

Ad. 289.0 Planning & Outlines

~~Have~~ Macro, Resource Conser. & Env.
Course description, ~~Macro & the Env.~~

Topics

~~Env. includes conservation~~

Pre reqs: ~~Diff. & Intermediate~~ Intro. Econ.,
and at least one of the ff: Intermediate micro or
macro, Ec. 162, Adv. Eco., Calculus,

perhaps
text &
Reconciles Macro-econ. goals and Conservation -
Environmental goals. Macro goals include full
empl., growth, a cap. ^{mutual demand,} ~~fruct.~~ stability, productivity, ^(over) and
distrib. equity & nat. defense. ^{of price & prodn.} Cons - Env. goals include
ec. of nat. res. over time, reduced gen. of residuals, pro-
tecting & enhanc'g qual. of ^{the common} env., recycling, shift toward
renewable res., shift toward softer techn.,
adapt'g growth to resource limits, assertion of
a common interest in the earth, & enhanc'g
quality of life.

These goals often conflict. Course explores
methods & policies for reconciling them, by
reduc'g complement of res. used per job w/o
reduc'g p/c incomes.

rapid embodiment of new technology.

Both Macro- and Resource Econ. deal w. interesting. No. 1. a ~~common~~ methodological tool in common, i.e. is ~~the~~ K thy. ~~the anal. app. of int. choice. & thy~~
This serves as ~~the~~ ^{as} ~~the~~ link, joining ~~the two~~
~~and.~~

K thy. is devd. as a set of criteria for ^{economizing on scarce} land & cap. over ~~the~~ time. Economy of land & K entails some substn. of labor for both. The ~~most~~ mechanisms of substn. are explored, both analytically & by e.g.

Analysis shows the effects of changing generic parameters like wage rates, i.e., & various taxes. E.g. are taken from resource management fields: water, timber, minerals, ~~energy~~ environment, recreation, fisheries, ~~grassland~~ range, urban-regional plan., etc. Energy will receive special atten.

Phillips

Existing Courses. Sequential

240, Resource Ad.
Common frameworks

E.S. 172 Env. Analysis

E.S. 174 Law, Inetm & Env.
Urban land use

241, Env. Plan & Control (Implementation.
Legal & Instl.

282, Env. Policy Mgmt. (Applied to topics. One topic
for whole quarter.)

Proposed Courses, Guy's priorities, in rank.

241, 174 1) Govt. reg. of priv. land

~~Also Earth Sci. (Ken Gaudin)~~

240 2) Mgt. Public Land

241, 282 3) Ec. of env. reg. (Ken Gaudin)

Methods 4) Project ^{program} analysis, public sector, ^{base analysis} (Part of public face.)
(Broaden out, evaluation of programs, all public spending)

5) Water

6) Air

7) Extractive Resources.

8) Full Employment

Fall, 1978

Ad. 289-0

Econ. Env. & Employment

→ Macro-e., & the Env. Resources & the Environment.
Themes.

3
3
28
How to employ everyone productively
using less resources
conserving the environment
meeting demand for land services.

How to reconcile:

3
env. quality
full empl.

2
full use of land, (full service, resource supply)

5 4.5
Trade-offs: Factor mix
Energy, Capital, Labor

3
Growth, resource limits, & jobs
growth input,

Firm; city; indy; region; economy.

4.2
Capital input :: Method stressed will be —

5
Applications to:

Project Planning.

Effect of changing parameters on,
Adapting to changing relative scarcities

5 Technology:
"A.T."
"Technology Assmt."

3 Resource supply, provision

4 ✓ Intertemporal choices, empl. & env.
Savings

3 Rate of using extr. res.
(3?) Capl. longevity, & factor substitution.
Meeting nat. payroll.

2 Macro ~~topics~~ goals
Growth, stability, employment, capital
formation, saving, investment, turnover, taxation,
capital structure, capital-output ratios, aggregate
demand, national accts., regional accts., & mults., "extended
benefits":

4.6 Sensitivity analysis

1.6

Purpose of course: work macro into curric.
Modify macro to account for resource scarcity, (incl. env. qual.)
" " " " " capital " "

5

Having established that the ~~ex~~ macro solution is essentially substg labor for K, then modify project analysis, taxn. r & d, edu., &c. instns. w. this in mind.

