemistry & Dir. Of Chemical Laboratories

Dr. Corey Lerclerc, Assistant Professor of Chemical Engineering

Dr. Michaelann Tartis, Assistant Professor of Chemical Engineering

Dr. Anders Jorgensen, Assistant Professor of Electrical Engineering

Dr. Rene Arechiga, Associate Professor of Electrical Engineering

Dr. Andrew Budek, Assistant Professor of Civil Engineering

Dr. Catherine Snelson, Assistant Professor of Geophysics

Dr. Nadir Yilmaz, Visiting Assistant Professor Mechanical Eng.

Dr. Barbara Bonnekessen, Assistant Professor of Social Sciences

Dr. Julianne Newmark, Assistant Professor of English

Dr. Ranis Ibragimov, Assistant Professor of Mathematics

Mr. Dylan Merrigan, Vice President, Student Association

Mr. Josh Asplen, President, Student Association

Mr. Earl Eiland, President, Graduate Student Association

Dr. Anwar Hossain, Department Chair, Mathematics Department

Dr. Her-Yuan Chen, Department Chair, Petroleum Eng Department

b. Enrollment Update - P. Gerity. Dr. Gerity said the undergraduate headcount for Fall 2007 is down 2 percent, while undergraduate credit hours are up 2 percent. The headcount for graduate students continues to grow and is up 12 percent. Gerity noted that student retention has risen from 69 percent a year ago to 73 percent.

c. Invitation to Orientation & Workshops - S. Zeman . Zeman said email notices would be sent out for the New Faculty Workshop on Teaching scheduled from noon to 1:30 p.m. in Library 212; lunch is included. In addition, a day-long workshop will be given on Friday, Oct. 5 in the Galena Room of Macey Center featuring Dr. Ray Landis, a recognized authority on engineering education. Zeman asked faculty to RSVP to vkimble@admin.nmt.edu.

d. Dishonesty Reports - D. Johnson and S. Zeman. Zeman, as Associate Vice President for Academic Affairs, referred to a handout reflecting academic honesty violations for Spring and Summer 2007. No action was warranted in five incidents, Zeman said, adding that of the

four at the graduate level, three students had no priors, and one had served a disciplinary probation. "The policy seems to be working," he said. "It does impress upon (students) something about our expectations." Johnson said some faculty are hesitant to report violations because "there's a feeling it could totally destroy a person's life. . . .The report does not go into the Registrar's file." Zeman noted the importance of documenting offenses, specifically in tracking repeat offenders. Westfahl cited the importance of notifying either Johnson or Zeman of possible violations so faculty can take the correct action, rather than act in haste. Borchers noted that the six-page policy is available online.

e. PAS - R. Kalish (report given out of sequence). Ronna Kalish, director of the Performing Arts Series (PAS), invited new faculty to this year's "great season" of PAS performances. "And I would love to see more faculty at Club Macey events," Kalish said. Kalish had at a previous Faculty Senate meeting announced plans for a science and arts event. "There's too much going on right now, so that project has been put on hold - but I still think it's a great idea," she said.

f. Proposal Routing - S. Moore. In introducing herself, Moore explained that she assists with certain aspects of the research cycle, and also runs the Institutional Research Board. "Even if you plan a classroom survey, talk to me about it," she said. Moore also tracks the demographics of the student body and can provide that data to faculty.

g. Children's Center - C. Tiegs and C. Pulaski. Cheryl Pulaski, Director of Advancement, addressed the Senate, while Carol Lynn Tiegs, Assistant Director, displayed architectural drawings of the proposed center. The process started 18 months ago in choosing among 16 sites, said Pulaski. The 7,000-square-foot center will be built on the south side of Macey Center, she said, and will be the second "lead" building in New Mexico designated "green." The center will accommodate 50 students, 18 more than the current center's capacity. Pulaski noted that 24 children are currently on a waiting list. An anonymous donor has pledged to match every dollar raised one-to-one, she said, up until December 31. "I am confident will raise the money needed, or modify the building somewhat," she said, in response to a question about what would happen if fund-raising falls short. Gerity noted that the drive for a new Children's Center started a few years ago when a previous vice president announced that the center would be closing because of revenue shortfalls. The idea for a new center came from the meetings that followed, he said. The project was later turned over to Dr. Ricardo Maestas, Vice President for Student and University Relations, who brought it to fruition.

h. Lab Safety and Lab Inspections - C. Verploegh. Hazardous Waste/Safety manager Curtis Verploegh announced that he would like to inspect all research labs during October and November, and had copies available of the recently revised Laboratory Inspection Checklist. Verploegh said he will deliver a lab safety course at 4 p.m. on Sept. 20, and that the course can be tailored to departments with eight to 10 new student workers. "I try to do two (safety courses) a year, but can add another if there's a need," he said. In reply to a question, Verploegh said the course generally runs from 30 to 40 minutes.