Also resource input; govt. regn.; land use regn; govt. admin; etc.

Regional balance of prints

5

Mass systems as approp. technology
(When cars overload streets, switch to buses, etc.)
Shift from neg. externalities to + ones.)

Resource-holding v. wealth-creating.

~~Red~~ Reducing capt.-int. of mass systems.

1.6

Quest for reconcil. of macro goals & conservation goals.

Ad. 289

Topics

Growth Mgmt.

Urban Sprawl.

Settlement Patterns.

Env. Impact. (Knecht, Edel

Technology Assmt. - A.T.

Cartel Bias - Adelman, Kahn

Env. controls -- K bias

Product & Process Modifica. Bower, Kuen, Downing?

Materials Flow life of products

Energy Crisis

Memo to Pamela

Texts to order for Admin. 289, Macro-economics and the Environment

1. Charles Schultze, NATIONAL INCOME ANALYSIS, Prentice-Hall, latest ed.

(IF above is o.p., try the following: Dernburg, Thomas , and McDougall, Duncan, MACRO-ECONOMICS, McGraw-Hill, latest ed.)

2. Matthew Edel, ~~ECONOMY~~ ECONOMIES (sic) AND THE ENVIRONMENT, Prentice-Hall.

3. Amory Lovins, SOFT ENERGY PATHS, Penguin Books.

4. Harold Barnett and Chandler Morse, Scarcity and Growth, Johns Hopkins University Press.

(Please return after executing. Thank you!.)

The cyanide pills were dropped at exactly 11:55:29. Be assured that is has been killed.

EXCERPTS
PA
EXCERPTS
EXCERPTS

Ad. 289

Memo-ess. & the Env.

Readings

M. F. Water.. In Ec. Anal. & Eff. & Haveman.

M. F. Full Empl. & the Env.

Res. M. F. ~~A~~ Toward Full Empl. w. Limited Land

Res. T. Page

~~A. Lovins~~

RERC Costs of Sprawl

David Pimentel

Acts.: W. Wilson, Vander Ryn, etc.

Growth Probe, etc.

Environmentalism for Full Empl.

Res. Ecst. from Wms, whom I invited to TRED

TISCO

See TRED-ED

~~Basic deep memo text, McKinnon, Schultze, Mumfield,~~

~~Reinburg & McDougal~~

Res. Daly, Herman Es. of Stationary State

Res. Landsberg? No-Growth Society is weak.

Res. Commons, Closing Circle. SIP

Res. Ward, B. Towards a World of Plenty.

~~Edel, Economics & the Env.~~

Engl.

Demand

Nat. defense

Growth

Productivity

Stability

Embed. Tech.

Capl.

(Distr.)

SURVEY ON GRADING

Continued from First Page

preparation they are receiving in high schools, Astin said.

For example, 42.6% of the students said a "very important" reason for deciding to go to college was to improve their reading and study skills, up from 35.1% in 1976 and 22.2% in 1971.

Describing this as "incredible," Astin attributed it to students becoming increasingly aware that they are "ill-prepared when they start college to deal with college material."

Another survey finding was that

energy conservation had replaced the environment as the principal issue concerning college freshmen.

Other chief concerns were that the government was not doing enough to control pollution or protect consumers from faulty goods and services.

Substantially less than a majority, 37.4%, agreed that "students from disadvantaged social backgrounds should be given preferential treatment in college admissions." But the percentage was up slightly from 1976.

Beyond that, freshmen attitudes reflected a mixture of liberal and con-

servative viewpoints on controversial issues.