4. Committee Reports

Dr. Tom Kieft on behalf of the Nominating Committee proposed the slate of nominees for the 2007-2008 academic year (as shown in Attachment A). A number of corrections were made on the Distance Ed, Budget, and Campus Planning committees. Dr. Pietrass made a motion to change the Standing By-Laws of the Faculty Senate to state that the Ombudsperson should serve a two-year term and that a faculty member be chosen from the Faculty Senate and a staff member be chosen from the Institute Senate. The motion was seconded and passed.

Dr. Kieft moved to adopt the slate of nominees as presented. The motion was seconded. A number of additional changes were made on the Retention Committee, stating the Ex-Officio member should be the Associate Vice President of Academic Affairs, instead of Carole Yee.

Dr. Borchers pointed out that the number of committee members were being changed and not following the Standing Rules of the Faculty Senate. Dr. Stone made a motion that the committees meet to decide who will remain on the committees and report back. The motion was seconded and approved.

Dr. Gerity suggested and made a motion that the slate of committee membership be returned to the Nominating Committee so that they could revise it properly. The motion was seconded by Dr. Johnson and passed unanimously.

Dr. Cormack moved to adopt the nominees of officers as presented. Dr. Borchers seconded the motion, and the motion passed.

Dr. Westpfahl stated that he would like for every Faculty Senate Committee to report at least one time during the academic year. He asked each committee to meet and then schedule a reporting time to the Faculty Senate. He then called on the Academic Standards and Admissions Committee to make their committee report.

Dr. Borchers reported that the Academic Standards and Admissions Committee met to consider 11 applications for the summer session. Of these appeals, 10 were readmitted under conditions that required them to follow pre-approved plans of study and meet regularly with the Director of Advising Resource Center. Of these 10 students, 8 were back in good academic standing at the end of the summer session. At the start of the fall semester, 15 applications were received by the committee. Eight were denied and 7 were readmitted with certain conditions. The committee also considered 8 first-time admissions and approved six of these for admission. The committee recommends that the results of 8 out of 10 succeeding proves that with proper guidance these students can succeed. Dr. Borchers stated that this might be the reason for a rise in our retention rate. The committee points out that this report is based on the students that go through the appeal process only. The committee deals with them after suspension and the committee feels that earlier intervention could reach more students preventing the high number of suspensions.

1. Old Business.

Dr. Gerity reminded everyone that the nominations for full professor are due into Academic Affairs by September 28.

He reported that the Mechanical Engineering Department received full accreditation from ABET and congratulations should go to the department, Gillian Bond, Tom Engler and Osman Inal. A round of applause was given to the department.

ABET will be visiting the Computer Science Department on October 7, 8, and 9 th . And a reminder that Math, English, Chemistry, and Physics should gather the course material and deliver to Francesca Denton on Friday, October 5, to Cramer 230 before 3:00 p.m.

1. New Business.

The Registrar, Luz Barreras, made a motion to approve the Master of Science Degrees for Marcia Barton and Ann Shea (Ahern-Gomez) as completed this summer, 2007. Dr. Johnson seconded the motion. Questions were raised on approving these degrees now. Ms. Barreras reported that the New Mexico Department of Education would not recognize their completion until the granting of their degrees which resulted in these teachers not receiving a raise until next year. The motion passed and these degrees will be taken to the Board of Regents.

1. Adjournment. The meeting was adjourned at 5:01 p.m.

Respectfully submitted,

Debby Olguin

May 2007

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY

MEETING OF THE FACULTY SENATE

Friday, May 11, 2007

3:00 P.M.

Workman 101

MINUTES

1. Call to order. Dr. David Westpfahl, Chairman, called the meeting to order at 3:03 p.m.

2. Approval of the minutes of April 3, 2007 (attached). A motion to approve the minutes was made by Dr. Robert Cormack and seconded by Dr. Brian Borchers. The motion passed.

3. Announcements.

On behalf of the Retention Task Force, Dr. Tanja Pietrass reported that the group had been meeting regularly for the past year and a half, and that she would "make a full-blown announcement" at the first fall meeting of the Faculty Senate in September. The Task Force will develop a website with the names of contact people, "so people can see what we're doing and discussing," Pietrass said. Faculty will be given a heads-up by email on what's being done.

Dr. Scott Zeman, Associate Vice President for Academic Affairs, reminded faculty that contracts are due May 15.

4. New Business

a. Approval of the May 2007 Graduates (the final list will be provided at the meeting.) Because a final list was not yet available, it was agreed to postpone this agenda item until later in the meeting.

5. Committee Reports

a. Honorary Degrees and Awards Committee - T. Pietrass. It was agreed to postpone this item as well for the same reason as above.

6. Old Business.

a. Council of Chairs Minutes - P. Gerity. On behalf of Dr. Gerity, Dr. Zeman announced that two motions would be brought forward from the Council of Chairs meeting of April 13. Regarding the first motion, Dr. Robert Holson, Chair of the Psychology and Education Department, presented a revised 18- credit hour curriculum for the Alternative Licensure Program (ALP). Holson explained that following an education team visit last fall, it was recommended that New Mexico Tech increase the credit load for the ALP, "so we went up to 20," he said, and the proposal was approved by the Council of Chairs. The only changes were to course content and credit hour numbers, said Holson. Now, however, the team says it had been mis-informed, and that only 18 credit hours were needed. The courses for the 18-credit hour curriculum are the same, Holson said, with a cutback on teaching hours. "There are no substantive changes," he said.

The following proposed program and course changes for the Alternative Licensure Program (ALP) at New Mexico Tech are being made in response to the National Council for Accreditation of Teacher Education (NCATE) State Board of Examiners (BOE) Report. NCATE's initial visit was made in November 2006. The BOE recommended that EDUC 411, Directed Teaching be dropped from 6 credit hours to 3 credit hours.

To take effect Fall of 2007:

Program Changes

Old catalog entry:

Specific Requirements for Alternative Certification

- EDUC 323 (2), 340 (2), 343 (3), 401 (3), 403 (2), 411 (6)
- Passing scores on state-approved tests

Note: Requirements for the Master of Science Teaching degree are found on page 122.

Minor in Education

Minimum credit hours required—18

The following courses are required:

- EDUC 323 (2), 340 (2), 343 (3), 401 (3), 403 (2), 411 (6)

Proposed change:

Specific Requirements for Alternative Certification

- EDUC 323 (3), 340 (2), 343 (3), 401 (3), 403 (4), 411 (3)
- Passing scores on state-approved tests

Note: Requirements for the Master of Science Teaching degree are found on page 122.

Minor in Education

Minimum credit hours required—18

The following courses are required:

- EDUC 323 (3), 340 (2), 343 (3), 401 (3), 403 (4), 411 (3)

Course Changes

Old catalog entry:

EDUC 323, Child and Adolescent Growth and Development, 2 cr, 2 cl hrs

The development of human behavior from conception through adolescence. Includes cognitive, social, personality, emotional, behavioral and physical development.

Proposed change:

EDUC 341, Student Learning and Effective Teaching Practices, 3 cr, 2.5 cl hrs, 1.5 lab hrs

Prerequisites: Permission of the Alternative Licensure Program Coordinator, and admission to the Alternative Licensure Program.

How students learn and develop; including cognitive, social, emotional and physical development as it relates to students individual needs and strengths. How to teach in a classroom of diverse learners; including differentiating instruction, modifying for special needs students, and motivating student learning. Lab hours will be spent observing and working in public school classrooms.

Old catalog entry:

EDUC 403, Methods and Practices of Secondary School Teaching, 2 cr, 2 cl hrs

Must be taken immediately prior to EDUC 411

Prerequisites: Seven (7) credit hours of upper-division education courses, enrollment in Alternative Licensure Program, or consent of instructor

A study of essential principles, comprehensive lesson planning, teaching procedures, modern techniques, and resource materials.

Proposed change:

EDUC 403 Methods and Practices of Secondary School Teaching, 4 cr, 3 cl hrs, 3 lab hrs

Prerequisites: eight (8) credit hours of upper-division education courses, permission of the Alternative Licensure Program Coordinator, admission to Alternative Licensure Program, and education minor added.

A study of essential teaching principles including: instructional planning and implementation; assessment of student learning, appropriate feedback, and subsequent lesson modification; effective questioning to encourage student participation and to promote individual thinking and problem solving. The implementation of a variety of instructional strategies to meet the needs of all learners. The use of various resource materials and technology. Lab hours will be spent observing and working in public school classrooms.

Old catalog entry:

EDUC 411, Directed Teaching, 6 cr

Prerequisites: Senior standing; enrollment in Alternative Licensure Program; EDUC 403; consent of the chair of the education department, and consent of the public school principal. Lab fee may be assessed for teaching outside of Socorro.

Methods and materials may be taught by the student's major department prior to supervised teaching. All aspects of teacher training will be integrated and directed for the purpose of developing a high level of teaching competence.

Proposed change:

EDUC 411 Directed Teaching, 3 cr

Prerequisites: Senior or graduate standing; permission of the Alternative Licensure Program Coordinator, admission to the Alternative Licensure Program, education minor added, EDUC 403, and consent of a public school principal. Lab fee may be assessed for teaching outside of Socorro.

Practice teaching in a local secondary school. Students will experience all aspects of teaching. It involves a commitment of 2 hours per day, five days a week, in the classroom. Expect to spend

an equal number of hours in preparation. Student teachers will also meet one hour per week with the Education Instructor.

Old catalog entry:

Students working toward a bachelor's degree at New Mexico Tech must also complete an approved program in one or more teaching fields and complete certain general requirements beyond the general requirements for the Bachelor of Science degree.