For the first time in the history of the survey, for example, a majority (52.9%) supported the legalization of marijuana. And the percentage supporting busing to achieve racial balance in schools increased from 37% in 1976 to 40.6% last fall.

However, nearly two-thirds (64.3%) agreed that "there is too much concern in the courts for the rights of criminals," compared to 59.7% in 1976.

As in years past, the survey indicated that students continue to move toward the political center, with more than half now describing themselves as "middle-of-the-road."

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Three course proposals by Mason Gaffney for; the environmental program.

RESOURCE MANAGEMENT: Economics and Institutions

Kinds of resources treated: Water, air, extractive, soils, grazing lands; fisheries, urban land, rights-of-way, forests, radio spectrum, amenities and the public face of private property, wilderness, scenery, parklands, wild game, outdoor recreation.

Topics: the land market as a control over competition among uses; settlement patterns; resources and employment; optimal timing and intensity of use and development; conservation economics; zoning; resource taxation; private and public roles in resource management.

TAXATION AND LAND AND RESOURCE USE

Designed for needs of students of both tax administration, and resource management.

Several kinds of taxes have important effects on how land is used. The property tax is one, a tax based on resources themselves, and their improvements. Most jurisdictions have built elaborate systems of classification and exemptions and preferential treatment of different resources.

The income tax treats resource income distinctively, too, with profound effects on use, on conservation, materials supply for the economy, and so on. There are also many special resource taxes: severance, yield, reserves, mine income, net proceeds, effluent taxes, betterment charges, and so on.

Leasing of publicly owned resources also yields public revenues. Different payments required by leases are analogous to different forms of taxation in their rationale and their effects on management incentives. Many alternative leasing systems are under active review currently, and will be studied.

SPIillovers FROM LAND USES: Mutual Aid, Interference, and their control by public and private action.

Mutual aid comprises regional development and economic base analysis; interference gets into pollution, congestion, lot-line crowding, and the like.

This is a preliminary draft of ideas, circulated for information and for feedback.

Full empl. & ~~intensive use~~ full service vs.
Conservation and the environment
Can they be reconciled?

Involves:

Soft technology

Land mgmt.

Factor propns.

Energy

Capt. & applied to land mgmt.

Ec. history (of containment efforts)

Instr. bias

Urban growth controls, (zoning & plan)

Primary v. 2nd & higher activities. Ec. base

analysis,

Externalities, techn. & pec.

Techn. (env.) vs. pec. (empl.)

Exclusionary rationale

Land use, ~~for~~ human

Full employment, ^{resource demands} conservation and the environment

Resource demands of full employment

Fitting growing population and limited resources.

Factor proportions.

Ec. Growth, ~~with~~ ^{limited} ~~fixed~~ resources and environmental constraints
and full employment, ~~with~~

Modifying resource mgt. (private and public) harmoniously
to accommodate needs for full employment and full service
from resources. Intensification ~~of~~ with conservation and
~~Reconciling~~ ^{Harmonizing} conflict of
quality of environment. ^{Identifying} Just l. ^{biases with appropriate} ~~obstacles~~

Technology and

^{combinations of land, capital and labor.}
~~optimal~~ ~~econ. intensification.~~ ^{public policy questions}

Problems & policies. ^{Methods for finding optimal}

Analytical

combos. of inputs and appropriate technology.

Idea for summer, '78

Project for AFS on acreage limitation.

Ecs. of scale.

Data from G. Ballis.

" " new acreage limitation program.

Efficiency of water use.

Etc.

There is a big market for such a study!

I have the background

the destruction of soil and forest resources (as well as land grabbing) if spontaneous. The positive case maintains: (1) that the tropics contain potential for highly efficient conversion of the sun's energy into vegetation despite weak soils; (2) that once research discovers new methods these lands could provide specialty tropical agricultural goods and, particularly, beef for an insatiable world demand; and, (3) that mineral exploitation could be expected as well.