Proposed change:

Students working toward a bachelor's degree at New Mexico Tech must also complete an approved program in math and/or science teaching fields (in addition to the general degree science requirements, science field requirements must include at least 4 credits each in Biology, Earth Science and Computer Science) and certain requirements beyond the general requirements for the Bachelor of Science degree. These must include any course in American History (3); PSY 323, Psychology of Child and Adolescent Development (3); and PSY 311, Tests and Measurements (3).

.

A motion to approve was made by Dr. Dave Raymond and seconded by Dr. Cormack. The motion passed.

Zeman then presented Dr. Sayavur Bakhtiyarov, Chair of the Mechanical Engineering Department, who moved to approve amendments to the Mechanical Engineering section in the 2007-2009 catalog. The proposal includes new aerospace courses and minors in Mechanical Engineering and Explosives Engineering as follows:

Amendments to Mechanical Engineering Section in Catalog 2007-09

Change the designations (Page 3):

AE 411 to AE 311

AE 413 to AE 313

AE 418 to AE 318

AE 418L to AE 318L

Add (Page 3):

AE 418, Structural Dynamics in Aerospace Engineering, 3cr, 3 cl hrs

Add (Page 3):

Minor in Mechanical Engineering

Minimum credit hours required - 18

The following courses are required

At least eighteen (18) credit hours of ES or MENG courses and/or labs beyond those required for major. These courses and labs are subject to the approval of the Mechanical Engineering Minor Adviser.

Add (Page 3):

Minor in Explosives Engineering

Minimum credit hours required - 18

The following courses are required:

- . EXPL 311/MENG 545, Introduction to Explosives Engineering, 3 cr, 3 cl hrs
- . EXPL 412/MENG 549, Wave Propagation, 3 cr, 3 cl hrs
- . EXPL Elective, 3 cr, 3 cl hrs (subject to the approval of the Explosives Engineering Minor Adviser)
- . One course from:
 - o EXPL 314, Theory and Application of Pyrotechnic, 3 cr, 3 cl hrs
 - o EXPL 413/MENG 589, Impact Dynamics, 3 cr, 3 cl hrs
- . Two courses from:
 - o EXPL 314, Theory and Application of Pyrotechnic, 3 cr, 3 cl hrs
 - o EXPL 316, Energetic Material Chemistry, 3 cr, 3 cl hrs
 - o EXPL 317, Energetic Material Safety, 3 cr, 3 cl hrs
 - o EXPL 320, Explosives Technology and Applications, 3 cr, 3 cl hrs
 - o EXPL 413/MENG 589, Impact Dynamics, 3 cr, 3 cl hrs
 - o EXPL 414/ChE 475, Explosives Surety, 3 cr, 3 cl hrs
 - o EXPL 415/MENG553, Computer Modeling of Detonations, 3 cr, 3 cl hrs
 - o EXPL 418, Shock Physics and Structural Response to Blast, 3 cr, 3 cl hrs
 - o EXPL 419, Experimental and Diagnostic Techniques, 3 cr, 3 cl hrs

In Requirements Change (Pages 4 and 5):

MENG 517 to MENG 517/ME 517

Add (Page 6):

AE 418, Structural Dynamics in Aerospace Engineering, 3 cr, 3 cl hrs

Prerequisites: MATH 231, ES 302, ES 303, AE 414.

This course explores structural dynamic topics covering a broad range of aerospace applications. Vibration of single and multi-degree-of-freedom systems is reviewed in the context of modeling the aerospace structural systems. Essential structural elements - bars, beams, and plates are addresses in the dynamics of continuous systems section. Structural response to transient, shock, and random loads is discussed and practical aspects of dynamic testing are presented.

Add (Page 7):

Explosives Engineering Courses

EXPL 311, Introduction to Explosives Engineering, 3 cr, 3 cl hrs

Prerequisites: CHEM 122 and 122L; PHYS 122 and 122L; ES 111 or CS111; ES347 or ES350; or consent of instructor

Introduction to the broad field of explosives science and technology. Basic organic chemistry, decomposition reactions, properties of explosives, thermodynamics of explosives, shock wave theory, detonation theory, initiators, Gurney equations, blast effects and demolition.

EXPL 314 Theory and Application of Pyrotechnic, 3 cr, 3 cl hrs

Prerequisite: EXPL 311

Fundamentals of basic concepts of pyrotechnic. Thermo-mechanical/chemical aspects of pyrotechnics, formulation and mixing of pyrotechnic mixtures, application of pyrotechnic including illumination, tracers, incendiaries, delays, etc.

EXPL 316 Energetic Material Chemistry, 3 cr, 3 cl hrs

Prerequisite: EXPL 311

An introduction to the chemical aspect of energetic materials. Based on basic/advanced chemical and thermo-chemical concepts and dynamics, understand the characteristic and typical properties of energetic materials.

EXPL 317 Energetic Material Safety, 3 cr, 3 cl hrs

Prerequisite: EXPL 311

Development of the concept of detonation process or Detonation-Deflagration Transition (DDT) mechanics. Analysis of the thermo-dynamic behavior of explosives, hydro hot-spot theory, shock initiation, explosives cook-off, explosive sensitization.

EXPL 320 Explosives Technology and Applications, 3 cr, 3 cl hrs

Prerequisite: EXPL 311

Focus on the application of explosives mechanics. Fundamentals of explosive welding/cutting, shaped charges, explosive-driven flux-compression generators, spallations, explosives initiation methods, explosives applied testing methods, etc.

EXPL 412, Wave Propagation, 3 cr, 3 cl hrs

Prerequisites: MATH 335, ES303, ES305; or consent of instructor

An in-depth study of the propagation of waves in various media. The derivation and application of the Rankine-Hugoniot jump equations. The concept of the rarefaction wave and various wave interactions. Derivation and application of the Mie-Grüneisen equation of state. The differential form of the conservation equations, as well as some numerical solutions for simple cases. (Same as ME 549)

EXPL 413 Impact Dynamics, 3 cr, 3 cl hrs

Prerequisites: EXPL 412

A specialized but very important branch of engineering mechanics deals with the collision of multiple bodies throughout a broad range of relative velocities. The physical phenomenon during impact and subsequent response of each of the bodies is dependent on the mechanical material properties of each, the impact velocities, and the relative size and orientation of each of the bodies. Impact response is most easily categorized based on the impact velocity (relative approach velocity of two bodies), ranging from elastic response with little change in temperature at low velocities, through plastic deformation and/or fracture at higher velocities, to physical state changes of bodies or a portion of a body at hyper-velocity impacts (> 1 km/sec).

EXPL 414 Explosives Surety, 3 cr, 3 cl hrs (same as ChE 475)

Prerequisite: Upper-class standing or consent of instructor

An introduction to explosives and other energetic materials. The basic chemical compositions, properties and environmental effects of commercial, military, and improvised explosives and some pyrotechnics will be compared. The basic physics of shock waves and detonation. Explosive effects, blast detection, tagging and environmental issues. Case studies or recent bombings will be used to describe a variety of terrorist approaches. Safety in handling of explosive materials and classifications for transportation and storage.

EXPL 415 Computer Modeling of Detonations, 3 cr, 3 cl hrs

Prerequisite: EXPL 412

Introduction to the numerical/hydrocode modeling of detonation behaviors. Focus on the area of detonation initiation, behavior of heterogeneous explosives, explosive/propellant performances, experiment interpretations, and numerical expressions of explosives relate theories.

EXPL 418 Shock Physics and Structural Response to Blast, 3 cr, 3 cl hrs

Prerequisite: EXPL 412

An in-depth study of structural behaviors on blast and vibration. Structure damage prediction/estimation, blasting shockwave mitigation methods/concepts, shockwave propagation/properties on structures, structure failure criteria.

EXPL 419 Experimental and Diagnostic Techniques, 3 cr, 3 cl hrs

Prerequisite: EXPL 412

An introduction to the explosive testing data acquisition systems. Basic concepts of the measurement of detonation product properties and characteristics of detonation process. Analysis of material properties under high pressure shock compression, and data interpretations

Add (Page 9):

MENG 110, 110L Introduction to Mechanical Engineering, 2 cr, 1 cl hr, 3 lab hrs

Corequisites: MATH 103 or higher; MENG 101 and 101L are co-requisites of each other

A broad overview of mechanical engineering, including an introduction to mechatronics, explosives, thermal and fluid sciences, solid and structural mechanics. Practical hands-on experience using the Mechanical Engineering department's computer-based applications software and lab equipment.

In description of courses ES 305 and MENG 305 delete (Pages 7 & 9):

"Computational techniques using MATLAB"

Add:

AE 420 Compressible Fluid Flow, 3 cr, 3 cl hrs

Prerequisites: ES 216, ES 347, ES 350, MATH 335

Explanation of the physical phenomena encountered in compressible flow by providing practical applications and examples. Provide the knowledge and understanding of the basic fundamentals of compressible flow and gas dynamics

Add (page 9):

MENG 216, Engineering Fluid Mechanics, 3 cr, 3 cl hrs

Prerequisite: ES 201

Corequisite: MATH 231

Fundamentals of fluid mechanics including fluid statics, velocity of continuous media, continuity, and momentum balance. Introduction of laminar and turbulent flows, similitude, dimensionless analysis, Bernoulli's equation, friction factor, introduction to pump and compressor selection.

Dr. Johnson seconded the motion, and it passed.

5. Committee Reports

a. Honorary Degrees and Awards Committee - T. Pietrass. As committee chair, Dr. Tom Kieft conducted this segment of the meeting after it was agreed to move ahead with the agenda item, as any students nominated for awards would have completed graduation requirements.