The empirical heart of the study is a survey of twenty four Latin American colonization projects visited by the author. The projects are classified into five types: directed colonization, semi-directed settlement, highways and spontaneous settlement, foreign colonization, and private company land settlement. They range from rigidly organized government ventures (such as the \$60 million Mexican project *la Chontalpa*) to little more than a penetration road. The author cites as the single most successful colonization experience in Latin America the development and sale of 1.2 million hectares to 39,000 families in Parana, Brazil since the 1930's by a private land company.

The individual projects in each group are discussed at a level of detail which is insufficient to satisfy those concerned with particular projects themselves (are the internal rates of return calculated by the author or the project directors, and under what assumptions?) but more than adequate to test the patience of the reader. Nevertheless, the chapter provides a chronicle of success stories and fiascos which forms the basis for the author's subsequent policy conclusions. A major shortcoming of the empirical presentation is that it fails to state the proportional relationship between the 24 project sample and the universe.

The central results of the study are drawn in the final chapter, which evaluates the observed projects as "dynamic," "acceptable," and "poor." On this basis, the author concludes that spontaneous settlement with penetration roads is much more successful than directed colonization (due to "inadequate technical and administrative capacity of government agencies" and consistent overestimation of benefits and underestimation of costs in project planning); and private land company development is promising but currently politically unwelcome.

These conclusions, if they appear to merit some policy application, are not based on statistical hypothesis testing. The precise criteria for classification are vague. Six of the eight "dynamic" projects show no cost-benefit estimates whatsoever. Of six

"poor" directed projects, one is too small to warrant generalization and the others show acceptable or even high internal rates of return (especially if labor is shadow priced). Thus, the author's conclusion of superiority of non-directed projects appears to rest on numbers of families involved relative to public costs, not on complete cost-benefit analyses including public and private costs.

Admittedly, a strong appeal of spontaneous settlement is its cheapness compared to directed colonization. The author estimates that the former typically requires public costs of \$700 per family whereas the latter cost \$5000 per family—practically ruling out directed colonization as a feasible option for absorption of rural labor on a significant scale.

Other points warranting attention include: (a) the author's opinion that land clearing should generally be mechanized, especially where speed or large scale are required (yet the only empirical comparative evidence, from a Mexican case, fails to shadow price the labor intensive alternative). (b) Cattle breeding must be large scale for efficiency (a verdict unsupported by other sources indicating constant returns to scale for livestock activity based on statistical production function estimates). (c) Excessive pre-investment studies and resource surveys should be avoided (although note that new earth resources satellite technology should greatly lower survey costs). (d) Housing is the least essential item for colonization success.

Major recent changes in the world economy may well modify the relevance of the book's conclusions. If the enormous recent commodity price increases are even partially maintained, the prospective markets and output benefits for tropical agriculture will be greatly improved. If the world market for grains is to be tight for several years, owing to the entry of socialist countries into the market combined with the multiplied feed grain demand effect of increased meat consumption as world incomes rise, there may be a much better case for tropical beef production, and for production of certain grains (rice in particular) in new settlement areas to release land for production of more temperate crops (corn, soybeans, wheat) in established agricultural areas in Latin America. At the same time, the increase in petroleum prices may alter colonization prospects, negatively from the standpoint of raising transportation costs, but perhaps positively from the standpoint of stimulating new oil exploration in unsettled tropical areas.

Subject to a reevaluation in light of these changes, the conclusions of the book should hold valid: colonization of the tropical forests cannot be relied upon to provide a major solution to poverty in Latin America; highly directed government settlement schemes are bound to be costly and absorb very limited portions of the labor force; but governments will persist in colonization schemes for reasons of military security and in an attempt to do something for the rural poor without carrying out socially upsetting land reform in established areas. This book serves as a useful reference volume to at least help minimize the costs of such colonization programs by highlighting past mistakes.