. Cramer Award. Dr. Osman Inal, reporting for the Engineering Chairs, announced that Victoria Aston and Keenan Dotson were the nominees for the Cramer Award for the female and male engineering students with the highest GPA, both with a 4.0. Dr. Donald Weinkauff seconded the motion, and it passed. The award consists of citations and \$200 cash prizes.

. Brown Award. Nathan Goulding was voted the recipient of the 2007 Brown Medal given to the person graduating with a Bachelor of Science degree who is judged by the faculty to be highest in scholarship, conduct and leadership. The award includes a plaque and a \$500 cash prize.

. Founder's Award. The award is given to the recipient of an advanced degree who has made an outstanding contribution to New Mexico Tech through scholarship, research and involvement in campus affairs. The award consists of a plaque and a \$400 cash prize. Following discussion, Dr. Johnson, who had placed a name in nomination, withdrew the motion, followed by a second from Dr. Phil lips. The motion passed. A new motion was made and seconded not to present a Founder's Award this year. That motion also passed.

. Langmuir Award. The Langmuir Award for Excellence in Research is given for an outstanding scientific research paper by any student or graduate of New Mexico Tech. Dr. Deidre Hirschfeld, Chair of the Materials Engineering Department, announced Ming Tang as recipient of the 2007 award, adding that the doctoral student will be hooded at Saturday's commencement service by his advisor, Dr. Ping Lu.

4. New Business

a. Approval of the May 2007 Graduates. Registrar Luz Barreras and staff members delivered and handed out copies of the Spring 2007 list of graduating students for Faculty Senate approval. Dr. Lorie Liebrock announced that the name of Divya Suryakumar was incorrectly listed as an MS in Computer Science and should have been listed as an MS in Computer Science with Information Technology Option. Liebrock then moved for a correction. The motion was seconded and it passed.

Materials Engineering Professor Dr. Gillian Bond announced that Michael Robert Czerepak had failed a required course and was not going to graduate. Registrar Barreras asked faculty to ensure that the list they were approving did not include the names of Clarke Haskins in Computer Science and Alex Fish in Mechanical Engineering; both had failed to meet requirements and would not graduate. Kieft, conferring with the Registrar and her staff, announced that a candidate for a Bachelor of Science in Biology was still under consideration. Kieft then moved to approve the amended list, pending an additional change. Westpfahl noted that the final list of graduates still had to be approved by the Board of Regents at their meeting Saturday morning. A second was made and the motion passed.

After the vote, Dr. John Wilson noted that a practice at other universities is to let students "walk" at commencement and receive a blank diploma, if what they were missing was something small. "They don't do that here!" said Wilson. "No, they don't," responded Barreras. "The issue has been discussed, as you all know." She added that the Registrar's office "bust our ass to make sure the program is accurate." Wilson said he would like to see the issue on the agenda next fall for discussion.

7. Adjournment. Westpfahl adjourned the meeting at 3:54 p.m.

Respectfully submitted,
Valerie Kimble

April 2007

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY

MEETING OF THE FACULTY SENATE

Tuesday, April 3, 2007

4:00 P.M.

Workman 101

MINUTES

Call to order. Dr. Westpfahl called the meeting to order at 4:05 p.m.

Approval of the minutes of March 6 and March 20, 2007 (attached). Approval of the minutes as written was moved and seconded, and the motion passed.

Announcements.

- Dr. López presented an overview of the legislative session which New Mexico Tech did very well.
- o five percent salary increase for Tech faculty and other employees, plus a 0.75 percent allowance for the employee retirement fund;
- o a zero tuition credit for state institutions of higher learning; and
- o \$1.5 million plus \$2 million will be received for infrastructure;
- o \$12 million for matching endowment programs of which Tech will receive \$2 million.
- o Mesa will receive \$40,000;
- o \$264,000 for the Bureau of Geology;
- o \$50,000 for ICASA;
- o \$50,000 for Science Fair for the International Science Fair;
- o funds for Summer Science Program with Cal Tech;
- o funds for Super Computing;
- o \$50,000 for Dr. Inal's pre-engineering program with a match from Sandia of an additional \$50,000;
- o funds for the Aerospace Engineering Program which has been funded for the past three years;
- o \$275,000 for the planning of the New Bureau of Geology facility;
- o \$100,000 for the planning of the Wellness Center;
- o \$100,000 for the Golf Course to improve the restrooms, etc.;
- o \$60,000 for Mesa to acquire computers.

Questions were raised on the matching endowment funds which Dr. López elaborated on. Dr. Liebrock asked about the New Mexico Computational Program of which one of the satellite centers will be located at New Mexico Tech. This also received funding.

- Dr. Gerity congratulated Dr. López for gaining the five percent salary increase for faculty and staff and having such a successful legislative session. He reported that contracts will be sent out on April 15 th and they must be returned by May 15 th .

- Dr. Borchers briefly stated his own problems involving the TIAA-CREF contributions and that he had turned over his personal TIAA-CREF statements to Lonnie Marquez who was checking into the problem. Mr. Marquez reported that he reconciled Dr. Borchers payroll deductions internally. With New Mexico Tech changing the payroll system to Banners, the contribution percentages changing by the State, along with TIAA-CREF undergoing a new software change, it all resulted problems in some of the alternative retirement contributions. Dr. López reported that New Mexico Tech can only reconcile Tech's payroll records because we do not have access to the individual alternative retirement records. It is up to the individual to check their own statements. Mr. Marquez said that any errors found should be brought to his attention and that they will work with TIAA-CREF to rectify the problem.

- Dr. Pietrass announced an upcoming workshop for department chairs and senior faculty funded through the NSF PAID grant (Partnerships for Adaptation, Implementation, and Dissemination). The workshop will be held on May 17 th and 18th at Sevilleta. The main goal of the grant is to increase faculty diversity, and to increase faculty retention and success. An important component is a mentoring program for junior faculty. Faculty who are interested in the program should contact one of the Tech participants: Ricardo Maestas, Dave Johnson, Scott Zeman, Sue Dunston, Jean Eilek, Fred Phillips, Claudia Wilson, and herself.

- Mr. Ellard announced the launch of Tech's institutional repository. Located at <http://dspace.nmt.edu> and titled *NMT Community Archive* , the repository will make available in digital form as much of the research output of the institution as possible. It will include material such as preprints, technical reports, working papers, theses, dissertations, conference papers, images, and more. The archive will also include many of the digital assets generated by normal campus life, such as administrative documents, course notes, newspapers, or learning objects.

Mr. Ellard also announced that for this year online access to journals published by Elsevier will be expanded from our current 71 titles to 1782 publications, with full-text available dating back to 1998. For a full list of the journals now available from Elsevier, see <http://www.sciencedirect.com/>

- Dr. Weinkauff announced that the IAS (Institute for Advanced Studies at Los Alamos National Laboratory) is sponsoring The First Annual Teaming Workshop of the New Mexico Consortium's Institute for Advanced Studies on April 20 and 21 st at New Mexico Tech. This workshop is to initiate discussion on possible research collaborations and all interested faculty are encouraged to attend.

· Mr. Kloeppe reminded the faculty of the upcoming International Science Fair on May 13-19 in Albuquerque. New Mexico Tech will have a booth at the convention center and encourages departments or clubs to help display what is going on in their areas showing perceptive students what Tech is all about. They also need students or faculty to help man the booth. Anyone departments interested are encouraged to call the Admission Office.

Committee Reports

Dr. Pietrass reported that the Computer Science Department is asking that a Posthumous Degree be awarded to Michael Hogan. On behalf of the department, Dr. Liebrock moved to grant Michael Hogan a Bachelor of Science Degree in Computer Science. The motion was seconded by Dr. Johnson. The motion passed unanimously and the department was encouraged to invite Michael's parents to commencement.

Dr. Pietrass on behalf of the Honorary Degrees and Awards Committee, reported that there are three nominations for the Langmuir Award which are posted on the Academic Affairs webpage for review. Dr. Bowman suggested that a vote be taken early on the Langmuir Award so that the recipient could participate in commencement. Dr. Pietrass suggested that an e-mail vote be taken and a decision made by April 15 th . The recipient can then be invited to attend.

A motion was made and seconded to adjourn. The meeting adjourned at 4:55 p.m.

Respectfully submitted,

Debby Olguin

March 2007

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY

MEETING OF THE FACULTY SENATE

Tuesday, March 6, 2007

4:00 P.M.

Workman 101

MINUTES

1. Call to order. Dr. David Burleigh, Vice Chairman, called the meeting to order at 4:07 p.m., following adjournment of the Institute Senate meeting.

2. Approval of the minutes of February 6, 2007 (attached). Approval of the minutes as written was moved and seconded, and the motion passed.

3. Announcements. Legislative Update, delivered at the meeting of the Institute Senate - Dr. Peter F. Gerity. Gerity updated the group on the 2007 Legislative session, saying, however, that nothing is final until Governor Richardson signs off on the bills. Pending are a 5 percent raise not including compensation, and a .75 percent increase in Institutional benefits. New Mexico Tech is in line for just under \$5 million for the hot water loop project - the request had been for \$14 million. Also in the works is \$2 million in planning money for the new Bureau of Geology building and the proposed Wellness Center . Gerity said the planning funds are critical if the university is to seek capital funds through a General Obligation bond issue in November 2008. Also pending are funds for the ongoing aerospace program, and a statewide library measure which would provide the Skeen Library with some \$60K to \$90K.