WILLIAM R. CLINE

Brookings Institution

720 NATURAL RESOURCES

Environmental decay. Economic causes and remedies. By JOE S. BAIN. Little, Brown Series in Economics. Boston: Little, Brown, 1973. Pp. ix, 235. \$4.95.

This is one of the recent flood of textbooks in environmental economics (printed, of course, on recycled paper). Bain says it is primarily for advanced undergraduates who already know price theory well. As it turns out, he presumes the student knows the standard partial equilibrium models of firm and industry, but he uses almost no other theory. This narrowness is a major weakness. However, much of his institutional and empirical material is excellent and can be profitably used independently of his theoretical chapters. The result is that the book is not suitable, in my opinion, as the main text for a course, but it is potentially useful as a supplementary volume in an environmental economics course or even a general course.

No standard format for texts dominates this field, in contrast to, say, intermediate theory or public finance. "Environment" is a big topic, and courses are short, making preparation of a syllabus an even more painful economizing job than it usually is. Instructors have varying ideas on what should be included, and so do textbook writers. However, Bain's will strike almost all as a highly individual product even in that context, both in its theoretical treatment and its case studies.

Chapters 1 and 2 present and apply economic theory to predict inefficient allocation of resources when there are unrecognized externalities and to review the economic merits of various public remedies

(effluent taxes, regulations, bans, subsidies, etc.). Chapter 3 is a reprinted article by Anthony Downs on the political economy and sociology of the environmental "movement," comparing environmental issues to other social issues and developing a very interesting general theory of the "issue-attention cycle." Chapter 4 is a reprinted article by Allen Kneese on water quality, criticizing public policy in pollution abatement and urging user charges. Parts of these two essays overlap with Bain's Chapter 2. Chapter 5 is a reprint of Bain's own earlier (1970) article on automobile pollution. Then come three new chapters by Bain, on rural recreation and wilderness, the deteriorating environment of central cities and suburbanization, and the adverse environmental effects of highway and airline transportation. The last chapter summarizes and draws conclusions.

I found the theoretical introduction unsatisfactory. As mentioned, Bain relies almost wholly on partial equilibrium models of firm and industry, using them to discuss welfare losses due to external costs, the possibility that monopoly distortions may offset externality distortions, the effects of effluent taxes and subsidies, and misallocations of land and water resources between recreation and other uses. All the diagrams are the same basic type, with cost curves (all too often marginal cost is assumed to equal average cost) and demand curves. Someone familiar with the field and the general run of texts, who thumbs through Bain, will be struck by the absence of the customary "optimal pollution" diagram. That is a matter of taste, but some other omissions are more serious. Crucial parts of economic theory are missing: the theory of public goods; the essentials of cost-benefit analysis; the distinction between "marginal" and "lump-sum" externalities; the impact of externalities and policies on income distribution; the Coase theorem and the "bargaining solution." The attention to monopoly is useful, but the cursory treatment of the intermediate case of oligopoly is surprising coming from Bain. And the notion of rent of a natural resource is not well explained.

Then, too, surely environmental economics is not only microeconomics. Students will look in vain for such lively topics as the shortcomings of GNP as a measure of welfare and the dispute over the desirability of continued economic growth, and they will find the relationship between population growth and environmental degradation treated in only a few sentences.

"Macro-econ. & the Environment"

Course titles

~~Oh, this pen again!~~

Technology and jobs

Substitution among inputs

Input substitution, growth and jobs

Economy, environment and employment

Growth Management, micro & macro

Capital Management, micro & macro.

GROWTH MANAGEMENT (with limited resources)

Treats national, urban and firm growth. Accommodating growing population and demand with limited national resources. Adapting project planning, technology, factor proportions, scale and organization to shifting cost parameters and relative scarcities. Resource conservation, intertemporal choices and the environment. Managing urban growth, at the fringes and in total. Institutional constraints, lags and biases affecting economic optimization. Growth of firms: synergy vs. the frictions of scale.