A. Student Appreciation Award - Chelsea Buffington. Nomination forms for the Student Appreciation Award are available in SCOPE and on Tech's website, said Buffington, director of Career Services. Undergraduate and graduate students are eligible for the award which honors student workers who go beyond the basic duties of their job, such as being active in clubs or volunteer work. "It's not based on academic merit," she said. March 19 is the deadline for nominations. Usually, one award goes to a club, and several others go to individuals. Of 19 individual nominations last year, seven awards were given. "We'd like to have a similar number this year," said Buffington.

B. Distinguished Teaching Award - Scott Zeman. Zeman asked that nominations for the 2007 Distinguished Teaching Award be sent to him, along with any supporting materials, by March 20. The award will be presented at Commencement ceremonies on May 12. In a separate matter, Zeman as director of the Center for Innovative Teaching and Learning (CITL) announced the winners of the individual and department awards for 2007 - Dr. Wim Steelant for a biochemistry laboratory that included a segment on folk medicine (\$4,000) and the Chemistry Department for redesigning its first-year courses to more of a discovery-based learning format (\$8,000). CITL received six proposals, Zeman said.

C. Cheryl Wilson - Superintendent, Socorro Consolidated Schools . Dr. Mike Topliff introduced Wilson, who was invited to speak at the invitation of Dr. Richard Sonnenfeld. Wilson is a native New Mexican with 13 years classroom experience and author of a mathematics textbook. As part of her presentation, Wilson referred to a handout with statistics on student achievement and other facts, and cautioned that the charts reflected only two years of data. " New Mexico is kind of new to this game," she said, referring to standardized tests mandated by the No Child Left Behind federal act. "We are above the line," she said; however, the district must address issues related to "poverty" as defined by families eligible for the free lunch program. With 72 percent of K-5 students classified as living in poverty, the issue is significant. Wilson said No Child Left Behind tests students in math, language arts and science. "That's what we're held accountable for," she said. On the good news side, ACT composite scores have improved over time, and two-thirds of the graduating class takes the exam. Wilson, acknowledging that some faculty parents live away from Socorro for educational options; but said students in local schools can have as much of "an awesome experience" as they can

elsewhere. Public education is "tough but important work," and schools should be able to meet multiple needs within the classroom. "We have pockets of brilliance throughout Socorro schools," said Wilson, adding, "but we are not systemically organized to be (totally) brilliant." Unfortunately, she said, "a lot of Socorro students don't believe in opportunities." She suggested collaborative work with New Mexico Tech in professional development, and offered to meet with the entire university community. "I could create grant topics for you," Wilson said, noting the academic community's penchant for applying for NSF monies.

D. Other. Gerity announced that the final deadline for catalog changes is March 7, or March 8 at the latest, and reminded faculty that New Mexico is now on a two-year catalog schedule. Registrar Luz Brian Barreras added that course offerings for Fall 2007 are due March 9, and that the new schedule is going to the printer at the end of March. Barreras said she and her staff will be reviewing the course schedule this week. "A few departments have not responded at all," she said. Replying to a question from Dr. Brian Borchers, Barreras said that faculty can verify their course offerings through Rose Baca-Rivet, Ina Crawford or herself. In other Registrar business, Barreras reminded faculty to order their caps and gowns for spring Commencement; and that mid-term is March 7, with web entry of grades open until March 24.

Librarian Owen Ellard announced a presentation from 2 - 3:30 p.m. on March 24 by Dr. Robert Fugate on "Researching the Sky: The Revolution in Ground-Based Astronomy" in the Library's Tripp Conference Room.

4. Nominating Committee - Tom Kieft (see attached memo). Dr. Bill Rison has agreed to fill the slot of a member of the Faculty Senate Academic Freedom and Tenure Committee who recused himself from hearing a particular case, said Kieft, who moved that Rison join the committee until said case is resolved. The motion was seconded and approved.

5. Old Business. Dr. Rick Aster asked if Borchers had figured out the paycheck issue as addressed at the Feb. 6 meeting, involving ERB and TIAA-CREF contributions. "I believe I understand what the law is," replied Borchers, adding that he has requested a written memo outlining contributions for the next several years, but has not received a reply. The compensation percentage increased to 7.1 percent last July 1, he said, "but in my case, it stayed at 6.4 percent . . . You would all be well advised to check your own paychecks." Borchers suggested inviting Lonnie Marquez, Vice President for Administration and Finance, to the next Faculty Senate meeting. Burleigh then suggested that Borchers pursue the issue.

6. New Business. Sonnenfeld moved to host a "Community Conversation" with Superintendent Wilson and students, faculty and staff, and the motion was seconded and approved. Burleigh suggested that Sonnenfeld and Wilson work on a meeting date and time.

7. Adjournment. A motion was made and seconded to adjourn the meeting. The motion passed and the meeting was adjourned at 4:57 p.m.

Respectfully submitted,

Valerie Kimble